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Please award this degree, even though it is likely to make others miserable – and me too

An investigation of the relationships of absolute and relative socio-economic status with subjective wellbeing in the United States and England

Laura Kudrna

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Declaration

I declare that my thesis consists of 95,833 words.

I can confirm that chapters one, two, six and sections 3.1, 3.4, 4.1, 4.4, 5.1 and 5.4 of my thesis were copy edited for conventions of language, spelling and grammar by Lisa Findley.

Statement of conjoint work

Conjoint work is always indicated by footnotes in the thesis. I confirm that sections 1.3 and 6.2 were jointly co-authored with Professor Paul Dolan. They are drawn from Dolan and Kudrna (2016). I contributed to this work by writing and revising drafts with Paul Dolan and conducting a literature review, and Paul Dolan provided the core conceptual guidance. In section 2.3, the subsections 'Subjective wellbeing – general introduction to measurement' (p. 109) and 'Control variables – ATUS' (p. 119) were drawn from jointly authored work with Professors Paul Dolan and Arthur Stone (Dolan, Kudrna and Stone 2017). I contributed to this work by writing and revising drafts with Paul Dolan and Arthur Stone, and I analysed the data. Paul Dolan and Arthur Stone provided conceptual guidance.

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Abstract

This thesis argues that we can better understand the relationship between socio-economic status and subjective wellbeing (SWB) by considering more carefully to whom and how people make comparisons and what is meant by SWB. It questions existing knowledge with new empirical evidence and frameworks for both 'reference groups' – the people to whom we (may) make comparisons – and SWB. These contributions are situated within existing social comparison, norm and identity theories from economics and psychology. Using two large datasets from the United States and England, over 300 reference group measures are created. Nearly 4K models are analysed, adjusting for multiple comparisons. Although the results should be interpreted cautiously due to issues of endogeneity, they suggest that upward comparisons to others' socio-economic attainment do matter for SWB and are almost always negative after accounting for individual attainment and multicollinearity. Comparisons to others of a similar age and to perceptions of those in 'society' matter most consistently. Socio-economic attainment in and of itself, however, is not sufficient to improve how people feel even if it improves their thoughts about how well their lives are going, and it is difficult to escape the negative effects of relative socio-economic status. Negative effects are evident across the distributions of SWB and absolute socio-economic status, for both women and men, and across age groups. It is not possible to dismiss the idea that comparisons to others' socio-economic attainment do not matter – and yet, achieving socio-economically in absolute terms does not guarantee a life free of misery and full of happy and meaningful moments, either, even if this should be the ultimate aim of people and social policies. These results can inform normative debates about optimal resource distributions in societies and underscore the importance of considering how well people are doing socio-economically in relative and not only absolute terms.

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List of abbreviations

AIC: Akaike information criterion

ATUS: American Time Use Survey

BIC: Bayesian Information Criterion

CPS: Current Population Survey

DRM: Day Reconstruction Method

ELSA: English Longitudinal Study of Ageing

GOR: Government Office Region

LA: Local Authority

ONS: Office for National Statistics

SWB: Subjective wellbeing

SWLS: Satisfaction with Life Scale

VIF: Variance inflation factor

WWID: World Wealth and Income Database

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Chapter summaries

This thesis is about what matters to people. It takes the dominant paradigm of thinking in policy and many private lives, which is that socio-economic achievement is what matters, and looks at its relationship with an alternative account of wellbeing, which is that it is people's subjective mental states – that is, their subjective wellbeing (SWB) – that matter. In chapter one, the argument that we can better understand differences in how well or badly people are doing by looking at how these accounts are related is discussed. A challenging issue that complicates their descriptive relationship is that it is not just individual attainment that affects SWB. Prior research shows that people make upward comparisons to others' socio-economic status – that is, to 'relative socio-economic status' in some 'reference group' – which usually negatively affects how they feel and think about their lives. But it is difficult to interpret the results of existing research due to ambiguity in the conceptualisation and measurement of both relative socio-economic status and SWB, which is a problem because it is then difficult to know how they are related. Chapter one, therefore, introduces new frameworks for thinking about relative socio-economic status and SWB. The first is a framework for 'reference groups' – the people to whom we (may) make comparisons. This framework categorises relative socio-economic status and its measures according to 'scope' (boundary conditions or 'frames of reference' like geography, age or gender), 'summary' (e.g. average, median or proportion) and 'standpoint' aspects (which explicitly incorporate an individual's position in the socio-economic distribution, like rank or distance from the average). The SWB framework classifies SWB along two dimensions – 'evaluations' and 'experiences' of 'pleasure' and 'purpose'. Throughout, the disciplinary focus of the thesis is twofold – economics and psychology – the former because it focusses on the allocation of scarce resources, which influences people's absolute and relative socio-economic positions, and the latter because it has contributed to our understanding of how social comparisons operate, which are a prominent mechanism between relative socio-economic status and SWB. Prior research into relative socio-economic status and SWB in these disciplines is reviewed with a focus on social comparison, norm and identity theories.

In chapter two, the methodological approach is justified and developed. It is argued that a quantitative research approach is most appropriate for characterising the 'effects' of socio-economic status on SWB due to psychological tendencies such as the focussing illusion and confirmation bias, which would likely lead to an overestimation of the strength of the relationship of socio-economic status with SWB in a qualitative study. In the absence of social network datasets with detailed measures of both socio-economic status and SWB, and of any evident natural experiment to better estimate causal effects, two secondary datasets are analysed with linear and fixed effects regression models. These are the 2012-13 wellbeing modules of the American Time Use Survey (ATUS) and waves two through six of the 2004/5 – 2012/13 English Longitudinal Studying of Ageing (ELSA). Using these (and a few other datasets), over 300 measures of relative socio-economic status are created and analysed (a few of these already existed in the data). These measures vary according to nearly 30 different scopes such as age, gender and religious affiliation in states and government office regions; three different summary metrics – average, median and proportion; four different standpoint metrics – rank, distance from average and from median, and perceptions of relative standing; and four core aspects of socio-economic status – income, wealth, education and unemployment. They are analysed for their relationship with four measures of SWB in each dataset that capture evaluations and experiences of pleasure and purpose, and nearly 4K models are analysed in the thesis. These analyses are adjusted for multiple comparisons, conducted without and with controls, and use survey weights; AIC (Akaike Information C riterion), BIC (Bayesian Information Criterion) and VIF (Variance Inflation Factor) criteria of model fit; and multiple imputation for missing data to assess the robustness of the results. A summary of the methodology is in Table 2.1, p. 71; the SWB measures are shown in Table 2.5, p. 113; and the 300+ relative measure are shown in Tables 2.7 and 2.8 on pp. 141 and 142.

In chapter three the relationships of absolute income, wealth, education, occupation and unemployment with SWB in ATUS and ELSA are established. Although much prior research shows that better individual-level socio-economic status is associated with better SWB, it is questionable whether 'high' socio-economic status is always associated with better SWB due to socio-economic differences in identity, leisure time, values, conformity and social comparisons. In ATUS, high income is only associated with better life

evaluations and not better experiences. Those with family incomes of $100K+ even experience lower levels of happiness and less meaning than some lower income groups (which is rare in the context of prior literature), although higher income does protect against negative experiences (as in prior research). In ELSA, income is not associated with any dimension of SWB after introducing controls and fixed effects, although wealth is still associated with better life evaluations. This is consistent with the idea that the greater stability of wealth vs. income may afford it a greater contribution to SWB. The relationship of education with SWB in both datasets depends on the controls used, confirming the idea that the benefits of education are in what accompanies it, such as more income and better health. On the other hand, higher occupational class is largely associated with better evaluations of SWB but not better experiences across datasets, and while unemployment is clearly associated with worse evaluations of life, it is not usually associated with worse experiences. In ATUS, the transition out of unemployment is characterised by relatively low SWB, which could be due to uncertainty and adaptation processes occurring around the time of re-employment. Policies might consider addressing the point of re-employment to improve SWB and/or encourage re-employment.

After establishing the absolute effects of socio-economic status on SWB, chapter four turns to the relative effects. Prior research and theory suggests that higher relative status in a reference group might have positive or negative effects on SWB. Social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect' all predict positive effects, while relative income, deprivation and other theories predict negative effects. Although the effects predicted by these theories might be at play in combination with each other, most prior literature shows negative average effects of relative socio-economic status on SWB. This is also confirmed in the analyses in this thesis. Of the over 300 measures of relative socio-economic status, around a third are excluded due to multicollinearity. In many instances, these measures would have otherwise shown misleading positive effects. Of the rest, three are associated with SWB in ATUS and 30 in ELSA after adjusting for multiple comparisons and excluding those that did not withstand the multiple imputation. Summaries of these results are shown in Tables 4.15 and 4.16 (pp. 253 and 254). This is evidence that relative socio-economic status does, in fact, matter for SWB on the whole, and that the overall effect is usually negative even if people do derive some benefit from

seeing others do well, such as hope. In terms of how relative socio-economic status mattered for SWB, the scopes age and perceptions of those in society mattered most consistently, and summary measures outperformed standpoint measures of socio-economic status in terms of statistical significance – in contrast to what would be predicted by range-frequency theory. The relative socio-economic status of neighbours in states (in ATUS) and local authorities (in ELSA) alone were never associated with SWB, suggesting that people need to identify with their neighbours in some way (such as age) in order for social comparisons to them to matter for SWB. In ELSA, relative generally mattered more for SWB than absolute socio-economic status in AIC and BIC tests of model fit, whereas in ATUS absolute socio-economic status mattered more. Consistent with the negative effect of high income on happiness in chapter three, higher rank earnings in ATUS is, exceptionally, associated with less happiness.

In chapter five a selection of the relative effects in chapter four are further explored according to individual differences in levels of SWB, socio-economic status, gender and age. Differences according to SWB are particularly important because if relative socio-economic status only impacts those who are already doing well, they may be less of a policy concern. Yet there are negative effects across the distribution of SWB, as well as across the distributions of socio-economic status, gender and age. It is difficult to find a group that is not affected by their relative socio-economic position, although in ATUS, the unemployed are not negatively affected by higher relative unemployment in age groups in states. This is consistent with a social norm effect of unemployment, whereby people feel better when there are more people like them – which is the case for people who are unemployed when relative unemployment is higher. These results do not show directly that the unemployed feel better; however, they at least do not feel worse from higher relative unemployment. Women's SWB also appears to be slightly more affected on standpoint measures of relative socio-economic status than men's, which prior theory suggests may be due to the greater emphasis that they place on social relationships.

Chapter six provides an overall discussion of the key results, their implications and policy conclusions. It argues that experiences of SWB are a better reflection of how well people's lives are going than evaluations are due to issues such as duration neglect in evaluations

and comprehension problems in life satisfaction judgements. Although relative socio-economic status on the whole was more closely associated with evaluations than experiences of SWB in this thesis, it still mattered for experiences, and, therefore, still matters in terms what sort of wellbeing should be prioritised by people and policymakers. Even though standpoint measures of relative socio-economic status were not more closely associated with SWB than summary measures, the idea that rank matters should not be dismissed because these results should be interpreted in the context of other research showing that it does matter. Even if one accepts the argument that policy decisions should be cleansed of psychological processes such as envy, the absolute effects of socio-economic status on SWB warrant caution about pursuing socio-economic achievement to excess. Methodological and other limitations are discussed, including the problems of multicollinearity, endogeneity, mechanisms and missing data. Future research directions are explored, such as the need to consider SWB within and between generations, longitudinal data on people's experiences of SWB alongside measures of socio-economic status and the distribution of SWB within scopes and not just the distribution of socio-economic status.

1. Introduction

Summary

Some people do better or worse than others. Does this matter? This thesis argues that it does by exploring how two ways of conceptualising difference are related. The first is difference according to socio-economic wellbeing. This a prominent account of wellbeing that some argue lies at the core of welfare maximisation. Social policies track and influence socio-economic wellbeing, such as by recording unemployment rates and encouraging social mobility. These efforts appear to be partly based on the assumption that changes in socio-economic wellbeing reflect changes in how well or badly people are doing. There are reasons, however, which are explored throughout this thesis, to suppose that they do not. One way to find out is by drawing on a relatively newer account of wellbeing in shaping social policies, which is subjective wellbeing (SWB). This is the second way that this thesis considers difference. In the existing literature, it is difficult to know how socio-economic wellbeing and SWB are related to one another because of ambiguity in their conceptualisation and measurement. This is a problem because it is then difficult to know how socio-economic and subjective wellbeing are related, and whether absolute or relative socio-economic status affects SWB more. This chapter contributes to the literature by providing new frameworks for thinking about the reference groups used to capture the people to whom social comparisons are or may be made, as well as for the dimensions of SWB. It introduces the research questions, which are about how the relationship of socio-economic status with SWB changes based upon how socio-economic status and SWB are conceptualised and measured – with 'scope', 'summary' and 'standpoint' aspects of reference groups, and with 'experiences' and 'evaluations' of 'pleasure' and 'purpose', respectively. These questions are contextualised within existing social comparison, norm and identity theories from economics and psychology. Identity theories have not been applied widely enough across the literature on relative socio-economic status and SWB, which this thesis addresses in order to provide greater coherence and breadth to discussions of how relative effects might operate.

Background and motivation

How well or badly individuals and societies are doing is a central concern of contemporary social policy (Dolan 2011; Dean 2012). Some do better or worse than others. There are differences within and between countries in wellbeing according to how healthy people are, for example, and in how much money they earn, how free they are to express themselves and whether or not they can access education (Sen 1985; Nussbaum 2008; Deaton 2013). These inequalities result in individual and group-level differences in status, e.g. in health and educational status, which are shaped by social policies. Governments collect taxes and redistribute income, create laws to protect or suppress freedoms, provide free or subsidised education and healthcare, and invest in programmes to reduce unemployment. All of this affects people's absolute and relative status in various domains.

The ways in which absolute and relative status affect wellbeing depend upon how wellbeing is conceptualised. This thesis focusses upon two conceptualisations of wellbeing and how they are related to each other. The first is socio-economic wellbeing, in particular, socio-economic status. This term is used here to indicate a broad concept reflecting both someone's absolute socio-economic position (such as their level of income or education) as well as their relative socio-economic position (such as their level of income relative to their neighbours or colleagues) (Shaw 2007). It is often assumed that high (low) socio-economic status reflects high (low) wellbeing. For example, income gives people the opportunity to satisfy more of their preferences, which some argue lies at the core of individuals' welfare maximisation (Harsanyi 1996; Hausman and McPherson 2009). Reducing unemployment and ensuring access to education are routes to increasing people's socio-economic status, and these are presented as important policy goals (BIS 2014; Atherton 2017).

Contribution of thesis

This thesis explores how socio-economic status is related to a relatively newer account of wellbeing in shaping social policies, subjective wellbeing (SWB), which reflects how people feel and think about their lives (Pavot and Diener 1993; Kahneman and Riis 2005). SWB is often measured by asking people to report on how they are feeling with a question

such as, “How happy do you feel right now?” or on thoughts about how well their lives are going, such as by asking, “How satisfied are you with your life overall?” (Dolan and Kudrna 2016). Such questions are of increasing relevance for monitoring, informing and/or appraising social policies (Dolan and Metcalfe 2012). In 2009, the landmark Stiglitz Commission recommended that national statistical offices collect SWB data in addition to more traditional measures of wellbeing, such as GDP, to better understand how well or badly people are doing in ways that economic indicators do not always capture. In the UK, the Office for National Statistics (2011, 2017) collects nationally representative SWB data annually, includes SWB as an official national statistic and uses SWB measures in cost-benefit analyses – for example, to assess the non-pecuniary benefits of culture and sport to society (Fujiwara and Campbell 2011; Fujiwara, Kudrna and Dolan 2014). Internationally, the United Nations (UN 2012), Organisation for Economic Cooperation and Development (OECD 2013, 2017) and US National Academy of Sciences (NAS 2014) have all recognised the importance of SWB for social policy.

Despite interest in the answers to SWB questions in policymaking, there is still considerable debate about what affects SWB and in what ways, including the role of socio-economic status. A grounding assumption of this thesis is that whether or not higher socio-economic status is desirable for individuals and societies should be informed by empirical evidence on SWB – though perhaps never fully determined. It should not be taken for granted that the concern of social policies with socio-economic status necessarily reflects the concern with how well people and societies are doing. Instead of assuming that socio-economic status in terms of, for example, higher education, inequality, upward social mobility and low or no unemployment are good or bad, SWB evidence should be used to inform about whether or not they are in fact good according to people’s own reports of how well their lives are going.

SWB data provides evidence about how people react to their own and others’ socio-economic attainment. These data can illustrate whether the pursuit and realisation of being better educated than one’s parents improve how people feel and think about their lives or not, for example, or whether increases in income improve people’s feelings and thoughts about their lives if the people they live close to also receive a similar increase in income. In

so doing, research on SWB can inform discussions about the optimal level and distribution of socio-economic resources for individuals and societies. Necessarily, such an investigation is only informative. To make a determination, a social welfare function, incorporating concerns about equity and efficiency, is required. SWB research can, however, inform about the parameters of a social welfare function (Rodríguez 2015).

It is not at all clear from the existing SWB literature that improving (reducing) socio-economic status leads to increased (decreased) SWB. As an example, Hadjar and Samuel (2015) show that upward intergenerational social mobility is associated with reduced SWB in the UK. The reasons for why socio-economic and SWB may not always be closely linked are explored later in this thesis (see chapter three). First, it is important to be clear what is meant by both 'socio-economic' and 'subjective' wellbeing, and there are a number of challenges that affect our understanding of the relationship of socio-economic status with SWB. A selection of these inspire the research questions in this thesis.

These challenges and questions are the focus of the first section (1.1) of this chapter. The next two sections provide new conceptual frameworks for thinking about socio-economic status (section 1.2) and SWB (section 1.3), which illustrate how these concepts will be approached in this thesis in light of the research challenges and questions. The chapter concludes with a critical overview of how the disciplines of economics and psychology have tackled the question of how socio-economic status relates to SWB (section 1.4), which further provides a conceptual foundation for the subsequent empirical chapters of the thesis.

1.1 Research challenges and questions

This section illustrates that it is difficult to understand the nature of the relationship of socio-economic status with SWB due to ambiguity in the conceptualisation and measurement of (a) socio-economic status, in particular its relative aspect, and (b) SWB. A core contribution of this thesis is to clarify the landscape of existing SWB concepts and measures, and to explore whether and how socio-economic status differentially relates to different dimensions of SWB. These two initial challenges also complicate the issues of (c) whether absolute or relative socio-economic status matters more for SWB and (d) for

whom relative socio-economic status matters most. Following from the discussion of these challenges, a number of research questions are proposed that relate to each of the four challenges.

The challenge of conceptualising and measuring socio-economic status

Socio-economic status is sometimes considered to be an 'objective' measure of wellbeing. This is mainly because it can be assessed independently of people's perceptions (Nussbaum 2008; Adler 2012) even though SWB can be, too (see p. 110). Moreover, 'subjectivity' is still present in conceptualising and measuring socio-economic status. For example, when measuring household income, subjective and normative decisions must be made about the most appropriate equivalisation methods to account for households of differing sizes (Jenkins 2011). There are also issues about what indicators to use to capture the concept (Hox 1997). Many indicators have been discussed as reflecting aspects of socio-economic status, including income, wealth, education, ethnicity, social class, consumption, debt, housing, occupational level and employment status, and there are also more qualitative aspects of socio-economic status, such as power and social relations or cultural capital (Bourdieu 1984; Argyle 1994; Braveman et al. 2005; Navarro 2006; Savage et al. 2013).

There are of course many ways one can define socio-economic status using such 'objective' indicators. The aim of this thesis is not to exhaust all such possible measures; rather, to use some of the most prominent ones. Income, wealth, education and unemployment are the central aspects of socio-economic status investigated, following the majority of previous literature investigating the relationship of relative socio-economic status and SWB (see section 4.1). It is acknowledged that some dimensions of socio-economic status are necessarily omitted as a consequence of this approach; however, the indicators used in this research may capture some of the variance in related constructs like occupational prestige, social class or cultural capital.

One of the main issues in the literature on socio-economic status and SWB is that it is not just one's absolute level of socio-economic status that can affect SWB. Relative socio-economic status also matters. Intuitively, an annual payrise of £10,000 might seem like a

lot and contribute positively to someone's SWB; however, if those around that person also receive a payrise of £20,000 – and if this is known – their own payrise might affect their SWB less, not at all or even negatively because of the social comparisons made to others' pay.

Yet, what is meant by the phrase 'those around' in that last sentence?

This thesis tackles this question through the lens of 'reference groups'. In this thesis, reference groups are defined throughout as the people to whom we compare ourselves (Hyman 1942, 1968; Runciman 1966) or simply have knowledge of in some form even if we don't engage in comparison processes. For example, we might notice our neighbours' levels of education, and either compare our education to theirs – or not, we may simply take note of their levels of education and move on. The phrase 'reference group' is interpreted in diverse ways across various literatures, both without and with comparison processes as part of the definition. Shibutani (1955), for example, defines reference groups as "groups whose perspectives are assumed by the actor" (p.563). Social comparisons are not present in this definition.

Unlike Shibutani's definition, however, the definition of reference groups in this thesis does not even assume that individuals take on anything about the perspectives of other people in their reference groups. They are simply a source of information – that is, a group that people acquire information about in some manner. One of the definitions of 'reference' is "a source of information…to which a reader or consulter is referred" (Merriam-Webster 2017). And so here, groups are a source of information individuals refer to – 'reference groups'. Because two people are called a pair, groups are simply three or more people; however, for reasons that are laid out in detail in chapter two of this thesis, the reference groups considered in this thesis are mostly larger than three people. There is much information that one could consider about a group, and this thesis focusses upon the acquisition of socio-economic information about groups.

When people acquire information about others' socio-economic status, there are very different psychological processes evoked when they are told that someone else's socio-

economic status is, for example, high or low versus when they make their own judgement about whether it is high or low. It is also difficult to avoid judging information about others' socio-economic attainment in some way and to avoid using one's own socio-economic status in the judgement. The following discussion from Kahneman and Miller (1986) illustrates both of these points:

> In category-centered comparisons, the object of judgment is compared to the norm for a specified category. In stimulus-centered comparisons, the elements of the norm tend to be recruited directly by the stimulus itself. "Jane owns a small dog" is an example of a category-centered judgment. To make and to interpret such judgments, a norm of size for a particular category must be invoked… Stimulus-centered judgments are more elusive. Consider the following information: "Ms. Z is 26 years old, with a Master of Science degree in geography. She earns $33,000 a year." Most readers will probably recognize that, although not instructed to do so, they have already evaluated Ms. Z's salary as high or low. The norm for this judgment is not precomputed: Few people will have access to stored statistics for the income of 26-year-old women with a master's degree in geography. Furthermore, we suspect that the norm that yields the spontaneous judgment of Ms. Z's salary is not quite the same as would be elicited by the category-centered instruction "Compare Ms. Z's income to 26- year-old…" In particular, some friends have joined us in confessing that thoughts of their own past and present income were not irrelevant to their evaluation of Ms. Z's salary. Stimulus centered norms are not restricted to members of a particular category and are likely to be biased toward highly available examples (p.150).

Kahneman and Miller go on to note that category-centred judgements are not wholly different to stimulus judgements; rather, they are on a continuum with each other. In reality, people can acquire information about the socio-economic attainment of others in their reference groups in a whole host of different ways – from being told that top income shares are too high by the media (*BBC News* 2016), to noticing someone's accent and inferring their social class (Argyle 1994). Recent research even suggests that people can infer someone else's social class better than chance from their faces alone (Bjornsdottir and Rule 2017).[1] The way in which we internalise information about others' socio-economic status, and compare our own to others' attainment, is discussed further in section 1.2. The important points here are simply that people's judgements about others' socio-economic

[1] See also US evidence on inferring social class from voice here, http://www.npr.org/podcasts/484357984/everyday-ethics, 24 May 2017, 11:28, Voice Modulation

attainment can differ depending on how they acquire this information, it is difficult to avoid making comparisons even though it is possible not to and the definition of reference groups used in this thesis does not assume we compare to others – although we might, and often do (see also Gilbert, Giesler and Morris 1995 for a discussion of these issues).

When we do compare our own to others' socio-economic status, there must be some reference group that we use to make the comparison. In the language used by Kahneman and Miller above, there must be some 'norm', which in this thesis is interpreted as being the socio-economic status of some reference group of people. So, just who are the people in our reference groups? This is one challenge that will be addressed in this thesis. Are these people neighbours, friends or colleagues (Luttmer 2005; Card et al. 2012; Phua 2013)? Are they celebrities, or perhaps political figures (Miller, Wlezien and Hildreth 1991; Franzoi and Klaiber 2007)? Family members, or people's past or future selves (Giallo et al. 2013; Dolan and Lordan 2013; Hadjar and Samuel 2015)? Despite this potentially vast diversity in such characteristics, they are usually not varied within studies that investigate the relationship of relative socio-economic status with SWB – or if they are, there are only varied in a few ways, and the analyses do not focus on differences across the variations or their effects on SWB (for some important exceptions, see section 4.1 for Dornstein 1988; Law and Wong 1998; Bygren 2004; Knight, Song and Gunatilaka 2009; Senik 2009; Clark and Senik 2010; Pérez-Asenjo 2011; Anderson et al. 2012; Callan, Kim and Matthews 2015). The reference groups often contain different people between studies, and so it is challenging to compare them to discover those that matter for our SWB or not.

It is not just how to define "those around" that is a challenge. There is also the issue of how information about reference groups is reduced for measurement, and again, the approaches are very different between studies. Should we take an average of a particular characteristic within a reference group, such as average income (e.g. McBride 2001) or average education (e.g. Nikolaev 2016a)? An average would be one way to get at a 'norm'. Should we consider how equal the distribution of income is (Cheung and Lucas 2016)? What about considering a rank measure (e.g. Brown et al. 2008; Clark et al. 2009; Wood et al. 2012; Kifle 2014), or distance from summary measures, such as distance from average income or education (e.g. Hounkpatin et al. 2015; Botha 2014)? Or should we just ask people where

they see their relative socio-economic position, for example, relative to their friends or within 'society' (e.g. Adler et al 2000, Singh-Manoux, Marmot and Adler 2005; Anderson et al. 2012; Callan, Kim and Matthews 2015; Sheehy-Skeffington and Sidanius 2016)? To address these challenges, this thesis classifies approaches to varying aspects of the reference group under three broad categories of aspects – 'scope', 'summary' and 'standpoint', and varies them within samples in analyses to investigate whether and how they affect the relationship of relative socio-economic status with SWB.

The scope, summary and standpoint aspects of reference groups are shown visually in Figure 1.1. Because this is a key contribution of the thesis, it is first shown here for illustration, and then discussed in further detail and within the context of other literature in section 1.2. In brief, the scope is the boundary condition of the reference group; that is, any feature or characteristic like age, geography or gender that is used to distinguish one group from another. The summary of a reference group is the metric used to present aggregate information about the heterogeneous individuals contained within the scope of the group, such as average income or median education. The standpoint of an individual within the reference group is where an individual is positioned within the group with respect to the aspect of relativity investigated, such as rank income or distance from the average income within scopes. How these aspects are related to each other is discussed further in section 1.2.

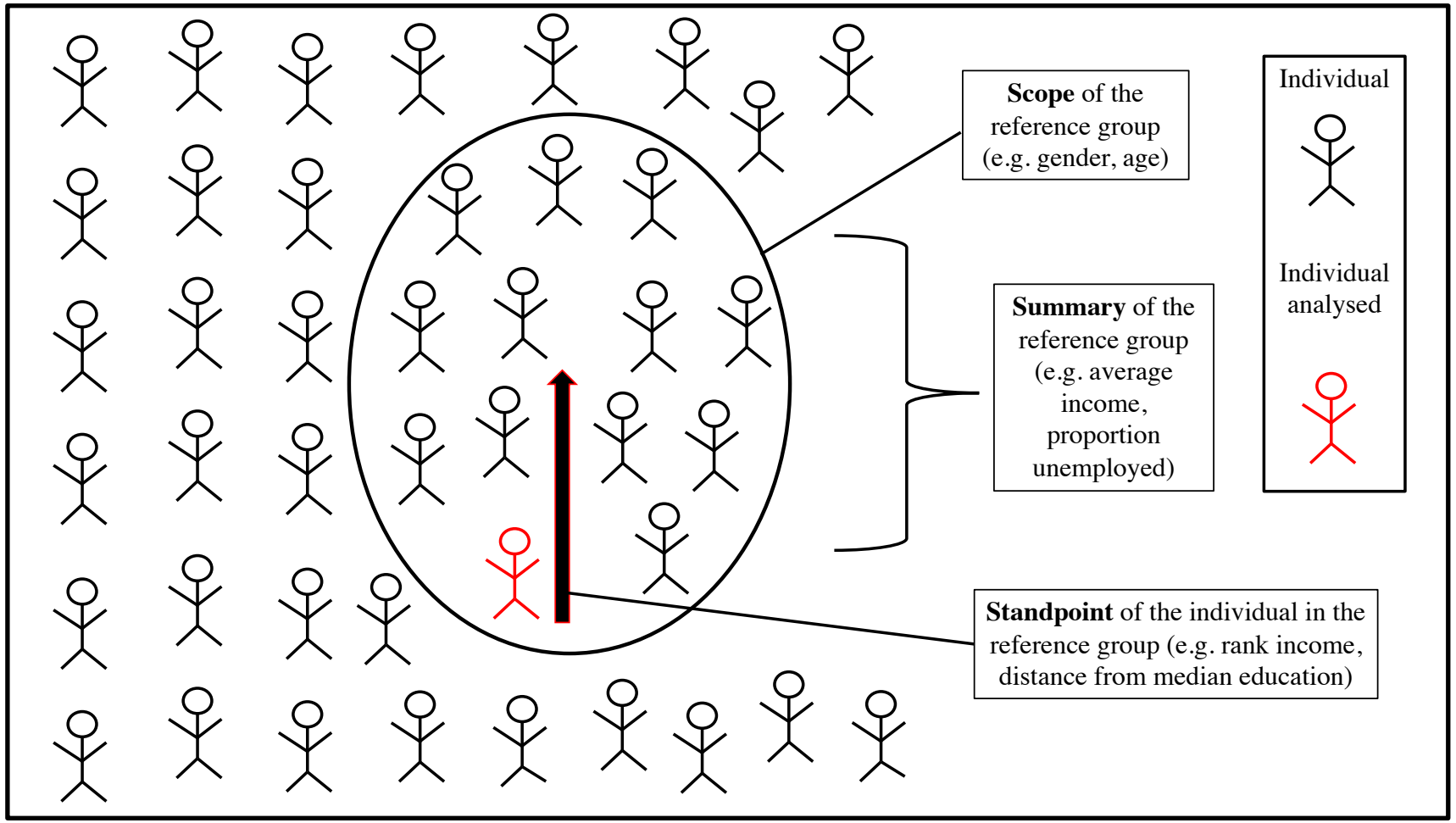

Figure 1.1: Stylised depiction of the scope, summary and standpoint aspects of reference groups.

The challenge of conceptualising and measuring subjective wellbeing

As mentioned earlier, another key contribution of this thesis is to clarify our conceptual understanding and measurement of SWB. To be useful in policy and research, any measure of SWB should meet three criteria: policy relevance, empirical robustness and theoretical rigour (Dolan, Layard and Metcalfe 2011). The policy relevance of SWB was established earlier (p. 16), and there has been substantial research into the empirical robustness of SWB measures, especially on questions such as, "How happy do you feel right now?" and "How satisfied are you with your life overall?". Existing research suggests such measures are valid and reliable indicators of wellbeing. As summarised by Kahneman and Krueger (2006), they predict whether or not people recover from illness, are associated with neural activity in the prefrontal cortex and smiling, and are similar to informant assessments of SWB from family and friends. SWB measures are not always reliable in the psychometric sense that they produce the same result on every measurement occasion; however, it may be that a SWB-altering event occurred between measurement occasions. For example, even momentary changes in thoughts can affect SWB (Killingsworth and Gilbert 2010; Alahmadi et al. 2017). Thus, changes in SWB between measurement occasions could be a valid reflection of changes in the construct over time, rather than a lack of reliability reflecting a lack of empirical robustness.

Given the established policy relevance and empirical robustness of SWB measures, this thesis focusses upon their theoretical rigour. The conceptual basis of SWB – that is, what exactly SWB is - has been debated for thousands of years (Aristotle 2002 translation; Bentham 1907; Dolan and White 2007). Despite these longstanding debates, there is still substantial ambiguity in the literature surrounding the meaning and measurement of SWB. Adler (2012) and Robinson (2013) discuss whether SWB has a role in policy at all, arguing that the lack of clarity about what SWB is and how to measure it renders its place in policy premature. Their concerns are not unfounded because many researchers are unclear about what their various measures of SWB capture and there is no obvious consensus about which one(s) should be used.

For example, Fredrickson et al. (2013) conducted a study, covered in the media as 'Meaning Is Healthier Than Happiness' (The Atlantic 2016), on the genetic basis of different dimensions of SWB. The authors argued that their research demonstrated that people who score high on eudemonic SWB - one aspect of SWB that loosely reflects 'purpose' – have a dissimilar gene expression to people who experience adversity and stress, whereas people who score high on hedonic wellbeing – another aspect of SWB that loosely reflects 'pleasure' – have a similar gene expression. The article was quickly critised by other SWB researchers for being "conceptually deficient" and mis-measuring the dimensions of SWB (Brown et al. 2014, p. 12705). Looking to the measures used in the study, this appears to be a fair criticism: it is questionable whether asking people how often they feel 'that people are basically good', as was done in this research, is a valid reflection of SWB. This question appears to better reflect how people feel and think about others' lives, rather than their own lives.

In addition to issues like this surrounding the conceptual rigour of SWB assessments there are also ongoing normative debates about which component of SWB best reflects how well people and societies are doing. A key distinction, discussed further in section 1.3, is between people's thoughts and reflections on how well their lives are going overall (evaluations of SWB) and their more moment-to-moment feelings and sentiments (experiences of SWB) – (Pavot and Diener 1993; Kahneman and Riis 2005; Dolan 2014; Dolan and Kudrna 2016). In reviewing the book *Measuring Happiness* (Weimann, Knabe and Schöb 2015), Kudrna (2016) comments on this debate. I discuss what Weimann, Knabe and Schöb conclude from their finding that unemployment is associated with worse life evaluations but not worse experiences of SWB:

> Assuming unemployment does not cause people to experience less happiness or meaningfulness, what are the implications of such as result? According to the authors, "…we believe that affective [experiential] happiness isn't a suitable guide for evaluating social conditions at all" (p.138). But we should not select an indicator on the basis of whether or not it produces results we expect or not, or, worse still, like or not. Otherwise, we risk selecting indicators that confirm existing perceptions about what we believe should matter to other people's lives, rather than discovering what actually does. How to decide what sort of happiness should be prioritised in our assessments of wellbeing is an unresolved debate worth having (Luhmann et al., 2012; Dolan, 2014; Adler et al., 2015; O'Donnell and

Oswald, 2015; Dolan and Kudrna, 2016).

Given unresolved debates like these about what SWB is, how to measure it, and what component of SWB best reflects how well people's lives are going, understanding the relationship of socio-economic status with SWB it is not straightforward. We cannot know how socio-economic status relates to SWB without understanding what SWB is conceptually and how SWB measures relate to the conceptual basis of SWB. This is an important issue because differences in what is meant by SWB and how it is measured can affect who appears to be doing well and badly, and consequently, can impact upon our conclusions about who should be prioritised in the allocation of scarce resources (Kahneman and Deaton 2010; Luhmann et al. 2012). To address this challenge, this thesis carefully specifies the theory underlying the SWB measures that are used, and assesses multiple components of SWB to avoid the criticism that a component has been overlooked (see section 1.3 and chapter 2).

Because the classification of the dimensions of SWB is another key contribution of this thesis, it is introduced here and discussed in further detail in section 1.3. The dimensions are shown below in Table 1.1. In brief, there are two key dimensions. The first is the 'level', which includes 'evaluations' and 'experiences', and the second is the 'type', which includes 'pleasure' and 'purpose'. Evaluations are cognitive judgements about life overall or certain aspects of life such as work or relationships (Kahneman and Krueger 2006). Experiences are people's assessments of how they feel on a moment-to-moment basis (Scollon, Kim-Prieto and Diener 2003; Kahneman, Krueger, Schkade and Schwartz 2004). Pleasure is shorthand for a range of adjectives associated with positive and negative hedonic feelings, such as joy, contentment, anger, worry, stress and sadness (Watson and Tellegen 1985). Purpose is shorthand for a range of adjectives associated with positive and negative feelings that are non-hedonic, such as purpose, fulfilment, meaning, pointlessness and futility. There is also a category for 'satisfaction' measures in the Table, classified as 'combinations and other', which is discussed further in section 1.3, p. 53.

Type ***Level***	***"Pleasure"***	***"Purpose"***	***Combinations and other***
Evaluation	*"How happy are you with your life overall?"*	*"How worthwhile is your life overall?"*	*"How satisfied are you with your life overall?"*
Experience	*"How happy do you feel right now?"*	*"How worthwhile does what you are doing feel?"*	*"How satisfied are you right now?"*
Combinations and other	*"How happy did you feel yesterday?"*	*"How worthwhile are the things that you do in your life?"*	*"How satisfied were you yesterday?"*

Table 1.1: The two dimensions of subjective wellbeing.

The challenge of whether absolute or relative socio-economic status matters more for SWB

Next, this thesis contributes to our understanding of the relationship of socio-economic status with SWB by assessing how the foregoing two issues – conceptualising and measuring socio-economic status and SWB – affect our conclusions about whether absolute or relative socio-economic status affects SWB more. This question could have implications for understanding why people feel and think the way that they do, and what, if anything, should be done to alter how socio-economic resources are distributed in society. On the one hand, if only absolute socio-economic status matters, we might choose to focus on the characteristics of individuals in order to improve wellbeing and reduce misery. On the other hand, if only relative socio-economic status matters, we might choose to turn our attention away from individuals and focus on the distribution of socio-economic resources across individuals – subject to social welfare functions.

It is not entirely clear from the existing literature whether absolute or relative socio-economic status matters more for SWB. There is some support for the strong relativist

position. For example, Singh-Manoux, Marmot and Adler (2005) show that absolute socio-economic status does not matter at all for people's physical and mental health when accounting for their perceptions of their relative socio-economic standing. Wood et al. (2012) report similar results using (actual) rank income and wealth, as does Ferrer-i-Carbonell (2005) when looking at the difference between individuals' income and average income in a reference group. But there are also a number of studies supporting the strong absolutist position, which show a null effect of relative socio-economic status on SWB (Diener et al. 1993; Böckerman and Ilmakunnas 2006; Clark, Westergard-Nielsen and Kristensen 2009; Oesch and Lipps 2012; Clampet-Lundquist et al. 2011; Deaton and Stone 2013; Luo, Wang and Huang 2016). What the heterogeneity in these results suggests is that we now need a better understanding of under what circumstances absolute or relative socio-economic status matters more for SWB.

To improve our understanding, this thesis draws upon on the first two challenges to explore how our conceptualisation and measurement of socio-economic status and SWB affect the 'contest' between absolute and relative socio-economic status. For example, it may be that absolute socio-economic status matters more than relative socio-economic status for some components of SWB, such as evaluations rather than experiences. Or it may be the case that absolute socio-economic status matters more than relative socio-economic status for some aspects of socio-economic status, such as income rather than wealth, and it does not for others. Or it could be that the defining characteristics of people in the reference group, such as those based on gender but not age, change whether absolute or relative socio-economic status matters more for SWB. Why any of this might be the case, and any specific predictions related to these issues, are discussed further in the introductions to the empirical chapters of this thesis (sections 3.1, 4.1 and 5.1).

This thesis does not aim to exhaust our understanding all the reasons why absolute or relative socio-economic status might matter more for SWB, rather it focusses specifically on the roles of our conceptualisation and measurement of socio-economic status and SWB. For example, changes in the ease – or perception of the ease – of opportunities to move up the socio-economic ladder could affect whether people care about their absolute or relative position more. If people are hopeful they can change their socio-economic position with

ease, then they might not care so much about how others are doing (Cheung 2016). Although they are discussed conceptually, empirically, these issues are beyond the scope of this thesis.

The challenge of for whom relative socio-economic status matters most

This research will go beyond looking at the effect of relative socio-economic status on average SWB. Going beyond averages is important because it shows not just the overall relationship of relative socio-economic status with SWB but for whom this relationship is important. In other words, whose wellbeing is most or least affected by relative socio-economic status? By addressing this question, this research may better inform policy discussions about inequalities between groups (e.g. Hills et al. 2010) by highlighting whose SWB is likely to be most and least affected by changes in their relative socio-economic status. It will also generally improve our academic understanding of how relative effects operate. Four characteristics are explored. These are SWB, absolute socio-economic position, gender and age.

These characteristics, briefly introduced here and discussed in further detail in chapter six, are important for several reasons. First, considering SWB, whether or not relative socio-economic status affects the most or least miserable is important because one of the goals of social policy is to improve wellbeing and reduce misery (Dolan 2011; Dean 2012). If relative socio-economic status only negatively affects those who are already doing well, it may be less of a concern; on the other hand, if it negatively affects those who are miserable, then this could suggest that relative effects are of more interest for policy because changing the relative distribution of resources in society could improve the wellbeing of those with the lowest wellbeing.

Regarding absolute socio-economic position, it is of interest whether relative socio-economic status only negatively affects the SWB of the wealthy, well-educated or securely employed. These groups are not typically the target of any intervention to improve their wellbeing because it is assumed they are already doing well, although there are some exceptions, such as subsidies to the arts that sometimes benefit those of a high socio-

economic status more than others (New York Times 2016). If it is only high status people who are negatively affected by their relative position, then relative effects may be of less interest to policies that care most about helping the worst off socio-economically. This thesis will thus investigate whether it is the worst off in terms of both socio-economic and subjective wellbeing that are impacted by relative effects.

This thesis will have implications for our academic understanding of how relative effects operate by also investigating how gender and age affect the relationship of relative socio-economic status and SWB. Gender and age are characteristics that previous theory and evidence suggests may affect the propensity to be affected by relative socio-economic status (e.g. Clark 2003). For example, men are more competitive than women in some domains (Frick 2011), and so the social comparisons they make to others about their salary or educational qualifications may have more of an effect on SWB than the comparisons that women make. Moreover, social norms define men more so than women through their work status, and so relative unemployment could affect men more because their identities are more strongly liked to their employment status (see section 1.4). Regarding age, some prior research from other domains suggests that relative effects differ by age (Carrieri and De Paola 2012; Cheng, Fung and Chan 2007). There are different results between studies; however, it is sensible to expect that most effects will be strongest among those who are working age. Relative unemployment rates, for example, may only be relevant for much of the adult working-age population before they retire because this is the only stage of the life course when people are expected to be employed. Such predictions will be tested empirically in this thesis.

Research questions

The overarching research question this thesis aims to answer is:

What are the relationships of absolute and relative socio-economic status with subjective wellbeing?

There are a number of research questions that are inspired by the four foregoing challenges and the gaps in the literature they relate to. These are:

How do the relationships of absolute and relative socio-economic status with SWB depend on…

1. …how socio-economic status is conceptualised and measured – that is, as (a) income, (b) wealth, (c) education or (d) unemployment, and across variations in the (e) scope, (f) summary and (g) standpoint aspects of reference groups?
2. …how SWB is conceptualised and measured – that is, as (a) evaluations of pleasure, (b) evaluations of purpose, (c) experiences of pleasure and (d) experiences of purpose?

How does whether absolute or relative socio-economic status matters more for SWB depend on…

3. …how socio-economic status is conceptualised and measured as (a) income, (b) wealth, (c) education or (d) unemployment, and across variations in the (e) scope, (f) summary and (g) standpoint aspects of reference groups?

4. …how SWB is conceptualised and measured – that is, as (a) evaluations of pleasure, (b) evaluations of purpose, (c) experiences of pleasure and (d) experiences of purpose?

How does the relationship of relative socio-economic status with SWB depend on…

5. ...SWB, conceptualised and measured as evaluations and experiences of pleasure and purpose?

6. ...absolute socio-economic position of income, wealth, education and unemployment?

7. ...gender?

8. ...age?

Each chapter contains a focussed literature review relating to these research questions, and any specific predictions relating to each of these research questions are contained within these chapters. Although some limitations of the research are discussed within the empirical chapters, such as causality, most limitations are focussed on in the final chapter six in order to summarise the issues that cut across each chapter. We now turn to consider what variations in the conceptualisation and measurement of socio-economic status and subjective wellbeing will be considered in research questions one through four. In brief, for socio-economic status, these are income (household and family, and earnings income), wealth, education and unemployment, as well as 'scope', 'summary' and 'standpoint' aspects of the reference group (see Figure 1.1, pp. 23, 37). For SWB, these are 'evaluations' and 'experiences' of 'pleasure' and 'purpose' (see Table 1.1, pp. 27, 53).

1.2 Conceptualising and measuring socio-economic status

As discussed in section 1.1, there are many aspects of socio-economic status and this research focusses upon absolute and relative income, wealth, education and employment aspects in keeping with the majority of prior psychological and economic literature. The first sub-section below introduces three further issues related to the conceptualisation and measurement of relative socio-economic status – the scope, summary and standpoint aspects of reference groups. It then discusses literature on the psychology of social comparisons, and justifies the focus of this thesis on what is happening at the top of the socio-economic distribution within reference groups based on research suggesting that we make social comparisons to those who are both similar and dissimilar to us according to some attribute(s).

The scope, summary and standpoint aspects of reference groups

The first aspect of reference groups this thesis considers is their 'scope' (see Figure 1.1, p. 23 or p. 37). As mentioned earlier, the scope is defined here as the boundary condition of the reference group – that is, any feature or characteristic like age, geography or gender that is used to distinguish one group from another. This scope is important because the reason that some studies may have failed to find a relationship of relative socio-economic status with SWB is that the reference group scope was mis-specified in the sense that it did not reflect those people others make comparisons to or notice. Thus, conclusions of no effect of relative socio-economic status on SWB may not be supported with robust evidence (Diener et al. 1993; Böckerman and Ilmakunnas 2006; Clark, Westergard-Nielsen and Kristensen 2009; Oesch and Lipps 2012; Clampet-Lundquist et al. 2011; Deaton and Stone 2013; Luo, Wang and Huang 2016). For example, perhaps people aren't particularly aware of the socio-economic status of other people in their geographic area – a reference group scope used in some research – but they may be more aware of the socio-economic status of people of a similar age or gender in their geographic area. Or people may care more about others of a similar socio-economic status to them rather than those of a similar age or gender. Policies seeking to influence wellbeing by changing the distribution of socio-economic resources in society may be unsuccessful if they do not attend to the scope of the reference

group within which they make such changes. This research will inform such issues by varying more scope characteristics than in any other prior study. In total, 27 scope characteristics are considered.

Notably, it is difficult to determine what scope characteristics to use in defining a reference group because we cannot entirely rely on public or expert judgements. Although prior research has asked people to whom they compare themselves (e.g. Clark and Senik 2010; see section 4.1, p. 223), psychological studies have demonstrated that people are not always aware of the people in their comparison groups. Mussweiler, Rüter and Epstude (2004), for example, showed groups of students pictures of people high or low in a particular trait – aggressiveness and athletic ability – but showed the pictures for such a short duration that participants reported being unaware of having seen the pictures. When participants were subsequently asked to rate their own abilities, their ratings were affected by having been shown the pictures, even though they were not aware of having seen the pictures. The implication of this study is that the people that the public or researchers think should be included in reference groups may not be the people who are in the reference groups that affect SWB. In this thesis, the scope conditions are varied to maximise their variation inasmuch as feasible but to also to maintain comparability with prior literature (see section 2.2). The aim of this is to inform future research struggling with the challenge of what boundary conditions to use to define a particular reference group scope, as well as policy debates about how changing the distribution of socio-economic resources in society might affect wellbeing. These scope conditions can never be exhaustive, but by using more scope conditions than in any other prior study, and comparing those used in separate previous research studies within single samples in this research, it will be possible to build an initial understanding of some scope conditions that may be important for SWB.

Prior research into reference groups has discussed various scopes but has seemingly not used this term when doing so. In the first usage of the term ‘reference group’ by Hyman (1942), different scopes such as friends, colleagues and acquaintances are referred to as “frames of reference” (p. 15). In a study analysing data that asked people to whom they compare themselves, Clark and Senik (2010) refer to the “direction” of income comparisons (p. 576). Pérez-Asenjo (2011) uses the phrase “defining reference group

characteristic" (p. 1421), and Callan, Kim and Matthews (2015) use "comparison targets" (p. 1415). All of this heterogeneous language is intended to be encompassed by the use of the word 'scope'; however, scope does not inherently require a social comparison in the way that direction of income comparisons or comparison targets do. It is, therefore, most closely aligned with the term 'frames of reference'.

The second aspect of reference groups this thesis considers is how they are 'summarised'. This is akin to 'summary statistics'. As discussed earlier, the summary of a reference group is the metric used to present aggregate information about the heterogeneous individuals contained within the scope of the group. In the literature on relative socio-economic status, much of prior research summarises information about a reference group using an average – e.g. average income (McBride 2001; Putnam 2001; Blanchflower and Oswald 2004; Luttmer 2005; Ferrer-i-Carbonell 2005; Kingdon and Knight 2007; Caporale et al. 2009; Layard, Mayraz and Nickell 2010; Davis and Wu 2014; Luo, Wang and Huang 2016) or average education (Nikolaev 2016a). The other main summary measure is proportion unemployed (e.g. Clark 2003). This thesis broadly considers all measures of a reference group that somehow condense an aspect of socio-economic status such as income or unemployment into a single figure to be summary measures of relative socio-economic status. This includes measures of income polarisation and inequality (e.g. Charles-Coll 2011; Rodríguez 2015). The theories underlying the relationship of SWB with measures of central tendency (such as average) versus those of dispersion (such as polarisation and inequality) are, however, quite different. Whereas measure of central tendency are typically discussed in terms of social comparison and norm theory, those of dispersion rely on more theories such as equity aversion (see also p. 213).

Although there are many potential summary measures of the socio-economic status of the reference group, in order to facilitate comparability with prior literature, this investigation uses average measures of income and wealth, as well as proportion unemployed. These are common ways information about income, wealth and unemployment are summarised in the existing literature on relative socio-economic status and SWB, as discussed in the paragraph above (see also p. 215). This research also uses median educational qualifications. Although prior relative education and SWB studies use average education

(Kingdon and Knight 2007; Botha 2014; Nikolaev 2016a; Clark private correspondence 2017), the datasets select for the empirical analyses – for the reasons discussed in section 2.1 – do not contain an education variable that can be averaged. For reasons related to the policy applicability and theoretical rigour and of this research, which are discussed further in the next two sub-sections, this thesis additionally focusses upon those at the top of the socio-economic distribution by assessing shares of income at the top, and proportions of people with 'top' incomes, wealth and education.

There is a third aspect of reference groups considered in this thesis, and this is the 'standpoint' of an individual within the reference group. Again, this is where an individual is positioned within the group with respect to the aspect of relativity investigated – whether it is height (Carrieri and De Paola 2012), intelligence (Nikolaev and McGee 2016), or socio-economic status. Rank measures are standpoint measures, as are distance from average measures. The difference between the summary and standpoint aspects of a reference group is that summaries do not directly capture how an individual is related to that reference group, whereas standpoint aspects do. As such, they are not categorically equivalent. A summary of a scope – e.g. median education in gender group – might indeed be based on information about the individual that one makes comparisons to or is aware of in the reference group. For example, a woman may compare her own education to other women's median education. But this comparison does not say anything about how far that woman is from the median education among other women. Rank measures of relative socio-economic status are not summary measures because they tell us where an individual is positioned with respect to the number of people in the group (Brown et al. 2008; Clark et al. 2009; Wood et al. 2012; Kifle 2014). All distance from summary measures, including distance from average income or education (Hounkpatin et al. 2015; Botha 2014), quite obviously consider the standpoint of an individual within a reference group, and thus they also encompass the standpoint aspect of reference groups. The same is the case for measures that ask people where they see themselves relative to others in some scope (e.g. Adler et al. 2000).

This thesis varies how information about the standpoint of an individual within a group is conveyed using three common methods from prior literature. One is rank of income, wealth

and education; the next is distance from average income, average wealth and median education; and the final is one's perception of their socio-economic standing.

Again, a stylised depiction of the scope, summary and standpoint aspects of relative status is shown in Figure 1.1. The red person is the individual analysed to inform their standpoint relative to the reference group. Across scope, summary and standpoint aspects of SWB, over 300 different reference group measures across datasets are created and analysed in this thesis.

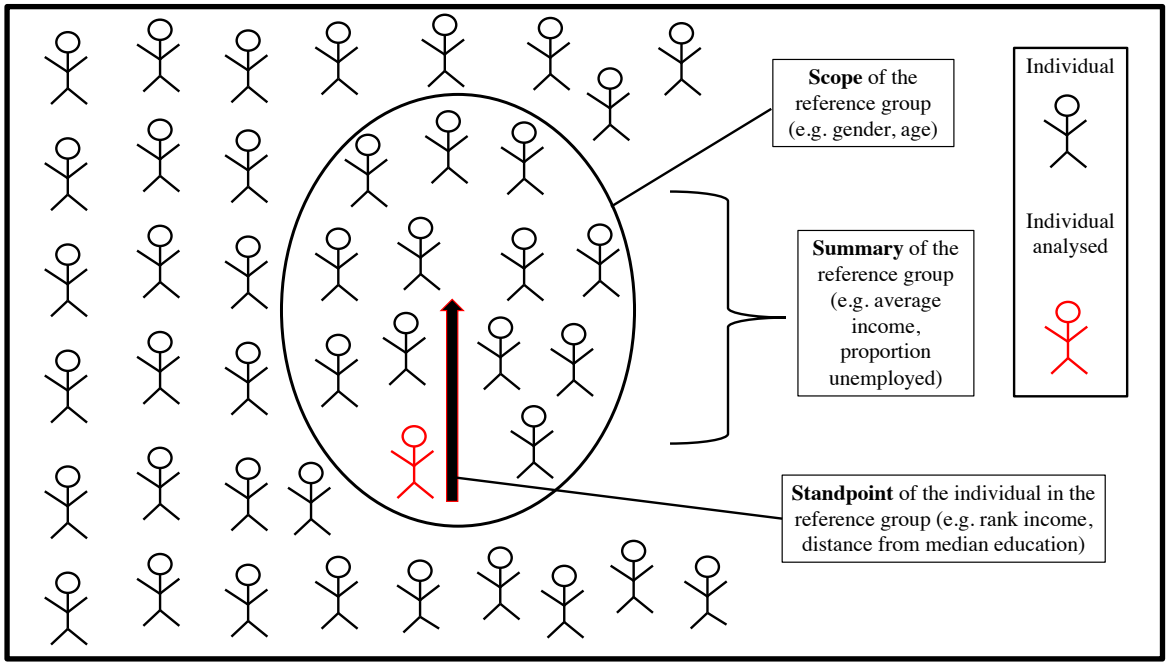

Figure 1.1 (repeated from p. 23): Stylised depiction of the scope, summary and standpoint aspects of reference groups.

It is possible to consider variations on Figure 1.1. Instead of thinking about an individual and their comparison to, or awareness of, a group, one could think about how an individual compares their group to another group. This is subtly but indeed different to looking at the how the effect of relative socio-economic status on SWB differs according to an individual's group membership (e.g. gender group), which is the focus of research questions five through seven. In the first instance, one might ask, how do changes in the median education of older adults over time affect the average SWB of younger adults over time? And in the second instance one might ask, how do changes in the median education of one's age group over time affect the SWB of young and old adults differently? The notion of groups having a particular status and being affected by the status of other groups is central to relative deprivation theory in sociology, psychological theories of intergroup conflict, as well as social identity theories in social psychology that consider both intergroup and intragroup comparisons (Tajfel and Turner 1979; Tajfel 1982; Yuki 2003). Group-level analyses in this literature go beyond the idea that people compare *themselves* to other groups or group members, emphasising instead that people may compare their *group* to other groups. Thus, instead of a red individual in Figure 1.1, there would be a red circle to characterise the scope of the group analysed.

Another variation on Figure 1.1 that this thesis does somewhat consider is that an individual might be within or outside the reference group. The idea that our reference groups are only or primarily comprised of people who are similar to us on some dimension was posited by psychologists (Festinger 1954; Suls, Martin and Wheeler 2002) who suggested that we use other people as a benchmark to evaluate how well we are doing in some domain. Much of the economic literature on relative socio-economic position is still based on the assumption that we compare ourselves to similar others (e.g. Luttmer 2005; McBride 2010; Bogaerts and Pandelaere 2013), although there are exceptions (Falk and Knell 2004).

Psychologists, however, have since refined early theories that our reference groups are only comprised of similar others. People also make 'downward' and 'upward' comparisons with people who are worse or better off than themselves, respectively, according to some attribute. In a classic study, Hakmiller (1966) asked participants to take a personality test. One random group was told that their scores indicated that their personalities were

undesirable and another that their personalities were desirable. Participants were then asked which other person's score they would like to see. Those who were told they had undesirable personalities were significantly more likely to ask to see scores from people with worse (i.e. more undesirable) scores than their own. It may be that downward comparisons like these to dissimilar others (on at least some dimension) are made strategically in order to enhance how people view themselves (Wills 1981). Extended to socio-economic status, this would suggest that people might ask to see others' pay if it is a smaller amount than their own, i.e. in another income group, to feel better about their own pay.

Another classic study, however, using an identical experimental paradigm, illustrates that people also make upward comparisons. Wheeler (1966) again asked participants to take a personality test, this time with the ostensible purpose of selecting the student participants for a seminar group. This time, all participants were told their rank score was of four out of seven. They were then asked whose score they would like to see, and the majority of participants asked to see the scores of those who did better than they did, indicative of upward comparisons. Upward comparisons like these may be made so that people can learn about what they could achieve or do better in the future (Taylor and Lobel 1989). In support of this idea, in the Wheeler (1966) study, an even higher majority of participants asked to see the scores of those who did better than they did when the seminar course was described as exciting and thus desirable rather than dull and less desirable. It appears that the participants were motivated to learn what they could do differently to be part of the exciting seminar course.

Since these studies, other research has investigated the conditions under which people select upward versus downward comparison targets. For example, the direction of social comparison can depend upon people's mood (Wood, Michela and Giordano 2000), self-esteem (Wheeler and Miyake 1992) and culture (White and Lehman 2005), but there is not a clear consensus about how these and other conditions affect the direction of comparison (Buunk and Gibbons 2013). Regardless, it is clear that social comparisons are not always made to similar others, a conclusion that is also supported by research suggesting that SWB is affected by international income comparisons (e.g. Becchetti et al. 2013).

There is also not a consensus about whether upward or downward comparisons improve or reduce SWB. Buunk et al. (1990) appear to be one of the first to demonstrate that making downward comparisons may harm SWB, instead of improving it by enhancing self-perceptions. Their research showed that cancer patients low in perceived control felt fearful and anxious when comparing themselves to other cancer patients who were not doing as well as they were, and that spouses who were dissatisfied and uncertain about their marriages experienced negative emotions when thinking about other people's worse marriages. Other research has confirmed that the roles of certainty and control are important in whether downward comparisons improve SWB or not (Smith 2000; Michinov 2005).

Regardless of the lack of the consensus in the literature in these areas, the psychological evidence is clear that people do sometimes compare to those who are better or worse than themselves. Thus, the widespread practice of only creating reference groups comprised of similar others – that is, where the red person (individual analysed) is inside the black circle (the scope) in Figure 1.1 lacks theoretical rigour because we also make comparisons to dissimilar others. Moreover, it is not always clear what 'dissimilar' means. If a rich celebrity is the same gender as someone less rich and not as famous, are they dissimilar to that person? They may be socio-economically dissimilar, but not in terms of their gender. This research addresses this limitation by summarising information about people within reference group scopes that are comprised of others dissimilar to some individuals analysed – those at the top of the socio-economic distribution.

Focussing on the top

The effect of those at the top of the socio-economic distribution on SWB is relevant for policy debates. In particular, that SWB may be negatively impacted by upward social comparisons to socio-economically dissimilar others casts doubt on a key idea in economics still salient in some policy discourse: Pareto (1927) improvements. A Pareto improvement occurs when a resource transfer is made such that one individual is made better off without making others worse off. For example, an increasing concentration of wealth at the top of the wealth distribution is typically considered a Pareto improvement as

long as this wealth is not transferred from other people below the top of the wealth distribution – those at the top are made better off, whilst those at the bottom are not made any worse off. This idea has led some to argue that socio-economic inequality in and of itself does not matter unless it results in socio-economic deprivation for some, and that the focus should be on addressing the latter rather than the former (Feldstein 1999; Kamin 2013; Reich 2014).

If SWB is used as the measure of how well off someone is, as opposed to socio-economic status alone, the scope of what can be classified as a Pareto improvement is significantly narrower. For example, an increasing concentration of wealth at the top of the wealth distribution – even if not transferred from others below the top – may negatively impact upon people who compare to and/or interact with others at the top. As Rawls (1971) pointed out, it is not immediately clear that this should matter for policy, but if policymakers continue to take SWB seriously, the existing evidence suggests that a narrower definition of what constitutes a Pareto improvement could be warranted. Because there is more debate about whether socio-economic inequality as a result of the concentration of resources at the top – rather than the middle or bottom of the distribution – matters for SWB, this thesis focusses upon socio-economic reference groups that are comprised of high socio-economic status individuals. This approach is further justified in light of the aforementioned psychological evidence showing that people do make upward comparisons. The way in which upward comparisons might affect SWB is discussed further in section 4.1.

Summarising the top

How might information about reference groups comprised of high socio-economic status individuals be summarised? Both psychological evidence and policy debates are applicable for addressing this issue. Psychological evidence suggests we do not use average income or wealth to assess whether a particular value of wealth is high or low, and that we are affected by the distribution of income or wealth (Tripp and Brown 2016). Parducci's (1963; 1965) range-frequency theory shows that when participants judge how one stimulus fares relative to a series of stimuli (e.g. as large or small, good or bad), their judgement depends

partly upon a) how participants perceive the upper and lower bounds of the stimuli and b) the relative frequency with which different stimuli occur. Thus, someone's judgement of where their own income or wealth lies in different series of others' income depends upon a) what they perceive as the upper and lower bounds of the income or wealth distribution and b) how frequently certain income or wealth values occur relative to other income or wealth values. Measures of rank income and wealth incorporate Parducci's insights (e.g. Brown et al. 2008; Clark et al. 2009; Wood et al. 2012); however, they are limited in their ability to inform about the effect of the top of the income and wealth distribution on SWB – and, as discussed, people appear to make comparisons to those who are doing better than them according to some characteristics.

A novel contribution of this research is to focus upon the proportion of 'high' income earners, wealth holders and the highly educated. Of course, 'high' could be defined in many different ways. In the US, it is interpreted as $100K+ gross household income, $100K+ gross household earnings and degree-level or higher education. In the UK, it is interpreted as £46K net benefit-unit level income, £46K net benefit-unit level earnings, £450K benefit-unit level wealth and degree-level or higher education (there was no measure of wealth used in the US due to data availability). All of these income, earnings and wealth figures are around twice the median for the year that they represent, and are selected based on reasons related to data availability, comparability between datasets in this research and with other prior research, and informing policy, as discussed in further detail in the next chapter (pp. 100, 103). Proportions of people with top education has recently been investigated before in SWB research (Nikolaev 2016a; see p. 218).

Using proportion incorporates the frequency aspect of the psychological insights from Parducci's (1963; 1965) range-frequency theory that people are likely affected by the frequency with which other people have certain earnings, amounts of wealth or education, and it is also consistent with the interest of this thesis in the top. Furthermore, it makes intuitive sense: the effect on SWB of ten people with incomes of $100K moving into an area with an average income of $100K is likely different to the effect of one person with an income of $100K moving in, but average measures of income would not capture this. Note that the frequency isn't just an absolute frequency, e.g. 10 is half of 20 but a third of 30. So

it is the relative frequency, or percentile rank, of the number of those with 'top' incomes (see p. 242 for the discussion of defining the 'top'). Again, focussing on proportion also allows a focus on the top, which rank measures do not permit.

Focussing on the proportion of people at the top is also related to policy debates about what sort of socio-economic distribution is 'best'. For example, Rowlingson (2011) argues that there may be a certain level of income inequality that begins to produce health and social problems such as low SWB, cancer and homicide. There is also public concern about the 'disappearing middle class' and whether industrialised economies are moving towards an 'hourglass' or 'dumbbell' shaped economy, with a higher proportion of people and economic resources situated at the top and bottom of the income or wealth distribution but not the middle (Allen 2014; Dorfman 2014). In the academic literature this is referred to income or wealth polarisation.

Polarisation concerns are somewhat similar to concerns about inequality, particularly the effect of the increasing concentration of income or wealth at the top of the distribution (Oxfam 2015; Rowlingson 2011). It is technically possible, however, to reduce inequality but increase polarisation (see Zhang and Kanbur 2001). The concern over polarisation is that it reduces economic growth and increases social conflict (Esteban and Ray 1999; Esteban and Schneider 2008; Ezcurra 2009), although no studies appear to have assessed the relationship between any form of economic polarisation and SWB. There has been considerable debate about how to assess whether polarisation is in fact occurring, particularly because the middle class is often arbitrarily defined (Esteban, Gradín and Ray 2007; Foster and Wolfson 2010).

By summarising information about those with top incomes, wealth and education as the proportion of those at the top, this research can inform policy debates about whether polarisation is a concern. Of course, only part of the debate – the effects of what is happening at the top, and not the middle or bottom – is addressed.

It is not only the proportion of people at the top that is relevant in the context of current policy discourse. Piketty (2014) has illustrated from tax documents that top shares – i.e. the

share of national income and wealth held by the top 1% of income and wealth holders – has risen in the United States, and to a lesser extent other countries, to levels preceding the 1930s Great Depression (see Fig 1.2). This has led to discussions about whether the recent increases in top shares are justifiable – e.g. in moral and economic terms – or not (Murphy 2015; The Economist 2016). An advantage of SWB research is that it can inform debates about the acceptability of increasing top income shares by showing whether or not they are associated with better or worse SWB. This provides a welfarist lens for understanding the acceptability of changes in top shares additional to other lenses such as justice-based arguments (Rawls 1971; Scheve and Stasavage 2016). The share of income held by the top 1% of earners across US states is also used in this research, building upon prior research investigating the relationship of top income shares around the world and SWB (Burkhauser, De Neve and Powdthavee 2015; see also pp. 215, 221).

Before turning to conceptualising and measuring SWB, it is important to note that the rank measures used in this study are exceptional because they assume that people's wellbeing is affected not just by their absolute position (e.g. $40K) but how many people are both higher or lower than them in a particular reference group (e.g. 42nd rank out of 100 people). This approach draws not only on range-frequency theories, but also evolutionary theories related to the negative physical and psychological consequences that come from being lower in rank to others (Wood et al. 2012). This thesis does not focus on evolutionary theories because studies in this area of research are usually conducted within smaller scopes than those that are analysed in this research such as within families (Gilbert, Price and Allan 1995)[2]. Instead, the main theoretical underpinnings of this research are social comparison theory, range-frequency theory and social norm and identity theories (see section 1.4 for discussion of the latter two).

[2] As a caveat, there is a subfield of evolutionary psychology that considers larger scopes copmrised of social coalitions (e.g. Flinn, Geary & Ward, 2005). Thank you to Dr Jennifer Sheehy Skeffington for drawing my attention to this literature.

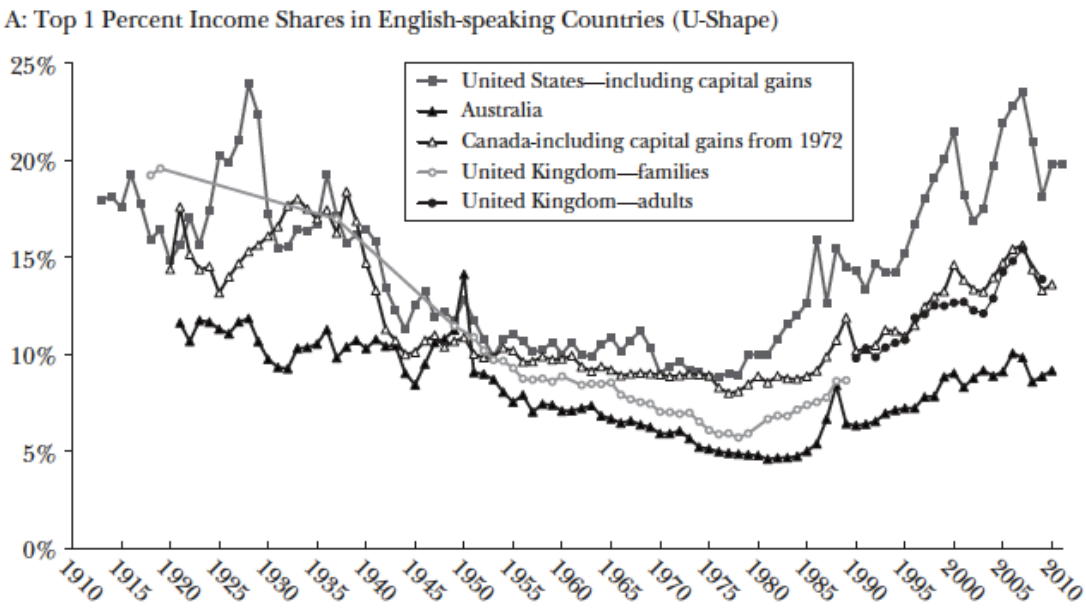

Figure 1.2: Top 1 percent income shares in English-speaking countries. Source: Alvaredo et al. (2013, p.6).

1.3 Conceptualising and measuring subjective wellbeing (SWB)[3]

Many researchers are confused about what SWB is and how to measure it (see section 1.1). This section reviews the existing theories about what SWB means, ties these theories to existing SWB measures and illustrates why it is important to differentiate distinct components of SWB. It provides the framework for understanding the different dimensions of SWB investigated in this thesis.

Before proceeding, however, it is important to note that SWB is primarily consistent with one of three main accounts of human wellbeing, the mental state account, which stands alongside the objective list and desire fulfilment accounts (Nussbaum and Sen 1993; Parfit 1984). These accounts often generate agreement about what affects wellbeing but sometimes they do not and this has sparked lively debates (Nussbaum 2008). This thesis does not directly engage in these debates and, like many government and non-government organisations worldwide, accepts that the theoretical and empirical support for SWB measures is sufficiently advanced to warrant an investigation of what affects them in order to better understand how to improve wellbeing and reduce misery (Dolan and Metcalfe 2012; NAS 2014; OECD 2013, 2017; ONS 2011, 2017; UN 2012; Stiglitz, Sen and Fitoussi 2009; Legatum Institute 2012).

Moreover, quantitative measures of SWB – the focus in this thesis – necessarily assume that SWB can be measured. This is not a universally accepted assumption (Angner 2013). For one, there are concerns that it is impossible to reflect a complex construct like SWB in a measure that relies on ordinal rankings (e.g. a 0-10 scale) or binary assessments (e.g. yes/no). It may be that SWB is not ordinal or binary in people's lives and in their understanding of SWB, and thus reflecting 'higher' or 'lower' SWB with a number that is higher or lower than another number is an oversimplification. Another potential objection is that measuring SWB subjects it to reification. It may be that SWB is too abstract to be measured, and that doing so lends it a sense of materiality that is overly concrete. Finally,

[3] This section is from Dolan, P and L Kudrna. 2016. "Sentimental Hedonism: Pleasure, Purpose, and Public Policy." In *Handbook of Eudaimonic Well-Being*, edited by J Vittersø, 437–52. Springer International Publishing. Note that because this section is a jointly authored contribution, at times, the pronoun 'we' is used.

there are concerns that different people interpret SWB scales differently and even differently from themselves over time, which may limit any conclusions about intra- and inter-individual differences that can be drawn from SWB research (Adler 2012; King and Wand 2007; Weimann, Knabe and Schöb 2015). Although these are important considerations, this thesis accepts that it is possible to measure SWB quantitatively, and to derive meaningful information from examining what is related to people's responses to questions about their SWB and what is not.

Evaluations and experiences of pleasure and purpose

There are many different definitions and measures of SWB (OECD 2013; NAS 2014; Pavot and Diener 1993; Kahneman and Riis 2005; Ryff and Keyes 1995; Dolan, Layard and Metcalfe 2011; ONS 2011). Following Dolan (2014), the first dimension is the *level* at which happiness is being assessed: either in terms of cognitive "evaluations", which is how people think about their lives, or "experiences", which is how people feel during the experience of their lives (Pavot and Diener 1993; Robinson and Clore 2002; Kahneman and Riis 2005). The second dimension is the *type* of happiness being assessed: either "pleasure", and related positive and negative emotions like joy, pain and worry, or "purpose", and related positive and negative experiences like meaning, pointlessness and futility (Bentham 1907; Aristotle 2002 translation). Previously, experiences have been referred to as affective wellbeing (Pavot and Diener 1993; Luhmann et al. 2012). Following the US National Academy of Sciences (2014), we consider affective wellbeing to include not only positive and negative emotions, but also positive and negative experiences more generally, including meaningfulness. Even if self-reports of experiences must contain some element of evaluation due to the act of reporting, we are persuaded by arguments made by philosophers of emotions like Dokic and Lemaire (2015) who show that there are experiences that exist independently of evaluations.

Existing efforts to classify happiness measures have contributed greatly to the proposed classification herein. Diener (2000), for example, was a pioneer in distinguishing between affective and cognitive wellbeing (see also Pavot and Diener 1993), which Kahneman and Riis (2005) later referred to as evaluations and experiences. Here, we emphasise the

evaluation and experience terminology because experiences can encompass more than affect, including experiences of purpose and pointlessness, which may not be affective (Biswas-Diener, Kashdan and King 2009). Ryff and Keyes (1995) contributed significantly to our conceptualisation of evaluations of purpose with their investigation of the construct "Purpose in Life". Yet a focus on evaluations of purpose neglects whether the activities of our lives feel worthwhile and meaningful.

Our original contribution here is to emphasize that purpose resides in people's experiences; that is, experiences can *feel* purposeful, worthwhile, fulfilling and meaningful. And they can do so independently of the cognitive evaluations of purpose e.g. purpose in life. Academics thus far who have discussed and investigated the experiential component of purpose do not go far enough because they have not analysed measures that truly capture it. For example, Hicks et al. (2010) measure feelings of meaning with measures that capture understanding and sense-making, e.g. "I struggle to make sense of events" (p. 972). We argue that understanding and sense-making are predictors or consequents of experiences of meaning, not experiences of meaning in themselves. Steger, Kashdan and Oishi's (2008) 'Daily Meaning Scale' has two items: "how meaningful does your life feel?" and "how much do you feel your life has purpose?" (p.27). Such measures combine evaluations and experiences of meaning by asking about both life and feelings (see also Nelson et al. 2013), whereas we emphasise solely experiences. Our view also differs conceptually from academics like Baumeister (1991), who views meaning as a superordinate concept to purpose, values, efficacy and self-worth, because we consider meaning and purpose to be synonyms and values, efficacy and self-worth to be antecedents and/or consequents of experiences of meaning.

We do not presently investigate in detail the separateness or relatedness of the various dimensions of happiness (Busseri and Sadava 2010). Instead, we emphasise that these distinctions between the dimensions of happiness matter because, as noted earlier, the determinants of happiness differ depending on which level and type of happiness is being measured. For example, as people earn more than $75,000 each year they become increasingly more satisfied with their lives in an evaluative sense, but they do not report feeling any happier in an experiential sense (Kahneman and Deaton 2010). So our

conclusions about how circumstances of life affect happiness depend critically on the level at which happiness is measured. And whilst working is experienced as one of the least pleasurable activities, it is also experienced as one of the most purposeful (White and Dolan 2009). So our conclusions about how the activities we engage in affect happiness depend critically on the type of happiness being measured.

In what follows, we will set out more clearly the conceptual and empirical differences between the two main dimensions of happiness. Experiences of purpose have been most overlooked in the literature to date and so we additionally present a brief summary of some fresh evidence from data on time use.

Following from the discussion of the dimensions of happiness and their differing determinants, we then address the second issue and consider which level of happiness is more important for determining the degree to which someone is happy (Dolan and Metcalfe 2012; in section 6.2 of this thesis, p. 351). The aim is not to reinvigorate well-rehearsed debates about hedonism (Crisp 2006; Smart, Quinton and Williams 1973; Nozick 1977); rather, it is to consider whether evaluations or experiences are a better indicator of how well our lives are going. This then informs the practical task of selecting happiness indicators in research and policy. We define the rich array of feelings we experience as 'sentiments' and put forward 'sentimental hedonism': an account of happiness that emphasises experiences of happiness containing assessments of both pleasure and purpose.

It is worth emphasising that this article is not intended to be a descriptive account of what people do or how they think and feel. Rather, it is an attempt to clarify ambiguities in the academic literature on happiness for policy purposes, as well as an invitation to reflect on how we can better understand what we measure when we research 'happiness', and what we should be paying more attention to when we do so. Our main conclusions are that it is incumbent on those who use happiness measures to be clear about how they define happiness, that we should work towards improving our understanding of experiences of purpose in particular and that the debate about what sort of happiness should be our primary aim should continue.

As alluded to above and introduced earlier on in the thesis, we suggest that measures of happiness can be categorised according to two dimensions. The first is the level at which happiness is being tapped into. On the one hand, we can elicit relatively high level evaluations that capture cognitive judgements about life overall or certain aspects of life such as work or relationships (Kahneman and Krueger 2006). A typical question would ask something along the lines of "Overall, how happy are you these days?" which clearly requires an evaluation of overall happiness. Alternatively, we can tap into relatively low level experiences that capture people's assessments of how they feel on a moment-to-moment basis (Scollon, Kim-Prieto and Diener 2003; Kahneman et al. 2004). A typical question would ask something along the lines of "How happy do you feel right now"? It has long been recognised that evaluations and experiences are separate constructs even though they are not always treated as such (Campbell, Converse and Rodgers 1976; Pavot and Diener 1993; Weiss 2002; Kahneman and Riis 2005).

We reach different conclusions about who is happiest and what makes people happy if we use evaluative measures as compared to experiential ones. We would conclude that retirement makes people unhappy from evaluative but not experiential questions, and that marriage doesn't affect happiness at all if we looked only to experiential questions rather than evaluative ones (Luhmann et al. 2012). Middle age is usually the most miserable time of life according to evaluative measures of life satisfaction, but studies of experiences of happiness have shown that younger people are actually less happy than middle aged people (Blanchflower and Oswald 2008a; Carstensen et al. 2011). So, young people can seemingly look forward to better experiences of happiness with age but not better evaluations of their lives. Unemployed people are much less satisfied with their lives than the employed but their day-to-day experiences of pleasure are similar to the employed because they have more free time (Knabe et al. 2010). Our conclusions about the impact of unemployment beyond its economic consequences will therefore depend greatly on the level at which happiness is conceptualised and measured.

The second dimension that happiness measures can be categorised according to is the type of happiness being assessed. On the one hand, there are assessments of what we shall call pleasure. We use this term as shorthand for a range of adjectives associated with positive

and negative hedonic feelings, such as joy, contentment, anger, worry, stress and sadness (Watson and Tellegen 1985). The idea of hedonic happiness is most closely associated with the famous utilitarian philosopher Jeremy Bentham (1907). Assessments of pleasure can also be at the evaluative level, such as when people are asked how happy they feel overall. On the other hand, we can tap into a different type that we shall refer to as purpose. Under this heading sits adjectives associated with positive and negative feelings that are non-hedonic, such as purpose, fulfilment, meaning, pointlessness and futility. The idea of non-hedonic happiness, which can be called eudemonic happiness, is associated with the ancient Greek philosopher Aristotle who postulated that the ultimate good is a virtuous life that contains worthwhile activities (Aristotle 2002 translation). As with pleasure, assessments of purpose can be at the evaluative level, such as when people are asked how much purpose they have in their lives, or at the experiential level, such as when people are asked how worthwhile their activities feel.

The determinants of happiness again differ depending on whether happiness is measured with a hedonic or non-hedonic type of question. For example, studies investigating the effect of having children on evaluations and experiences of pleasure show that their effect is, at best, neutral (Dolan, Peasgood and White 2008; Hansen 2012). Yet children are associated with more purpose, both in people's evaluations and in their experiences (Burton 1998; White and Dolan 2009). In addition, the activity of watching TV would appear better for happiness than the activity of working from the data on experiences of pleasure, whereas the opposite would be concluded from the data on experiences of purpose (White and Dolan 2009). And people who volunteer do not necessarily report experiencing more pleasure than those who don't, but they do report higher evaluations of purpose (Son and Wilson 2012). Just as if we looked only to evaluations or only to experiences of happiness, if we looked only at pleasure or purpose, we would reach different conclusions about who is happiest and what makes them so.

Combining the evaluative and experiential levels of happiness with the pleasure and purpose types of happiness, leads to a 2 x 2 typology of measures of happiness, as shown in Table 1.1. Later we will describe data that have been used previously to show the distinct factor structures of pleasure and purpose (White and Dolan 2009), which complement

extensive previous work distinguishing evaluations from experiences (Kahneman and Riis 2005; Robinson and Clore 2002). There are certainly further typologies within some of these categories, such as positive and negative affect within experiences of pleasure (Watson and Tellegen 1985), and judgements about the pleasure or purpose associated with various domains of life, such as work or relationships, within the evaluation categories. Here we focus on the higher-level differences between overall categories. Note also that we have excluded all behavioural conceptualisations of happiness from these dimensions, taking the view that activities and behaviours – or perceptions of them – like goal-setting and socialising are determinants of happiness, rather than happiness itself (Ryff and Keyes 1995).

Type ***Level***	***"Pleasure"***	***"Purpose"***	***Combinations and other***
Evaluation	*"How happy are you with your life overall?"*	*"How worthwhile is your life overall?"*	*"How satisfied are you with your life overall?"*
Experience	*"How much pleasure do you feel right now?"*	*"How worthwhile does what you are doing feel?"*	*"How satisfied are you right now?*
Combinations and other	*"How happy did you feel yesterday?"*	*"How worthwhile are the things that you do in your life?"*	*"How satisfied were you yesterday?"*

Table 1.1 (repeated from p. 27): The two dimensions of subjective wellbeing.

Table 1.1 also shows that some measures are 'other' or combinations of the level of happiness. For example, the question, "How happy did you feel yesterday?" is evaluative in the sense that it asks for a cognitive judgement about the whole of yesterday, but is also experiential because it asks about feelings. Students who were asked the 'happy yesterday' question, and who also filled out a diary of yesterday's activities and reported how happy they felt during them, recollected feeling happier yesterday than shown in the aggregated average daily happiness scores from their diaries (Tadić et al. 2014). Other studies have shown that evaluations of experiences like these tend to be more intense for negative as well as positive emotions, such that people also recall feeling worse than the average of their experiences of negative emotion across a given time period would indicate (Miron-Shatz, Stone and Kahneman 2009; Christodoulou, Schneider and Stone 2014).

The question, "How worthwhile are the things that you do in your life?" is also both evaluative and experiential: it is evaluative in the sense that it requires a judgement about the worthwhileness of things in general, and also experiential because it asks about doing things rather than life overall. In nationally representative data from the Office for National Statistics in the UK, there are no differences in how worthwhile employed and unemployed groups consider the things they do in their life to be, and there are also no differences by

education level (Deeming 2013). Yet other research has found that people who are unemployed report lower evaluations of purpose in life than the employed and also that people with higher education report better evaluations of purpose in life (Ryff, Keyes and Hughes 2003). It would seem that people who find their life to be purposeful are not the same people who find the things that they do in their life to be purposeful, although, as with all between-group comparisons discussed, it is also possible that these differences can be attributed to differences between the samples rather than differences between the measures.

Further measures reflect combinations of the type of happiness. As noted by several scholars, one of the most widely used happiness questions asks about overall life satisfaction (Aknin et al. 2013; Jivraj et al. 2014). At the time of writing, about 10% of the publications on Google Scholar containing the word 'happiness' also contain the phrase 'life satisfaction', which is indicative of its prevalence. Life satisfaction is clearly an evaluative question, requiring a cognitive judgement about life overall, but it is unclear whether it is about pleasure or purpose, as the term 'satisfaction' could refer to one or the other, or to both in some combination. That life satisfaction is not clearly about either pleasure or purpose is part of what makes the existing conceptualisations and measures of happiness so confusing.

Whilst overall evaluations of life satisfaction typically do not vary much from overall evaluations of happiness, subtleties do sometimes emerge. For example, there is more between-country variation in life satisfaction than in evaluative happiness measures, which would impact any judgement of how much happier one country is compared to another (Waldron 2010). Age affects life satisfaction and evaluations of purpose rather differently too: whereas life satisfaction improves after middle age, evaluations of purpose do not always, and so it would seem that older people are happier than middle aged people according to the life satisfaction data but sometimes not from the data on evaluations of purpose (Blanchflower and Oswald 2008a; Ryff and Singer 2008; Pinquart 2002). We are not aware of any studies that would allow a comparison of whether the determinants of how satisfied people feel right now are different to those of experiences of pleasure or purpose right now.

From this discussion, it is evident that it is important for anyone investigating the causes of happiness with only a single measure to be clear that their results may differ if another happiness measure were used. Making general claims about happiness based on analyses of a single measure poses a serious problem to those seeking to understand the causes of happiness because the determinants of happiness differ according to the level and type of happiness measure used. Yet our understanding of the differences between the levels and types of happiness is limited by the fact that we know much less about some aspects of happiness than others, a consideration to which we now turn.

Focussing on purpose

Researchers focus more on some dimensions of happiness than others, with the various adjectives of emotion and 'happiness' being the most commonly used terms in the literature to date. This is according to Google Scholar and Web of Knowledge keyword searches of happiness terms. Evaluative happiness and life satisfaction measures are popular in economics and policy (Benjamin, Heffetz, Kimball and Szembrot 2014). For example, economic articles often refer to happiness and life satisfaction interchangeably (Kavetsos and Koutroumpis 2011; Van Landeghem 2012; Easterlin 2013), and life satisfaction measures are used for cost benefit analyses by the UK's HM Treasury (Fujiwara 2010).

Where purpose has been separately referenced, it is typically done so at the evaluation level; that is, whether life overall has meaning or purpose (Huta and Waterman 2014; Ryff and Keyes 1995; Shin and Steger 2014). A common scale used to measure purpose is in fact called "Purpose in Life", with "in life" reflecting the evaluative nature of its items (Ryff and Keyes 1995). There has been some recognition that experiences of purpose are distinct from evaluations (Reker and Wong 1988, pp. 220-221; Krause 2009, p. 105; Steger 2012, pp. 381-382). White and Dolan (2009) conducted a principal-component exploratory factor analysis of time-use data to determine whether or not positive and negative affect are conceptually distinct from experiences of worthwhileness, meaningfulness and purposefulness. The results were a two-factor solution where the positive and negative affect items loaded onto the first factor and the purpose items loaded onto the second factor.

The US National Academy of Sciences' (2014) report on measuring wellbeing concluded experiences of purpose are important in addition to experiences of pleasure:

> An important part of people's experiences may be overlooked if concepts associated with purpose and purposelessness are not included alongside hedonic ones like pleasure and pain in measures of [experienced wellbeing]... People do many things because they are deemed purposeful or worthwhile, even if they are not especially pleasurable (e.g., reading the same story over and over again to a child, visiting a sick friend, volunteering) (National Academy of Sciences, 2014, p. 43).

Given the relative paucity of research investigating experiences of purpose, a key contribution of this thesis is to explore its relationship with absolute and relative socio-economic status. This is important because some aspects of socio-economic status have recently been shown to have no association with experiences of pleasure, which has led some to argue that experiences are not a suitable measure of SWB for policy purposes because they do not capture variation in SWB according to labour force status (Weimann, Knabe and Schöb 2015). It may be, however, that people who are unemployed experience less purpose than other groups and existing measures of SWB do not capture this. Debates about which dimension of SWB best reflects how well our lives are going would thus be better informed with information about the relationship of socio-economic status with experiences of purpose as well as experiences of pleasure, which this research will address by using measures of experiences of purpose along with measures of experiences of pleasure and evaluations of purpose and of life.

1.4 Socio-economic status and SWB in economics and psychology

Now that the frameworks for conceptualising socio-economic status and SWB have been established, we turn to more general theories about how these concepts are related and why. This provides the conceptual context for understanding the results of this thesis and integrating them with what has been done before. It also informs the selection of measures used in the thesis, as discussed throughout the next chapter.

Interest in the relationship of socio-economic status with SWB spans many disciplines. This thesis focusses primarily upon economics and psychology. Economics is relevant because it investigates how scarce resources are allocated, and the allocation of scarce socio-economic resources affects people's socio-economic status. Psychology is important because the psychology of social comparisons is a theoretical approach motivating this thesis (see section 1.2), and psychology has informed some economic approaches to the study of the relationship of relative socio-economic status with SWB. There are some natural overlaps between economics and psychology and with other disciplines, including philosophy, sociology and epidemiology.

This section evaluates and integrates key economic and psychological theories about SWB and socio-economic status. First, it illustrates that economics has typically been less concerned with SWB than psychology because economics traditionally relies on a preference satisfaction account of wellbeing. Second, it shows that preference-based accounts of wellbeing are not entirely congruent with the subjective account of mental wellbeing due to psychological processes that lead people to mis-estimate what affects how they feel and think about their lives. Third, it considers Amartya Sen's critique of the preference-based account of wellbeing, but illustrates that it was the discovery of the Easterlin paradox rather than this critique that revived earlier interest in SWB in economics, especially relative socio-economic status and SWB. Fourth, it shows that although the relative income, wealth, education and unemployment literatures emerging from the Easterlin paradox unevenly rely upon relative consumption and social norm theories, both theories are applicable across all of these aspects of socio-economic status. Finally, it

briefly shows how the discipline of sociology has approached the topic of relative socio-economic status, and clarifies how this thesis differs from the sociological approach.

Economics has been less concerned with SWB than psychology

Although early economists referenced SWB in their writings (Smith 1843; Keynes 1933; Carabelli and Cedrini 2011; Drakopoulos and Katselidis 2017), most classical and neoclassical economists typically do not study SWB. Instead, they tend to rely on people's stated and observed preferences – i.e. tastes, choices and behaviour – to infer their wellbeing. According to traditional economic theory, people behave rationally in the sense that, with complete and correct information, they have preferences – stated by people themselves and observed in their behaviour – that maximise their utility. Thus, the focus of much economic research has been on what people prefer, how they make choices, and what they do, and there has been little room for consideration of people's own reports of their wellbeing in terms of how they feel and think about life.

Psychology, on the other hand, has long contributed to the study of SWB. Some of the earliest psychologists theorised about the structure of emotions (James 1884; Wundt 1897); however, SWB was largely irrelevant during the behaviourist paradigm in the early 20th century, which focussed only on directly observable behaviours. Interest in SWB was revived once many researchers reached the conclusion that behaviour and cognition are inextricably linked, and SWB most prominently re-emerged in research around the 1960s when United States survey organisations began to ask people questions about their SWB (Land 1983; Brey 2012). SWB is extensively studied within the positive psychology movement, which reacted to the largely negative focus in psychology on dysfunction with research into positive functioning (Sheldon and King 2001). According to the conceptualisation of SWB in this thesis, however, SWB can reflect both positive and negative functioning, e.g. experiences of pleasure and purpose as well as misery and futility (see section 1.3). Thus, this thesis is not only concerned with positive functioning.

Preferences are not congruent with SWB

Within the preference satisfaction account of wellbeing it is possible to consider lower-order preferences and higher-order preferences or 'desires'. As Harsanyi (1996) discusses, economics tends to discuss people's preferences and philosophy people's desires. A key principle of preferences is that they are inherently comparative – that is, to prefer something requires a comparison between two or more things, such as preferring apples more than oranges. Higher-order preferences, or desires, are not necessarily comparative. They can be directed at something singular, such as the desire for food, without requiring someone to assess whether they desire food more than, say, shelter. This is relevant for SWB because people could prefer to have one sort of life over another (Benjamin et al. 2012; Benjamin, Heffetz, Kimball and Rees-Jones 2014), or they could simply desire to have a good life. Whether comparative or not, both preferences and desires assume that people know what is good for their wellbeing and not, and they are judged as arbiters of wellbeing.

Yet people do not appear to always know what is good for their wellbeing, at least, for their SWB. One of the psychological reasons for this is the focussing illusion (Kahneman et al. 2006). The focussing illusion illustrates that we think something is more important for our SWB than it actually is when we focus our attention on thinking about it. So if people are asked how much socio-economic status matters for their SWB, they are inclined to think it matters more than it does simply because their attention is focussed upon it. Thus, asking people how much something matters for their SWB is not a robust method to assess how much it actually matters, although this is unfortunately still done in some research (Page 2010; Sotgiu 2016).

Another related psychological reason that people do not always know what is good for their SWB is that people make affective forecasting errors (Gilbert et al. 1998; Wilson and Gilbert 2003). Affective forecasting errors occur when people mis-predict how they will feel in the future in terms of the valence of an emotion, the type of emotion, the intensity of an emotion or the duration of an emotion. For example, Eastwick et al. (2008) have shown that people predicting how distressed they will be after the dissolution of a romantic

relationship expect to be more distressed than they actually are both initially and over time. And while football fans accurately predict that they will be happy when their team wins, they think that their feeling of happiness will last longer than it does because they do not predict how quickly they will adapt to their team's win (Wilson et al. 2000).

The incongruence of people's preferences with their reports of how they feel and think about their lives illustrates a tension between preference-based and subjective accounts of wellbeing. We can rely on what people say they prefer and desire, and on what they do to infer their wellbeing, or we can rely on people's own reports of their SWB, but ultimately we cannot rely on both because they produce different conclusions about what affects wellbeing and how. Again, this thesis does not directly engage in these normative debates about what sort of wellbeing best reflects how well our lives are going – e.g. preferences or SWB – and instead accepts that reports of SWB provide important information about people's lives that can be used to inform research and policy. The distinctions between preferences and SWB, the focussing illusion and affective forecasting errors are used to guide some of the choices about the methodology used in this thesis, as discussed in the next chapter.

Moving away from preferences – Amartya Sen and the Easterlin paradox

Others, however, have engaged in such debates about what sort of wellbeing best reflects how well our lives are going. Perhaps the most notable criticism of the preference satisfaction account of wellbeing was levelled by the economist Amartya Sen. Sen argued that preferences are too limited as an account of welfare because people can behave rationally, with preferences that are consistent with each other, but be 'rational fools' because self-interested preferences do not account for the 'commitments' that people make when they sacrifice their welfare for the welfare of others (Sen 1977). While this was largely a descriptive critique about the inadequacy of the preference-account of wellbeing to describe welfare, Sen built on this and other ideas to develop another normative approach to wellbeing, the capabilities approach (Sen 1982), which prioritises freedom and the capability to be well, e.g. the capability to speak freely and to be happy. Capability theorists remain critical of both preferences and the SWB approach to wellbeing (e.g.

Nussbaum 2008). Thus, rather than a concern with whether preferences are the best account of welfare, it was an empirical finding – Richard Easterlin's (1974) discovery of the Easterlin paradox – that contributed to reviving interest in SWB, particularly the relationship of socio-economic status with SWB, among economists (see Drakopoulos and Katselidis 2017 for a more in-depth discussion of the relationship of psychology and economics throughout history).

The paradox is that that although there is a positive (logarithmic) association between income and SWB at the individual level, increases in gross domestic product (GDP) in wealthy countries over time are not associated with increases in SWB over time. This called into question whether GDP was really a good measure of how well people's lives were going, and spurred much theory and research into explaining the paradox (Clark, Frijters and Shields 2008; Ma and Zhang 2014). There were two main proposed solutions. One was that people's SWB adapts to increases in GDP, and so although SWB may receive a temporary boost from increases in GDP, the overall effect is null. The second solution was social comparison effects. Although people might have higher SWB from gains in their income or wealth, because their SWB is negatively affected by comparisons to other, richer people who have also similarly gained, the overall effect is null.[4] The latter explanation is consistent with an effect of relative socio-economic status on SWB.

Recent research, however, suggests that the Easterlin paradox is a methodological artefact rather than a robust result. By extending the number of countries and time periods observed, Sacks, Stevenson and Wolfers (2012) convincingly show that increases in GDP over time are associated with increases in SWB, although others (with less data) still find a null effect (Graham 2009; Layard 2006; Easterlin 2010). De Keulenaer et al. (2014) go further and show that decreases in GDP have a negative impact on SWB that is more than twice the size of the positive impact of equivalent increases in GDP, with the sum of SWB variations over time according to GDP perhaps contributing to the previously found overall null effect. Sacks et al. (2012), however, have a seemingly illogical interpretation of the

[4] It could also simply be that national incomes have reached a SWB satiation point, in that economic growth no longer benefits national SWB to the degree that it once did – even though it does at the individual level (Professor Paul Dolan, conversation 2016).

conclusions of their research. They suggest that relative income does not matter much for SWB merely because they find a positive association between economic growth and SWB.

Although income comparisons were one of Easterlin's original interpretations of the paradox, even if the paradox does not exist, relative socio-economic status and social comparisons could still matter for SWB – and much evidence suggests that they do (see section 4.1). It could be that absolute income increases SWB more than income comparisons detract from SWB – producing Sacks et al's (2012) positive association of income and SWB - and, therefore, relative income still matters. Another explanation is that people are both negatively and positively affected by relative income, depending upon the circumstances in which they make income comparisons, and thus absolute increases in income improve SWB while the negative and positive effects of relative income are cancelled out (Boyce et al. 2013a; De Keulenaer et al. 2017). Thus, the interest in positional concerns in economics sparked by the Easterlin paradox is not necessarily misplaced, even though the existence of the paradox is not unequivocally supported by data.

Economic and psychological theories of positional concerns

The research into comparison effects on behaviour and SWB following the Easterlin paradox revived interest in older economic theories about positional concerns. Veblen (1899) and Duesenberry (1949) were early proponents of the idea that individual consumption and utility are dependent on the consumption of the group, i.e. 'Keeping up with the Joneses'. Although their theories were not popular among economists at the time of their publication, they are now frequently cited by economists investigating the relationship between socio-economic status and SWB, especially relative socio-economic status (e.g. Reinert and Viano 2014; Cohn 2015).

These economic theories about positional concerns centre upon consumption and, by association, income and wealth, which are used to proxy consumption in research into relative socio-economic status and SWB (Luttmer 2005, p. 965, footnote 4). Yet not all economic theories that incorporate positional concerns focus upon consumption. Especially relevant to the relationship of relative socio-economic status and SWB is Akerlof and

Kranton (2000, 2010)'s theory of identity economics, which draws upon psychological and sociological theories about social norms (see also Akerlof 1980):

> The discipline of economics no longer confines itself to questions about consumption and income: economists today also consider a wide variety of noneconomic motives. But identity economics brings in something new. In every social context, people have a notion of who they are, which is associated with beliefs about how they and others are supposed to behave. These notions, as we will see, play important roles in how economies work (Akerlof and Kranton, 2010, p. 4).

The basic premise of identity economics is that it is not only people's preferences and tastes that affect their decisions but also social norms about what is and is not appropriate. Whether or not these norms affect people depend upon their identities. For example, more men than women smoked until the 1980s, when the number of women smoking increased to the point where the gender gap in smoking largely disappeared. What can explain this change? Akerlof and Kranton (2010) argue that prior to the 1970s it was seen as unacceptable for women to smoke, but during the women's liberation movement, social norms changed. After this change in social norms, smoking was no longer incongruent with the identity of being a woman, and so the number of women smoking rose. Without incorporating concerns about social norms and identity, explaining this shift in women's smoking behaviour would be difficult because preferences are not seen as so malleable in traditional economic theory.

Both theories of positional consumption and identity economics are discussed throughout the relative income, wealth, education and unemployment literatures. This discussion is, however, rather uneven, with some literatures appearing to give more weight to one theory than another. Yet, as will be shown in what follows, both are applicable across all of these aspects of socio-economic status. The relative income and wealth literatures appear to be founded on theories of positional consumption, which is evidenced by key papers that refer to ideas rooted in positional theorists such as Veblen and Duesenberry but not social norm and identity economics theorists such as Akerlof and Kranton (Easterlin 1974; Luttmer 2005; Clark, Frijters and Shields 2008).

It is evident, however, that social norm and identity theory are also applicable to research into the relationships of relative socio-economic status with SWB. For example, Bertrand, Kamenica and Pan (2015) illustrate that when a woman earns more than her partner, couples are less satisfied with their marriage. This can be explained by the general notion that individual utility is dependent upon others' consumption, i.e. relationship satisfaction is dependent upon one's partner's earnings – assuming relationship satisfaction can proxy utility. It can also be explained by the social norm that husbands should earn more by their wives, which negatively affects couples' satisfaction when husbands don't earn more than their wives because their identity is different to the norm. Or take the finding from Davis and Wu (2013) that relative income negatively affects evaluations of life among Whites but not Blacks in the United States. This is again general evidence that individual consumption and utility depend upon the group; however, it could also reflect a social norm for Black solidarity. Note that in this example, even though Blacks might be different from the norm – in terms of average income – the norm for Black solidarity apparently dominates their wellbeing, and not the norm for income. People's identities are not singular and can be multifaceted (Ramajaran 2014).

Scholars in the smaller literature on relative education and SWB refer to both positional and identity theories (Kingdon and Knight 2007; Salinas-Jiménez, Salinas-Jiménez and Artés Caselles 2011; Botha 2014; Nikolaev 2016a). Unlike in the relative income literature, education is not typically considered a proxy for consumption but rather a good in and of itself that is consumed. For example, there may be absolute benefits from consuming education, such as higher future earnings, productivity and experienced meaningfulness while learning (Becker 1994; Schultz 1963; Anusic, Lucas and Donnellan 2015). Consistent with positional theories of consumption, however, people have lower SWB when others around them are better educated (Botha 2014; Nikolaev 2016a; Clark private correspondence 2017). Identity theory provides a more nuanced lens to explain why this might occur. SWB may depend on the education of others because others' education sets a social norm for how well-educated people are expected to be, and people evaluate their own educational identities – i.e., their absolute level of education – based on the degree to which they fit in with the educational norm. Thus, education can signal status to others and

affect others' SWB when they internalise norms about education based on their own educational identities (Akerlof and Kranton 2002; Salinas-Jiménez, Salinas-Jiménez and Artés Caselles 2011).

In contrast to the relative income, wealth and education literatures, the relative unemployment and SWB literature is rooted more in social norm and identity theory than on positional theories of consumption. Those studies focussed upon social norms include Powdthavee (2007); Clark, Knabe and Rätzel (2010); Stutzer and Lalive (2004); Shields, Price and Wooden (2009); Chadi (2013); and Oesch and Lipps (2012). There are exceptions. One is Eggers, Gaddy and Graham (2006, p.227), who introduce their discussion of norms by discussing Duesenberry's (1949) relative income hypothesis. The second is Clark (2003), who refers to both social norm theory and theories of positional consumption:

> Although the above discussion is couched in terms of norms, the relationship examined (broadly, my experience of a phenomenon depends on others' exposure to it) can equally be expressed in terms of social comparisons to reference groups (e.g., Duesenberry 1949; Homans 1961; and Runciman 1966). I will hence use the terms "social norm" and "social comparison" indifferently (p. 325).

Despite their similarity, and the understandable approach of using them indifferently to simplify discussions, it is important to keep in mind that the terms social comparison and social norm do not reflect equivalent concepts. As in the discussion above, people may make comparisons to others that affect their utility and consumption, but social norm and identity theory provide more detail on the context and effects of social comparison processes – i.e. comparisons result in the internalisation of norms dependent on the extent to which the norms are congruent with one's identity. This difference is important for explaining some of the key results in this literature. For example, the finding that the SWB of men is more affected by relative unemployment than women in Clark (2003) is poorly explained by more general theories of positional consumption that don't predict whether men or women would be more affected by others' consumption. A better explanation, in the

sense that it is more specific, comes from social norms theory – it is more acceptable for women to be out of the labour force than men.

In summary, although the relative income, wealth, education and unemployment literatures vary in the extent to which they apply positional consumption or social norm and identity theories, this thesis will rely on both. Positional consumption theories provide the general insight that individual consumption and utility are dependent upon others' consumption, while social norm and identity theories explain how and why they are dependent and explicitly expand the consideration of consumption to other domains, including education and unemployment. Although social norm and identity theories have been part of psychology and other disciplines for many years (Allport 1954; Tajfel and Turner 1987), Akerlof and Kranton (2010) prominently brought these theories into economics and thus it is this perspective that is primarily relied upon in this thesis. This is notwithstanding the limitations of relying on any identity theory, such as the risk of imposing categories onto people that may not be relevant or meaningful for them, and of reification of the concept – similar to the criticism that measures of SWB are subject to reification (see p. 46 of this thesis and Brubaker and Cooper 2010).

A note on sociology

Even though this thesis is situated within economics and psychology, it is important to note that work within these disciplines overlaps substantially with work done by sociologists. Sociologists have primarily studied the relationship between socio-economic status and SWB from the perspective of relative deprivation, which occurs when people feel deprived, and potentially angry and resentful, relative to a particular reference group (Merton 1968; Runciman 1966; Smith et al. 2012).

Although investigations of relative deprivation and SWB share similarities with investigations of relative socio-economic status and SWB, there are important differences. Relative deprivation typically necessitates feelings of deprivation, whereas relative socio-economic status does not. Whether or not people feel deprived relative to others might be inferred from a negative impact of relative socio-economic position on SWB; however, this is not the only explanation. An alternative explanation is that people feel they are not achieving as much as they think they could, and rather than feeling deprived, they may feel

they are not living up to the expectations they have formed for themselves in light of information they have obtained from their reference group (Solnick and Hemenway 1998; Nickerson et al. 2003). This thesis does not purport to explicitly investigate relative deprivation because it does not investigate feelings of deprivation, only people's absolute and relative position in a reference group and their SWB. Relative deprivation is, however, discussed as a potential explanation for the relationship of relative socio-economic status with SWB.

Conclusion

This chapter provided the background and motivation for this thesis by showing that policy is concerned with people's wellbeing and social policies shape differences in wellbeing. In turn, these differences in wellbeing result in differences in people's absolute and relative status. It argued that we can improve our understanding of people's wellbeing by showing how socio-economic status and subjective wellbeing are related to each other.

While there are many aspects of socio-economic status, this thesis focusses upon income, wealth, education and unemployment to maintain consistency with prior literature. It contributes conceptually to existing literature by providing a new framework for thinking about reference groups according to their 'scope' (boundary conditions, e.g. age or gender or geography), 'summary' (e.g. median education, top shares of income) and 'standpoint' (e.g. rank, perception of socio-economic position). In total, there are over 300 reference group measures created and analysed in this thesis, more than in any other prior investigation. Because SWB is ambiguously conceptualised and measured in the existing literature, this chapter provided a second novel framework for SWB measures classified according to their level – 'evaluations' and 'experiences, and type – 'pleasure' and 'purpose'. This thesis will assess multiple components of SWB according to this framework in order to ensure an important component has not been overlooked.

By investigating variations in the scope, summary and standpoint aspects of reference groups, as well as various ways of measuring SWB, this thesis will contribute to our understanding of whether absolute or relative socio-economic status matters most to people.

Differences in for whom relative socio-economic status matters most will also be considered across SWB, absolute socio-economic, gender and age groups to inform our theoretical understanding of how relative effects operate and how resource allocation decisions are made.

This chapter concluded by evaluating the various approaches to understanding the relationship of socio-economic status and SWB across the disciplines of economics and psychology. In particular, it highlighted how the SWB approach differs from the preference satisfaction account of wellbeing traditionally favoured by economists, and showed that although positional consumption and identity theories have been unevenly applied across the relative income, wealth, education and unemployment literatures, both theories are applicable across these literatures and for this thesis.

2. Methodology

Summary

How can we go about assessing the relationships of absolute and relative socio-economic status with SWB? This chapter argues that a quantitative approach is most appropriate for characterising the 'effects' of absolute and relative socio-economic status on SWB because the interpretation of effects in qualitative research is challenging due confirmation bias – our tendency to disregard information that does not accord with our prior beliefs even when we try not to – and the focussing illusion, which shows that we are likely to overestimate the effect of something on SWB when our attention is drawn to it. Two quantitative household surveys are selected for this research based primarily on their comprehensive measures of socio-economic status and SWB, waves 2004/5-2012/13 English Longitudinal Study of Ageing and the 2012-13 wellbeing modules of the American Time Use Survey. Additional information is imported into ATUS from the World Wealth and Income Database, Current Population and American Community surveys, mainly to improve the representativeness of reference groups. The scope of reference groups (i.e. their boundary conditions, such as neighbours or those of a similar age) are selected based on three guiding principles: consistency with the research questions and theoretical framework, comparison with prior research and maximisation of variation in the type of people in reference groups with the available data. In total, over 300 reference group measures are created across datasets, and nearly 4K models are analysed throughout the thesis. Particular attention is paid to adjusting for multiple comparisons and addressing missing data in the analyses. It is argued that even when there are no observations in a particular reference group, this can sometimes be a valid and reliable representation of a weak or non-existent social comparison standard or norm. Survey weights are applied to adjust for several aspects of the complex survey design. The primary method of analysis is multiple linear and fixed effects regressions, along with VIF, AIC and BIC tests of model fit. It is not possible to fully resolve the problem of endogeneity, and thus all conclusions of the research must be interpreted with this caveat in mind.

Structure of chapter

The following discussion of methodology first provides a brief justification for the use of quantitative methods and a rationale for selecting secondary data analysis. Next, the process of selecting the datasets is described, followed by a description of the variables that are created and drawn from each of them to answer the research questions. These measures are discussed in order of absolute socio-economic status; scope, summary and standpoint aspects of the reference groups; measures of SWB; and control variables. There are general introductions to the process of selecting some of these measures. Finally, the method of analysis and how it will be interpreted to answer the research questions in the subsequent chapters of the thesis is laid out. A summary of the methodology in this thesis is shown in Table 2.1.

Main datasets	Aspects of socio-economic status	Summary measures of relative status	Standpoint measures of relative status	Scopes	Measures of SWB	Control variables	Analyses
Notes	*307 total relative status measures*			*27 total scopes*	*8 total SWB measures*	*Drawn from Fujiwara & Campbell (2011) and literature review*	*A total of 3,976 models*
2012/13 ATUS; also CPS, ACS, WWID	Income, earnings, education, unemployment	Top 1% (WWID); average, median, proportion (CPS)	Distance from average and median, rank (CPS)	State; age, gender, marital, race, parent, occupation, income, education, and unemployment group in states (CPS)	Life evaluation (Cantril ladder), experiences of positive and negative affect, experiences of meaning	age; age squared; gender; marital status; self-rated general health; whether they took pain medicine / were well rested on the diary day; hypertension; minutes alone; minutes in religious practices; whether hh has a telephone; median housing cost by state (ACS); children < 18 yrs in the hh; state; income; earnings; education; employment; wave; no. people in hh; race; typicality of days' feelings; population density; day of week of diary day	Weighted OLS regressions with clustered standard errors without and with controls, AIC & BIC tests of model fit, Bonferroni adjustment for multiple comparisons, quantile linear regressions, multiple imputation for missing data
Waves 2-6 2004/5-2012/13 ELSA	Income, earnings, wealth, education, unemployment	Average, median, proportion	Distance from average and median, rank, perception	Local authority; age, gender, marital, race, parent, occupation, income, wealth, education, unemployment, religion and political in GORs, society, friends, colleagues, nearby	Two life satisfaction measures, life meaning, experienced affect last week	age; age squared; gender; marital status; longstanding illness or disability; has any friends; religiously affiliated; index of multiple deprivation; no. of problems with accommodation; whether has any children; whether cared for anyone in the past month; local authority; income; earnings; education; occupation; unemployment; wave; no. of people in hh; wealth; race; urban/rural; member of political party / trade union / environmental group	Pooled cross sectional and fixed effects regressions with cluster-robust standard errors without and with controls, AIC & BIC tests of model fit, Bonferroni adjustment for multiple comparisons, quantile fixed effects regression, weighs for creation of relative variables, multiple imputation for missing data

Table 2.1: Summary of the methodology. ATUS = American Time Use Survey, CPS = Current Population Survey, ACS = American Community Survey, GOR = Government Office Region, ELSA = English Longitudinal Study of Ageing, WWID = World Wealth and Income Database, Hh = household, OLS = Ordinary least squares, AIC = Akaike information criterion, BIC = Bayesian information criterion. Absolute (but not relative) occupation is also assessed in chapter three (see p. 89).

2.1 Justification

Epistemological assumptions

There are many different perspectives on the suitability of various quantitative and qualitative methodologies to answer and even derive research questions, and these are often laced with different epistemological assumptions (Hammond and Wellington 2012). I take a social constructivist approach to knowledge (Berger and Luckmann 1967), which means that I believe truth and knowledge are relative to the individual perceiving them, but that some versions of truth and knowledge are better than others and research can help to inform about this. For example, some people may believe that consuming a fatal poison will not result in death even in light of ex-ante evidence about deaths from the poison. This is their relative truth but a better, evidence-informed version of truth is one that does believe consuming the poison will result in death.

Why quantitative?

While qualitative research has strengths, e.g. it can provide rich descriptions of causal mechanisms (Pawson and Tilley 1997), it is not generally very appropriate for characterising the 'effect' of one thing, such as socio-economic status, on something else, like SWB. Psychologists have demonstrated a number of tendencies that make it likely researchers and participants would overstate the effects of SWB determinants in qualitative research, such as the 'focussing illusion' (previously discussed in section 1.4, p. 59), as well as 'confirmation bias' (Schkade and Kahneman 1998; Nickerson 1998).

Again, the 'focussing illusion' shows that nothing is as important as it is when people are thinking about it. To illustrate, in a classic study, people with expensive cars report that they enjoy driving them more than those with less expensive ones – because they focus on the value of the car whilst they are thinking about driving it – but there are no differences according to the car's value for their reported enjoyment of the last time they drove it (Schwarz et al. 2009; see also Schkade and Kahneman 1998; Kahneman et al. 2006; Kahneman 2011). A quantitative SWB approach avoids this problem by looking at the

effects of SWB determinants on SWB without asking people how much they think the determinant impacts their SWB. This approach shows, for example, how much something like wealth or air pollution matters to how people feel and think about their lives rather than how much they think it matters (Dolan and Laffan 2016).

We also exhibit confirmation bias, the tendency to discard information that doesn't conform with our beliefs, even when we try not to (Nickerson 1998). For example, reviewers of academic journal papers are more likely to publish articles that conform to their own theoretical perspective (Mahoney 1977; Hergovich, Schott and Burger 2010). Fingerprint experts are also more likely to make a match with a suspect if they are told the suspect confessed to the crime than if they did not even if the evidence is the same (Dror and Charlton 2006; Kassin 2012). This research suggests that if I analysed language or behavioural data to derive codes and themes to answer questions about what the effect of absolute and relative socio-economic status on SWB is, these codes and themes would likely be based on my preconceived notions about the answer. People also typically behave very differently when they know they are being watched (Risko and Kingstone 2011), which is usually an unavoidable ethical requirement in academic qualitative behavioural research. This would limit the generalisability of and any society-wide policy implications from any observational data I might collect.

The focussing illusion and confirmation bias also limit the applicability of methodological triangulation, e.g. using both qualitative and quantitative methods, as an approach to investigating the relationship of socio-economic status with SWB. What people say in qualitative research matters for their SWB may not be what does with a quantitative approach, and reconciling different findings from different methods is beyond the scope of this thesis.

Qualitative research is, however, particularly good for enriching our understanding of why socio-economic status may affect SWB. It would be reductionist to argue that unemployment, for example, leads to low SWB because people no longer have worthwhile work – and tautological, too, because experiences of worthwhileness are an aspect of SWB (see section 1.3). By speaking to people, however, e.g. in qualitative interviews, it would be

possible to learn why unemployment might lead to misery. Some of the earliest qualitative research into poverty in the UK identified a number of mechanisms in this relationship, such as poor health and living conditions (Mayhew 1861). Such research is important for characterising the relationship of socio-economic status with SWB but is not a focus of this thesis, which is concerned with 'effects'. The effects investigated in this research are, however, contextualised within a theoretical framework that encompasses social comparisons, SWB, identity and social norms, as introduced in chapter one.

Establishing causality

This quantitative approach emphasises causal methods to the extent permitted by practical considerations. If socio-economic status has a causal effect on SWB, policymakers can be more confident that any decisions related to these factors will impact SWB similarly again. A causal effect is necessarily limited to a particular place and time, however, and if the context is different in the future, or if a causal mechanism that was once present is no longer present, the effect may not occur again (Pawson and Tilley 1997). It is only through the accumulation of causal evidence from many contexts that we can begin to be confident about a causal link between absolute or relative socio-economic status and SWB. This research will add to this body of evidence.

Following Dolan, Fujiwara and Metcalfe (2012, p.11), we can be confident to different degrees about causation depending on how well the counterfactual is assessed; that is, what SWB would have been had the individual had a different absolute or relative socio-economic status (see also Angrist and Pischke 2008). In ascending order of confidence, the quantitative designs that reflect causation are:

1. natural field experiments;
2. randomised controlled trials;
3. quasi-experiments;
4. matching techniques/regression analysis;
5. simple comparisons, where there is a treated and control group but no attempt is made to control for differences between the groups;

6. and pre- and post-analysis, where there is no control group and participants are assessed before and after a treatment.

Because people largely self-select into their jobs and education, which also affects their income and wealth, it is challenging to attempt any experimental manipulation of these factors in a small-scale research project precluding (1) and (2). Moreover, because the sample of participants in experimental research is often limited by budgetary constraints, making it relatively small, the results may not generalise to other populations, which is important if policymakers wish to use this research to inform decisions about the allocation of resources amongst the general public.

There is unfortunately not an evident quasi-experiment (3) for these research questions. The 2008 economic recession, for example, was considered as a candidate that might near randomly affect socio-economic status but prior research suggests that anticipatory effects would confound attempts to delineate precise start and end dates of the crisis (Mondria and Quintana-Domeque 2013). Means-tested benefits, such as pension credits, are not taken up by all who are eligible for them and thus introduces a self-selection problem into any attempt to utilise arbitrary cutoffs for eligibility as a quasi-experiment (Barton 2012). A number of instrumental variables were also considered for socio-economic status, including parents' socio-economic status, but the assumption of instrumental variable analysis – that the instrument is uncorrelated with the error term – is unlikely to hold: parents' SES will likely influence current SWB via many factors other than socio-economic status which are not available in the data and thus contained in the error term, such as attachment style (Abadie 2003; Scott and Cordova 2002; Zhang and Labouvie-Vief 2004; Green, Furrer and McAllister 2007).

This research, therefore, will conduct regression analyses (4) using data from two large national surveys containing measures of absolute and relative SES and SWB, and discuss limitations about the extent to which causation can be inferred.

2.2 Datasets

Ideal attributes

The ideal dataset would possess a number of attributes. Fundamentally, it must contain measures that would permit an investigation of the research questions. This includes measures of both absolute and relative socio-economic status – income, wealth, education and unemployment – and also diverse socio-economic, socio-demographic, or other information to create reference groups. It would also include measures of each of the SWB dimensions, especially experiences of purpose. For research questions seven and eight, measures of gender and age are also necessary.

The ideal dataset would be longitudinal, following the same people over time. This is as opposed to cross-sectional or repeated cross-sections, containing information about people at only one point in time or different people at different points in time, respectively. Information about the temporal order of events within individuals, which is provided by longitudinal data, is essential to establishing causality because one event must precede another in time in order to have a causal effect (Ruspini 2003). Assessing within-individual changes over time also provides the ability to adjust for unobserved time-invariant within-individual characteristics that could confound the relationship of socio-economic status and SWB, such as childhood experiences. Longitudinal data is not perfect, however, especially because asking the same people a SWB question more than once can influence their subsequent responses. In a study investigating such effects, Dolan and Metcalfe (2010) found that football fans who answered a happiness question both before and after their team lost had scores that were a whole point lower on a 0-10 scale than those who were only asked after the event.

Finally, the ideal dataset would be representative of a large group of people. It would also be representative of both majority and minority populations within this large group, including, for example, diverse ethnic, geographic (e.g. urban, rural) and age groups. This would ensure the generalisability of the conclusions of the research and its relevance for a range of audiences.

Social network datasets?

Although many secondary datasets contain measures of absolute socio-economic status, it is more challenging to find datasets that contain information about reference groups in order to construct measures of relative socio-economic status. Datasets that contain detailed information on people's social networks are a potentially rich source of reference group information, and these have been used extensively in the past by researchers interested in the influence of social norms on health and behaviour (Christakis and Fowler 2013). One dataset that contains information on SWB, socio-economic status and reference groups is the Framingham Heart Study (FHS). The FHS collects longitudinal information about people's relatives, friends, co-workers and neighbours, as well as socio-economic variables such as income and education. This dataset has been used extensively to inform about how social networks influence a range of phenomena including smoking, divorce, obesity and SWB, although social network analysis as a methodology is still limited in its ability to separate network effects from the effects of shared events within the network (Christakis and Fowler 2013). Unfortunately, there are not many measures of SWB in this dataset, as the existing measures appear to be those from the Center for Epidemiological Studies depression scale. This scale focusses on positive and negative affect and behaviours (e.g. last week I was happy, I felt sad, I had crying spells). One question on this scale is whether or not people thought their lives had been a failure. This might be considered be a combination or 'other' measure of evaluations of pleasure / purpose; however, it is not clearly about pleasure or purpose, and it is not a common way of assessing evaluations of SWB (such as life satisfaction, see p. 54).

Another dataset containing social network information, as well as socio-economic and SWB measures, is the National Longitudinal Study of Adolescent Health. This dataset is a sample of adolescents through young adulthood, limiting its generalisability in terms of age, but it does contain information about family, peer, partner and geographic reference groups. Unfortunately, the socio-economic information collected about reference groups is limited, and moreover, this dataset was not available at the time of preparing or writing this thesis due to a ban on new applications for the data. Social media datasets containing information on online social networks are a potentially rich source of reference group

information (e.g. Bond et al. 2012), but again, socio-economic information about these reference groups is not readily available and would require survey data collection methods too time intensive to undertake as a component of this thesis.

English Longitudinal Study of Ageing

A well-known longitudinal dataset containing detailed information on SWB and the socio-economic characteristics of participants is the English Longitudinal Study of Ageing (ELSA). This is a survey of adults aged 50 years and older and their younger partners who reside in England. For the reasons detailed in what follows, it is one of the datasets chosen for the present investigation.

The financial information in ELSA is notably comprehensive, containing information on both income and wealth (see p. 152 for a discussion of why income and wealth might differ from each other in their relationship with SWB). This financial information is available for both the main respondent and their partner, although many couples share their finances. There is also information about respondents' educational level and employment status. Aside from partners and one item about parental socio-economic status, however, the study does not contain information about the socio-economic status of participants' social networks. But it does contain a number of perceptual questions asking participants how their socio-economic status compares with that of their friends, colleagues, neighbours and society. It also contains detailed geographic and demographic information that can be used to construct reference groups. Thus, this dataset meets the requirements for socio-economic measures.

ELSA contains multiple measures of SWB, including positive and negative affect, as well as evaluations of purpose and satisfaction with life. Thus, this dataset mostly fulfils the requirements for SWB measures, although there is unfortunately no measure for experiences of purpose. ELSA is also, self-evidently, longitudinal, spanning six waves over about ten years from 2002/03-2012/13, fulfilling the requirement for longitudinal data.

Although ELSA is a large dataset, containing information on over 10,000 older adults, it is may not be entirely representative of the English population – even of those aged 50 and over. This is because the survey sample is comprised of those who agreed to be contacted from the Health Survey for England (HSE), which introduces self-selection effects that could bias the results in ways that even sampling weights cannot adjust for due to the fact that not all differences between the sampled and non-sampled populations are observed. For example, ELSA participants could be more motivated than the general population, and thus the result of any ELSA analyses would only apply to other similarly motivated groups. This is a limitation of the data.[5]

Other sources of information that could be imported into ELSA in order to improve the representativeness of reference groups, especially at lower geographic levels, were considered and eventually excluded. The Annual Population Survey (APS) is a good source of information for local authority information, for example, which is a reference group scope used in ELSA, as discussed below (p. 96). The APS does not contain information on all the reference group scopes used in ELSA, however, such as wealth and religion (see section 2.3). Thus, if the APS were used for some but not other reference group scopes in ELSA, it would not be possible to compare which reference group scope affected SWB more (research questions 1e and 3e, see p. 31) because the differences could be due either to the different datasets or to the reference group scope.

Thus, the main strengths of ELSA are that it contains detailed socio-economic information and that it is longitudinal. Its main weaknesses are that it is not representative of a large population and that it contains no measure of experienced purpose. Although there is not extensive social network information, there is sufficient information to construct reference groups for measures of relative socio-economic status. Given that there is not very much existing research into experiences of purpose, and the focus on this aspect of SWB in the thesis, the second dataset is selected with experienced purpose as a foremost consideration.

[5] In conversation with Dave Hussey and Christos Byron from the National Centre for Social Research, I was assured that efforts were made to account for these self-selection effects using the weights.

Wellbeing Modules of the American Time Use Survey

There are only two datasets I was aware of at the time of commencing this thesis that contain a measure of experienced purpose. The first is the 2006 German Day Reconstruction Method (German DRM) study, conducted by Paul Dolan and Mat White (White and Dolan 2009). This is a study of around 600 Germans who filled out a diary of the activities they performed yesterday and reported how they felt during them, including whether they felt the activities were worthwhile and meaningful. The second is the 2010, 2012-13 wellbeing modules of the American Time Use Survey (ATUS), a repeated cross-sectional study each year of over 10,000 adults aged 15 years and older residing in the US, who also filled out a diary of yesterday's activities. They reported how they felt during a selection of three activities, including how meaningful they considered the activity to be.

ATUS is selected instead of the German DRM for two reasons. First, it is representative of the non-institutionalised household population of the United States who are fifteen years of age and older. In contrast, the German DRM is a smaller, unrepresentative sample. Second, there are more detailed questions on socio-economic information in ATUS, such as education, that are not available in the German DRM. Like ELSA, ATUS does not have detailed social network information. ATUS does, however, contain information on the family income, earnings, educational level and occupational status of the respondent. Along with demographic information, these data can be used to create diverse reference groups. Thus, ATUS meets the requirement for socio-economic data well.

Since commencing the thesis I am now aware that the 2012 German Socio-Economic Panel Survey Innovation Sample (GSOEP-IS) also contains a measure of experienced purpose (Anusic, Lucas, and Donnellan 2015). This survey is very similar to the ATUS, asking a nationally representative cross-sectional sample of German respondents how meaningful their activities were. These data were not released until April 2014, however, which was after I commenced the thesis. Thus, I selected ATUS instead.

In addition to a measure of experienced purpose, ATUS also contains measures of positive and negative affect and evaluations of life. Thus, it is possible to contrast the determinants

of these four components of SWB and ATUS meets the requirements for SWB measures. The ATUS is not longitudinal like ELSA; however, no known national dataset containing a measure of experienced purpose is longitudinal. Thus, causality is a limitation of ATUS, and the results are discussed with this caveat in mind.

The ATUS wellbeing module data was downloaded from the Bureau of Labour (2016b) statistics as recently as 23 February 2016.

Supplements to ATUS: the American Community and Current Population Surveys, and The World Wealth and Income Database

Although ATUS is representative of the adult US population, it is not representative at the state level (BLS 2016). This is important because geographic regions could be reference groups for participants (Putnam 2001; Luttmer 2005). For socio-economic information about US residents that is better representative at the state-level, the three main surveys available are the American Community Survey (ACS), the basic Current Population Survey (CPS) and the March supplement of the CPS (US Census Bureau 2016a). The basic and March CPS (also called the Annual Social and Economic Supplement, or ASEC) are similar except that the March CPS asks additional and more detailed questions about socio-economic status. The CPS is the sampling frame for the ATUS, and some of the questions in the ATUS are drawn from the CPS.

For reference group information, the March CPS was selected instead of the basic CPS or the ACS. The March CPS was preferred over the basic CPS because household income was reported as a continuous variable that could be averaged in the March CPS but not in the basic CPS. Moreover, more detailed questions on income were included in the March CPS than in the basic CPS, which could improve the validity of the measure. The March CPS (henceforth CPS) was selected instead of the ACS because the ACS asks about income in the prior year from the date of the survey, whereas the CPS asks about the prior calendar year, meaning that there is less variability between respondents in the CPS than in the ACS regarding what time period the household income measure covers. Thus, using the CPS also improves the reliability of the estimates relative to the ACS because income has the

same reference period between respondents. Because of this important difference between the CPS and the ACS, all reference group information imported into ATUS was drawn from the CPS. This ensured that any differences in the effect of socio-economic status on SWB according to the scope of the reference group were truly due to the scope and not sampling differences, i.e. if some reference group information was drawn from the ACS and others from the CPS. One control variable not available in the CPS, housing value, was drawn from the ACS, as discussed below (pp. 120, 125).

To maintain consistency with ATUS, the sample of the CPS and ACS was restricted to those aged 15 years and older. Although some studies of relative socio-economic status and SWB restrict the sample to those older than 15 years, such as to only working aged adults (e.g. Clark 2003), the effects are looked at according to age in chapter six. Thus, the generalisability of the results is improved by including more ages in this research without sacrificing comparability to prior research. There were around 65K unique individuals in each year of the CPS survey after restricting the age, and around 1.5 million households in each year of the ACS survey.

CPS data were downloaded from the National Bureau of Economic Research (NBER 2016) as recently as 3 October 2016. ACS data – in the form of Public Use Microdata Samples (PUMS) – were downloaded from the US Census Bureau (2016a) as recently on 12 October 2016.

A source of information for capturing information about the top earners and wealth holders is the World Wealth and Income Database (WWID). This database provides information on top income and wealth shares in an expanding selection of countries globally (Alvaredo et al. 2016). To calculate these top shares, the authors use tax records from each country. This is a strength because it limits the bias that can affect self-reported measures of income and wealth (as used in the CPS, ATUS and ELSA) due, for example, to unit or item non-response, sample under-coverage, inaccurate recall or social desirability (Moore and Welniak 2000; Groves et al. 2013). However, people also have an incentive to strategically report as little income and wealth as possible in their taxes to avoid paying tax. Tax avoidance and fraud are not captured by these data and could bias top share estimates

downwards. WWID statistics are also pre-tax and transfers, which is a weakness for this research. Theoretically, it would be best to capture the most visible forms of relative socio-economic status to consider in the relationship with SWB because of the theories of social comparison and norms, which rely upon people being aware of others' socio-economic status in some fashion (see p. 227). Post-tax income and wealth are more visible than pre-tax because they can be spent and invested, for example, on visible goods such as clothing and housing. Still, pre-and post-tax incomes and wealth will be related, and the latter will partially reflect the former.

Because ATUS was selected following and informed by the selection of ELSA (see p. 79), ELSA was discussed first above and ATUS second. In the rest of this thesis, however, ATUS is always discussed prior to ELSA because it was more complex to build the relative variables in ATUS than in ELSA due to the importing of information from the CPS, APS and WWID into the ATUS. Thus, the aim was to harmonise ELSA in light of what was done in ATUS rather than vice versa.

2.3 Measures

There are four sets of measures used in the analysis: absolute socio-economic status, relative socio-economic status (in terms of the scope, summary and standpoint aspects of the reference group), SWB and control measures. These are discussed in this section and described in further detail in Appendix A. Appendix A, Table 2.1 shows details of the measures of absolute socio-economic status. The relative variables can be seen in Tables 2.7 and 2.8 later in this chapter. Further information about the summary measures of relative socio-economic status are in Appendix A, Table 2.2, the measures of SWB are in Table 2.5 later in this chapter and the control variables are in Appendix A, Table 2.3. First, however, the psychometric approach informing the selection of indicators is briefly discussed.

Psychometric approach – reflective and formative indicators

According to psychometric theory, socio-economic status and SWB are complex underlying constructs that can never be truly observed (Hox 1997). Instead, measures of socio-economic status and SWB are the observable indicators of the unobservable constructs. There are two main types of indicators. Reflective indicators are those in which variation in the construct causes variation in the measure. This would mean that changes in people's SWB, for example, affect changes in the SWB measure. Formative indicators are those in which variation in the measure causes variation in the construct (Land, Michalos and Sirgy 2011). Indicators of socio-economic status are formative because changes in indicators like income and wealth cause changes in socio-economic status rather than vice versa (Perron and Gillespie 2015). Thus, this thesis uses a combination of reflective and formative indicators.

Absolute socio-economic status – ATUS

Because the relationships of the different aspects of socio-economic status with SWB are of interest for different reasons, these are investigated separately. For example, a particular relationship of income with SWB helps to inform how much income someone should earn to optimise their SWB – notwithstanding issues like the ecological fallacy (Schwartz 1994) – whereas a particular relationship of unemployment with SWB could inform about the non-pecuniary costs of being out of work. These are different issues and are treated as such. To avoid the issue that different aspects are related, analyses are conducted without and with controls for different aspects of socio-economic status (see p. 129). Following from the Introduction (p. 18), this thesis aims to assess the income, wealth, education and employment aspects of socio-economic status. Each of these are discussed in turn. The measures of absolute socio-economic status used in this research are summarised in Table 2.1, Appendix A.

Income. In ATUS, there are two main income variables: annual family income and weekly earnings. Each were used in the analyses. The weekly earnings variable contains precise information on earnings to the hundredths of a decimal, whereas the family income variable

is less precise, containing uneven categories of income (e.g. $35,000 to $39,999; $75,000 to $99,999). Household income is from the final CPS interview, which was conducted earlier than the ATUS (recall some items from the CPS are contained in ATUS, see p. 81), and asks about income in the prior calendar year. The weekly earnings information was updated in ATUS from the CPS if the respondent had changed or found a job or new employer since the CPS interview. It only captures earnings at their main job and not any other jobs, is not defined for respondents who do not work for pay (some family business or farm workers) or who are self-employed, excludes overtime earnings, and it is topcoded at $2,884.61 a week – about $150K a year – for confidentiality purposes.

The weekly earnings variable is from the ATUS interview, and it was missing some information – for 10,016 of the final sample total of 21,590 participants (46.39%), and 1,480 of the 13,054 participants who were employed at the time of the ATUS interview in the final sample (11.3%). The family income variable was not missing for any participants, as those who did not respond had values imputed from other questions they did answer in the CPS. Theoretically, weekly earnings could be a less valid indicator of socio-economic status than family income because someone could have low weekly earnings but still have a high amount of economic resources at their disposal because of a family member's income – assuming resources are shared collectively within households, which is not always the case (Bobonis 2009). Both income and earnings, therefore, were used in the analyses. Weekly earnings values were multiplied by 52 weeks in the year to facilitate comparison with the household income measure.

Due to the uneven categories of family income, income values were recoded from 16 into five even categories of $25K ranging from less than $25K to $100K+ (see Appendix A, Table 2.1). This transformation was preferred to analysing the income variable with uneven categories to ease the interpretation of the results. After I created and analysed this measure, there were two publications analysing income and SWB in ATUS. First, Kushlev, Dunn and Lucas (2015) treated this categorical variable as continuous. I did not do this in order to avoid confounding different levels of measurement without evidence they can be treated comparably in this instance. Second, Stone et al. (2016) took the midpoints of each category of income and then treated it as continuous (see further discussion on p. 150). I did

not take this approach it was unclear to me what the distribution of family income within the categories of family income were the ATUS. It could be that the midpoint is not a reflection of the actual family income within the family income categories – e.g. the distribution might be weighted towards the top or the bottom of the category and not the midpoint.

Family income and earnings in ATUS are unequivalised variables. Because household income is categorical, it cannot be easily adjusted for household size. This is a problem because what is a 'high' income for, say, a family of seven is different to what is a 'high' income for a couple with no children. To improve comparability between models, household size is included as a control variable in the ATUS models (see Appendix A, Table 2.3, and p. 119). Family income and earnings are self-reported, which introduces measurement error. People tend to underreport their income, for example (Moore and Welniak 2000), especially if they are dissatisfied with it (Prati 2017) – however, this is challenging to avoid.

Wealth. There is no measure of wealth in ATUS.

Education. There was only one measure of education in ATUS – highest level of education attained. This information comes from the CPS, and is current at the time of the CPS interview. It was not updated in the ATUS interview. Education originally contained 16 categories of qualifications. There were, however, insufficient numbers of participants in each category to conduct statistical analyses, e.g. only 35 people with less than 1st grade education. Various transformations of education were conducted, and eventually responses to this variable were recoded into six categories in order to ensure a sufficient number of participants in each educational group for statistical analyses (see Appendix A, Table 2.1). This decision was also informed by the education categories available in the CPS, which were used to create education reference groups, to avoid reference groups with no people in them (though see p. 90 for a discussion of why no people in a reference group might be acceptable theoretically).

Unemployment. ATUS contains two variables indicating whether or not the respondent was unemployed. The first is from the CPS, which asks about labour force status in the 'last week' at the time of the CPS interview, and the second is from the ATUS interview, which updates the CPS information and asks about labour force status in the 'last seven days'. Thus, there is a tradeoff between maintaining comparability with income and education by using the CPS measure, which is important for research questions one and three as discussed above for ELSA (p. 79), and reducing measurement error by using the ATUS measure, which is important for drawing conclusions from the research. To ensure the research questions could be addressed, the older CPS unemployment measure was used; however, the newer ATUS variable was also included as a robustness check.

Absolute socio-economic status – ELSA

Moreso than ATUS, ELSA contains detailed information about many aspects of socio-economic status, including measures of income, wealth, consumption, employment status, education and occupational grade.

Income. As discussed in the Introduction (p. 62), income is typically used to proxy consumption in the relative income and SWB literature. Thus, it is worth considering whether any consumption measure(s) in ELSA could be used instead of a proxy. The consumption measures in ELSA are not particularly detailed and only ask about a few goods, such as a dishwasher, television or CD player. Thus, they are unlikely to provide information about how the consumption of those of a high socio-economic status differs from those at middle or lower levels. As discussed, investigating the top is an important issue for relative socio-economic status (see p. 40). Thus, consumption as a measure of socio-economic status is not included given its lack of detail about the consumption of those at the top.

In contrast to the consumption measures in ELSA, there are many measures of income, including self-employment income, income from pensions, asset income, benefits and so on. To maintain consistency with ATUS, this research first takes the overall household income variable that includes income from these various sources. This variable is at the

benefit unit level, which is a couple or single person plus any dependent children. It is equivalised using an OECD equivalence scale where second adults are weighted at 0.5, dependent children 14 years and older are also weighted at 0.5, and children under 14 years are weighted at 0.3 (Hagenaars, De Vos and Zaidi 1996). The second income variable, like ATUS, is earnings. To maintain consistency with ATUS, this variable excludes self-employment earnings and earnings from other jobs, although this information is available – unlike in ATUS. Income from earnings is at the benefit unit level for both the main ELSA respondents and their partners, and it is unequivalised. It appears to ask about the last payslip they received, explaining why it is defined even for some of those who reported being currently unemployed (see p. 127 for a discussion of missing data, and Appendix A, p. 404).

Income values across waves of ELSA are not strictly comparable due to changes in the cost of living over time. Thus, these income values were converted to June 2013 – the last month of ELSA interviews in the sample analysed – real terms using the average ONS (2015a) consumer price index (CPI) according to the month of interview for ELSA. For example, in December 2004 the CPI was 99.1, and in June 2013 it was 125.9. Thus, income from interviews in December 2004 was divided by 99.1 and then multiplied by 125.9. Values without this adjustment were also analysed but not presented (see footnote on p. 177).

Wealth. There are many measures of wealth in ELSA, including housing wealth, business wealth, debt and savings in risky and non-risky assets. The overall wealth variable is used in the analyses, including all wealth from these various sources. Like income and earnings, wealth is at the benefit unit level. Again, wealth values are converted to real 2013 values using the ONS (2015a) CPI. There is not a commonly accepted standard for equivalising wealth and so these values are unequivalised; however, household size is controlled for in ELSA analyses (see below, p 121).

Education. In ELSA, there are two primary education variables: the highest level of qualifications they have attained and whether they attended a formal educational training course in the last year. The former variable provides the most information because it

differentiates between levels of qualifications rather than just attending a particular course; therefore, highest level of educational qualification attained is the main educational variable used in the analyses. There were sufficient numbers of respondents for reliable estimates in each education category and so the original categories were used; however, none and foreign/other were collapsed into one category to ease the interpretation of the results (see Appendix A, Table 2.1).

Unemployment. The employment status variable in ELSA contains information on whether or not the respondent is retired, semi-retired, employed (including self-employed), unemployed, permanently sick or disabled, looking after home/family and other. Consistent with ATUS, all categories other than unemployed were collapsed into one category so that unemployment is a binary variable consisting of unemployed and not unemployed (see Appendix A, Table 2.1).

As discussed in section 2.4 below, the effects of absolute occupation in both ATUS and ELSA on SWB are analysed. Relative occupation is, however, not investigated in this thesis because the majority of prior literature looks at relative income, education and unemployment effects, and not relative occupation effects (see literature review in chapter four, and discussion on p. 18). Details of the occupation variable and its coding in ATUS and ELSA are discussed below (p. 96) and shown in Appendix Table 2.3.

The scope characteristics of reference groups – general introduction

The scope conditions defining the characteristics of people in reference groups (e.g. neighbours, friends, educational level) were selected based on weighing up three guiding principles. The first principle was consistency with the research questions and theoretical framework of the study as outlined in the Introduction, which allows the research questions to be addressed and interpreted. The second principle was enabling comparisons with prior research, which strengthens the conclusions that can be drawn from studies in this area. Special attention is paid to the reference groups in Pérez-Asenjo (2011), as this is one key study that explicitly investigates how the type of people in reference group scopes affect the relationship of relative socio-economic status with SWB (see section 4.1, p. 225). The final

principle was maximisation in the variation in the type of people, which facilitates the aim of discovering how different reference group scopes affect the relationships of absolute and relative socio-economic status with SWB (research questions 1e and 3e).

It is important to note, however, that the aim was not to exhaust all possible types of people that could be in reference groups that are important for relative socio-economic status and SWB. Rather, it was to consider some that may matter, based on the guiding principles. All reference group scopes were selected based on the idea that people make comparisons to others and internalise norms based on readily observable characteristics, in line with the theoretical framework and the guiding principles for defining scope. It is unlikely that someone would compare to someone else based on a characteristic they are unaware of, such as unexpressed preferences.

In general, care was taken to avoid reference groups with no people in them by widening the scope categories, e.g. those used to define age, occupation and marriage groups. This was done so that the estimates are valid and reliable in the sense that they capture an effect that can be repeated in other research with other similar samples. Even though smaller reference groups – such as very specific occupation groups – may be important for SWB, these data do not sample such groups in detail and so they do not lend themselves to an investigation of them. It is an assumption of this thesis that relatively 'large' and 'wide' rather than more 'narrow' and 'local' reference groups are important for SWB; however, the extent to which more narrow or local vs. large and wide reference groups are important for SWB is left for other research (see, for example, Anderson et al. 2012; and see the studies discussed in section 4.1).

In some instances, however, it is plausible that there are in fact no people representing a particular characteristic. For example, it may be that there are no unemployed people in some states in some years who are living in households with a combined annual income of $100K+. Other more official and detailed data corresponding to the reference groups in this research – such as tax records – did not appear to be publicly available at the time of writing and thus a comparison standard was not readily available. A choice was therefore made to allow values for some reference groups to be a minimum of zero. Although these

zeros then suggest the entire absence of someone to compare to or a norm, the presence or absence of a certain value of socio-economic status in a reference group in the population is only ever approximated by these data. A zero may reflect the absence of a group, comparison standard or norm, or it may reflect a weaker norm or comparison standard relative to a higher value if the population value is not zero. In this sense, then, I argue that the estimates are still valid and reliable even if they are based on reference groups with some values that are zero or close to zero or based on very few people.

In ATUS, the reference group information was drawn from the March CPS or the WWID and then imported into the survey. For ELSA, all reference groups were drawn from the ELSA survey. Other datasets were considered as supplements to import into ELSA, such as the Annual Population Survey, but they did not have as many scope characteristics as ELSA to create reference groups. Notably, it may be that there are some reference groups in the CPS not represented by a person or people in ATUS or ELSA. The reference group from the WWID was only state, and there were always some people in each state in ATUS. In the CPS, however, there were more specific reference groups, such as average income in age group in state. Although the sampling weights (see below, p. 125) in ATUS and the CPS should adjust for under-sampling in each survey, for some reference groups from the CPS, occasionally there were no people in ATUS onto which the CPS information could be matched (see p. 106). This is a limitation of these data.

Most groups were defined based on a single characteristic, such as age, rather than multiple characteristics, such as age and gender group. One exception to this is geography, for the reasons discussed elsewhere (pp. 81, 92). Although using multiple characteristics to define reference groups would increase variation in the type of people in reference groups, and multiple characteristics have been used in past research to create reference groups (e.g. Wood et al. 2012), I argue the role of single-characteristic reference groups in the relationships of absolute and relative socio-economic status with SWB should be established before investigating the role of multiple-characteristic reference groups. Doing so provides clarity and specificity about the type of people in reference groups that matter most for SWB in order to address research questions one and three, in line with the first guiding principle. Future research could build on these initial results, for example, by using

combinations of the single-characteristic reference groups that appear to matter most to investigate whether they change the relationship of relative socio-economic status with SWB. Of course, it may be that some combination-based reference groups matter when the singe-characteristic reference groups used to create them do not; however, this issue is left for future research. The issue of overlaps in the people contained between single-characteristic reference groups is also mentioned on p. 130.

It would be ideal to have information about the characteristics of people those in the sample frequently interact with, such as colleagues and friends. ATUS and ELSA do not contain socio-economic information on people's social networks apart from other members of their household. In ATUS these are specified as people's spouses, unmarried partners, own household children less than 18 years old, grandchildren, parents, brothers/sisters, other relatives, foster children, housemates/roommates, roomers/boarders and other non-relatives. In ELSA, this is simply the younger partner of the respondent. These are relatively small reference 'groups' – in the case of a partner, it would be a single person, and in the case of an entire household, an average of 2-3 people (US Census Bureau 2016c). These smaller groups generally are not well suited to summary and standpoint measures of average, median, top shares, proportion, rank and distance, which are investigated in this thesis for the reasons discussed in the Introduction, p. 35. Relationships between partners, such as distance between couples' incomes, is a related but separate literature to what is focussed upon in this thesis (see, for example, Bertrand, Kamenica and Pan 2015). Thus, household, and various household members, are not investigated as a reference group scope – although ELSA does contain several measures of perceived standpoints in society, among friends, colleagues and neighbours (see p.108).

The scope characteristics of reference groups - ATUS

The basic building block for the reference groups in ATUS is state. Conceptually, it makes sense that people compare to the people in their local areas because they are more likely to come into contact with these people than those in other states, notwithstanding the role of the media in transmitting information about other people in less proximate geographies. Nation was not a reference group due to limited variation by year, given that there are only

two years of ATUS analysed, and that preliminary analyses suggested a high degree of collinearity between absolute and relative socio-economic status when other characteristics were used to build nation-level reference groups. Collinearity was indicated by a variance inflation factor (VIF) greater than ten (O'Brien 2007). This can be a problem in part because collinearity can inflate standard errors, leading to a failure to detect relationships that are statistically significant (see also pp. 133, 234). County information is also available in the CPS, and may have been requested for the ATUS; however, it appeared to be missing for around half of CPS observations. Moreover, absolute and relative income are likely to be highly correlated in small local areas (see p. 215), and so these data were not used. The assumption, therefore, is that people are aware of at least some of the people who are physically proximate to them. It is not, however, that they are highly physically proximate. States are relatively large areas and so it is assumed that people will be affected by information from others in their states, such as via local news, talking to people in their social networks or seeing them online or outside.

As discussed further in chapter four (p. 223), other potential reference group scopes from prior research may be work colleagues, family members and friends (Clark and Senik 2010; Hong Kong, Law and Wong 1998); occupational groups (Dornstein 1988; Bygren 2004; Pérez-Asenjo 2011); as well as age, sex, race, educational degree, region, work status, marital status, occupational prestige, religion, political views and city/country (Pérez-Asenjo 2011). Pérez-Asenjo (2011) continues to be an important foundation for this research because it is a recent contribution with wide variation in reference group scopes.

Several observable characteristics were selected from the available data: age, gender, race, marital status, occupation and whether or not someone has children living with them at home (‘parent’). The first three have been used to create reference groups before – e.g. Pérez-Asenjo (2011) – whereas ‘parent’ appears to be new to the relative socio-economic status and SWB literature, and also addresses the third principle of increasing variation in the type of people in reference groups.

Prior research also suggests relative socio-economic status within socio-economic reference groups matters for SWB (e.g. Senik 2004; Pérez-Asenjo 2011); therefore, relative

household income within education and unemployment groups in states was a further reference group, as well as relative education within household income and unemployment groups, and relative unemployment within household income and education groups. Income, education and employment status are all associated with observable characteristics such as language and consumption (Argyle 1994). Note that 'people with a certain level of earnings' was not included as a reference group scope. This is because earnings information was missing for a high proportion of respondents (see above, p. 85), which makes it challenging to compare, say, relative education in earnings group with relative education in gender group because the samples would be different. Although earnings information is imputed for the substantial results for earnings to assess their reliability (see below, p. 127), this is a robustness check and not a substitute for sample information. Household income is imputed in the CPS; however, far more sophisticated methods with far more information is used and thus the estimates are likely much more reliable than for the earnings imputation in this thesis (US Census Bureau 2013a).

Pérez-Asenjo (2011) additionally analysed references groups based on city vs. country, political views, religious beliefs, occupation (administrative, service, precision and operators, managerial) and occupational prestige (NORC rating system). ATUS does not contain information on city vs. country, political views or occupational prestige, but it does contain information on occupation. Like income, education and unemployment, this characteristic is also possibly observable to some degree (Argyle 1994), and thus it is included as a further reference group type for relative income and education though not unemployment, as the unemployed do not have an occupation. The ATUS reference group scopes are shown in Table 2.2 below. In total, there are 10 scope characteristics in ATUS.

1. State
2. Age group in state
3. Gender group in state
4. Marital group in state
5. Race group in state
6. Parent group in state
7. Occupation group in state
8. Income group in state
9. Education group in state
10. Unemployment group in state

Table 2.2: The scope characteristics of the ATUS reference groups.

The groups used to create the relative variable were within wave and correspond to the groups shown in Appendix A, Table 2.1, which details the absolute socio-economic status variables, and in Appendix A, Table 2.3, which details the control variables (see below, p. 119). One exception is age group, where the reference group contained those five years above or below the respondent in age, e.g. for those aged 25 years, the reference group contained those aged 20 to 30 years inclusive. This is consistent with the approach taken by McBride (2001). It is theoretically better than other ways of creating the age reference group in other studies, such as using fixed five-year bands (e.g. Wood et al. 2012 – 20-24 years, 25-29 years, etc; Pérez-Asenjo 2011 – 18-30 years, 30-40 years, 40-50 years, etc. – where it is unclear whether 30 years was in the 18-30 or 30-40 year age group, 40 years was in the 30-40 or 40-50 year age group, etc.). This is because there is no reason to assume that, say, a 24-year-old only compares to those younger than him or her and not older. The categories for the age scope and other scopes are discussed further in Appendix A, p. 400. All measures of relative socio-economic status were imported into ATUS from the CPS in order to ensure representativeness at the state level.

The scope characteristics of reference groups – ELSA

As in ATUS, the characteristics used to define the scope of reference groups in ELSA were selected based on the guiding principles of consistency with the research questions and theoretical framework of the thesis, enabling comparisons with prior research – especially Pérez-Asenjo (2011) – and maximisation in the variation of scope characteristics to avoid (but not entirely preclude) the criticism that an important scope condition had been omitted. In addition, the aim was to construct at least the same reference groups as in ATUS.

The basic building block for the scope of reference groups in ATUS was state, a geographic-level variable. In ELSA there were two geographic variables: local authority (LA) and Government Office Region (GOR). Special permission and access for LA information was granted by the National Centre for Social Research. There was not a sufficient sample size in each LA in each wave to construct LA-level reference groups (some LAs had less than 10 people). There were also not enough GORs to conduct analyses with the proposed controls (see p. 121 for controls – nine GORs X five waves for a total of 45 observations is insufficient). Thus, one scope characteristic for the reference groups was LA, and the other scope characteristics were combined with GOR. The purpose of having LA alone was to assess the accuracy of the assumption that more 'large' and 'wide' rather than more 'narrow' and 'local' reference groups are important for SWB – but still being cautious about multicollinearity by using VIFs (see p. 133).

In addition to geography, ATUS included age, gender, marital status, race, parent status and the socio-economic reference groups – occupation, household income, education and unemployment groups. These were all also included in ELSA, as well as wealth. For occupation, unlike ATUS, the occupation group was defined for some of those who were unemployed. This is because the occupational classification was carried over for some respondents from the prior years.

ELSA contains one measure that could be used to create a reference group based on one's past, which is occupation of the father or main carer when the respondent was 14 years old. Father's occupation and the respondent's occupation, however, were not based on similar

coding schemes – whereas father's occupation had a possible 18 categories, respondent's occupation had a possible 40. Thus, I recoded respondents' and fathers' occupation to be comparable based on the names of the occupation categories. This relative variable was never statistically significant in the analyses, and thus it is excluded from the thesis because it is unclear whether occupation relative to father really does not matter for SWB in these analyses or whether there was an issue with the recoding process. Further information about these analyses is available upon request. The final coding of occupation included five categories – semi-routine and routine occupations, lower supervisory and technical occupations, small workers and own account workers, intermediate occupations, and higher managerial, administrative and professional occupations (see Appendix A, Table 2.3).

Unlike ATUS, ELSA does contain information on city vs. country, political views and religious beliefs, which were analysed by Pérez-Asenjo (2011) and are of interest for this thesis based on the principle of comparability with prior research. City vs. country is too low of a level of geography to consider in ELSA, however, due to limited sample sizes in some LAs and GORs being too large for classification. Instead, urban versus rural was a control variable (see p. 122).

For political views, no questionnaires contained a relevant item when searching for 'political', 'conservative' or 'liberal'. Although there is information on whether or not they were a member of a political party, there appeared to be no information about which one. Political affiliation was thus included as a reference group but only as affiliated or not. Waves five and six of ELSA do contain information on the specific religious affiliation of the respondent, whereas all waves contained general information on whether the respondent was affiliated or not. To keep the sample sizes comparable across different scopes, religious affiliation was simply affiliated or not.

Although the scopes religion and political may seem out of place because they are based more around beliefs than characteristics like age, they are in keeping with early theorising about the nature of reference groups that included scopes based on ideas – 'ideational referents' (Paynton 1966). In Hyman's (1942) investigation into the groups that people reported comparing themselves to, people mentioned both religious and political groups;

however, Hyman was critical of whether these were really dimensions of status (p. 19). This research incorporates ideational reference groups because they have a theoretical basis, and Pérez-Asenjo (2011) finds that they do matter for SWB.

These ELSA reference group scopes are shown in Table 2.3. ELSA also contains several standpoint measures of reference groups based on an individual's perception of their socio-economic situation relative to others, which are discussed further in the 'Standpoint' section below (p. 108). The scopes of these subjective standpoint measures are society (all waves), friends, colleagues and nearby (waves two through four). In total, there are 17 scope characteristics in ELSA, as shown in Table 2.3 below (see Tables 2.7 and 2.8 for full reference group information). Combined with the 10 scopes in ATUS, there are 27 different scopes across datasets.

1. Local authority
2. Age in GOR
3. Gender in GOR
4. Marital in GOR
5. Race in GOR
6. Parent in GOR
7. Occupation in GOR
8. Household income in GOR
9. Wealth in GOR
10. Education in GOR
11. Unemployment in GOR
12. Religious in GOR
13. Political in GOR
14. Society (perception)
15. Friends (perception)
16. Colleagues (perception)
17. Nearby (perception)

Table 2.3: The scope characteristics of the ELSA reference groups.

As in ATUS, the groups used to create the relative variable were within wave, and they correspond to the groups shown in Appendix A, Tables 2.1-2.3. There were three exceptions for age, income and wealth, which are discussed in Appendix A, p 401).

Summarising reference groups – general introduction

Following from the Introduction (p. 35), this thesis aims to summarise information about reference groups using average income and earnings, top 1% income shares and proportion with top incomes and earnings; average wealth and proportion with top wealth; median education and proportion with top education; and proportion who are unemployed.

Summarising reference groups - ATUS

Average income (household and earnings). Information about average household income within reference groups was drawn from the March CPS to create the first relative income variable. March CPS interviews with ATUS respondents in 2012 and 2013 (the waves of ATUS analysed in the current research, see p. 111) were conducted between August 2011 and October 2012, and September 2012 and October 2013, respectively. Because the CPS asks about income in the prior calendar year, the ATUS respondents from 2012 reported their household income for the 2010 and 2011 calendar years, and the ATUS respondents from 2013 reported for 2011 and 2012 calendar years. To ensure comparability between the absolute and relative income measures, which is particularly important in considering whether absolute or relative socio-economic status matters more for SWB (research questions three and four, p. 31), relative household income information from the CPS was drawn from the surveys in 2011, 2012 and 2013 (with respective reporting periods of 2010, 2011 and 2012), and matched according to the year of the ATUS CPS interview. The ideal measure would capture current income, to correspond with the SWB measures current at the time of the ATUS interview; however, past income was used to inform about current income.

Like income, the earnings question in the March CPS asked about the prior year – but the earnings variable in ATUS is current at the time of the year of the ATUS interview (see p.

85). Thus, relative earnings information was drawn from the 2013 and 2014 March CPS to obtain information about relative earnings in the ATUS for 2012-13. Self-employed persons were excluded in the relative earnings calculations in the ATUS; however, there were still differences between the earnings information from ATUS and the relative earnings information from the March CPS. In the March CPS, the earnings were for the 'longest job' in the prior year rather than for the 'main job' in ATUS. The CPS figure also included tips and overtime for some workers, whereas earnings did not include tips and overtime in the ATUS. It did not appear possible to separate tips and overtime out of the earnings figure in the March CPS for the longest job. Thus, some of the relative earnings variables may capture absolute earnings from tips and overtime.

Proportion with top incomes (and earnings). In ATUS the highest family income bracket provided by the Bureau of Labor Statistics is $150K+. After recoding the income variable into even categories (see above), however, the highest category is $100K+. In the CPS, there is ratio-level data on family income up to the millions. For the purposes of investigating how the relationship of relative income with SWB differs according to absolute income in chapter six, the second relative income variable is defined as the proportion of people earning $100K+ in a particular reference group. If a cutoff higher than $100K+ was used, it would not be possible to tell whether those who are most or least affected by relative income are members of one group ($100K+) or another group (<$100K), and to still maintain even income categories. The issue of group membership is important for interpreting the results within the framework of social norm, identity, distance and other theories, which are discussed further later in the thesis (e.g. p. 213, 273).

$100K is about twice the median income in the USA (Noss 2011, 2012), and twice the median has been used in previous research to characterise the affluent (Jenkins 2016). This median benchmark figure is drawn from the American Community Survey, and from the questionnaire, it appears to be a gross rather than net household income figure like ATUS (US Census Bureau 2013b). Still, due to the aforementioned data limitations of the ACS (p. 81), the proportion with household incomes $100K+ was drawn from the CPS. In terms of earnings, in 2012-13 in the US, the average median earnings across eight quarters was $772.50 a week, or $47,895 annually (Bureau of Labor Statistics 2016). This figure comes

from the CPS and is thus comparable to the gross earnings figure in ATUS. To ease the interpretability of the results, the cutoff for high earnings was rounded up from $95,790 and is also $100K+.

Top 1% income shares. The World Wealth and Income database additionally provides data on the share of income held by those with the top 1% of incomes by state, as well as by other top cutoffs, such as the top 10% and 0.5%. The top 1% is selected because this is a common top cutoff in academic and policy analysis (Piketty 2014; Keister 2014; Alvaredo et al. 2013; Oxfam 2015); therefore, the 1% cutoff enhances comparability of this research with other research. The top 1% measures by state include capital gains and were only available for the year 2012 and earlier at the time of writing. As the years of ATUS analysed are only 2012-13, only the year 2012 is used for the top shares analyses.

Average wealth and proportion with top wealth. Again, there is no measure of wealth in ATUS.

Median education. The ATUS educational variable – highest educational attainment - is ordinal-level. To maintain comparability with relative income, relative education is also drawn from the March CPS rather than the basic CPS or the ACS. Thus, one summary measure of relative education is median education within reference group scopes from the March CPS.

Proportion with top educations. In considering the cutoff for "top" educations in the March CPS, degree-level or higher was selected. The reasoning was twofold. First, adults 25 years and older with degree-level education or higher are just in the minority on average in the US, 42% in 2015, and it is theoretically important that the "top" represents a minority rather than a majority. This figure can be compared to 88% with a high school diploma or GED, and around 33% with a Bachelor's degree or higher (Ryan and Bauman 2016).

Second, the US Department for Education – at the federal level – distinguishes between funding for postsecondary – that is, degree-level or higher – and elementary or secondary education but not between various sorts of degrees (US Department of Education 2016a).

For example, Federal Pell Grants support students on vocational and undergraduate courses (US Department of Education 2016b), and the Federal Work-Study programme supports those on undergraduate, graduate and professional courses (Federal Student Aid 2016). These are both areas of discretionary rather than mandatory government spending; therefore, illustrating the effect of financial incentives to pursue post-secondary level education is policy-relevant in the current framework of educational spending in the US. The variation in proportion of total educational spending on degree-level education or higher is shown in Figure 2.1. The purpose of this figure is simply to show that spending does vary substantively across years. We can see that spending dropped significantly during the Recession in the mid-2000s. As with income, relative education information was drawn from March CPS years 2011-13 and matched at the individual-level according to CPS survey date.

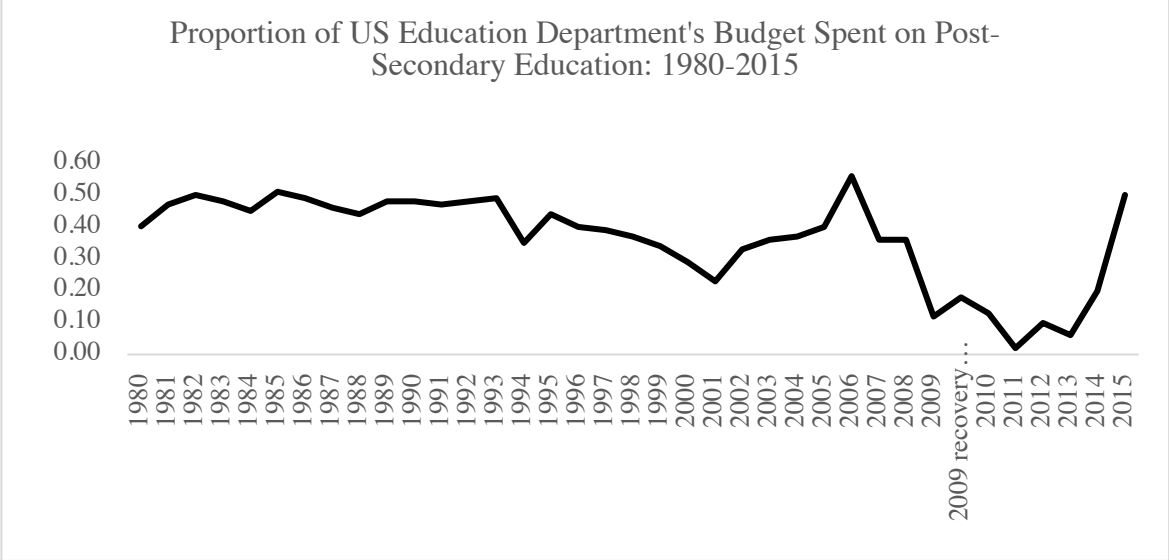

Figure 2.1: Proportion of US Education Department's budget spent on post-secondary education. 1980-2015. Source: http://www2.ed.gov/about/overview/budget/history/index.html, author's own proportional calculations.

Proportion unemployed. Consistent with prior literature (e.g. Clark 2003; see section 4.1, p. 182), the relative employment measure was simply the proportion unemployed in a particular reference group. To correspond with the older unemployment variable from the CPS in ATUS, relative unemployment information was drawn from CPS years 2011-13 and was matched at the individual-level in ATUS according to CPS survey date. For the newer unemployment variable in ATUS, this information was also drawn from the CPS, but matched to the 2012-13 survey years of ATUS.

Summarising reference groups – ELSA

Average income and proportion with top incomes (and earnings). In addition to average income and earnings, this thesis investigates the proportion of those with 'top' incomes. As mentioned, what constitutes a 'top' income is largely arbitrary. In ELSA there is more flexibility than in ATUS in defining top incomes because the income variable is ratio rather than categorical. To maintain comparability with ATUS, a similar 'top' income cutoff is used that is about twice the median income in England. In 2012/13 – which covers the period for which real income values are expressed in the ELSA analyses – median net equivalised household income was £440/week, or £22,880 annually. These data are from the Department for Work and Pensions and are UK-wide rather than England-based, as it appears these data are not disaggregated by country (Carr et al. 2014). To ease the interpretability of the results, twice the median is rounded up from £45,760 to £46K annually. Thus, the proportional measure of relative income is defined with respect to the proportion of people with households with an income of £46K annually. The same cutoff is used for earnings. This is again to ease the interpretability of the results, and to maintain comparability with ATUS where the cutoffs for top income and earnings are the same.

Top 1% income shares. The World Wealth and Income database additionally provides data the share of income held by those with the top 1% of incomes by year in the UK; however, there is not enough variation by year of ELSA in SWB to conduct statistical analyses (five waves is insufficient). Top 1% shares are not investigated for their association with SWB in ELSA.

Average wealth and proportion with top wealth. One measure of relative wealth in ELSA is average wealth in a reference group. This thesis also aims to capture the proportion of people with top wealth and top wealth shares. As with income, the definition of top wealth is arbitrary. To maintain consistency with the measurement of relative income, 'top' wealth is first defined with respect to twice the median wealth.

Information about median wealth in the UK is available from two sources, the Wealth and Assets Survey and Personal Wealth Statistics. Because the Personal Wealth Statistics survey may not adequately sample those with top wealth (ONS 2016a), median estimates are drawn from the Wealth and Assets Survey. The closest time period to June 2013 – the period for which real wealth values are expressed in ELSA – that is reported by the Office for National Statistics from the Wealth and Assets Survey is July 2012 to June 2014. During this time median wealth was £225,100 (ONS 2015b). Twice the median is thus £450,200. To ease the interpretability of the results this is rounded down to £450K, and the proportional measure of relative wealth used is the proportion of households with wealth of £450K+. This is similar to the average wealth of the most well-off social class group in Savage et al's (2013) Great British Class Survey, a non-representative sample of British residents, designed with the aim of characterising different social class groups in Britain. The mean housing plus savings wealth of the most well-off group in this survey was £467,458.

Median education and proportion with top education. Like ATUS, the educational variable is ordinal and thus one summary measure of relative education is median education in a reference group. The highest educational qualification that is reported in ELSA is NVQ4/NVQ5/Degree or equivalent; therefore, the proportion of people attaining this level of education within reference groups is the second measure of relative education. This is comparable to ATUS, where the cutoff for a high education is also degree-level or equivalent.

Proportion unemployed. Again, as with ATUS and consistent with prior literature (p. 218), relative unemployment is summarised as the proportion of people who are unemployed within reference groups.

The standpoint of an individual within a reference group – general introduction

Following from the Introduction, this thesis aims to capture the standpoint of individuals with rank income, wealth and education; distance from average income and wealth; distance from median education; and perceptions of relative socio-economic standing.

The standpoint of an individual within a reference group – ATUS

Rank income (earnings). Because household income is a categorical variable in ATUS it is not assigned a rank; however, earnings income is a ratio-level variable. Rank earnings income for each individual was thus calculated.

Following Brown et al. (2008), and Wood et al. (2012), rank earnings within reference group scopes are represented as "frequency values" or "ranked ordinal positions" (Brown et al. 2008, p. 360) in this research with the following formula:

$$R_i = \frac{r_i - 1}{n - 1}$$

where R is the "frequency value" or "ranked ordinal position" (Brown et al. 2008, p. 360), i is the individual, r is the individual's rank of an attribute (e.g. income) within a stimulus set (e.g. the range of income in gender group), and n is the total number of observations within the reference group. R_i gives the individual a rank within a reference group scope that ranges from 0-1, which enables standardised comparisons between reference groups. For example, if someone is the 20th best paid in their reference group of 101 people, R_i = 0.19 because 20-1=19, 101-1=100, and 19/100 = 0.19 (Brown et al. 2008). R_i is thus the ratio of the number of people below the individual's socio-economic status in the reference group divided by the number of people in the reference group – excluding the individual.

R_i is very similar to a percentile rank, which can have two definitions: the proportion of scores (e.g. income) *at or below* a given score, or the proportion of scores *below* a given score (Miller and Lovler 2015). R_i is different because it excludes the individual by

subtracting one from the total number of people in the reference group. Thus, technically, looking back to Figure 1.1, the red person (the individual analysed) is outside the black circle (the reference group scope). With large samples it is unlikely to make a difference in the estimation if the individual analysed is excluded or included, i.e. excluded as '– 1' in the R_i formula. Because the reference group scopes always include the individual in this thesis, it would be more conceptually consistent to include the individual in R_i; however, the guiding principle of maintaining consistency with prior literature is prioritised. This is because the conceptual consistency can be simply noted here, and it is not likely to make a substantive difference to the results or their interpretation.

To create the rank earnings variable, the aim was to match ATUS respondents to CPS respondents to improve the representativeness of the rankings at the state level. Although information from the ATUS respondents' final CPS interview can be imported into the ATUS wellbeing module, earnings information was updated and thus more current at the time of the ATUS interview. Consequently, the CPS earnings information would be out of date by comparison. Thus, ranking earnings reported in ATUS based on the CPS dataset would produce an out-of-date standpoint measure – and confound the comparison of whether absolute or relative earnings matters more for SWB (research questions three and four).

Instead, ATUS 2012/13 wellbeing module respondents were matched to CPS 2012/13 respondents based on earnings and the reference group scope variables (e.g. state, gender in state) using the STATA programme *nearmrg* (Benini 2012). CPS values of income greater than $149,999.70 were top-coded at $149,999.70 to provide consistency with ATUS. In cases where there was not an exact earnings match, the closest value of the ATUS earnings information in CPS was located. In cases of ties, the lower value from the CPS was used to match. This was because the mean difference between the ATUS earnings value and the matched CPS earnings value – when matched on nearest earnings alone – was slightly lower when using the lower rather than the high tie breaker ($0.34 versus $0.64, respectively, and ranging from -$500 to $476.80 and -$358 to $500 in annual earnings, respectively). Between three and five ATUS respondents (nine and 15 activities) could not be matched to a CPS respondent for each reference group scope except for age, where 196

respondents could not be matched (568 activities) after excluding those missing on any SWB item. These values were replaced with their ranking in ATUS because they were not technically missing values, just simply not values not available in the CPS.

The survey weights in the CPS were applied to calculated weighted ranks for r_i of annual earnings income within reference group scopes using the procedure detailed by Cox (2008). This resulted in the average rank for persons depending on how many people in the population they represented. This weighted r_i figure was then used to calculate R_i. The survey weights were applied to create weighted sample sizes within reference groups for n.

Rank wealth. Again, there is no measure of wealth in ATUS.

Rank education. Education in ATUS is from the CPS interviews, which were conducted in 2011-2013. Thus, rank education within reference group scopes was calculated by matching the ATUS to CPS respondent based on the reference group scope within waves 2011-13 of the CPS. The same formula was used for education that was used for earnings. This was again a weighted rank calculated by using the procedure detailed by Cox (2008). All observations from ATUS were matched to a CPS respondent within reference group scopes except for age in state, where 196 people (568 activities) could not be matched after excluding those missing on any SWB item. These values were replaced with their ATUS ranking as for rank earnings.

Distance from average income (earnings). The average CPS earnings within the reference group scopes were simply subtracted from ATUS respondents' earnings. Because household income is a categorical variable in ATUS it is not used to create a distance from an average measure.

Distance from average wealth. Again, there is no measure of wealth in ATUS.

Distance from median education. The median CPS education values within reference group scopes were simply subtracted from ATUS respondents' education.

Perceptions of relative socio-economic standing. There is no measure in ATUS.

The standpoint of an individual within a reference group – ELSA

Rank income, earnings, education and wealth. Rank benefit-unit level income, rank individual earnings, rank individual education and rank benefit-unit level wealth were created within reference group scopes 1-13 in Table 2.3. The same rank formula was used as described above. The survey weights in ELSA are not based on the population of England (the survey weights in the ATUS and CPS are based on the US population); rather, in ELSA, the weights are based on responses to the HSE and to multiple waves of ELSA. In some instances, therefore, there were weights that summed to a figure smaller than one within reference group scopes. Because this summed weight figure was used to calculate the rank (Cox 2008), there were a few observations with ranks slightly less than zero or more than one. The negative ranks would not have occurred if one was not subtracted from the formula above to remove the individual's socio-economic status from the rank score. The negative ranks were coded as zero and those greater than one as one.

Distance from average income, wealth and median education. Average income, wealth and median education within reference group scopes were subtracted from the respondent's own income, wealth and education, respectively.

Perceptions of relative socio-economic standing. There were four measures of perceptions of relative socio-economic standing: how well off they are in terms of money, education and jobs relative to society (the MacArthur ladder; Adler et al. 2000); and in terms of their financial situation relative to friends, colleagues and those nearby. These measures are shown in Table 2.4. The MacArthur ladder was only available for respondents who filled in the voluntary self-completion questionnaire, and the other three measures only in waves two through four of ELSA. Thus, the sample sizes analysed for these measures are smaller than for the other relative variables (see p. 404 for precise sample sizes).

Perceptual measures of relative socio-economic standing	Question wording and coding
MacArthur Ladder	Think of this ladder as representing where people stand in our society. At the top of the ladder are the people who are the best off – those who have the most money, most education and best jobs. At the bottom are the people who are the worst off – who have the least money, least education, and the worst jobs or no jobs. The higher up you are on this ladder, the closer you are to the people at the very top and the lower you are, the closer you are to the people at the very bottom. Please mark a cross on the rung on the ladder where you would place yourself. (0-10)
Well off friends	How does your financial situation compare with most of your friends? (Much worse off, a bit worse off, about the same, a bit better off, or much better off)
Well off colleagues	How does your financial situation compare to most of your close work colleagues? (Coding as above)
Well off nearby	How does your household's financial situation compare with other people living around here? (Coding as above)

Table 2.4: The question wording and coding for the perceptual measures of relative socio-economic standing in ELSA.

Subjective wellbeing – general introduction to measurement [6]

While the measurement of different SWB types simply differs according to the language used in the survey item (e.g. happiness versus worthwhileness), there is more complexity in the measurement of different SWB levels. At the evaluative level, survey questions typically capture cognitive judgements about life overall or certain aspects of life such as work or relationships (Kahneman and Krueger 2006). A typical question would ask something along the lines of "Overall, how happy are you these days?", which clearly asks for evaluation of overall SWB. One limitation of such questions is that we do not have access to the 'black box' of respondents' cognition. It may be that this sort of question is difficult to answer, and so respondents actually answer a more simple question, such as how happy they have felt today (Kahneman 2011).

[6] This subsection is drawn from Dolan, P, L Kudrna, and A Stone. (2017). 'The Measure Matters: An Investigation of Evaluative and Experience-Based Measures of Wellbeing in Time Use Data.' *Social Indicators Research*, 134 (1): 57-73.

Several evaluative survey questions are used in this research. In order to most clearly illustrate the differences in the determinants of the high-level dimensions of SWB shown earlier in Table 1.1, pp. 27, 53, the focus is on evaluations of pleasure and purpose rather than with domains of life such as evaluations of job or family life.

Experiences of SWB are typically collected using three methods. The most direct is experience sampling (ESM) or Ecological Momentary Assessment (EMA), where people rate how they feel at the time they are asked, e.g. 'how happy do you feel right now?' This method is least subject to recall biases because data are collected 'in-the-moment' (Scollon, Kim-Prieto and Diener 2003). In the Day Reconstruction Method (DRM), which was used in ATUS, people fill out a diary of yesterday's activities and rate their feelings during them (Kahneman et al. 2004). The third approach is to use a single-item indicator asking people how they felt over a certain time period e.g. 'how happy did you feel today (or yesterday)?' (ONS 2011). Longer recall periods reflect increasing degrees of evaluations of experiences. Various types of feelings are collected using these methods, usually in the form of positive and negative affect – 'hedonic' or 'experiential' SWB – like joy, pain, stress or worry, and some studies also ask about eudemonic feelings of meaning (Bradburn 1969; White and Dolan 2009; Christodoulou, Schneider and Stone 2014).

Although they are the most popular, it is noteworthy that survey questions about SWB are not the only method of assessing SWB. Researchers are currently investigating whether it is possible to measure SWB without asking people about their SWB, which is important because it is possible that asking people about their SWB affects their SWB – an issue referred to as 'reactivity effects' (Scollon, Kim-Prieto and Diener 2003). For example, researchers are exploring the use of biomarker information from blood samples (Pajer et al. 2012), eye tracking data (Fox, Russo and Dutton 2002) and skin conductance (Mauss, Wilhelm and Gross 2004) to inform about people's SWB without asking them. The development of these measures is still in the early stages, however, and thus they are not a focus of this thesis.

Out of the three main methods of SWB assessment, this thesis uses single-item measures and DRM responses, as discussed below.

Subjective wellbeing – ATUS

Evaluations of SWB. There is only one measure of evaluative SWB in ATUS, the Cantril ladder of life. This measure asks participants to rate where their life ranks on a ladder where the bottom rung is the worst possible life and the top is the best (see Table 2.5 below). Like some items in ELSA, discussed in more detail below, this item is seemingly more consistent with a preference satisfaction account of wellbeing because it asks participants to compare their life with an ideal, and preferences are comparative in nature (Hausman 2011). Nevertheless, like satisfaction with life, the Cantril ladder is a popular measure of evaluative SWB and it is used as the sole measure of evaluative SWB in ATUS analyses due to the absence of other measures in these data (Kahneman and Deaton 2010). Although the wellbeing module of ATUS ran in 2010, 2012 and 2013, the ladder was only introduced in 2012 and 2013 and thus only these years of ATUS are included in the analyses.

The measures of experiential SWB in ATUS were captured in a partial DRM diary (Kahneman et al. 2004), which asked participants to fill out a diary of yesterday's activities and report how they felt during a random selection of three of these activities. There was an error in the selection of these activities such that the last activity was under-sampled and thus they are not truly randomly selected. The survey weights provided, however, adjust for this error and they are used in the analysis (BLS 2013; see section 2.4, p. 93). All participants were asked how happy they felt during the activity, as well as how stressed, tired, sad and in pain they felt, and how meaningful they considered the activity to be. Happy was used as the sole indicator of positive affect, while the average of stressed, tired, sad and in pain was used as the indicator of negative affect. Recall that positive and negative affect can have different socio-economic determinants (Kushlev, Dunn and Lucas 2015). The meaningful item is indicative of experienced purpose.

The exact item wordings for the measures of SWB in ATUS (and ELSA, discussed next), along with the component of SWB each measure reflects, are show in Table 2.5 below. To facilitate comparisons across measures and datasets, all SWB measures are standardised such that they have a mean of zero and a standard deviation of one across waves. As

discussed below, although these measures are technically ordinal and not ratio or interval-level, prior research suggests treating SWB measures as ratio/interval rather than ordinal level does not substantively impact conclusions about what affects SWB (Ferrer-i-Carbonell and Frijters 2004). It is now common practice in SWB research to treat ordinal SWB variables as ratio/interval variables (Carstensen et al. 2011; Dolan, Peasgood and White 2008). Thus, treating these ordinal-level variables as ratio/interval in order to standardise them is in keeping with current theory and practice.

ATUS		
SWB Measure	*Component of SWB*	*Item wording*
Cantril ladder	Combination / other - evaluations of SWB	Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time?
Happy	Experienced pleasure	"Use a scale from 0 to 6, where a 0 means you did not experience this feeling at all and a 6 means the feeling was very strong…. how [EMOTION] did you feel during this time?" The emotions were tired, happy, stressed, and sad. For pain the exact item was "From 0 – 6, where a 0 means you did not feel any pain at all and a 6 means you were in severe pain, how much pain did you feel during this time if any?" Negative affect measure created by taking average of tired, stressed, sad and pain
Negative affect	Experienced pleasure (pain)	
Meaning	Experienced meaning	From 0 to 6, how meaningful did you consider what you were doing? 0 means it was not meaningful at all to you and a 6 means it was very meaningful to you
ELSA		
Life satisfaction (1)	Combination / other - evaluations of SWB	I am satisfied with my life (strongly agree, agree, slightly agree, neither agree nor disagree, slightly disagree, disagree, strongly disagree)
Life satisfaction (2)	Combination / other - evaluations of SWB	I feel satisfied with the way my life has turned out (often, sometimes, not often, never)
Life meaning	Evaluation of purpose	I feel that my life has meaning (often, sometimes, not often, and never)
Experienced affect last week	Experienced pleasure	Now think about the past week and the feelings you have experienced. Please tell me if each of the following was true for you much of the time during the past week. You felt depressed? You were happy? You felt sad? You felt lonely? (yes/no) - average taken

Table 2.5: SWB measures in ATUS and ELSA, the component of SWB they assess and item wording.

Subjective wellbeing – ELSA

Following from the Introduction, this thesis aims to capture evaluations and experiences of pleasure and purpose in the SWB measures. Evaluations and experiences are discussed separately in what follows, with pleasure and purpose contained within each of the evaluation and experience sections.

Evaluations of SWB. One set of evaluative SWB measures contained in ELSA is the satisfaction with life scale (SWLS), which consists of five items assessing agreement with overall cognitive judgements of life:

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

This scale was originally developed from a set of 48 SWB questions, and factor analysis – a method of assessing associations between various items – was used to separate these items into positive and negative affect and evaluations of life according to which items were most closely associated. The five life evaluation items most closely associated with each other were selected for the SWLS. Thus, the scale exhibits discriminant validity, and other studies have shown it to have temporal stability too, while still being sensitive to SWB interventions (Pavot and Diener 1993).

The items in SWLS are, however, not entirely consistent with the SWB framework presented in section 1.3. This is an issue of face validity. Item one is seemingly more consistent with a preference satisfaction account of wellbeing because it asks participants to compare their life with an ideal, and preferences are comparative in nature (Hausman 2011). Although SWB includes thoughts, and stated preferences are also, arguably, thoughts, it is important to conceptually and empirically separate thoughts about preferences from thoughts about how well one's life is going in order to ensure consistency

between the theory of SWB and the measures reflecting this theory. Thus, item one is not included in the analyses.

Item two also appears to be inconsistent with the SWB framework in section 1.3. It asks about perceptions of the conditions of life rather than thoughts about life itself. Items four and five appear to be more about desires – i.e. higher order preferences (see section 1.4) than about SWB: item four because it enquires about wants in life, and item five because it requires the respondent to engage in counterfactual thinking about what could have been and to assess their desire to change what has happened in their life so far. There is another life satisfaction measure in ELSA, not from the SWLS but from the CASP-19 (see below), which asks whether the respondent feels satisfied with the way their life has turned out. This suffers from similar problems because it doesn't just ask about life, it asks about the way life has turned out.

Thus, the only question in ELSA that seems consistent with the framework of SWB guiding this thesis is item three because it asks about satisfaction, which requires a cognitive evaluation independent of an assessment of preferences, desires or the objective conditions of life (Luhmann, Hawkley and Cacioppo 2014). It is still possible, however, that this measure is more a proxy of preferences than of SWB, especially if the word satisfaction invokes thoughts about the satisfaction of people's preferences. But because satisfaction with life is a very common measure of evaluative SWB in the SWB literature, this is one of the measures selected to reflect evaluations of SWB in this thesis, notwithstanding limitations about the extent to which it is more a measure of preferences or of evaluative SWB (Dolan and Kudrna 2016).

Another set of measures reflecting evaluative SWB in ELSA is the CASP-19, which has nineteen measures reflecting concepts such as control, autonomy, self-realisation and pleasure:

1. My age prevents me from doing the things I would like to do
2. I feel that what happens to me is out of my control
3. I feel free to plan for the future

4. I feel left out of things
5. I can do the things I want to do
6. Family responsibilities prevent me from doing what I want to do
7. I feel that I can please myself what I do
8. My health stops me from doing things I want to do
9. Shortage of money stops me doing things I want to do
10. I look forward to each day
11. I feel that my life has meaning
12. I enjoy the things that I do
13. I enjoy being in the company of others
14. On balance, I look back on my life with a sense of happiness
15. I feel full of energy these days
16. I choose to do things that I have never done before
17. I feel satisfied with the way my life has turned out
18. I feel that life is full of opportunities
19. I feel that the future looks good for me

The response options for these items are often, sometimes, not often and never. A number of these measures are about perceptions of behaviours, such as number 16, "I choose to do things I have never done before," which are not consistent with the account of SWB presented in section 1.3. Several others are about the feelings associated with particular activities, such as, "I enjoy being in the company of others," which is an issue because it is domain-specific – being in the company of others – rather than about life more generally.

Item eleven in the CASP-19 is very close to an evaluative measure of purpose, which asks participants how much they agree with the statement, "I feel that my life has meaning." Although the word 'feel' suggests this measure encroaches on experiences, the fact that the measure asks about life makes it more of an evaluative measure. Thus, this item is used to measure evaluations of purpose.

One consideration with using the life satisfaction measure that is most consistent with the account of SWB guiding this thesis is that the scales for the life satisfaction and life

meaning measures are different: the former asks whether someone agrees that they are satisfied with their life, whereas the latter asks about the frequency with which they feel their life has meaning. To assess the extent to which the measure matters, therefore, the life satisfaction measure in the CASP-19 – "I feel satisfied with the way my life has turned out" – is also used.

There appear to be no measures of evaluations of pure pleasure in ELSA, such as overall happiness. The evaluative measures from ELSA in this thesis will thus reflect evaluations of life (a combination/"other" measure, following from Table 1.1, pp. 27, 53) and evaluations of purpose (life meaning). The life evaluation question from SWLS was only introduced from wave two onwards and so only these ELSA waves are included to ensure comparability between different analyses.

Experiences of SWB. The closest measures to experiences of SWB in ELSA come from a section of the survey where respondents are asked how they felt in the past week. There are eight items, with binary yes/no response options:

1. You felt depressed?
2. You felt that everything you did was an effort?
3. Your sleep was restless?
4. You were happy?
5. You felt lonely?
6. You enjoyed life?
7. You felt sad?
8. You could not get going?

Some items in the above list are not consistent with the account of SWB presented in section 1.3. Items two, three and eight are seemingly more about behaviours or perceptions of behaviours than SWB. Item six, enjoying life, conflates evaluation and experience by asking about enjoyment, which is an experiential feeling, alongside life, which is more closely aligned with evaluative measures.

None of these are measures of experienced purpose, but there are measures of experienced positive and negative affect: item one, felt depressed; item four, felt happy; item five, felt lonely; and item seven, felt sad.

Because the time frame of these measures is the past week, they are not purely experiential measures, but they are more closely experiential than evaluative because they clearly ask about feelings, and thus they are used as measures of experiential SWB. Although positive and negative affect are separate constructs and relate to socio-economic status differently (Watson and Tellegen 1985; Kushlev, Dunn and Lucas 2015), there is not enough variation across waves in each individual measure to separate happy from depressed, lonely and sad. These measures are combined into a single measure of experience by subtracting the average of depressed, lonely and sad from happy. All of these SWB measures were standardised such that they had a mean of zero and a standard deviation of one.

Control variables – general introduction

Control variables are used to better inform about the causal nature of the relationship of socio-economic status and SWB. The same controls were used regardless of whether the investigation was of life evaluation or experience-based SWB. This was done in order to maintain comparability across different models. The one exception was earnings in ATUS, which were only available for the employed. Note, however, that all analyses are conducted without and with controls (see section 2.4 on analyses below), and some controls (age and gender) are of substantive interest in some models (e.g. to answer research questions seven and eight). The control variables were selected primarily based on HM Treasury's model of life evaluation for use in cost benefit analysis (Fujiwara and Campbell 2011); however, some control variables associated with experiences of SWB in particular were also selected. These control variables are shown in Appendix A, Table 2.3.

Control variables – ATUS[7]

The control variables in ATUS were age and age squared, gender, marital status, self-rated health, whether they took pain medicine on the diary day, whether they were well rested on the diary day, whether they have hypertension (see also Blanchflower and Oswald 2008b), time spent alone on the diary day, time spent in religious activities during the diary day, whether they had children and state of residence. Whether they had a telephone was also included as a proxy for material deprivation. Household size was included because household income is an unequivalised income variable (see above). All of these variables were drawn from the ATUS and not the CPS interview.

Note that gender and age are not only controls but variables of substantive interest for research questions seven and eight.

The HM Treasury model does not include ethnicity but other life evaluation models do and so race was a further control (Dolan, Peasgood and White 2008; Davis and Wu 2014). Typicality of days' feelings was an additional control. Although the survey weights (discussed in the next section, p. 125) adjust for the proportion of weekdays and weekends sampled, they do not adjust for how typical the participants' affect was on these days, and this variable may help to do so to improve generalisability. Some of these control variables are also associated with experiential SWB in particular, and these are age (Carstensen et al. 2011), whether they felt rested on the diary day (Tempesta et al. 2010), and the amount of time they spent alone on the diary day (Oerlemans, Bakker and Veenhoven 2011).

One important control from the HM Treasury model for this investigation is 'housing and environmental conditions and crime levels in the facility' (see Appendix A, Table 2.3). Controlling for the quality of living in a particular area is important because it is possible that any relationship of relative socio-economic status with SWB could be the result of variations in the cost of living rather than social comparisons and social norms, as in the

[7] Elements of this section are drawn from Dolan, P, L Kudrna, and A Stone. (2017). 'The Measure Matters: An Investigation of Evaluative and Experience-Based Measures of Wellbeing in Time Use Data.' *Social Indicators Research*, 134 (1): 57-73.

theoretical framework. Thus, following other studies (Luttmer 2005; Cheung and Lucas 2016), median housing cost by state was included as a further control. This variable was drawn from the 2012-13 American Community Survey.

Note, however, that there are sound arguments for not including housing cost as a control variable, too. Being surrounded by a high quality of living could affect the comparisons that people make to others and the social norms that interact with people's individual identities. For example, living in a neighbourhood with large houses could affect how wealthy people perceive their neighbours, and consequently the comparisons they make to their neighbours, the social norms they infer from their environment, and how they perceive themselves within the context of these norms. Still, to ensure a 'clean' test of social comparisons and norms based on perceptions of others rather than perceptions of one's environment, median housing values by state – drawn from the ACS (see p. 125) – are used as a further control of environmental conditions in addition to whether or not the household has a telephone.

The HM Treasury model additionally lists income, educational status and employment status as determinants of SWB. These are aspects of socio-economic status investigated in this research, and so for models where absolute socio-economic status is not of interest in and of itself (i.e. beyond chapter three), these are additional controls. In the income models, education and unemployment were further controls; in the education models, income and unemployment were further controls; and in the unemployment models, income and education were further controls. Occupation was a further control variable, as it is a form of employment status and is used to create reference groups (see p. 96). Without controlling for occupation, relative socio-economic status within the occupation group may capture some of the effects of absolute occupation, which is not a relative effect.

For all of the control variables that are also used to define the type of people in reference groups – region, age, gender, marital status, race, parent status, occupation, income, education and unemployment – the groups (e.g. male/female, married, never married, widowed/divorced/separated) were selected for the reasons discussed on pp. 95 and 99 above.

Following Cheung and Lucas (2016), controls were also included for state population density (state population / state size), as population density may vary with the level of inequality and the aim here is to capture the latter and not the former in considering top income shares and proportions of people with top incomes (Nielsen and Alderson 1997). The day of the week of the ATUS diary day was also included because SWB, especially experienced SWB, changes over the course of the week (Csikszentmihalyi and Hunter 2003) – though mixed results have been found for the effect of day of the week on evaluations of SWB (Schwarz and Clore 1983; Helliwell and Wang 2014; Yap et al. 2016).

Control variables – ELSA

As in ATUS, the same control variables were used regardless of the component of SWB assessed, and again these were primarily based on the HM Treasury model of life evaluation but some are also specifically associated with experiential SWB. The control variables in ELSA were age, age squared, gender, marital status, whether they had a longstanding illness or disability, whether they have any friends, whether they are religiously affiliated, the 2004 local authority-level index of multiple deprivation, number of problems with accommodation, whether they have any children or cared for anyone in the past month, local authority, wave, household size, urban/rural and political affiliation. The socio-economic controls were benefit-unit level income, individual earnings, wealth, occupation and unemployed or not unemployed (see p. 190 for a discussion of why occupation and unemployment status are different). All income, earnings and wealth values below zero were coded as zero because these variables were then transformed into their natural log, following prior literature (Clark, Frijters and Shields 2008). Future research, however, might consider investigating debt and relative debt (see p. 340 for a discussion of the limitations of the surveys used in this investigation in terms of the distribution of socio-economic status).

The controls are similar to the control measures in ATUS and selected for similar reasons with a few exceptions. Instead of housing prices and whether or not the household has a telephone for the 'housing and environmental conditions' category, the 2004 index of

multiple deprivation was used because it is a more comprehensive measure. Special permission and access for index of multiple deprivation information was provided by the National Centre for Social Research. This measure includes housing prices in the category 'difficulty of access to owner occupation', as well as indicators of distance to facilities like GPs and shops, area crime level and school quality (Office of the Deputy Prime Minister 2004). There did not appear to be a readily available measure of population density such as local authority population / square kilometers, and so a less detailed measure of urban/rural was used instead.

Although ELSA doesn't specify whether a respondent lives in an urban or a rural area, LAs are classified as urban or rural according to The Rural Urban Classification (ONS 2016b). This classification system defines urban areas as settlements of more than 10,000 people, and rural areas as those containing less than that amount. These data were first obtained from the 'Lookup for 2011 Rural Urban Classification of Local Authorities' document (Department for Environment, Food & Rural Affairs 2016a). Information on whether the LA was urban or rural was matched to the ELSA LA by name of the LA. Some ELSA LAs, however, were not contained in the 2011 Rural Urban documentation. Thus, several additional sources were consulted to further classify the LAs, listed in order of consultation: the '2001 Local Authority Classification dataset – post April 2009 LA boundaries' and '2001 Local Authority Classification dataset – pre April 2009 LA boundaries' (Department for Environment, Food & Rural Affairs 2016b); and documentation from the Rural Evidence Research Centre (2005), Scottish Government (2010), and the Wales Rural Observatory website (e.g. Wales Rural Observatory 2012). Across these multiple sources the distinction between urban and rural areas remained similar and was based upon the 10,000 population mark. Note that although the early waves of ELSA did not contain respondents living outside of England, in later years, respondents who moved out of England were followed up, and so some of the documentation consulted to obtain urban/rural information was not England-based. One weakness of these data in terms of its validity is that a LA may have changed from urban to rural or vice versa over the waves of ELSA; however, there did not appear to be readily available data to assess these changes over time.

2.4 Analyses

Analysing individuals within countries

In considering the relationships of absolute and relative socio-economic status with SWB, it is important to consider the level at which the relationship is assessed (Snijders and Bosker 2011). Two levels to consider are between versus within countries. This thesis opts for a within-country analysis for two reasons. First, and mainly, some of the research questions investigated (one and three, p. 31) explore how the summary, scope and standpoint aspects of reference groups affect the relationship of socio-economic status with SWB. In a cross-country analysis, the composition of the reference group is typically limited to people living in different countries, whereas within-country analysis is more suitable for exploring how heterogeneous compositions of the reference group affect SWB because more data on these reference groups is typically available in single-country datasets. Second, resource allocation decisions are more often made within rather than between countries. The results of this thesis aim to inform debates about the optimal allocation of resources within countries, as well as about how people react to this distribution, and so a within-country analysis is more appropriate. The conclusions of this research, however, might be used to inform about between-country resource allocation decisions (see p. 359).

Two other levels within countries at which the relationship of socio-economic status with SWB can be assessed are the individual and group – e.g. reference group, gender, geographic – levels. In keeping with the theoretical framework of social norm and identity theory (section 1.3), this thesis will investigate both levels by conducting analyses at the individual level but breaking the effects apart by some groups in chapter five. Looking at how different groups are affected by relative socio-economic status is in contrast to the majority of the economic and psychological literature about socio-economic status and SWB, especially the relative income literature, which tends to conduct analyses at the individual level alone with some exceptions (Ma and Zhang 2014). A focus on SWB at the individual level is in keeping with the idea that individuals make social comparisons to others and that individuals have particular reference groups within which they make these comparisons. The issue of individuals comparing groups that they are a member of to other

groups was discussed earlier on p. 38. Exploring analyses at other levels is an area left to future research (see p. 360), and the issue of clustered standard errors is discussed below (p. 125).

Following from the argument in section 1.4 that social norm and identity theory apply well to investigations of relative income, wealth, education and unemployment (see p. 63), this thesis aims to conduct sub-group analyses for relative income and earnings, wealth and education, as well as for relative unemployment. Following from section 1.1 (see p. 29), the key groups explored are characterised based on SWB, absolute socio-economic position, age and gender.

Multiple linear regression and fixed effects models

In order to answer the research questions, a series of bivariate analyses, multiple linear regressions models and fixed effects models were run in STATA 13. The ATUS measure of evaluative SWB, the Cantril ladder, was only collected once for each respondent and so there is no longitudinal variation to utilise. Thus, the Cantril ladder was only ever analysed in multiple linear regression models (without and with controls, using the ordinary least squares estimation method). The ATUS experiential SWB measures, however, were collected alongside three different activities at three different times of day. It is, therefore, possible in theory to use random or fixed effects models, e.g. to adjust for time-invariant aspects of respondents that did not vary on the diary day, such as baseline affect and reporting preferences (Morris and Guerra 2015, Krueger 2017). In these analyses, however, absolute and relative socio-economic status are of key interest and they do not vary (at least in measurement) on the diary day. Thus, only multiple linear regression analyses were conducted for ATUS data (both without and with controls). In ELSA, which is a panel study over multiple years, pooled cross-section analyses as well as fixed effects analyses were conducted. These models are discussed in detail later in this section on p. 130.

Although SWB measures are technically ordinal variables, it is common practice in the SWB literature to treat SWB measures at the interval/ratio level because some evidence suggests that the effects of SWB determinants are similar when analysing SWB items as

ordinal or interval/ratio (Ferrer-i-Carbonell and Frijters 2004; Dolan, Peasgood and White 2008; Carstensen et al. 2011). This thesis follows in this common practice in order to ease the interpretation of the results.

Weighting and standard errors

There are two types of weights in ATUS; person-level weights and activity-level weights. For the evaluative SWB models, the person-level weights were used because evaluative SWB is reported only once by each respondent. For the experiential SWB models, the activity-level weights were used because experiential SWB is asked of respondents three times. These weights also adjust for several aspects of the complex survey design, such as oversampling minority groups, unit non-response and activity length (BLS 2013). For the evaluative SWB models, these data are analysed at the person level; for the experiential SWB models, these data are analysed at the activity level. Standard errors are clustered at the person level. While successive difference replication weights are available in ATUS to adjust the standard errors for the complex survey design, preliminary analyses indicated that there were no substantive differences between models with and without these weights and thus they are not reported in the results. This has been found in other research using ATUS (Stone et al. 2016).

The CPS survey contains probability weights which adjust for several aspects of the complex survey design, including unit nonresponse, unequal probability of selection into the sample and over or under-coverage of demographic groups according to characteristics such as age and gender. For the March CPS, the sample was expanded to include male members of the Armed Forces residing in civilian housing or with their families on a military base, and additional Hispanic households, and the March final supplemental weights additionally adjust for this expansion (US Census Bureau 2006). These weights were used when creating the relative variables.

To obtain the appropriate weighted estimates in the ACS survey, these data were merged at the household-level, rather than the person-level, as the key variable selected from the ACS was housing value (see pp. 82, 120). Like the CPS, the housing weights also adjust for unit

nonresponse, unequal selection probability and over or under-coverage of demographic groups (US Census Bureau 2016b).

ELSA data are analysed at the person level with the Huber-White variance estimator applied to calculate robust standard errors (Huber 1967; White 1980; White 1982). This relaxes the assumption that all of the observations are independent, which they may not be if ELSA respondents were sampled, for example, from the same geographical areas. Longitudinal weights are provided in ELSA; however, these only include those who participated in the latest wave and all previous waves. Thus, they exclude participants with non-monotonic attrition; that is, they participated at one wave and then re-entered after missing one or more waves after their first wave of participation. There were only 4,466 core sample members who participated in all waves of ELSA analysed (two through six), which is a substantial (40%) reduction from the 11,061 core sample members who participated in two or more waves. To use the longitudinal weights would result in a large loss of data and thus this was not done.

The cross-sectional weights were, however, used to create information for the relative variables to reduce self-selection effects and improve the representativeness of the estimates. These weights were based on information from the HSE (the sampling frame for ELSA, see p. 79), as well as information from prior waves of ELSA (if there was this information). They adjusted for observable differences between the HSE and ELSA sample, such as in age and self-assessed health, and accounted for unit non-response at each wave. The cross-sectional weights are only applicable to core sample members and not younger partners, and thus the sample was restricted to core sample members – although information from core members who did not complete two or more waves was used to create the relative variables to improve representativeness.

There were 17,981 unique individuals across waves one through six of ELSA that took part in an interview, and 15,891 unique individuals across waves two through six of ELSA (recall that wave one is excluded from these analyses because it did not include one of the life evaluation measures used for analyses, see p. 117). Of the 15,891, 2,167 were coded as partners (14%). After dropping the partners because they did not have weights, there were

13,482 unique individuals (242 people appeared to be coded as a partner at one wave but a core sample member at another, and these were dropped). It is this dataset that was used to create the relative variables. After creating the relative variables, those who only participated in one wave were dropped, for a total of 11,061 respondents. After dropping those with missing data on any of the key variables, there were 10,103 unique individuals in the final sample and 32,250 observations. A summary of the exclusion of data in ELSA is shown in Appendix A, Table 2.6.

Item non-response and multiple imputation

In ATUS, the full sample across waves 2012-13 contained 21,736 individuals and 64,576 activities. There were some missing values on some of the experiential SWB items, and any activity missing at least one experiential SWB item was excluded from the final sample analysed. This approach to missingness was taken to keep sample sizes consistent across models with different SWB items to ensure comparability. It resulted in the exclusion of 146 individuals and 1,174 activities, which were 0.7% of the individuals and 1.8% of the activities in the sample, respectively. After excluding those with missing data on any SWB item, the final sample analysed contained 21,590 respondents across 63,402 activities.

Occupation was not defined for those who weren't in work; however, this is not missing data – it does not exist at the time of the interview, although it would be possible to consider potential occupation if the respondent were employed (as was the case in ELSA, see pp. 96, 190). The only other variable missing any information was earnings, although recall that family income was imputed by the BLS. In the final sample, there were 13,054 people employed at the time of the ATUS interview across 38,561 activities. But only 11,574 people had earnings information across 34,184 activities. Earnings information was, therefore, missing for 1,480 people across 4,377 activities – 11.3% and 11.4%, respectively, of the people employed at ATUS in the final sample analysed. Observations missing earnings were excluded from the analyses, and earnings was not included as a control variable across models due to this high proportion of missing responses. The one exception is in the relative earnings models, which require absolute earnings or else the relative earnings coefficients would likely reflect some of the effect of absolute earnings.

The choice to exclude observations with missing information – a complete case analysis – could bias the parameter estimates. This bias is likely to be small in the case of the experiential SWB items because of the small proportion of missing data. For earnings, however, the proportion of missing data is higher and this could impact the results. If the reason that earnings information is missing – the 'missingness mechanism' – depends on earnings itself, then important information may be lost (see Little and Rubin 1987). It is not possible to ascertain why earnings information is missing, and so multiple imputation was conducted as a robustness test in the models using information on earnings.

Multiple imputation is not making up data. Because multiple datasets are created in order to model missing values of earnings, the standard errors reflect the random variation and uncertainty that occurs during the process of multiple imputation (Hoyle 2014). Multiple imputation, therefore, is a robustness check to assess whether or not the results may be biased due to missing information on earnings. There are several approaches to conducting multiple imputation, and the chained equations approach was used in these analyses because of its flexibility (Raghunathan et al. 2001). This details of this for both the ATUS and ELSA (where most of the measures contained missing data) are discussed in Appendix A, p. 404.

Adjustment for multiple comparisons

Nearly 4,000 models are run in the analyses. With this many comparisons, it is very important to adjust for multiple comparisons to control the possibility of simply finding a statistically significant result due to chance (Nuzzo 2014). One common way to adjust for multiple comparisons is to use a Bonferroni correction (see Sham and Purcell 2014). This divides the critical p-value by the number of tests. In economics and psychology journals, the disciplines in which this thesis is primarily situated, the critical p-value is usually 0.05. This means that five out of every 100 tests of statistical significance will be statistically significant due to chance and not in the population.

The Bonferroni correction is considered conservative, however, because it assumes that the tests are completely independent of each other (Altman et al. 2013). While it is not always clear what 'dependence' means, in this research, dependence could be interpreted as the tests being related because they are on the same sample, across the same dimensions of SWB and aspects of socio-economic status. Thus, applying the Bonferroni adjustment could lead to a high rate of false negatives, and a failure to detect an important effect. As discussed in Altman et al (2013), there is not agreement about what to do in such situations.

To strike a balance between being over- and under-conservative, the results are not interpreted in terms of the Bonferroni adjustment in some chapters but they are in others. The adjustment is made within datasets, which is one way of interpreting dependence. It was not applied in the next chapter, which focusses upon the relationship of absolute socio-economic status with SWB. It is applied in the fourth chapter, where comparisons were made across the four SWB dimensions for the relative variables in ATUS and ELSA – it was applied separately, however, for the number of analyses in each chapter within datasets. It was not applied in the fifth chapter, which looks at how the effects of relative socio-economic status on SWB differ according to levels of SWB, absolute socio-economic status, gender and age. All of the full p-values, however, are reported across chapters so that readers can draw their own conclusions.

Descriptive statistics and bivariate associations

Descriptive statistics were calculated for all variables, such as measures of central tendency and dispersion. Bivariate regressions of absolute and relative socio-economic status with SWB were conducted – that is, regressions with SWB as the outcome variable and one measure of absolute or relative socio-economic status with no controls. For absolute socio-economic status, these corresponded to models 1 – 16 in ATUS because there were four measures of SWB and four aspects of socio-economic status – income, earnings, education and employment status (including occupation and unemployment status). The corresponding ELSA model numbers were 1 – 24 in ELSA because there were four measures of SWB and six aspects of socio-economic status – income, earnings, wealth, education, occupation and unemployment. Pearson's pair-wise correlations between all of

the relative socio-economic status variables were also calculated to illustrate the extent to which the reference groups overlap. Following from the bivariate regressions, three main sets of analyses were conducted, as described in what follows.

Set one analyses (chapter three) – research questions 1a-1d and 2a-2d

The first set of analyses investigates the relationship of absolute socio-economic status with the various dimensions of SWB in order to partially answer research questions one and two. They are only partially answered because these analyses focus upon absolute and not relative socio-economic status. Following from the bivariate regressions between absolute socio-economic status and SWB, the following models are run in ATUS, which introduce control variables:

$$(ATUS\ 17-20)\ Cantril\ Ladder_i = a + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + \beta Wave_i + e_i$$

$$(ATUS\ 21-24)\ Happy_a = a + \beta Absolute\ socio-economic\ status_a + \beta Control\ variables_a + \beta Wave_a + e_a$$

$$(ATUS\ 25-28)\ Negative\ affect_a = a + \beta Absolute\ socio-economic\ status_a + \beta Control\ variables_a + \beta Wave_a + e_a$$

$$(ATUS\ 29-32)\ Meaning_a = a + \beta Absolute\ socio-economic\ status_a + \beta Control\ variables_a + \beta Wave_a + e_a$$

Throughout this section, the large a is the constant intercept, the small a represents the activity, i represents the individual and e is the error term. Controlling for wave accounts for year fixed effects to adjust for any differences between the years of the sample. The control variables exclude earnings, as these were only defined for a sub-sample of participants (see p. 85).

Following from the analyses of the bivariate relationship between absolute socio-economic status and SWB, the following models are run in ELSA, which introduce control variables into the pooled cross-section:

$$(ELSA\ 25-30)\ Life\ satsifaction\ (1)_i = a + \beta Absolute\ socio - economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 31-36)\ Life\ satisfaction\ (2)_i = a + \beta Absolute\ socio - economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 37-42)\ Life\ meaning_i = a + \beta Absolute\ socio - economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 43-48)\ Experienced\ affect\ last\ week_i = a + \beta Absolute\ socio - economic\ status_i + \beta Control\ variables_i + e_i$$

There are 24 models run in this portion of the analysis, varying each of the four measures of SWB and six aspects of socio-economic status.

Next, individual fixed effects are introduced into these ELSA models to control for any unobserved time invariant characteristics that might affect the relationship of absolute socio-economic status and SWB. No controls are included in these models:

$$(ELSA\ 49-54)\ Life\ satisfaction\ (1)_{it} = \beta Absolute\ socio - economic\ status_{it} + e_{it}$$

$$(ELSA\ 55-60)\ Life\ satisfaction(2)_{it} = \beta Absolute\ socio - economic\ status_{it} + e_{it}$$

$$(ELSA\ 61-66)\ Life\ meaning_{it} = \beta Absolute\ socio - economic\ status_{it} + e_{it}$$

$$(ELSA\ 67-72)\ Experienced\ affect\ last\ week_{it} = \beta Absolute\ socio - economic\ status_{it} + e_{it}$$

Throughout this section, i is the individual, t is the wave of data collection, and e is the error term. There are 24 models run again, varying each of the four measures of SWB and six measures of socio-economic status.

Then, the time-varying control variables (so, gender is excluded) are introduced to the fixed effects models for another set of 24 models:

$$(ELSA\ 73-78)\ Life\ satisfaction\ (1)_{it} = \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

$$(ELSA\ 79-84)\ Life\ satisfaction\ (2)_{it} = \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

$$(EELSA\ 85-90)\ Life\ meaning_{it} = \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

$$(ELSA\ 91-96)\ Experienced\ affect\ last\ week_{it} = \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

Again, each of the four measures of SWB and six aspects of socio-economic status are varied.

These set one analyses will partially address the first research question with the interpretation of the coefficient on absolute socio-economic status according to whether socio-economic status is indicated by income, wealth, education or unemployment (1a-1d) and according to the different SWB measures (2a-2d, p. 31). The results of these analyses are discussed in chapter three.

Note that because there was no measure of evaluative pleasure in these data, research questions relating to 'evaluations of pleasure' are not strictly answered and are instead interpreted via the Cantril ladder in ATUS and satisfaction with life in ELSA.

Set two analyses (chapter four) – research questions 1a – 1g and 2a-2d

The second set of analyses considers the relationship of relative socio-economic status with SWB. These analyses complement the set one analyses to complete the answer to research questions 1a – 1d and 2a – 2d with respect to relative socio-economic status, and fully answer research questions 1e-1g by considering the scope, summary and standpoint aspects of reference groups. These analyses are discussed in chapter four.

Particular attention is paid to multicollinearity in the analyses. As mentioned earlier (p. 92), collinearity is a problem because it can inflate standard errors, leading to a failure to detect relationships that are statistically significant. It can also cause the sign of a coefficient to reverse, which is particularly problematic when attempting to estimate the effect of relative socio-economic status on SWB because theories predict both positive and negative effects (see section 4.1). Moreover, absolute and relative socio-economic status are likely to be related. Thus, a cautious approach was taken to multicollinearity by using a VIF cutoff of ten (O'Brien 2007). Measures of relative socio-economic status with a VIF of greater than ten were excluded from analyses.

Following from the bivariate analyses of the relationship between relative socio-economic status and SWB, which were mentioned in the last section, further models are run with controls. For each of the four measures of SWB in ATUS, the aim was to run 107 models, corresponding to different aspects of socio-economic status (income, earnings, education, unemployment), reference group scopes (e.g. age, gender), ways of summarising the reference group (e.g. top 1% income shares, median education), and standpoint aspects of reference group (e.g. distance from average income and median education). These 107 variations in reference groups are shown in Table 2.7, p. 141. VIF tests, however, indicated that 53 of these reference group variables could be collinear with another variable and so only 54 remained (see section 4.2, p. 234).

The bivariate relationships of relative socio-economic status with SWB in ATUS were contained in 216 models, which reflects four measures of SWB and 54 relative variables

that had VIFs < 10. These are model numbers 33 – 248 because the last absolute ATUS model was 32 above.

The next SWB models in ATUS for the 54 relative variables include controls and are as follows:

$$(ATUS\ 249-302)\ Cantril\ ladder_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + \beta Wave_i + e_i$$

$$(AATUS\ 303-356)\ Happyy_a = a + \beta Relative\ socio-economic\ status_a + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_a + \beta Wave_a + e_a$$

$$(ATUS\ 357-410) Negative\ affect_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + \beta Wave_i + e_i$$

$$(ATUS\ 411-464)\ Meaning_a = a + \beta Relative\ socio-economic\ status_a + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_a + \beta Wave_a + e_a$$

For ELSA there are 200 reference groups (see Table 2.8) and four measures of SWB. Thus, the aim was to run 200 models for each of the four measures of SWB. After excluding 60 reference group variables with a VIF greater than ten, however, there were 140 reference group measures left (see section 4.3, p. 243). Following from the bivariate analyses, these are initially pooled with controls, then with fixed effects and no controls, and then with fixed effects plus time-varying controls. The relative bivariate model numbers start at 97 because the last absolute model was number 96, as above. There are 560 relative bivariate models (four measures of SWB X 140 reference group measures), which then correspond to model numbers 97 – 656. Then, for pooled with controls, the models are:

$$(ELSA\ 657-796)\ Life\ satsifaction\ (1)_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 797-936)\ Life\ satisfaction\ (2)_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 937-1076)\ Life\ meaning_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + e_i$$

$$(ELSA\ 1077-1216)\ Experienced\ affect\ last\ week_i = a + \beta Relative\ socio-economic\ status_i + \beta Absolute\ socio-economic\ status_i + \beta Control\ variables_i + e_i$$

With fixed effects and no controls:

$$(ELSA\ 1217-1356)\ Life\ satisfaction\ (1)_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + e_{it}$$

$$(ELSA\ 1357-1496)\ Life\ satisfaction(2)_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + e_{it}$$

$$(ELSA\ 1527-1636)\ Life\ meaning_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + e_{it}$$

$$(ELSA\ 1637-1776)\ Experienced\ affect\ last\ week_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + e_{it}$$

And with fixed effects and controls:

$$(ELSA\ 1777-1916)\ Life\ satisfaction\ (1)_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

$$(ELSA\ 1917-2056)\ Life\ satisfaction(2)_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

$$(ELSA\ 2057-2196)\ Life\ meaning_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + + e_{it}$$

$$(ELSA\ 2917-2336)\ Experienced\ affect\ last\ week_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Absolute\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

Each model is calculated for each reference group variable and for each measure of SWB. Due to the multiple comparisons made, a Bonferroni-correction is applied to increase the conservativeness of the critical significance values (see above, p. 128). Interpreting the coefficient on the reference group variable (relative socio-economic status) according to whether socio-economic status is indicated by income, wealth, education or unemployment answers research questions 1a-1d, which complements the information for absolute socio-economic status in the set one analyses. Interpreting the coefficient on the reference group variable according to variations in the scope, summary and standpoint aspects of reference groups provides answers to research questions 1e-1g. Interpreting the coefficient on the reference group variable according to the measures of SWB answers research question 2a-2d, again complementing the information for absolute socio-economic status in the set one analyses.

Set three analyses (chapter four) – research questions 3a-3g and 4a-4d

Research questions three and four ask whether absolute or relative socio-economic status matters more for SWB. Comparing the effect of absolute and relative socio-economic status on SWB is often accomplished by considering whether relative socio-economic status mediates the relationship of absolute socio-economic status with SWB – that is, whether the magnitude of the coefficient on absolute socio-economic status is reduced (partial mediation) or becomes statistically insignificant (full mediation) when relative socio-economic status is introduced into the model (Baron and Kenny 1986; Singh-Manoux, Marmot and Adler 2005; Wood et al. 2012). There is, however, some evidence that

conducting a mediation analysis, especially with secondary data, can produce biased estimates (Maxwell and Cole 2007; Bullock, Green and Ha 2010).

Instead, model fit was compared between models with relative socio-economic status (but without absolute socio-economic status) and the absolute socio-economic status models in the set one analyses. This approach is based on the approach taken by Wood et al. (2012). Although model fit is typically assessed using a likelihood ratio test, relative socio-economic status models with different reference groups are not nested and thus violate the assumptions of this test (Everitt and Rabe-Hesketh 2006). For non-nested models, either AIC and BIC information criterion tests can be conducted. Following Kuha (2004), both AIC and BIC tests are conducted to ascertain the best model fit, with models selected where both criteria suggest the model fits best. Lower BIC and AIC scores reflect better fit (Kass and Raftery 1995). R-squared information is also presented, and for the fixed effects models in ELSA described below, these are within person.

In the relative ATUS models excluding absolute socio-economic status for the AIC and BIC tests, only 35 relative measures were excluded due to collinearity (fewer needed to be excluded due to the exclusion of absolute socio-economic status in these models, which was sometimes the source of the collinearity – see p. 239). This left 72 relative measures for the AIC and BIC tests across four measures of SWB for a total of 288 further models (72 X 4). All of these models were with controls, and corresponded to model numbers 465 – 752. In ELSA, there were only 32 relative measures excluded for the AIC and BIC tests (see p. 250) leaving 168 relative measures across four measures of SWB for a total of 168 X 4 = 672 further models (see p. 250). All of these models were with controls and fixed effects, and correspond to model numbers 2337 – 3008. Note that the AIC and BIC tests of model fit do not use a criterion of statistical significance to reduce the number of comparisons made.

An example ATUS model with relative and without absolute socio-economic status for the AIC and BIC tests of model fit is shown in what follows:

$$(ATUS\ example)\ Cantril\ ladder_i = a + \beta Relative\ socio-economic\ status_i + \beta Control\ variables_i + \beta Wave_i + e_i$$

And the corresponding example ELSA model is below:

$$(ELSA\ example)\ Life\ satisfaction\ (1)_{it} = \beta Relative\ socio-economic\ status_{it} + \beta Control\ variables_{it} + e_{it}$$

Comparing the AICs and BICs between these models and the AICs and BICs from the models in set one without relative socio-economic status across aspects of socio-economic status informs the answers to questions 3a-3d; across summary, scope and standpoint aspects of reference groups to questions 3e-3g; and across measures of SWB to questions 4a-4d.

Set four analyses (chapter five) – research questions five through eight

Research question five asks how the relationship of relative socio-economic status with SWB depends on levels of SWB. As described in further detail in sections 5.2 and 5.3, quantile regressions are conducted at the 10th, 25th, 50th, 75th and 90th quantiles of SWB for three relative measures from ATUS (associated with three SWB measures), and a select five relative measures from ELSA (associated with various SWB measures – reasons for selection are described in chapter five, pp. 281, 294). In ATUS, there are three relative measures at five quantiles for a further 15 models. In ELSA, there are 55 quantile regressions conducted reflecting various associations with different SWB measures across the five relative measures. This brings the total number of models in ATUS up to 767 (up from 752) and in ELSA to 3,063 (up from 3,008), as shown in Table 2.6.

Research questions six, seven and eight ask about how the relationship of relative socio-economic status with SWB depends on absolute socio-economic status, gender and age. Mostly, separate regressions are conducted for separate sub-groups defined by the data for these characteristics, such as by gender and levels of family income in ATUS, although interactions between absolute and relative socio-economic status are also created for some

models. In ATUS, a further 38 models are run for these analyses. In ELSA, a further 108 are conducted. In total, 805 models are run in ATUS and 3,171 in ELSA for a total of 3,967 models. Again, these model numbers are shown in Table 2.6.

Dataset	Research question(s)	Chapter	Analyses	No. models	Model numbers
ATUS	1-2	3	Absolute socio-economic status	32	1-32
ELSA	1-2	3	Absolute socio-economic status	96	1-96
ATUS	1-2	4	Relative socio-economic status	432	33-464
ELSA	1-2	4	Relative socio-economic status	2240	97-2336
ATUS	3-4	4	Absolute vs. relative socio-economic status	288	465-752
ELSA	3-4	4	Absolute vs. relative socio-economic status	672	2337-3008
ATUS	5	5	by SWB	15	753-767
ELSA	5	5	by SWB	55	3009-3063
ATUS	6-8	5	by absolute socio-economic status, gender and age	38	768-805
ELSA	6-8	5	by absolute socio-economic status, gender and age	108	3064-3171

Table 2.6: The number of models run in ATUS and ELSA, along with the research questions they address and the corresponding chapters.

		Summary									Standpoint			
		Top 1% income shares	Average income	% income 100K+	Average earnings	% earnings 100K+	Median education	% degree+	% unemployed (old)	% unemployed (current)	Rank earnings	Distance from average earnings	Rank education	Distance from median education
Scope	*State*	1	2	11	20	29	38	47	56	64	72	81	90	99
	Age group in state		3	12	21	30	39	48	57	65	73	82	91	100
	Gender group in state		4	13	22	31	40	49	58	66	74	83	92	101
	Marital group in state		5	14	23	32	41	50	59	67	75	84	93	102
	Race group in state		6	15	24	33	42	51	60	68	76	85	94	103
	Parent group in state		7	16	25	34	43	52	61	69	77	86	95	104
	Occupation group in state		8	17	26	35	44	53			78	87	96	105
	Income group in state				27	36	45	54	62	70	79	88	97	106
	Education group in state		9	18	28	37			63	71	80	89		
	Unemployment group in state		10	19			46	55					98	107

Table 2.7: The 107 variations of reference groups in ATUS according to aspect of socio-economic status assessed with reference group summary measure (top 1% income shares, average income, % income $100K+, average earnings, % earnings $100K+, median education, % degree+, % unemployed), and with standpoint measure (rank earnings, distance from average earnings, rank education, distance from median education), by reference group scope (state, age, gender, marital status, race, parent status, occupation, income, education, unemployment).

		Summary									Standpoint									
		Average income	% income £46K+	Average earnings	% earnings £46K+	Average wealth	% wealth £450K+	Median education	%NVQ4/NVQ5/ Degree+	% Unemployed	Rank income	Distance from average income	Rank earnings	Distance from average earnings	Rank wealth	Distance from average wealth	Rank education	Distance from median education	Perception of money, education, job	Perception of financial situation
Scope	Local authority	1	12	23	34	45	57	69	81	93	105	116	127	138	149	161	173	185		
	Age in GOR*	2	13	24	35	46	58	70	82	94	106	117	128	139	150	162	174	186		
	Gender in GOR	3	14	25	36	47	59	71	83	95	107	118	129	140	151	163	175	187		
	Marital in GOR	4	15	26	37	48	60	72	84	96	108	119	130	141	152	164	176	188		
	Race in GOR	5	16	27	38	49	61	73	85	97	109	120	131	142	153	165	177	189		
	Parent in GOR	6	17	28	39	50	62	74	86	98	110	121	132	143	154	166	178	190		
	Occupation in GOR	7	18	29	40	51	63	75	87	99	111	122	133	144	155	167	179	191		
	Income in GOR					52	64	76	88	100					156	168	180	192		
	Wealth in GOR	8	19	30	41			77	89	101	112	123	134	145			181	193		
	Education in GOR	9	20	31	42	53	65			102	113	124	135	146	157	169				
	Unemployment in GOR					54	66	78	90						158	170	182	194		
	Religion in GOR	10	21	32	43	55	67	79	91	103	114	125	136	147	159	171	183	195		
	Political in GOR	11	22	33	44	56	68	80	92	104	115	126	137	148	160	172	184	196		
	Society																		197	
	Friends																			198
	Colleagues																			199
	Nearby																			200

Table 2.8: The 200 variations of reference groups in ELSA according to aspect of socio-economic status assessed with reference group summary measure (average income, % with income £46K+, average earnings, % earnings £46K+, average wealth, % wealth £450K+, median education, %NVQ4/NVQ5/Degree+, % unemployed), and with standpoint measure (rank income, distance from average income, rank earnings, distance from average earnings, rank wealth, distance from average wealth, rank education, distance from median education, perception of money/education/job, perception of financial situation) by reference groups scope (LA; age, gender, marital status, race, parent status, occupation, income, wealth, education, unemployment, urban/rural, religion, society, friends and colleagues in GORs). *GOR= Government office region.

Chapter summary

This chapter argued that assessing the causal effect of absolute and relative socio-economic status on SWB is important because it lends confidence to those interpreting the results of this research that any effect is not due to something else. It also argued that representativeness is important for ensuring the generalisability of the results and their conclusions. This research thus uses the most causal method available applicable to the research questions, secondary data analysis. ELSA provides rich information about socio-economic status, SWB and longitudinal data, the latter of which helps to infer causality. The wellbeing module of ATUS contains a measure of experienced purpose, an overlooked component of SWB, and it is nationally representative. Pooled models without and with controls are conducted in ATUS to answer the research questions, while both pooled and fixed effects models without and with controls are conducted in ELSA. The basic building blocks for conducting the analyses were discussed in detail in this section, and the following chapters further develop what was laid out here.

3. Successful but no happier – and even less happy? The relationships of absolute income, wealth, education and unemployment with SWB

Summary

It is sometimes assumed that doing absolutely well in socio-economic terms means that people will both think that their lives are going well and feel well. This chapter shows that this is the exception rather than the rule, especially for experiences of SWB, and suggests possible explanations in terms of socio-economic differences in identity, leisure time, values, conformity and social comparisons. Although higher income (in ATUS) and wealth (in ELSA) are associated with better thoughts about life, and higher income (in ATUS) is associated with reduced negative affect, high income (in ATUS) is associated with *less* happiness and meaning. That high income is associated with lower SWB is unusual in the context of prior literature. Of income, earnings and wealth in ELSA, only wealth is (positively) associated with SWB after introducing fixed effects, and only for evaluations of SWB. Education does not consistently benefit any aspect of SWB across datasets, and the results differ substantively with controls. This supports the idea that the value of education is in what accompanies a degree, such as higher earnings and better health. On the other hand, higher occupational class was largely associated with better evaluations of SWB but not better experiences across datasets, and sometimes worse experiences – those in management and professional occupations reported feeling less happy than the unemployed in ATUS. The unemployed evaluated their lives worse than others across datasets; however, their experiences were usually not worse. Those who had recently moved out of unemployment in ATUS even had worse life evaluations than those who remained not unemployed. These results, therefore, suggest that re-employment may be characterised by relatively low wellbeing, which social policies could consider addressing. Several reasons underlying these results are proposed, such as the greater stability afforded by wealth versus income, and uncertainty and adaptation processes accompanying re-employment. All results need to be interpreted cautiously due to the implications of reverse causality, such as that less happy people could self-select into higher income groups.

Structure of chapter

This chapter first considers theories underlying why and how socio-economic status is associated with SWB, and then reviews previous literature regarding the relationships of absolute income, wealth, education and unemployment with the various dimensions of SWB. In discussing prior evidence, the central point is that although much is known about how absolute socio-economic status relates to overall evaluations of life, much less is known about how absolute socio-economic status relates to experiences of SWB, especially experienced purpose. This is a limitation to existing literature because, as motivated in the Introduction (p. 26), our conclusions about who is doing well or badly and who should get priority in the allocation of scarce resources may differ depending on the component of SWB assessed. To address this limitation, analyses of ATUS and ELSA look at the relationship of absolute socio-economic status with evaluations and experiences of SWB, including experiences of purpose, bringing in new evidence to inform discussions about the optimal level of absolute socio-economic status for individuals by showing how people react to their absolute socio-economic status.

3.1 Literature review

It is oftentimes assumed that higher socio-economic status is associated with higher wellbeing. Income, for example, allows people to satisfy their preferences through the consumption of goods and services, and some equate preferences with wellbeing (Harsanyi 1996). In policy, socio-economic mobility is typically presented as good and dis-mobility as problematic (Social Mobility and Child Poverty Commission 2013; White House 2013), and many governments around the world provide free or subsidised education. It is argued that education widens opportunities for social mobility, although some evidence suggests these opportunities are limited (Goldthorpe 2013). Poverty and unemployment are discouraged by policymakers, and the poor and unemployed are excluded, stigmatised and discriminated against by institutions and members of the public (Agulnik 2002). These are all reasons to assume that high socio-economic attainment will bring high wellbeing – or at least, that low socio-economic status will bring low wellbeing.

There are some objections to the assumption that higher socio-economic status is associated with higher wellbeing. One strand of thinking relates to the identity-related costs of socio-economic mobility. Vernon (2011), for example, states that whilst most would agree that social mobility is 'good', society favours 'non-social' market mobility, such as more income and better jobs, at the expense of social 'non-market' mobility, such as improvements in one's home life or involvement in the arts, which are also 'good'. Thus, people may make trade-offs to achieve market mobility at the expense of other types of mobility and doing so could negatively impact individuals and societies. There is some behavioural evidence for this from Akerlof (1997), who discusses Eugene Lang's observation that scholarship students are more likely to go on to further education if their schoolmates prior to further education all receive the same scholarship. Akerlof explains this in terms of the students not wishing to give up their prior social networks and the identities associated with being a part of these networks (see Friedman 2014 for an in-depth exploration of these issues from a sociological lens).

Another perspective questioning the link between socio-economic status and wellbeing considers differences in the time use and values of low vs. high socio-economic status individuals and groups, irrespective of whether or not they are socially mobile or dismobile. Since the 1980s, the rich have had less leisure time than those on lower incomes in many developed countries (Aguiar & Hurst, 2007), and people living in high-earning households report feeling more time stress while working and at home than those in households with lower earnings (Hamermesh and Lee 2007). Thus, people with higher incomes may simply feel more time pressure than those with lower incomes because they have less leisure time, which contributes negatively to their wellbeing. In support of this idea, in Australia, Nikolaev (2016b) has shown that people with higher levels of education are less satisfied with the amount of free time they have than people with lower levels of education.

People who are working class also tend to engage in behaviours that prioritise the group over themselves moreso than those who are not working class (Stephens, Fryberg and Markus 2011), suggestive of a more collective identity. This is supported by a range of evidence from psychology showing that people who are working class are more generous and empathetic (Piff et al. 2010; Kraus, Côté and Keltner 2010; Varnum et al. 2015;

Guinote et al. 2015), and kindness towards others can be associated with higher wellbeing (Andreoni 1990; Otake et al. 2006). It is, therefore, possible that people high in socio-economic status have lower SWB because they experience less of the 'warm glow' (Andreoni 1990) benefit that comes with the actions prioritised by valuing social relationships and group membership.

A further reason that people in high socio-economic groups might have lower SWB than those in lower socio-economic groups is that evidence suggests working class people are more likely to conform than others (although not in all cultures, see Miyamoto 2017). In a simple psychological study involving a teacher inviting US students into an office and offering them a free pen, Stephens, Markus and Townsend (2007) found that students who had at least one parent with degree-level education were more likely to choose the pen that was dissimilar to the other pens available, whereas the students who did not have a parent with degree-level education chose a pen that was similar. According to identity economics (see section 1.2), there is disutility in deviating from the norm, and so those who make choices that are consistent with the norm should have higher SWB.

Absolute socio-economic status might not benefit SWB if one's reference group scope changes with higher status. As socio-economic status increases, people might compare themselves to other people who are also doing similarly to them, and then not feel or think that they are doing any better by comparison. This idea was discussed in the Introduction (e.g. p. 18) and is the focus of the further subsequent chapters of this thesis. In theory, therefore, there are reasons to think that socio-economic attainment has both benefits and costs for wellbeing. By using the SWB approach, this chapter investigates those benefits and costs for income, wealth, education, occupation and unemployment by building upon a vast body of foregoing literature, which is reviewed in what follows.

Income

The literature investigating the relationship of income with SWB is very large and so what follows is a necessarily selective review, focussing upon causation for the reasons described in chapter two, as well as upon the dimension of SWB to address research

questions two and four. Most studies about income and SWB ask people about their life satisfaction, which captures the evaluative dimension of SWB as described in section 1.3. In general, people with low incomes have low life satisfaction, although there are diminishing marginal returns to income (Clark, Frijters and Shields 2008; see Figure 3.1 for a stylised graph of the relationship between income and evaluations of SWB).

One problem in assessing the relationship of income with SWB is that changes in income might not cause changes in SWB if people who have higher (lower) SWB are also more likely to earn more (less), which the evidence suggests that they are (Lyubomirsky, King and Diener 2005; De Neve and Oswald 2012). Thus, people who earn more income might simply have higher SWB because they had higher SWB in the first place, and not because of any change in their income. There could also be a third factor, such as personality or quality of the local area, driving both income and SWB, and leading to a spurious relationship between the two.

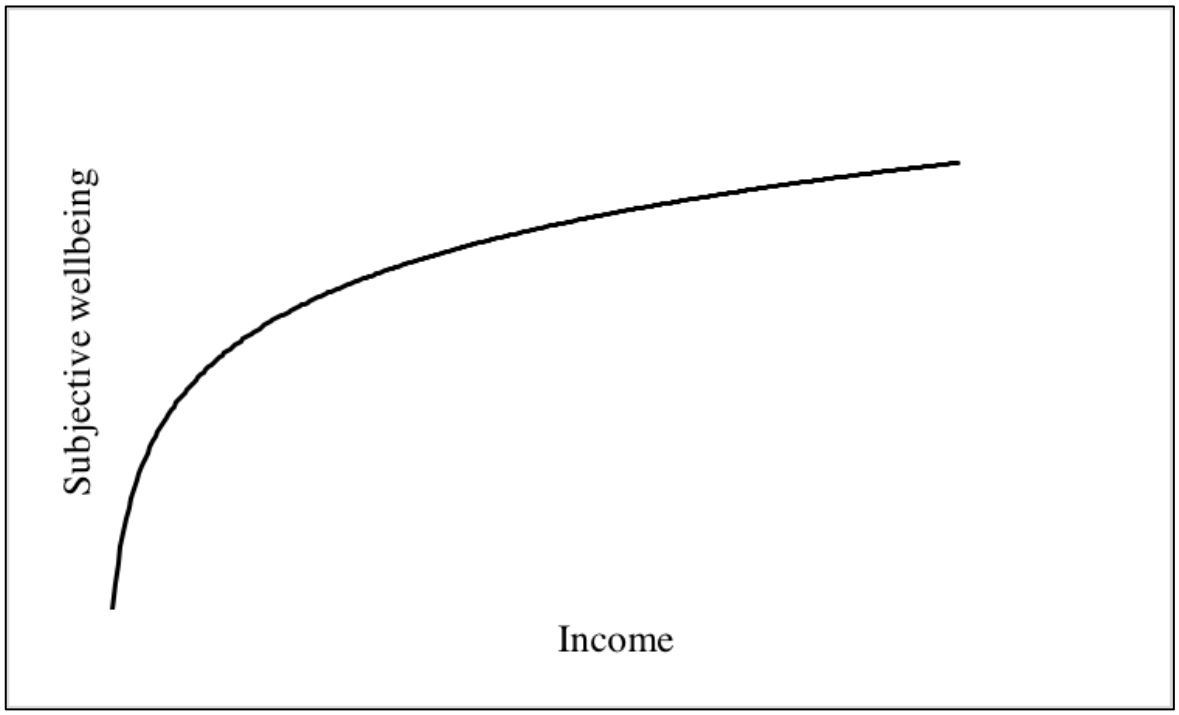

Figure 3.1: Stylised graph of the relationship of income with evaluations of SWB.

When methods for overcoming these problems of reverse causality and omitted variable bias are applied, at least some of the relationship of income with life satisfaction appears to

be causal. Frijters, Haisken-DeNew and Shields (2004) look at how exogenous increases in income as a result of the reunification of East and West Germany in 1989 affect life satisfaction in post-reunification years. Using a fixed effects model with additional controls for the main time variant determinants of life satisfaction, they find that increases in income account for at least two fifths of the increase in life satisfaction from 1991-1996, while unobserved factors account for most of the rest of the increase. These findings provide strong evidence for a causal relationship between income and life satisfaction because it shows that while unobserved factors – like SWB prior to the survey, personality or quality of the local area – affect SWB, income exerts an independent effect, too.

Many other studies show a positive relationship of income with SWB or measures that are closely related to SWB, such as health (Dolan, Peasgood and White 2008). These include studies of lottery winners (Gardner and Oswald 2007), twins (Li et al. 2011) and those adopting instrumental variable approaches (Powdthavee 2010). These causal methods are, however, not without their limiations. For example, lottery winners could be more risk-seeking than the general population. They might also feel happier because they feel lucky rather than because of their winnings (Clement Bellet, conversation 2017). A key finding is that that SWB adapts to changes in life circumstances over time, including income shocks, although adaptation is not always complete for everyone (Diener, Lucas and Scollon 2006; Lucas 2007; Di Tella, Haisken-De New and MacCulloch 2010; Clark and Georgellis 2013). There is an asymmetric effect of income losses and gains on SWB such that losses hurt more than gains increase (evaluations of) SWB (Kahneman and Tversky 1979; Boyce et al. 2013a; De Keulenaer et al. 2014). The literature on evaluations of purpose is less developed than the literature on life satisfaction but existing evidence suggests that income is positively associated with evaluations of purpose, too (Pinquart 2002; Kaplan, Shema and Leite 2008; Ward and King 2016).

Not all studies find a positive relationship between income and evaluative SWB, however. Peasgood (2007) reviews a number of exceptions to the general finding that income improves evaluative SWB, including no relationship and a negative relationship between income and evaluative SWB across a range of evaluative SWB measures. These studies are in the minority and the reason for the exceptions is not clear. It may be that among these

particular samples, the overall effort expended to earn income outweighs its benefits – or that the theorised benefits of more income, such as a better ability to satisfy one's preferences, are cancelled out by some of the theoretical reasons higher socio-economic status might negatively affect SWB discussed earlier (i.e. identity, leisure time, values, conformity, social comparisons). In contrast to the general result that income is positively associated with evaluations purpose, Oishi and Diener (2014) find that poorer nations report more meaning in life than wealthier ones. This result is largely due to the greater religiosity of poorer nations. This research, however, does not discuss between-country differences in SWB for the reasons discussed in chapter two (p. 123).

The question of whether income improves experiential as well as evaluative SWB has attracted attention in recent years (Luscombe 2010) but the results are not unequivocal – nor are attempts to find out (Cameron 1975). In a cross-sectional sample of US respondents, Kahneman and Deaton (2010) show that additional income after $75,000 USD improves evaluations of life overall, but not experiences of pleasure according to measures of yesterday's affect. Notably, it is difficult to sample those with high incomes, and estimates for those at the top (as well as bottom) of the income distribution are less reliable than for those in the middle (unless the survey specifically samples high and/or low earners). For example, homeless people are not included in household surveys, and there are difficulties with sampling high income populations such as gatekeepers (Barnard et al. 2007).

In ATUS, one of the datasets used in this research, Kushlev, Dunn and Lucas (2015) find that income is associated with less negative affect but not less happiness. They used the original uneven categories of the income variable in their analyses; however, they analysed this categorical variable as continuous. Stone et al. (2016) also use ATUS to analyse the relationship of income with SWB. They took the midpoints of each category of income to transform the categorical income variable into a continuous variable, and then took the log of income. This log income variable was then analysed as continuous, and both linear and quadratic effects were tested. They found no association of these income variables with experiences of happiness, stress or tiredness. There were negative log linear associations for sadness and pain, and meaning does not appear to have been reported in their analyses. This

research contributes to this work by recoding the uneven categorical income variable into new, even categories to look further at differences in SWB between income groups (see p. 85). It also analyses experiences of meaning.

In looking at other studies using experiential measures of SWB, Tay, Morrison and Diener (2014) look across 158 countries and find that increasing income is associated with both less negative affect and more positive affect, with affect measured using single-item measures of yesterday's affect. This study utilised cross-sectional samples, however, leaving room for bias due to reverse causality and omitted variables. Longitudinal or experimental data on income and experienced SWB is more difficult to find than for evaluations of SWB; however, Carstensen et al. (2011) use ten years of experience sampling data (see p. 110 for discussion of this method). They find that the socio-economic status of the participant before the study – as assessed by their income, occupation and years of education in a binary variable of white or blue collar – did not predict their experiential SWB later on.

Taken together, the evidence suggests that income is more strongly related to evaluative than to experiential SWB, although the evidence for experiential SWB is more limited. This conclusion is consistent with the idea that the circumstances of life – such as the activities we do and who we spend our time with – are more important for our experiences whereas personal characteristics, such as the amount of money we earn and whether we are married, are more important for how we think about our lives overall (Kahneman et al. 2004).

Notably, there appears to be no evidence on how income relates to experiences of purpose, consistent with the theoretical and empirical oversight in the literature neglecting this component of SWB (Dolan 2014; Dolan and Kudrna 2016). It may be that, like experiences of pleasure, income is less strongly related to experiences of purpose than to evaluative SWB because income is a personal characteristic rather than a circumstance of life. Or it may be that evaluations and experiences of purpose are so closely related that the same positive relationship of income with evaluations of purpose is observed for experiences, too.

Wealth

Wealth is different to income in that it involves the accumulation of assets that can be traded (Piketty 2014). The meaning of wealth, however, differs across culture, place and time. As discussed by Piketty, humans were once considered part of a person's wealth during the slave trade, for example, and may still be considered wealth among modern day human traffickers. A more narrow definition of wealth is taken in the SWB literature. In Senik's (2014) review, she notes that studies on wealth and SWB typically focus upon "questions about household assets, i.e. personal property, monetary savings and income-producing assets, including real estate, stocks, bonds and businesses" (p.93). This is also the focus taken in the present research, and there is a further focus on household rather than national wealth, for the reasons discussed on p. 78. In general, the measures of wealth in the following studies reflect assets less liabilities.

Because wealth is more stable than income, wealth provides greater financial security and thus it may be that it has more of a positive contribution to SWB than income. But perceptions of wealth do not always correspond to net levels of wealth. Sussman and Shafir (2012) have shown that people who are in debt are seen as being better off financially if they have more assets and thus more debt, whereas people who are not in debt are seen as better off financially if they have fewer assets and thus lower debt. Nevertheless, in longitudinal analyses of working age adults in the US, Australia, Britain, Germany, Hungary and the Netherlands, wealth is at least as important for SWB as income when using various measures of wealth and evaluative SWB (Mullis 1992; Headey and Wooden 2004; Headey, Muffels and Wooden 2004).

In Senik's (2014) review, she concludes that the relationship of wealth with SWB is positive. This is shown in the aforementioned studies, as well as in a sample of Italian schoolchildren, where (families') house ownership is positively associated with evaluations of life and mortgages negatively associated (Becchetti and Pisani 2012); a household panel sample of the French (reported by Senik 2014); and in the United States, where people around retirement age who were above median wealth experienced less of a decline in SWB than those below median wealth after the onset of disability. This study used a

combined measure of items asking participants whether they enjoyed life, were happy, sad or lonely (Smith et al. 2005). Senik (2014) also notes that wealth is positively associated with SWB across several developing countries.

There is very little evidence on wealth and evaluations of purpose in life and studies appear to generally investigate whether beliefs about wealth are associated with evaluations of purpose. For example, Kennedy, Kanthamani and Palmer (1994) asked participants whether wealth contributes to a sense of meaning in life and found no association between this belief and life meaning. Martos, Szabó and Rózsa (2006) find no association between valuing wealth accumulation as a goal and purpose in life. The only study that appears to measure wealth rather than beliefs about wealth is by Kim et al. (2013), who find that those in higher wealth quintiles report higher evaluations of purpose (private correspondence with Eric Kim). Thus, it would seem that valuing wealth doesn't contribute to purpose in life but possessing it does. It is a limitation of the existing literature that values and perceptions about wealth are studied instead of actual wealth – due to the focussing effect, mentioned earlier (pp. 59, 72) – and this research will address this limitation by looking at the relationship of wealth itself with evaluations of purpose rather than values about wealth.

The relationship of wealth with experiences of SWB was studied in Headey and Wooden (2004)'s longitudinal analyses, which show that log wealth is positively associated with experiences of positive and negative affect over the last few weeks, suggesting wealth matters for experiences, too. The time frame of reference of a few weeks is rather long in these measures compared to ESM or DRM studies, however, and thus it is not entirely clear whether these measures reflect evaluations or experiences. A shorter time frame in an experiential SWB question is provided in nationally representative UK data from the Office for National Statistics' Annual Population Survey, a cross-sectional dataset that asks about SWB yesterday. In these data, homeowners are less happy than those who rent their homes, but are no different in terms of their life evaluations (Deeming 2013). Although home ownership is only one aspect of wealth, and the cross-sectional evidence limits causal interpretations, this evidence also suggests wealth matters for experiences, too.

The literature on wealth and SWB is less developed than that on income and SWB and so not as much attention has been given to issues of reverse causality and self-selection by, for example, utilising exogenous changes in wealth as has been done in the income literature. Overall, there is much less evidence about wealth and experiences of pleasure or evaluations of purpose than about wealth and evaluations of pleasure or life satisfaction. Thus, in the analyses in the subsequent sections, a key contribution is the relationship of wealth with evaluations of purpose and experiences of SWB. As discussed in Section 2.2, however, neither of the main datasets analysed in this research contain measures of both wealth and experiences of purpose. Thus, experiences of purpose are excluded from the analyses of wealth and experiential SWB.

Education

Looking to education, there is a usually a small positive association between evaluations of pleasure and/or purpose and higher educational qualifications or more years of education in most studies (Blanchflower and Oswald 2004; Dolan, Peasgood and White 2008; Oreopoulos 2003; Ryff et al. 1999; Pinquart 2002), although there are also studies that find no or a negative relationship (Clark and Oswald 1996; Clark 2003; Flouri 2004), and even one quadratic relationship (Hartog and Oosterbeek 1998). It is difficult to assess causation in these studies because most students self-select into higher education and panel studies show little variation in education over time.

Again, there are differences according to the measure of SWB. The small positive associations typically found in studies that analyse evaluative SWB can be even weaker with experiential measures (Kahneman and Krueger 2006). But higher education – degree-level or above versus those below – is still positively associated with evaluations of purpose, and the association with experiences of SWB is not always weaker than with evaluations of SWB (Nikolaev 2016b).

A relatively robust trend is that data from lower income groups show a stronger positive association between education and SWB than data from wealthier groups, perhaps because education confers more of an advantage in the job market among lower income groups

(Veenhoven 1994; Fahey and Smyth 2004; Salinas-Jiménez, Salinas-Jiménez and Artés Caselles 2011). Importantly, the effects of education on SWB are often indirect via health and income (Dolan, Peasgood and White 2008; Molnar and Kapitány 2010; Deaton 2013). This suggests that education does not improve SWB unless it also provides people with the knowledge to be healthier or to earn higher incomes or that there is another unobserved factor, such as time preferences (Fuchs 1980), associated with both education and health. In other words, it is not education itself that affects SWB, but rather what education brings along with it – or what people bring to their education – that affects SWB.

Education is a personal characteristic and so, like income, it may be that it is more closely associated with evaluations than experiences, although there is less evidence on experiences to support this contention. As with income and wealth, assessing how education is related to experiences of SWB is a key contribution from the analyses.

Employment

Jobs at high or prestigious occupational levels are generally associated with high SWB (Kahneman, Diener and Schwarz 2003), and becoming unemployed has a large and enduring negative effect on SWB (Clark and Oswald 1994; Deaton 2011; Lucas, Clark, Georgellis and Diener 2004; Luhmann et al. 2012). In fact, the effect is so significant that other SWB determinants are compared to its effect in order to characterise their magnitude (Deaton 2011; Blanchflower and Oswald 2008a). People who become unemployed have lower initial life evaluations than those who do not but unemployment still reduces their SWB significantly (Winkelmann and Winkelmann 1998), and many people adapt to the negative SWB consequences of unemployment over time but some do not (Lucas et al. 2004; Clark and Georgellis 2013).

Recent evidence suggests that although there is a large negative effect of unemployment on evaluations of life, people who are unemployed use their time well – so well that their experiences of pleasure are similar to the employed when the duration of their experiences is accounted for (Knabe et al. 2010; Dolan, Kudrna and Stone 2017). This is cross-sectional evidence, however, and a review of 21 longitudinal studies produced different results.

Luhmann et al. (2012) found that the effects of unemployment on experiences of pleasure are heterogeneous between studies, ranging from strongly negative to moderately positive, although the overall average effect was negative. Jakoby (2016), using a longitudinal dataset from Switzerland, finds that unemployment increases the frequency of feeling negative emotions.

The measure of SWB used may account for the differences between Knabe et al.'s (2010) and Luhmann et al.'s (2012) findings. In longitudinal research, measures of experienced pleasure generally ask about a longer time frame than those from time use surveys, and so it may be that Luhmann et al.'s (2012) studies are more reflective of evaluations than experiences. This idea is supported by Helliwell and Huang's (2014) finding that unemployment is associated with lower evaluative SWB and experiential SWB, with experiential SWB measured as affect across the last month and yesterday. These measures are more evaluative than the diary measures of experience employed by Knabe et al. (2010). Although the activity of working is strongly associated with experiences of purpose (White and Dolan 2009; Christodoulou, Schneider and Stone 2014), it does not appear that the unemployed experience less purpose than the employed (Dolan, Kudrna and Stone 2017). This suggests that the unemployed use their time in other worthwhile ways that compensate for the loss of an activity that can be quite meaningful. The analyses in this chapter extend the analyses of Dolan, Kudrna and Stone (2017) by utilising additional information about unemployment prior to ATUS to move our understanding of the relationship of unemployment with experiences of meaning forward.

3.2 ATUS results

Descriptive information about each of the variables used in these analyses, and throughout the thesis, is shown in Appendix B, Tables 3.1-3.6. This Appendix contains the means, standard deviations and/or proportions for the measures of socio-economic status, SWB and the control variables. In ATUS the final sample analysed contained 21,590 people and 63,402 activities. ELSA contained 10,103 people and 32,250 observations.

The results of ATUS regressions from the set one analyses described in the Methodology (p. 130) are described in what follows. To recap, the relationship of absolute socio-economic status with SWB is analysed in regressions without and with controls. The uncontrolled results are mainly reported; however, all instances where the uncontrolled and controlled results differ in terms of statistical significance are noted below. The coefficient magnitudes can be seen in the Tables. Variance inflation factors for the coefficients reported in this chapter were never higher than four, suggesting no harmful multicollinearity that could inflate the standard errors (O'Brien 2007).

Household income

The relationship of household income with SWB is shown in Figure 3.2 and Table 3.1. Household income has a positive relationship with the Cantril ladder. All income categories $25K and higher are associated with significantly ($p<0.001$) higher Cantril ladder scores than those earning $25K or less. The three middle income categories appear to be associated with similar Cantril ladder scores and further analyses partially confirm this but only for those with the lowest two middle income scores – those with a household income of $25K to less than $50K do not have different Cantril ladder scores than those earning $50K to less than $75K ($b=0.03$, $se=0.03$, $p>0.05$), although they do have lower scores those earning $75K to less than $100K ($b=-0.11$, $se=0.03$, $p<0.001$). Those with incomes of $50K to $75K have lower ladder scores than those earning $75K to less than $100K ($b=-0.08$, $se=0.03$, $p<0.05$) Those earning $100K+ have higher ladder scores than all lower income groups (e.g. versus $75K to less than $100K, $b=0.11$, $se=0.03$, $p<0.001$). Household income explained about 2% of the variation in Cantril ladder scores.

In contrast to the Cantril ladder, household income is not closely associated with happiness. Starting with low incomes, those with incomes of less than $25K are less happy than those with incomes of $25K to less than $50K (b=-0.07, se=0.03, p<0.05) and $50K to less than $75K (b=-0.09, se=0.03, p<0.01) but do not differ to those with higher incomes (p>0.05) – and these relationships are insignificant with controls (p>0.05). Looking now at high incomes, those with incomes of $100K+ are less happy than those with incomes of $25K to less than $50K (b=-0.08, se=0.03, p<0.01, without controls only) and also $50K to less than $75K (b=-0.10, se=0.03, p=0.009); however, they do not differ in happiness from the other income groups (p>0.05). That those with incomes of $100K+ are less happy than some lower income groups was robust to treating the income variable in its original form of 16 categories, and to introducing random effects at the activity level (Morris and Guerra 2015; Krueger 2017). Looking now at the middle, those with incomes of $25K to less than $50K do not differ in happiness to the other higher income groups (p>0.05). Those with incomes $50K to less than $75K are no differently happy to those with incomes of $75K to less than $100K (p>0.05). Those earning $75K to less than $100K do not differ in happiness from the other income groups (p>0.05). Household income explained only 0.2% of the variation in happiness.

All of those with household incomes greater than $25K experienced less negative affect than those earning less than $25K, especially those with a family income of less than $25K to less than $50K (b=-0.17, se=0.03, p<0.001) and $50K to less than $75K (b=-0.24, se=0.03, p<0.001). The coefficients for those earning $50K to less than $75K, $75K to less than $100K (b=-0.25, se=0.04, p<0.001) and $100K+ (b=-0.28, se=0.03, p<0.001) versus less than $25K were similar, and those with family incomes $50K to less than $75K, $75K to less than $100K and $100K+ did not differ from each other in negative affect (p>0.05). Those earning $25K to less than $50K experienced more negative affect than all higher income groups (e.g. versus $50K to less than $75K, b=0.07, se=0.03, p<0.05); however, the difference relative to those earning $75K to less than $100K was not significant with controls (b=-0.03, se=0.03, p>0.05). Those earning $100K+ also experienced less negative affect than those in the $25K to less than $50K income group (b=0.11, se=0.03, p<0.001). Household income explained 1% of the variation in negative affect.

There were no differences in experienced meaning across income groups apart from the highest income group, $100K+. This group reported experiencing lower meaning than all other income groups: those earning $25K or less (b=-0.07, se=0.03, p<0.05), those earning $25K to less than $50K (b=-0.08, se=0.03, p<0.01), those earning $50K to less than $75K (b=-0.10, se=0.03, p<0.01) and those earning $75K to less than $100K (b=-0.08, se=0.03, p<0.05). Household income explained 0.1% of the variation in experienced meaning. Across all models, the coefficients with controls are generally smaller except for experienced meaning, where the coefficients are larger.

Individual earnings income

The relationship of log earnings with SWB is shown in Figure 3.3 and Table 3.2. The log of earnings is associated with higher Cantril ladder scores (b=0.08, se=0.01, p<0.001), decreasing about 40% in magnitude with controls to b=0.05 (se=0.02, p<0.001). In the uncontrolled results only, log earnings is associated with less happiness (b=-0.06, se=0.02, p<0.001). There is no association with negative affect nor experienced meaning (p>0.05). There are over 300 individuals in the sample of individuals with earnings of $10K or less, and over 3,000 with earnings $115K+, which is sufficient for statistical analyses (in Figure 3.3). The results do not change substantively with multiple imputation (see Table 3.2_MI, Appendix B). Earnings explained 0.6% of the variation in the Cantril ladder, 0.3% of the variation in happiness, 0.01% of the variation in negative affect and 0.04% of the variation in experienced meaning.

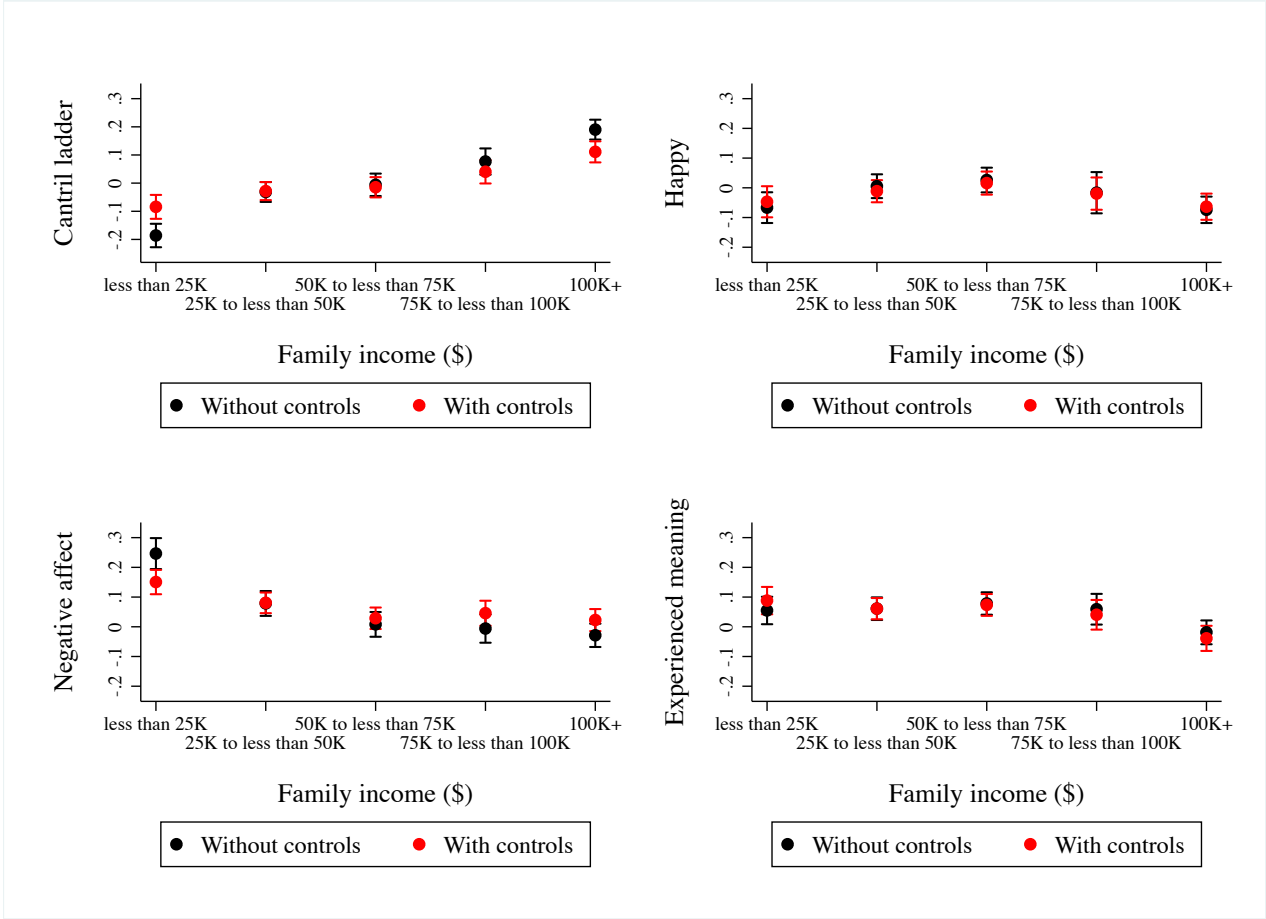

Figure 3.2: Predicted values of SWB (Cantril ladder; experiences of happiness; experiences of negative affect – average of stressed, tired, sad and pain; and experiences of meaning) in ATUS at each income group. Holding covariates at their sample mean, without and with controls (age; age squared; gender; marital status; self-rated general health; whether they took pain medicine / were well rested on the diary day; hypertension; minutes alone and in religious practices during diary day; whether household has a telephone; median housing cost by state (from ACS); children < 18 years in the household; state; education; unemployment; wave; no. people in household; race; typicality of days' feelings; population density; day of week of diary day). 95% confidence interval.

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Family income $25K to less than $50K	0.15	0.03	2.89E-08	0.06	0.03	0.04	0.07	0.03	0.03	0.04	0.03	0.27
Family income $50K to less than $75K	0.18	0.03	9.17E-10	0.07	0.03	0.02	0.09	0.03	6.10E-03	0.06	0.03	0.06
Family income $75K to less than $100K	0.26	0.03	1.94E-16	0.12	0.03	8.10E-05	0.05	0.04	0.26	0.03	0.04	0.49
Family income 100K+	0.38	0.03	1.91E-41	0.2	0.03	5.18E-10	-0.01	0.04	0.83	-0.02	0.04	0.66
Constant	-0.2	0.02	2.23E-18	-0.93	0.5	0.07	-0.07	0.03	0.01	-1.80	0.71	0.01
r2	0.02			0.2			0.002			0.13		
N	63402			63402			63402			63402		
	Negative affect (no controls)			**Negative affect (controls)**			**Experienced meaning (no controls)**			**Experienced meaning (controls)**		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Family income $25K to less than $50K	-0.17	0.03	8.36E-07	-0.07	0.03	9.52E-03	0.01	0.03	0.84	-0.03	0.03	0.36
Family income $50K to less than $75K	-0.24	0.03	2.53E-12	-0.12	0.03	1.84E-05	0.02	0.03	0.44	-0.02	0.03	0.63
Family income $75K to less than $100K	-0.25	0.04	2.41E-12	-0.10	0.03	7.43E-04	4.30E-03	0.04	0.90	-0.05	0.04	0.18
Family income 100K+	-0.28	0.03	1.40E-16	-0.13	0.03	1.97E-05	-0.07	0.03	0.02	-0.13	0.03	1.84E-04
Constant	0.25	0.03	1.96E-20	1.50	0.46	9.38E-04	0.06	0.02	0.02	-1.20	0.58	0.04
r2	0.01			0.3			0.001			0.07		
N	63402			63402			63402			63402		

Table 3.1: Results of ATUS regressions explaining variance in (Cantril ladder; experiences of happiness; experiences of negative affect – average of stressed, tired, sad and pain; and experiences of meaning) from family income. Without and with controls age; age squared; gender; marital status; self-rated general health; whether they took pain medicine / were well rested on the diary day; hypertension; minutes alone and in religious practices during diary day; whether household has a telephone; median housing cost by state (from ACS); children < 18 years in the household; state; education; unemployment; wave; no. people in household; race; typicality of days' feelings; population density; day of week of diary day). Clustered standard errors. Reference is family income less than $25K.

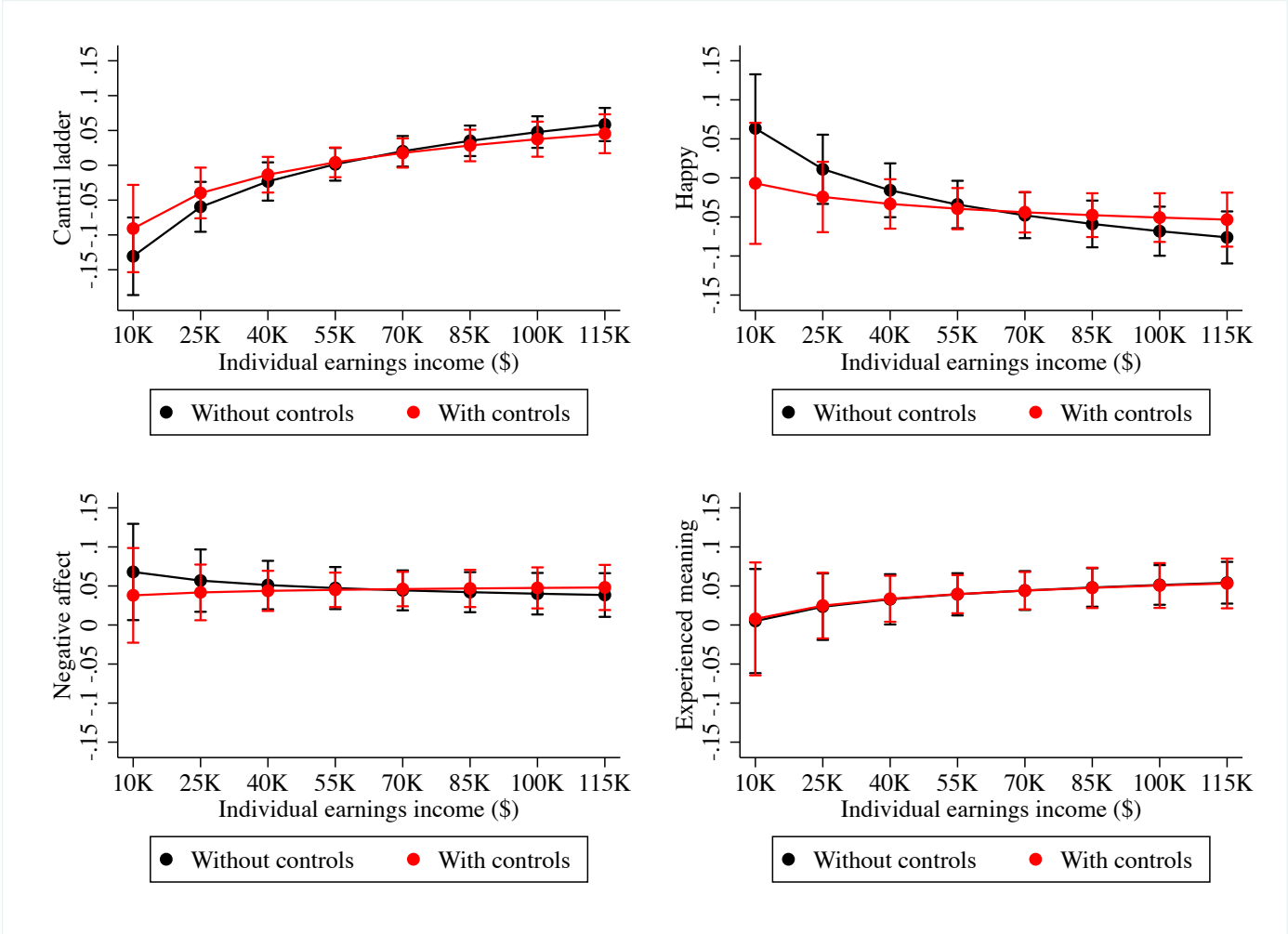

Figure 3.3: Predicted values of SWB in ATUS at selected values of earnings. Holding covariates at their sample mean, without and with controls. 95% confidence interval.

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Log earnings	0.08	0.01	1.15E-09	0.05	0.02	9.89E-04	-0.06	0.02	4.89E-04	-0.02	0.02	0.33
Constant	-0.84	0.14	4.36E-09	-1.3	0.26	3.65E-07	0.59	0.18	1.31E-03	-1.1	0.31	2.81E-04
r2	0.006			0.16			0.003			0.13		
N	34184			34184			34184			34184		
	Negative affect (no controls)			**Negative affect (controls)**			**Experienced meaning (no controls)**			**Experienced meaning (controls)**		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Log earnings	-0.01	0.01	0.39	0.003	0.02	0.85	0.02	0.02	0.19	0.02	0.02	0.36
Constant	0.18	0.16	0.26	1.2	0.26	7.41E-06	-0.18	0.17	0.30	-1.5	0.31	8.18E-07
r2	0.0001			0.26			0.0004			0.08		
N	34184			34184			34184			34184		

Table 3.2: Results of ATUS regressions explaining variance in SWB from log earnings. Without and with controls. Clustered standard errors.

Education

The relationship of education with SWB is shown in Figure 3.4 and Table 3.3. Education displayed a positive quadratic relationship with the Cantril ladder. A quadratic transformation was not tested, however, given the categorical nature of the education variable. Moving from the left of Figure 3.4, relative to those with less than a high school education, those with a high school diploma or equivalent had lower ladder scores (b=-0.10, se=0.03, p<0.01), as did those with some college but no degree (b=-0.16, se=0.03, p<0.001) and those with an Associate's degree (b=-0.12, se=0.04, p<0.01). Those with a Bachelor's degree had significantly lower ladder scores than those with less than a high school diploma in the controlled results only (b=-0.21, se=0.03, p<0.001).

Those with MSc/PhD-levels of education had higher ladder scores than those with less than a high school diploma (b=0.10, se=0.03, p<0.01); however, their scores were lower in the controlled results (b=-0.17, se=0.04, p<0.001). Recall that the variance inflation factor was never greater than four and so the sign switch is not likely due to multicollinearity. Now moving from the right to the left of Figure 3.4, those with A MSc/PhD level of education also had significantly lower ladder scores than every other level of education in the uncontrolled results (e.g. versus some college but no degree, b=-0.25, se=0.03, p<0.001); however, these relationships were not statistically significant in the controlled results.

Going back to the left of Figure 3.4, those with a high school diploma had higher ladder scores than those with some college but no degree (b=0.05, se=0.03, p<0.05) and those with an Associate's degree (in the controlled results only, b=0.09, se=0.03, p<0.01). Their scores were, however, lower than those with a Bachelor's degree (b=0.09, se=0.03, p<0.01) and those with MSc/PhD-levels of education (b=0.20, se=0.03, p<0.001) but only in the uncontrolled results. In the controlled results, they had higher scores than those with Bachelor's degrees (b=0.07, se=0.03, p<0.01) and were not significantly different to those with MSc/PhD levels of education (b=0.04, se=0.03, p>0.05).

In the middle of Figure 3.4, those with some college but no degree had scores that were no different to those with an Associate's degree (b=0.03, se=0.04, p>0.05). Their scores were

lower than those with a Bachelor's degree but only in the uncontrolled results (b=0.15, se=0.03, p<0.001), and, as mentioned, their scores were lower than those with MSc/PhD levels of education but only in the uncontrolled results (b=0.25, se=0.03, p<0.001). Those with an Associate's degree had lower scores than those with a Bachelor's degree (b=-0.12, se=0.03, p<0.01) and, again, those with MSc/PhD levels of education (b=-0.22, se=0.04, p<0.001), but only in the uncontrolled results. Education explained 0.6% of the variation in the Cantril ladder.

Increasing levels of educational qualifications were generally associated with less happiness. Going from the left to of Figure 3.4, relative to those with less than a high school diploma, those with a Bachelor's degree were less happy (b=-0.12, se=0.04, p<0.01), as were those with MSc/PhD levels of education (b=-0.13, se=0.04, p<0.01). There was no difference in happiness between those with a high school diploma and those with less than a high school diploma (b=-0.02, se=0.04, p>0.05), those with some college but no degree (b=-0.07, se=0.04, p>0.05) and those with an Associate's degree (b=0.01, se=0.04, p>0.05). Those with a high school diploma were, however, happier than both those with Bachelor's (b=-0.10, se=0.03, p<0.01) and MSc/PhD-level qualifications (b=-0.11, se=0.04, p<0.01). Those with some college but no degree were less happy than those with an Associate's degree (b=-0.08, se=0.04, p<0.05), although they did not differ in happiness to those with Bachelor's degrees (p>0.05) and they were happier than those with MSc/PhD levels of education but in the controlled results only (b=0.08, se=0.04, p<0.05). Those with an Associate's degree were also happier than those with Bachelor's (b=0.13, se=0.04, p<0.001) and MSc-PhD-level qualifications (b=0.14, se=0.04, p<0.001), but they did not differ in happiness from those with lower qualification levels (p>0.05) apart from being happier than those with some college but no degree (b=0.07, se=0.04, p<0.05). Those with Bachelor's and MSc/PhD-level qualifications did not differ in happiness to each other (b=-0.009, se=0.04, p>0.05).

Those with less than a high school diploma experienced more negative affect than those with higher educational qualifications (e.g. MSc/PhD levels, b=0.13, se=0.04, p<0.01) with a few exceptions. First, they did not significantly differ in negative affect to those with Associate's degrees in the uncontrolled results (b=0.08, se=0.04, p=0.07) but they did in the

controlled results (b=0.08, se=0.04, p<0.05). Second, they did not differ to those with Bachelor's degrees or higher in the controlled results (e.g. Bachelor's degree, b=0.05, se=0.03, p>0.05). Those with a high school diploma did not differ from the other educational groups except in the results with controls, where they experienced less negative affect than those with MSc/PhD-level education (b=-0.10, se=0.03, p<0.01). Those with some college but no degree did not differ from the other educational groups either, except relative to those with MSc/PhD-levels of education in the controlled results, who experienced more negative affect than those with some college but no degree (b=0.09, se=0.03, p<0.01). Similarly, those with an Associate's degree didn't differ from the other educational groups except in the controlled results, where those with MSc/PhD levels of education experienced more negative affect (b=0.08, se=0.03, p<0.01). Those with a Bachelor's degree did not differ in negative affect to those with MSc/PhD levels of education (b=0.006, se=0.03, p>0.05).

There was not a clear pattern in the relationship of education with experienced meaning. Relative to those with no diploma, those with a high school diploma experienced more meaning (b=0.13, se=0.04, p<0.001), as did those with an Associate's degree (b=0.16, se=0.04, p<0.001) and MSc/PhD-levels of education (b=0.08, se=0.04, p<0.05); however, these relationships were only significant in the uncontrolled results except for Associate's degrees, which retained significance but decreased in magnitude (b=0.08, se=0.04, p<0.05). Those with a high school diploma had higher meaning scores than those with some college but no degree (b=0.11, se=0.03, p<0.01); however, this difference was not significant in the results with controls. They did not differ to those with Associate's degrees and had higher meaning scores than those with Bachelor's degrees (b=0.10, se=0.03, p<0.001) and those with MSc/PhD education (but only in the controlled results, b=0.07, se=0.03, p<0.05).

Those with some college but no degree did not differ in meaning scores to those with higher levels of education except relative to those with Associate's degrees. In Figure 3.4, those with an Associate's degree appear to have the highest levels of experienced meaning, and the tests of statistical significance largely confirm this. In addition to their meaning scores being significantly higher relative to those without a high school diploma, they are also in significantly higher relative to those with some college but no degree (b=0.13,

se=0.04, $p<0.001$), those with a Bachelor's degree (b=0.13, se=0.04, $p<0.001$) and those with MSc/PhD levels of education (b=0.08, se=0.03, $p<0.05$). Yet those with an Associate's degree do not differ in experienced meaning from those with a high school diploma or equivalent (b=0.03, se=0.03, $p>0.05$). MSc/PhD graduates did not differ in experienced meaning to Bachelor's graduates (b=-0.05, se=0.03, $p>0.05$).

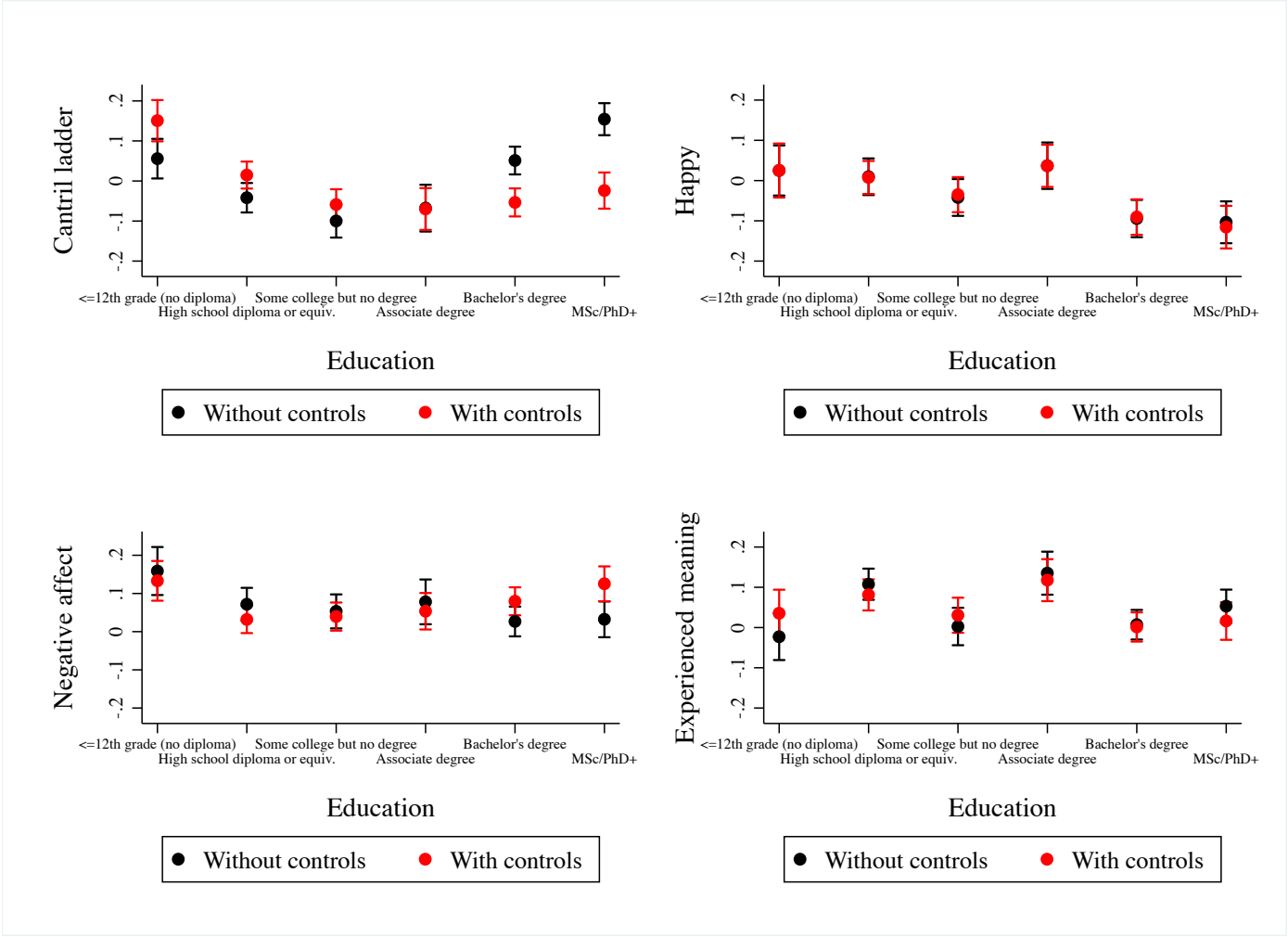

Figure 3.4: Predicted values of SWB in ATUS at each education group. Holding covariates at their sample mean, without controls and with controls. 95% confidence interval.

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
High school diploma or equiv.	-0.10	0.03	1.92E-03	-0.14	0.03	1.85E-05	-0.02	0.04	0.69	-0.01	0.04	0.77
Some college but no degree	-0.16	0.03	2.25E-06	-0.21	0.03	1.78E-10	-0.07	0.04	0.09	-0.05	0.04	0.18
Associate degree	-0.12	0.04	1.56E-03	-0.22	0.04	1.13E-08	0.01	0.04	0.79	0.02	0.05	0.66
Bachelor's degree	-4.60E-03	0.03	0.88	-0.21	0.03	1.15E-09	-0.12	0.04	2.55E-03	-0.11	0.04	0.01
MSc/PhD levels	0.10	0.03	2.35E-03	-0.17	0.04	3.11E-06	-0.13	0.04	1.89E-03	-0.14	0.05	3.03E-03
Constant	0.06	0.03	0.03	-0.95	0.50	0.06	0.03	0.03	0.43	-1.8	0.72	0.01
r2	0.006			0.2			0.003			0.12		
N	63402			63402			63402			63402		
	Negative affect (no controls)			**Negative affect (controls)**			**Experienced meaning (no controls)**			**Experienced meaning (controls)**		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
High school diploma or equiv.	-0.09	0.04	0.03	-0.1	0.03	1.35E-03	0.1	0.04	2.31E-04	0.05	0.04	0.17
Some college but no degree	-0.11	0.04	7.12E-03	-0.10	0.03	2.15E-03	0.03	0.04	0.50	-0.001	0.04	0.99
Associate degree	-0.08	0.04	0.07	-0.09	0.04	0.02	0.2	0.04	8.29E-05	0.09	0.04	0.04
Bachelor's degree	-0.13	0.04	4.62E-04	-0.06	0.03	0.10	0.03	0.04	0.39	-0.03	0.04	0.40
MSc/PhD levels	-0.13	0.04	1.55E-03	-0.01	0.04	0.81	0.1	0.04	3.58E-02	-0.02	0.04	0.63
Constant	0.16	0.03	7.39E-07	1.5	0.45	8.93E-04	-0.02	0.03	0.44	-1.20	0.58	0.04
r2	0.002			0.3			0.003			0.07		
N	63402			63402			63402			63402		

Table 3.3: Results of ATUS regressions explaining variance in SWB from education. Without and with controls. Clustered standard errors. Reference is less than a high school diploma.

Occupation

The relationship of occupation with SWB is shown in Figure 3.5 and Table 3.4. The employment status at ATUS was analysed rather than at the CPS.

The unemployed had the lowest evaluations of life on the Cantril ladder. Going from the left of Figure 3.4, they had lower scores than those not in the labour force (b=-0.40, se=0.05, $p<0.001$), as well as those in farming/construction/production (b=-0.30, se=0.05, $p<0.001$), service/sales/office (b=-0.34, se=0.05, $p<0.001$) and management/professional occupations (b=-0.45, se=0.05, $p<0.001$). Those not in the labour force had higher ladder scores than those employed in farming/construction/production (b=0.10, se=0.03, $p<0.01$) and in service/sales/office jobs (b=0.06, se=0.02, $p<0.05$) - though these differences were not significant in the controlled results ($p>0.05$). They had lower ladder scores than those in management/professional jobs but again only in the uncontrolled results (b=0.05, se=0.02, $p<0.05$). Those employed in farming/construction/production occupations did not differ to those employed in service/sales/office occupations (b=0.03, se=0.03, $p>0.05$); however, they had lower ladder scores than those employed in management/professional occupations (b=-0.14, se=0.03, $p<0.001$). Those in service/sales/office occupations had lower ladder scores than those in management/professional occupations but in the uncontrolled results only (b=-0.11, se=0.02, $p<0.001$).

The unemployed were not differently happy to any other labour force group except those employed in management/professional occupations, who were less happy than the unemployed (b=-0.10, se=0.04, $p<0.05$). Managers/professionals were also less happy than those not in the labour force but only in the uncontrolled results (b=-0.09, se=0.03, $p<0.01$), and they were also less happy than those employed in farming/construction/production (b=-0.07, se=0.03, $p<0.01$) and service/sales/office roles (b=-0.08, se=0.03, $p<0.05$, uncontrolled results only). Those not in the labour force, employed in farming/construction/production and in service/sales/office occupations did not differ in happiness from each other ($p>0.05$).

The unemployed did not differ from any other labour force group in terms of negative affect or experienced meaning. Those not in the labour force experienced more negative affect than those employed in farming/construction/production (b=0.07, se=0.04, p<0.05) and management/professional roles (b=0.10, se=0.03, p<0.001) but in the uncontrolled results only. They did not differ to those in service/sales/office roles (p>0.05). Those employed in farming/construction/production, service/sales/office and management/professional roles did not differ from each other or any further labour force group in negative affect (p>0.05). In terms of experienced meaning, those not in the labour force did not differ from other labour force groups (p>0.05). Those in farming/construction/production occupations experienced more meaning than those in service/sales/office jobs (b=0.07, se=0.04, p=0.05; uncontrolled results only and only marginally significant) but they did not differ to those in management/professional roles (p>0.05). Those in service/sales/office jobs did not differ in meaning scores to those in management/professional roles (b=0.03, se=0.03, p>0.05).

Supplementary unemployment analyses

Given that unemployment has a consistently large and negative effect on life evaluation, and that the unemployed usually did not differ in terms of experienced SWB to other employment groups in these analyses (apart from happiness relative to those employed in management and professional occupations), further analyses were conducted. There were 1,265 individuals who changed unemployment categories from the CPS to the ATUS interview. 521 moved out of unemployment, and 744 became unemployed. The results of SWB regressed on changes in employment status are shown in Table 3.5.

Relative to those who stayed unemployed, all other groups had better evaluations of life on the Cantril ladder - those who stayed not unemployed (b=0.63, se=0.07, p<0.001), those who became unemployed (b=0.35, se=0.09, p<0.001) and those who moved out of unemployment by becoming not unemployed (b=0.33, se=0.09, p<0.001). Relative to those who stayed not unemployed, all other groups had worse evaluations of life on the Cantril ladder - again, those who stayed unemployed (b=-0.63, se=0.07, p<0.001), as well as those who became unemployed (b=-0.20, se=0.06, p<0.001), and, interestingly, those who moved

out of unemployment by becoming not unemployed (b=-0.29, se=0.07, p<0.001). There were no differences in happiness, negative affect or experienced meaning across these groups (p>0.05).

Information on the duration of unemployment was available for people who were unemployed at the CPS interview. This information is about how long in weeks they had been unemployed at the CPS interview. We can, therefore, further compare those who remained unemployed from the CPS interview to the ATUS interview with those who moved out of unemployment when (1) controlling for the duration of unemployment and when (2) interacting the duration of unemployment with these two groups. Recall that relative to those who stayed unemployed, those who moved out of unemployment had better evaluations of life on the Cantril ladder (b=0.33, se=0.09, p<0.001) but did not differ in experiences of SWB (p>0.05). On the Cantril ladder, this relationship was still significant when controlling for the duration of unemployment alone (b=0.31, se=0.09, p<0.01) and when including duration of unemployment alongside the full controls (b=0.20, se=0.08, p<0.05). The interaction of duration of unemployment with change in unemployment was not significant without or with further controls (p>0.05). For experienced SWB, there was still no association with change in unemployment status when controlling for duration of unemployment, nor when interacting change in unemployment status with duration of unemployment, without or with further controls (p>0.05 in all instances).

We can also control for the activity that people were doing when they reported their experienced SWB. This did not substantively affect the results for happiness or negative affect. For experienced meaning, however, when controlling for the activity and including all other controls, those who became unemployed experienced slightly more meaning than those who remained not unemployed (b=0.10, se=0.04, p<0.05) – though the other comparisons were not statistically significant (p>0.05).

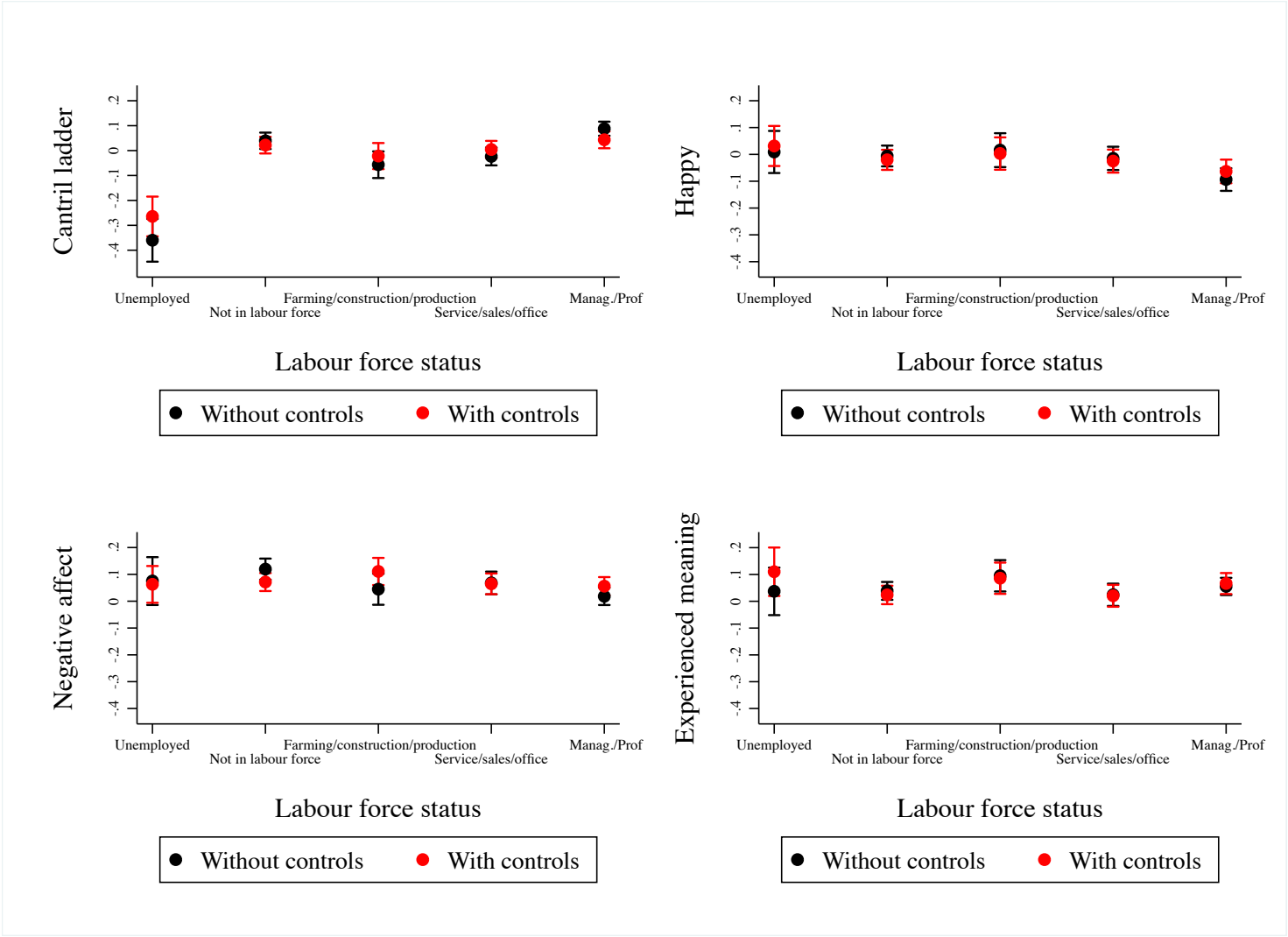

Figure 3.5: Predicted values of SWB in ATUS at each occupation group. Holding covariates at their sample mean, without controls and with controls. 95% confidence interval.

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Not in labour force	0.40	0.05	1.99E-17	0.29	0.04	1.22E-10	-0.02	0.05	0.74	-0.05	0.04	0.23
Farming/construction/production	0.30	0.05	4.39E-09	0.24	0.05	7.47E-07	0.01	0.05	0.89	-0.03	0.05	0.56
Service/sales/office	0.34	0.05	1.45E-12	0.27	0.05	2.13E-09	-0.02	0.05	0.60	-0.06	0.04	0.20
Manag./Prof	0.45	0.05	3.21E-22	0.31	0.05	7.81E-12	-0.10	0.05	0.02	-0.10	0.05	0.04
Constant	-0.36	0.04	2.29E-16	-0.95	0.5	6.02E-02	0.01	0.04	0.82	-1.8	0.7	0.01
r2	0.01			0.2			0.002			0.13		
N	63402			63402			63402			63402		
	Negative affect (no controls)			**Negative affect (controls**			**Experienced meaning (no controls)**			**Experienced meaning (controls)**		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
Not in labour force	0.04	0.05	0.37	0.01	0.04	0.83	0.00	0.05	0.97	-0.09	0.05	0.09
Farming/construction/production	-0.03	0.05	0.57	0.05	0.04	0.27	0.06	0.05	0.28	-0.02	0.06	0.66
Service/sales/office	-0.01	0.05	0.89	0.002	0.04	0.96	-0.01	0.05	0.80	-0.09	0.05	0.08
Manag./Prof	-0.06	0.05	0.24	-0.01	0.04	0.87	0.02	0.05	0.70	-0.04	0.05	0.39
Constant	0.08	0.05	0.10	1.50	0.45	9.33E-04	0.04	0.05	0.41	-1.20	0.59	0.04
r2	0.002			0.3			0.0005			0.07		
N	63402			63402			63402			63402		

Table 3.4: Results of ATUS regressions explaining variance in SWB from occupation. Without controls and with controls. Clustered standard errors. Reference is unemployed.

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
No change, not unemployed	0.63	0.07	2.54E-20	0.46	0.06	1.67E-14	0.01	0.07	0.93	-0.03	0.06	0.61
Became unemployed	0.35	0.09	5.45E-05	0.26	0.08	1.11E-03	0.06	0.09	0.47	0.03	0.08	0.68
Became not unemployed	0.33	0.09	2.70E-04	0.23	0.08	6.44E-03	-0.09	0.14	0.53	-0.11	0.12	0.33
Constant	-0.60	0.07	8.94E-19	-1.10	0.51	3.16E-02	-0.03	0.07	0.65	-1.80	0.72	0.01
r2	0.01			0.20			0.0004			0.13		
N	63402			63402			63402			63402		
	Negative affect (no controls)			**Negative affect (controls**			**Experienced meaning (no controls)**			**Experienced meaning (controls)**		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
No change, not unemployed	-0.06	0.09	0.46	-0.004	0.06	0.96	0.06	0.10	0.52	0.02	0.09	0.80
Became unemployed	-0.09	0.10	0.36	-0.03	0.07	0.72	0.08	0.11	0.46	0.15	0.10	0.16
Became not unemployed	-0.11	0.11	0.30	-0.08	0.09	0.37	0.04	0.12	0.77	0.03	0.13	0.80
Constant	0.13	0.09	0.11	1.50	0.46	1.12E-03	-0.01	0.10	0.88	-1.40	0.58	0.02
r2	0.0002			0.3			0.0001			0.07		
N	63402			63402			63402			63402		

Table 3.5: Results of ATUS regressions explaining variance in SWB from change in employment status from the CPS to ATUS interview. Without controls and with controls. Clustered standard errors. Reference is no change, unemployed.

3.3 ELSA results

The ELSA models are a continuation of the foregoing ATUS models as discussed in the set one analyses in section 2.4. To recap, four model variations were run: pooled, pooled plus controls, fixed effects and fixed effects plus controls. Any instances where the results differed across the model variations are noted. Again, in no model did the VIF exceed two for the variable of interest, suggesting that there is no harmful multicollinearity.

Income

The relationship of income with SWB is shown in Figure 3.6 and Table 3.6. There was a positive association of log income with SWB for every measure in the pooled cross-sections but never in the fixed effects models ($p>0.05$) – with one exception. This exception was for experienced affect last week, where there was a small positive association with fixed effects but no controls ($b=0.02$, $se=0.008$, $p<0.05$). But this was not robust to multiple imputation, as shown in Appendix B, Table 3.6_MI. The association of log real income with the first life satisfaction measure in the pooled model was $b=0.11$ ($se=0.01$, $p<0.001$), and this relationship was about 50% smaller in magnitude with controls ($b=0.05$, $se=0.008$, $p<0.001$). For the second life satisfaction measure, the pooled association was $b=0.13$ ($se=0.009$, $p<0.001$) decreasing by about 50% again to $b=0.05$ with controls ($se=0.008$, $p<0.001$). For life meaning this association was $b=0.10$ ($se=0.009$, $p<0.001$), which also decreased but by about 80% with controls ($b=0.02$, $se=0.007$). For experienced affect last week, the pooled association without controls was identical to the first life satisfaction measure ($b=0.11$, $se=0.009$, $p<0.001$), but it decreased by about 80% with controls ($b=0.23$, $se=0.008$, $p<0.01$). Log income explained 1% of the variance in agreement with satisfaction with life (the first measure), 1% of the variance in frequency of feeling satisfied with life (the second measure), 0.7% of the variance in life meaning and 1% of the variance in experienced affect last week.

Earnings

The relationship of earnings with SWB is shown in Figure 3.7 and Table 3.7. Similar to income, log real earnings was not associated with any SWB item with fixed effects with two exceptions: for life satisfaction (1) without controls the effect was marginally significant (b=0.002, se=0.001, p=0.05), and for life meaning without controls it was difficult to know because the result was not robust to multiple imputation (see Appendix B, Table 3.7_MI).[8] For the first life satisfaction measure, the pooled association was b=0.003 (se=0.001, p<0.001), which was also statistically significant and identical in magnitude with controls (p<0.01). For the second life satisfaction measure, the pooled association was b=0.006 (se=0.001, p<0.001) but this was not statistically significant with controls (p>0.05). For life meaning the pooled association was b=0.01 (se=0.001, p<0.001), which was significant but smaller in magnitude with controls (b=0.003, se=0.001, p<0.01). For experienced affect last week the pooled association was b=0.01 (se=0.001, p<0.001), which was also significant and similar in magnitude with controls (b=0.007, se=0.001, p<0.001). Log earnings explained 0.04% of the variance in agreement with satisfaction with life, 0.2% of the variance in frequency of feeling satisfied with life, 0.4% of the variance in life meaning and 0.5% of the variance in experienced affect last week.

[8] Linear, quadratic and other non-linear transformations for income and earnings were tested, as well as values without the CPI adjustment discussed on p. 88, but these were not significantly associated with SWB either in the fixed effects models.

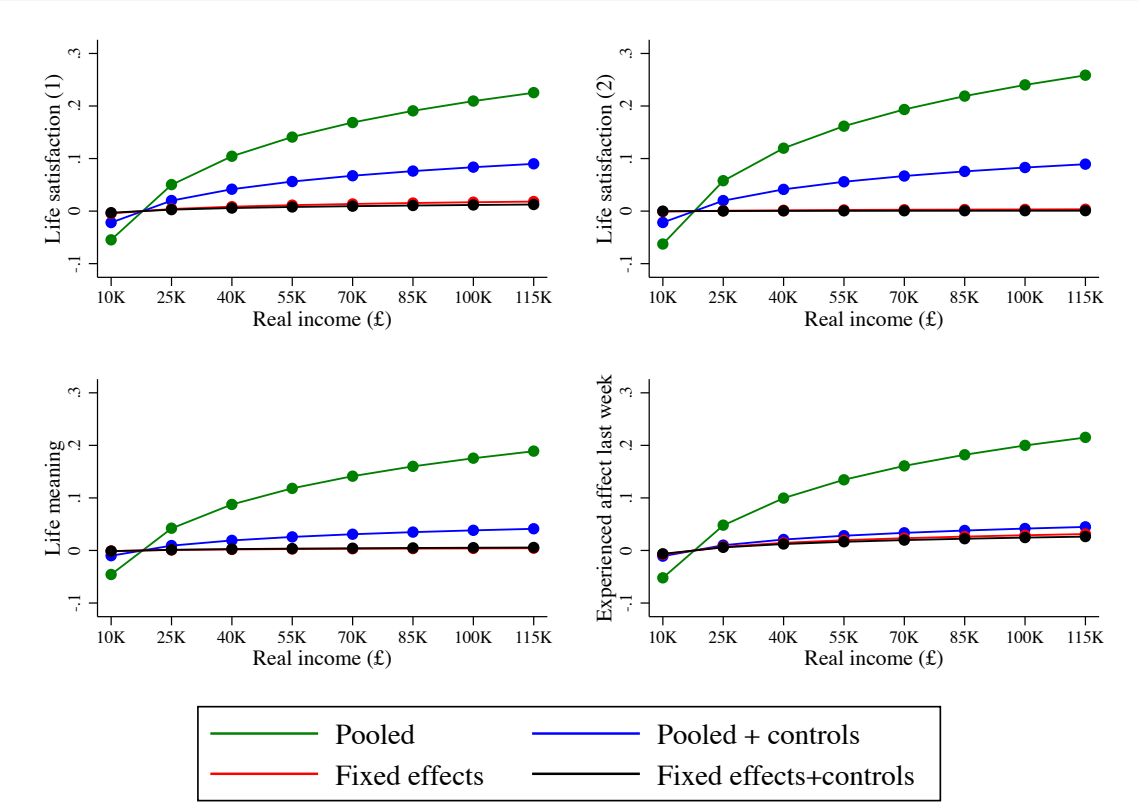

Figure 3.6: Predicted values of SWB (life satisfaction 1, life satisfaction 2, life meaning and experienced affect last week – subtracting the average of depressed, lonely and sad from happy in the 'last week') in ELSA at selected values of real income. Holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models (controls for age; age squared; gender; marital status; longstanding illness or disability; has any friends; religiously affiliated; index of multiple deprivation; no. of problems with accommodation; whether has any children; whether cared for anyone in the past month; local authority; earnings; education; occupation; wave; no. of people in household; wealth; race; urban/rural; member of political party / trade union / environmental group). Robust standard errors.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Log real income	0.11	0.01	8.96E-38	0.05	0.008	4.70E-09	0.009	0.007	0.16	0.006	0.007	0.33
Constant	-1.10	0.09	4.86E-37	-4.9	0.33	4.40E-50	-0.09	0.063	0.16	-6.8	0.92	1.04E-13
r2	0.01			0.12			0.0001			0.02		
N	32250			32250			32250			32250		
	Life satisfation (2)											
Log real income	0.13	0.009	2.24E-47	0.05	0.008	2.35E-09	0.002	0.007	0.80	0.0004	0.007	0.95
Constant	-1.3	0.089	1.94E-46	-2.5	0.32	2.80E-15	-0.02	0.069	0.80	-1.10	0.84	0.18
r2	0.01			0.12			3.70E-06			0.008		
N	32250			32250			32250			32250		
	Life meaning											
Log real income	0.10	0.008	9.89E-32	0.02	0.007	3.21E-03	0.002	0.008	0.78	0.003	0.008	0.72
Constant	-0.93	0.08	4.44E-31	-4.50	0.33	3.43E-41	-0.02	0.08	0.78	-3.1	1.00	2.96E-03
r2	0.007			0.081			4.70E-06			0.01		
N	32250			32250			32250			32250		
	Experienced affect last week											
Log real income	0.11	0.009	1.47E-34	0.02	0.008	2.69E-03	0.02	0.008	0.04*	0.01	0.008	0.09
Constant	-1.1	0.087	9.97E-34	-3.1	0.32	1.96E-21	-0.15	0.075	0.04	-1.8	0.99	0.07
r2	0.01			0.095			0.0002			0.011		
N	32250			32250			32250			32250		

Table 3.6: Results of ELSA regressions explaining variance in SWB (life satisfaction 1, life satisfaction 2, life meaning and experienced affect last week) from real income. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models (controls for age; age squared; gender; marital status; longstanding illness or disability; has any friends; religiously affiliated; index of multiple deprivation; no. of problems with accommodation; whether has any children; whether cared for anyone in the past month; local authority; earnings; education; occupation; wave; no. of people in household; wealth; race; urban/rural; member of political party / trade union / environmental group). Robust standard errors. *Not robust to multiple imputation.

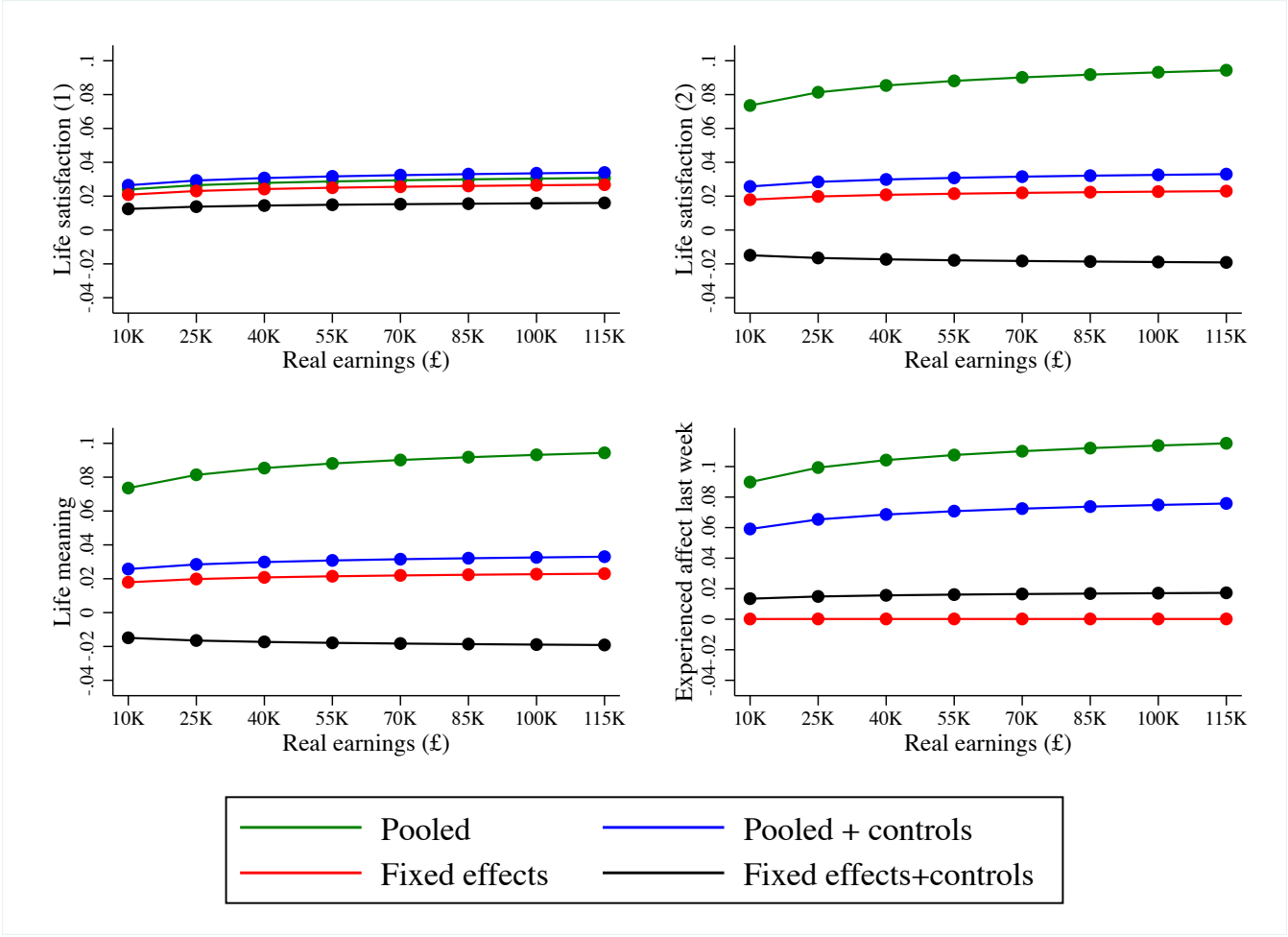

Figure 3.7: Predicted values of SWB in ELSA at selected values of real earnings holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Log real earnings	0.003	0.001	4.12E-04	0.003	0.001	2.57E-03	0.002	0.001	0.05	0.001	0.001	0.29
Constant	-0.002	0.01	0.77	-4.90	0.33	4.40E-50	-0.001	7.30E-04	0.05	-6.80	0.92	1.04E-13
r2		0.0004			0.12			0.0002			0.02	
N		32250			32250			32250			32250	
	Life satisfation (2)											
Log real earnings	0.006	0.001	6.12E-15	0.002	0.001	0.11	0.001	0.001	0.30	-6.40E-04	0.001	0.63
Constant	-0.004	0.006	0.53	-2.50	0.32	2.80E-15	-0.001	0.001	0.30	-1.10	0.84	0.18
r2		0.002			0.12			0.00005			0.008	
N		32250			32250			32250			32250	
	Life meaning											
Log real earnings	0.01	0.001	5.66E-28	0.003	0.001	0.003	0.002	0.001	0.09*	-0.002	0.001	0.21
Constant	-0.005	0.01	0.38	-4.50	0.33	3.43E-41	-0.001	0.001	0.10	-3.10	1.00	0.003
r2		0.004			0.08			0.0001			0.01	
N		32250			32250			32250			32250	
	Experienced affect last week											
Log real earnings	0.01	0.0008	1.05E-41	0.007	0.001	1.04E-11	1.50E-05	0.001	0.99	0.002	0.002	0.30
Constant	-0.01	0.006	0.28	-3.10	0.32	1.96E-21	-8.90E-06	8.00E-04	0.99	-1.80	0.99	0.07
r2		0.005			0.10			5.50E-09			0.01	
N		32250			32250			32250			32250	

Table 3.7: Results of ELSA regressions explaining variance in SWB from real earnings. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models. Robust standard errors. *Not robust to multiple imputation.

Wealth

The relationship of log wealth with SWB is shown in Figure 3.8 and Table 3.8. The only relationships that withstood multiple imputation and fixed effects with controls were with life satisfaction (1) (b=0.01, se=0.003, p<0.001) and life satisfaction (2) (b=0.01, se=0.003, p<0.001). The association of log wealth with the first life satisfaction measure was b=0.05 in the pooled model without controls (se=0.002, p<0.001), which decreased 60% to b=0.02 in the fixed effects model with controls (se=0.003, p<0.01). The fixed effects association without controls did not withstand multiple imputation (see Appendix B, Table 3.8_MI), and with fixed effects and controls the relationship was not significant (p>0.05). For the second life satisfaction measure, the pooled coefficient without controls was b=0.06 (se=0.002, p<0.001), which decreased in magnitude across models with controls and fixed effects but remained significant (p>0.05). For life meaning, the association was positive and significant across pooled and pooled plus controls models (b=0.04, se=0.002, p<0.001, and b=0.01, se=0.002, p=1.15E-14, respectively). The fixed effects models did not withstand multiple imputation. For experienced affect last week, only the pooled (b=0.04, se=0.002, p<0.001) and pooled with controls models (b=0.02, se=0.002, p<0.001) showed that wealth and SWB were significantly associated. The fixed effects models did not withstand multiple imputation. Wealth explained 3% of the variance in the first life satisfaction measure, 4% in the second life satisfaction measure, 2% in life meaning and 4% in experienced affect last week.

Because of the negative association of higher income groups with happiness and meaning in ATUS, supplementary ELSA analyses according to 'high' income, earnings and wealth are shown in Appendix B, Tables 3.7-3.9. There is no indication that people with high income, earnings or wealth have better experienced affect last week in the fixed effects analyses with controls. Any positive association disappears with fixed effects and controls, and there is one significant negative effect for high income and experienced affect last week with no fixed effects and controls (b=-0.05, se=0.03, p=0.03).

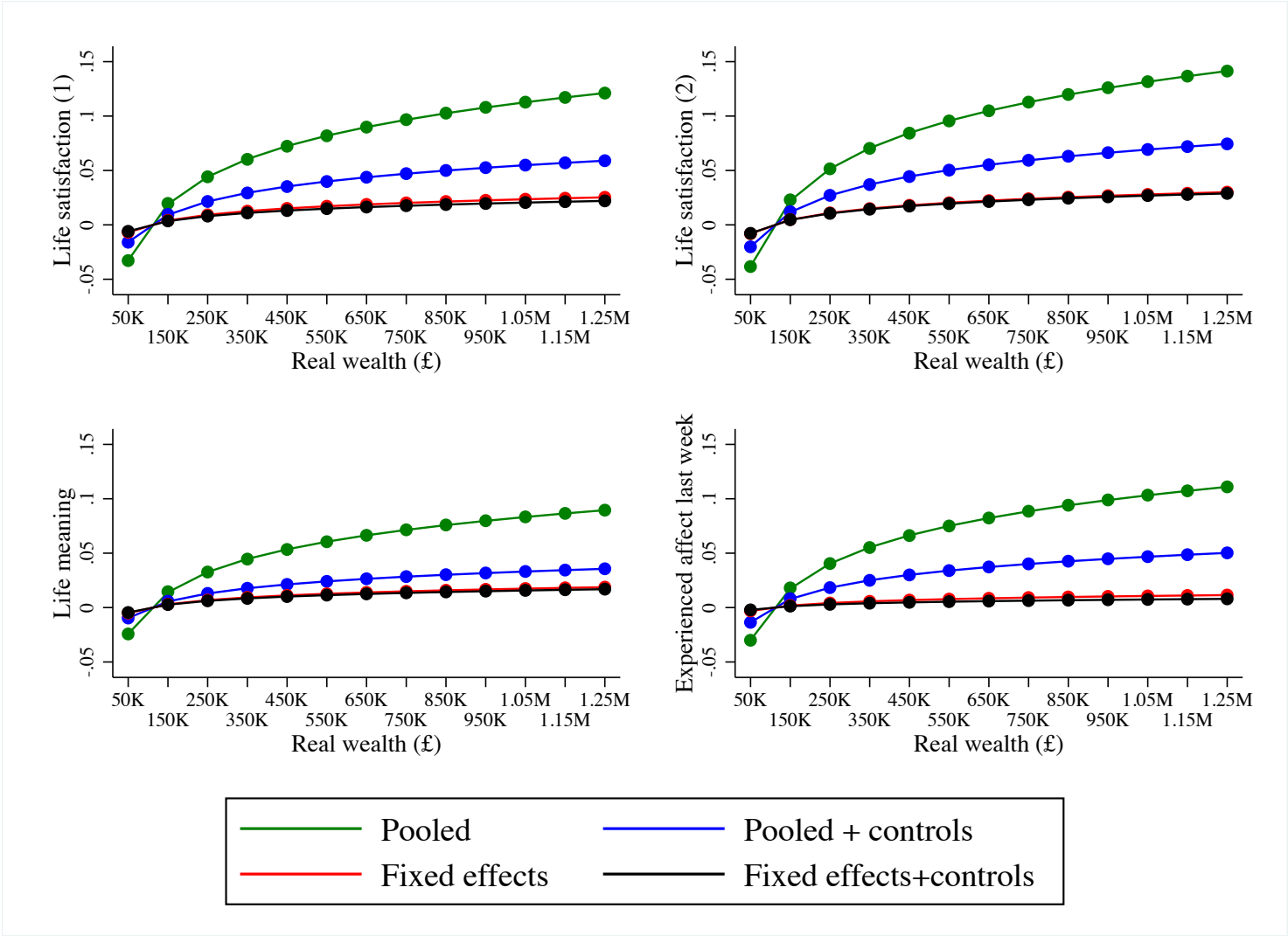

Figure 3.8: Predicted values of SWB in ELSA at selected values of real wealth. Holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	se	p	b	se	p	b	se	p	b	se	p
	Life satisfation (1)											
Log real wealth	0.05	0.002	4.10E-141	0.02	0.002	3.98E-33	0.01	0.003	0.002*	0.01	0.003	9.66E-03
Constant	-0.55	0.02	9.58E-123	-4.90	0.33	4.40E-50	-0.11	0.04	2.97E-03	-6.8	0.92	1.04E-13
r2	0.03			0.12			0.0006			0.02		
N	32250			32250			32250			32250		
	Life satisfation (2)											
Log real wealth	0.06	0.002	1.98E-210	0.03	0.002	8.83E-56	0.01	0.003	1.58E-04	0.01	0.003	2.70E-04
Constant	-0.64	0.02	8.09E-183	-2.50	0.32	2.80E-15	-0.14	0.04	1.58E-04	-1.10	0.84	0.18
r2	0.04			0.12			0.0009			0.008		
N	32250			32250			32250			32250		
	Life meaning											
Log real wealth	0.04	0.002	1.07E-91	0.01	0.002	1.15E-14	0.01	0.003	0.02*	0.01	0.003	0.04*
Constant	-0.41	0.02	3.01E-80	-4.50	0.33	3.43E-41	-0.09	0.04	0.02	-3.1	1.00	2.96E-03
r2	0.02			0.08			0.0003			0.01		
N	32250			32250			32250			32250		
	Experienced affect last week											
Log real wealth	0.04	0.002	3.64E-103	0.02	0.002	2.23E-21	0.005	0.004	0.24*	0.003	0.004	0.42*
Constant	-0.5	0.03	7.08E-89	-3.10	0.32	1.96E-21	-0.05	0.05	0.25	-1.80	0.99	0.07
r2	0.03			0.10			0.00010			0.01		
N	32250			32250			32250			32250		

Table 3.8: Results of ELSA regressions explaining variance in SWB from real wealth. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models. Robust standard errors.

Education

The relationship of education with SWB is shown in Figure 3.9 and Table 3.9. There were almost no statistically significant differences in SWB according to educational group in the fixed effects models without and with controls. One exception was those with degree level or higher qualifications, who reported less frequent feelings of satisfaction with the way that their lives turned out (the second life satisfaction measure) than those with no, foreign or other qualifications (b=0.11, se=0.04, $p<0.01$; with controls). The other exception was those with higher education but below a degree, who experienced less positive affect than those with NVQ2-equivalent qualifications (b=-0.12, se=0.06, $p<0.05$; with controls). In the pooled models, the results often differed substantively depending on whether or not controls were included, which is discussed in detail what follows. The main point, however, is that the results differed without and with controls.

In the pooled models, and considering the first life satisfaction measure, those with no, foreign or other qualifications had lower scores than those with NVQ4/NVQ5/Degree+ education (b=-0.13, se=0.02, $p<0.001$); however, there was no difference after introducing controls ($p>0.05$). They also had lower scores than those with higher education but no degree (b=-0.07, se=0.02, $p<0.001$) but after introducing controls they had higher scores (b=0.06, se=0.02, $p<0.01$). Those with no, foreign or other qualifications did not differ to any other educational group ($p>0.05$). Those with NVQ1-equivalent qualifications were only significantly different to the NVQ4/NVQ5/Degree+ group without controls, where they had lower scores (b=-0.10, se=0.03, $p<0.01$).

Those with NVQ2-equivalent qualifications only differed from the higher education (below degree) and NVQ4/NVQ5/Degree+ groups without controls, and their scores were lower (b=-0.08, se=0.02, $p<0.001$ and b=-0.14, se=0.02, $p<0.001$). With controls, however, these relationships became statistically insignificant ($p>0.05$). A similar pattern held for those with NVQ3-equivalent qualifications, who had lower scores without controls than those with higher education but no degree and those with NVQ4/NVQ5/Degree+ (b=-0.11, se=0.02, $p<0.001$ and b=-0.17 and se=0.02, $p<0.001$, respectively). In the pooled controlled results, the difference to those with higher education but no degree became insignificant

(p>0.05), and the difference with NVQ4/NVQ5/Degree+ remained significant (p<0.05). Those with higher education but below degree had lower scores than those with a degree, however, only in the pooled results without controls (b=-0.06, se=0.02, p<0.01).

Turning now to the pooled results for the second life satisfaction measure, every educational group had higher scores than those with no, foreign or other qualifications (e.g. higher education but below degree, b=0.15, se=0.02, p<0.001) but these relationships become statistically insignificant when introducing controls (p>0.05) or not robust to multiple imputation (see Appendix B, Table 3.9_MI). Those with NVQ1-equivalent qualifications had lower scores than those with higher education but below a degree and those with NVQ4/NVQ5/Degree+ education but only in the uncontrolled models (b=-0.09, se=0.03, p<0.01 and b=-0.15, se=0.03, p<0.001, respectively). The NVQ2-equivalent group had significantly lower scores than those with higher education but below degree and NVQ4/NVQ5/Degree+ in the uncontrolled model (b=0.09, se=0.02, p<0.001 and b=0.16, se=0.02, p<0.001, respectively) but only the difference to the NVQ4/NVQ5/Degree+ group held in the controlled model (b=-0.04, se=0.02, p<0.05). The NVQ3-equivalent group had lower scores in the uncontrolled results relative to those with higher education but below degree and NVQ4/NVQ5/Degree+ education (b=-0.10, se=0.02, p<0.001 and b=-0.17, se=0.02, p<0.001, respectively). Again, only the difference relative to the NVQ4/NVQ5/Degree+ group held in the controlled model (b=-0.05, se=0.02, p<0.01). Those with higher education but no degree had lower scores than the NVQ4/NVQ5/Degree+ group but only in the uncontrolled results (b=0.07, se=0.02, p<0.001).

In the life meaning pooled results, like those for the second life satisfaction measure, every educational group had higher scores than those with no, foreign or other qualifications (e.g. higher education below degree, b=0.20, se=0.02, p<0.001). Unlike the models for the second life satisfaction measure, however, these relationships held in statistical significance when introducing controls except for the NVQ1-equivalent group and the NVQ3-equivalent group (p>0.05), and the latter was not robust to multiple imputation. Those with NVQ1-equivalent qualifications had lower scores than those with NVQ2-equivalent qualifications (b=-0.06, se=0.03, p<=0.05), with higher education but no degree (b=0.14, se=0.03,

p<0.001) and NVQ4/NVQ5/Degree+ education (b=0.22, se=0.03, p<0.001) in the uncontrolled results, but only the difference relative to the NVQ4/NVQ5/Degree+ held in the controlled results (p<0.05). Those with NVQ2-equivalent qualifications had lower scores than the top two educational groups without and with controls (b=0.08, se=0.02, p<0.001 and b=0.16, se=0.02, p<0.001, respectively, without controls). Those with NVQ3-equivalent qualifications also had lower scores than the top two educational groups across both uncontrolled and controlled models (b=-0.09, se=0.02, p<0.001 and b=-0.17, se=0.02, p<0.001, respectively, without controls). The higher education but no degree group had higher life meaning scores than every group except the NVQ4/NVQ5/Degree+ group in the uncontrolled results, who lower higher scores (b=0.08, se=0.02, p<0.001). These relationships held in the controlled results except relative to the NVQ1 group (p>0.05).

Finally, for experienced affect last week, every education group experienced more positive affect than those with no, foreign or other qualifications in the uncontrolled results (e.g. higher education below degree, b=0.18, se=0.02, p<0.001) but only the differences relative to the NVQ1-equivalent group held in the controlled results (p<0.05). The NVQ1-equivalent group experienced more positive affect than the NVQ2-equivalent group in the uncontrolled results (b=0.06, se=0.03, p<0.05) but did not differ in the controlled results (p>0.05); instead, they had more positive affect than the NVQ4/NVQ5/Degree+ group in the controlled results (b=0.06, se=0.03, p<0.05). Those with NVQ2-equivalent qualifications experienced less positive affect than the top two educational groups in the uncontrolled results (b=0.07, se=0.02, p<0.001 and b=0.09, se=0.02, p<0.001, respectively) but only these differences did not hold in the controlled results (p>0.05). Those with NVQ3+ qualifications experienced less positive affect than those with the top two educational qualifications in the uncontrolled results (b=-0.05, se=0.02, p<0.05 and b=0.07, se=0.02, p<0.05, respectively); however, these differences were not statistically significant in the controlled results. There was no difference between the top two educational groups in either the controlled or uncontrolled results (b=0.02, se=0.02, p>0.05, uncontrolled).

Education explained 0.3% of the variation in the first life satisfaction measure, 0.7% of the variation in the second life satisfaction measure, 1% of the variation in life meaning and 0.6% of the variation in experienced affect last week.

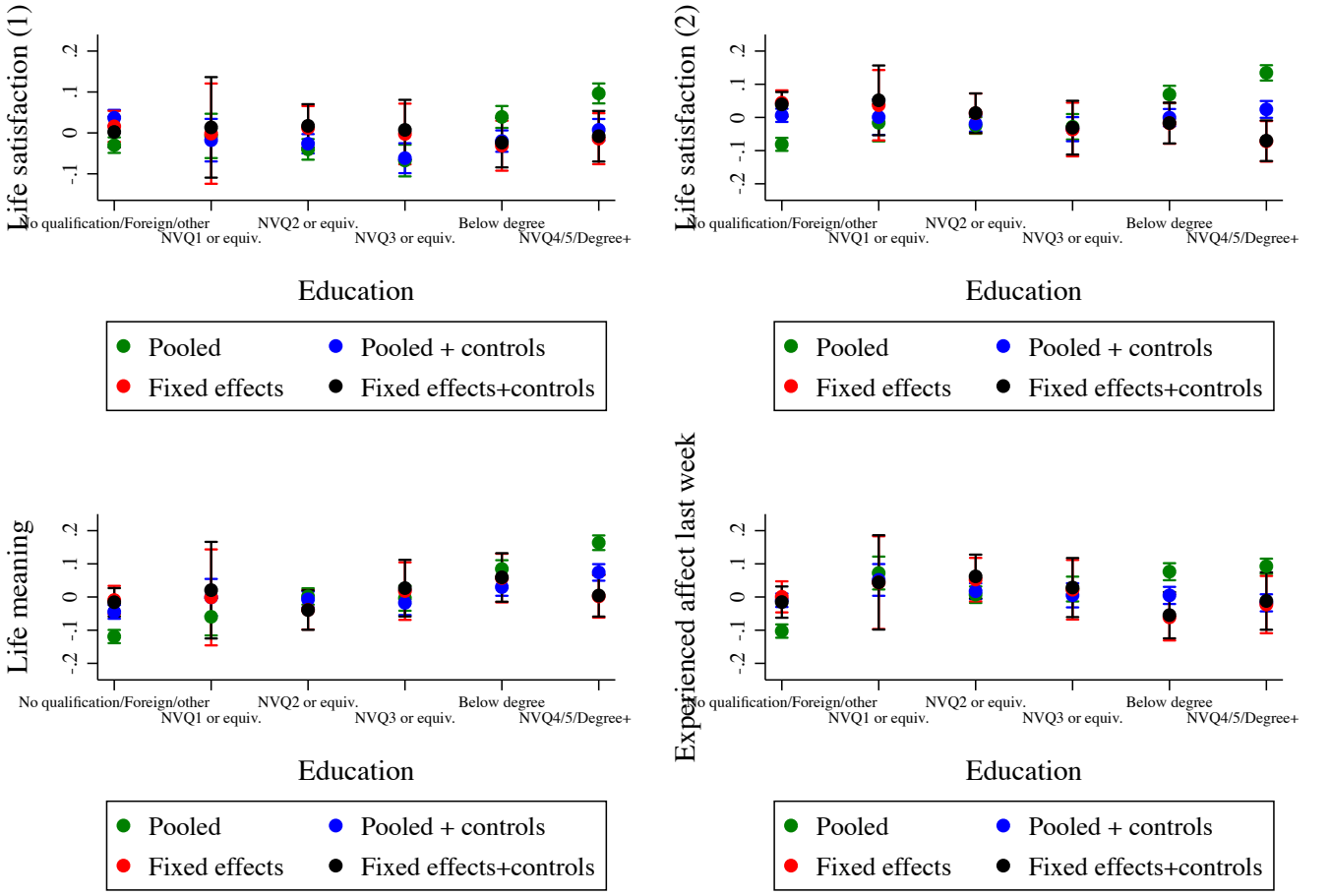

Figure 3.9: Predicted values of SWB in ELSA at each education group holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	se	p	b	se	p	b	se	p	b	se	p
	Life satisfation (1)											
NVQ1/CSE	0.02	0.03	0.44	-0.06	0.03	0.051*	-0.02	0.07	0.79	0.01	0.07	0.86
NVQ2/GCE O Lev	-0.01	0.02	0.52	-0.06	0.02	5.44E-05	0.00	0.04	0.92	0.02	0.04	0.70
NVQ3/GCE A Lev	-0.04	0.02	0.09	-0.10	0.02	5.15E-06	-0.02	0.05	0.69	0.01	0.05	0.91
Higher ed (below deg)	0.07	0.02	3.87E-05	-0.06	0.02	1.11E-03	-0.05	0.04	0.26	-0.03	0.04	0.54
NVQ4/NVQ5/Degree+	0.13	0.02	1.05E-15	-0.03	0.02	0.11	-0.03	0.04	0.48	-0.01	0.04	0.81
Constant	-0.03	0.01	2.03E-03	-4.80	0.33	1.44E-48	0.02	0.02	0.41	-6.80	0.92	9.93E-14
r2	0.003			0.12			0.00007			0.02		
N	32250			32250			32250			32250		
	Life satisfation (2)											
NVQ1/CSE	0.07	0.03	0.03	-0.01	0.03	0.86	-0.01	0.06	0.90	0.01	0.06	0.83
NVQ2/GCE O Lev	0.06	0.02	4.27E-04	-0.03	0.02	0.11	-0.03	0.04	0.44	-0.03	0.04	0.52
NVQ3/GCE A Lev	0.05	0.02	0.02	-0.04	0.02	5.30E-02	-0.08	0.05	0.10	-0.07	0.05	0.15
Higher ed (below deg)	0.15	0.02	3.39E-19	-0.01	0.02	0.69	-0.06	0.04	0.14	-0.06	0.04	0.19
NVQ4/NVQ5/Degree+	0.22	0.02	2.85E-44	0.02	0.02	0.31*	-0.12	0.04	5.17E-03	-0.11	0.04	8.38E-03
Constant	-0.08	0.01	4.11E-16	-2.5	0.3	8.32E-15	0.04	0.02	0.02	-1.20	0.84	0.17
r2	0.007			0.12			0.0004			0.008		
N	32250			32250			32250			32250		
	Life meaning											
NVQ1/CSE	0.06	0.03	0.05	0.04	0.03	0.15	0.01	0.08	0.92	0.04	0.08	0.64
NVQ2/GCE O Lev	0.12	0.02	7.88E-14	0.04	0.02	0.02	-0.03	0.04	0.49	-0.02	0.04	0.58
NVQ3/GCE A Lev	0.12	0.02	1.11E-07	0.03	0.02	0.21*	0.03	0.06	0.62	0.04	0.06	0.43
Higher ed (below deg)	0.20	0.02	1.32E-33	0.08	0.02	3.03E-05	0.07	0.05	0.19	0.08	0.05	0.13
NVQ4/NVQ5/Degree+	0.28	0.02	2.27E-77	0.12	0.02	5.36E-11	0.01	0.05	0.81	0.02	0.05	0.65
Constant	-0.12	0.01	1.36E-31	-4.40	0.33	9.09E-41	-0.01	0.02	0.67	-3.10	1.00	3.04E-03
r2	0.01			0.08			0.0002			0.01		
N	32250			32250			32250			32250		
	Experienced affect last week											
NVQ1/CSE	0.17	0.03	1.41E-10	0.06	0.03	0.02	0.04	0.08	0.57	0.06	0.08	0.43
NVQ2/GCE O Lev	0.11	0.02	1.96E-11	0.03	0.02	0.09	0.05	0.05	0.26	0.08	0.05	0.09
NVQ3/GCE A Lev	0.13	0.02	4.94E-09	0.02	0.02	0.49	0.02	0.06	0.71	0.04	0.06	0.44
Higher ed (below deg)	0.18	0.02	6.43E-27	0.02	0.02	0.40	-0.06	0.05	0.20	-0.04	0.05	0.42
NVQ4/NVQ5/Degree+	0.20	0.02	4.52E-36	-0.01	0.02	0.67	-0.02	0.06	0.69	0.003	0.06	0.96
Constant	-0.1	0.01	1.55E-23	-3.10	0.32	8.29E-22	5E-04	0.02	0.98	-1.80	0.99	0.06
r2	0.006			0.10			0.0002			0.01		
N	32250			32250			32250			32250		

Table 3.9: Results of ELSA regressions explaining variance in SWB from education. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models. Robust standard errors. Reference is no qualifications/foreign/other qualifications. *Not robust to multiple imputation.

Occupational class

In ELSA, occupational class was defined for some respondents who were currently unemployed because occupational class information was carried over from prior waves in some instances. Thus, analyses for occupational class and unemployment status were conducted separately. These variables thus reflect the occupational class of the respondent if they were to be employed. The results for occupational class are shown in Figure 3.10 and Table 3.10.

In the fixed effects analyses, only occupational class differed according to SWB on the life satisfaction measures. For the first life satisfaction measure, the only statistically significant differences were relative to those in semi-routine and routine occupations, who had lower SWB than all occupational groups except for those in intermediate occupations (e.g. higher managerial, b=-0.14, se=0.04, $p<0.001$), and relative those in intermediate occupations, who had lower SWB than those in higher managerial roles (b=0.09, se=0.05, $p<0.05$). Without controls, those in semi-routine and routine occupations only had lower scores than small workers and own account workers (b=-0.12, se=0.05, $p<0.05$) and those in higher managerial roles (b=-0.14, se=0.04, $p<0.01$), and those in the higher managerial group only had higher scores than those in intermediate (b=0.09, se=0.04, $p<0.05$) and semi-routine and routine occupations (b=0.14, se=0.04, $p<0.01$). But these results did not withstand multiple imputation (see Appendix B, Table 3.10_MI).

On the second life satisfaction measure, the only statistically significant differences in the fixed effects models (without controls) were relative to those in lower supervisory and technical occupations, who had lower SWB scores than small workers and own account workers (b=-0.12, se=0.06, $p<0.05$), those in intermediate occupations (b=-0.12, se=0.06, $p=0.05$) and those in higher managerial, administrative and professional occupations (b=-0.10, se=0.05, $p<0.05$). These differences were also statistically significant and similar in magnitude with controls in the fixed effects models.

Looking at the pooled models without controls for the first life satisfaction measure, all groups had higher life satisfaction scores than those in semi-routine and routine occupations

except for those in lower supervisory and technical occupations (b=0.04, se=0.02, p=0.07, not robust to multiple imputation; e.g intermediate occupations, b=0.06, se=0.02, p<0.001). With controls these differences were not significant except that those in higher managerial, administrative and professional occupations still had higher scores than those in semi-routine and routine occupations but the differences was smaller (b=0.04, se=0.02, p<0.01). Those in lower supervisory and technical occupations had lower scores than small workers and own account workers (b=-0.08, se=0.02, p<0.01) and those in higher managerial, administrative and professional occupations (b=0.12, se=0.02, p<0.001), but the difference to those in higher managerial positions only retained significance with controls (b=0.04, se=0.02, p<0.01). Small workers and own account workers had higher scores than those in intermediate occupations (b=0.05, se=0.02, p<0.01) but lower than those in managerial roles (b=-0.04, se=0.02, p<0.05), though only the difference relative to those in intermediate occupations was significant with controls (b=0.05, se=0.02, p<0.01). Those in intermediate occupations had lower scores than those in higher managerial roles both without and with controls (b=0.10, se=0.02, p<0.001, without controls).

For the pooled models and the second life satisfaction measure, all groups again had higher life satisfaction scores than those in semi-routine and routine occupations except for those in lower supervisory and technical occupations (b=0.04, se=0.02, p=0.09, not robust to multiple imputation; e.g intermediate occupations, b=0.14, se=0.02, p<0.001). With controls these differences were again not significant except that those in higher managerial, administrative and professional occupations still had higher scores than those in semi-routine and routine occupations but again the difference was smaller (b=0.07, se=0.02, p<0.001). Those in lower supervisory and technical occupations again had lower scores than small workers and own account workers (b=-0.11, se=0.02, p<0.01) and those in higher managerial, administrative and professional occupations (b=0.20, se=0.02, p<0.001), but they also had lower scores relative to small account workers (b=-0.12, se=0.02, p<0.001). Again, only the difference to those in higher managerial positions retained significance with controls (b=-0.09, se=0.02, p<0.001). Unlike the first life satisfaction measure, small workers and own account workers did not have higher scores than those in intermediate occupations (b=0.02, se=0.02, p>0.05) but they did again have lower scores than those in managerial roles without and with controls (b=-0.08, se=0.02, p<0.001,

without controls). Those in intermediate occupations again had lower scores than those in higher managerial roles both without and with controls (b=0.10, se=0.02, p<0.001, without controls).

For the pooled life meaning models, the pattern was similar to the life satisfaction models in that those in semi-routine and routine occupations had lower scores than all occupation groups except for those in lower supervisory and technical occupations and these differences retained significance in the models with controls for small workers and own account workers (b=-0.06, se=0.02, p<0.01) and those in higher managerial, administrative and professional occupations (b=0.09, se=0.02, p<0.001). Those in lower supervisory and technical occupations again fared worse than all other occupation groups without controls but only worse than those in higher managerial, administrator and professional roles with controls (b=0.06, se=0.02, p<0.001). Small workers and own account workers had lower scores than those in higher managerial, administrative and professional occupations without and with controls (b=0.09, se=0.02, p<0.001 without controls) but their scores were no different to immediate workers (p<0.05). Intermediate workers again had lower scores than higher managerial, professional and own account workers without and with controls (b=-0.11, se=0.02, p<0.001 without controls). Again, there were not significant differences in the fixed effects models (p>0.05).

In the pooled models explaining variance in experienced affect last week, all workers had significantly better affect than those in semi-routine, routine and routine occupations, and both without and with controls (e.g. intermediate occupations, b=0.06, se=0.02, p<0.001, without controls; relative to lower supervisory with controls not robust to multiple imputation). The coefficients were again generally smaller without controls. Similar to the evaluative measures, those in lower supervisory and technical occupations experienced less positive affect than those in higher managerial occupations (b=-0.08, se=0.02, p<0.001), and also relative to small workers and own account workers (b=0.05, se=0.02, p<0.01) but none of these relationships retained statistical significance in the controlled model (p>0.05). Small workers and own account workers had better positive affect than those in intermediate occupations (b=0.06, se=0.02, p<0.01) but did not differ to those in higher managerial, administrative and professional occupations (b=0.02, se=0.02, p>0.05) nor to

these groups with controls (p>0.05). Those in intermediate occupations again had lower scores than those in higher managerial, administrative and professional occupations without (b=0.08, se=0.02, p<0.01) and with controls (b=0.04, se=0.02, p<0.05). Again, there were not significant differences in the fixed effects models (p>0.05).

Unemployment status

For unemployment status, the results are shown in Figure 3.11 and Table 3.11. There were 233 people in ELSA who reported being unemployed during at least one wave, and 266 observations across waves where an individual reported being unemployed. Thus, there was little variation in unemployment across waves, yet unemployment was still negatively associated with life satisfaction in all models including the fixed effects models. For the first life satisfaction measure, the unemployed had scores 0.61 units lower than those who were not unemployed in the pooled models without controls (se=0.08, p<0.001), which reduced by about 50% with controls (b=-0.31, se=0.07, p<0.001), reduced further nearly by around 60% with fixed effects (b=-0.18, se=0.06, p<0.01), and remained similar in magnitude after introducing controls to the fixed effects (b=-0.17, se=0.06, p<0.01). For the second life evaluation measure, the unemployed had scores that were 0.47 lower than those who were not unemployed (se=0.07, p<0.001), which reduced by about a third to 0.16 with controls (se=0.07, p<0.05) and remained similar in size across the models with fixed effects both without (b=-0.13, se=0.05, p<0.05) and with controls (b=-0.14, se=0.05, p<0.05). For life meaning, the unemployed had 0.31 lower scores than those who were not unemployed (se=0.07, p<0.001), and with controls this reduced in magnitude by about 40% to 0.13, (se=0.06, p<0.05). There was no significant difference between the unemployed and others in the fixed effects models for life meaning (p>0.05). For experienced affect last week, the unemployed had significantly lower scores in the pooled model without controls only (b=-0.29, se=0.08, p<0.001). All of these results were robust to the multiple imputation, as shown in Appendix B, Table 3.11_MI.

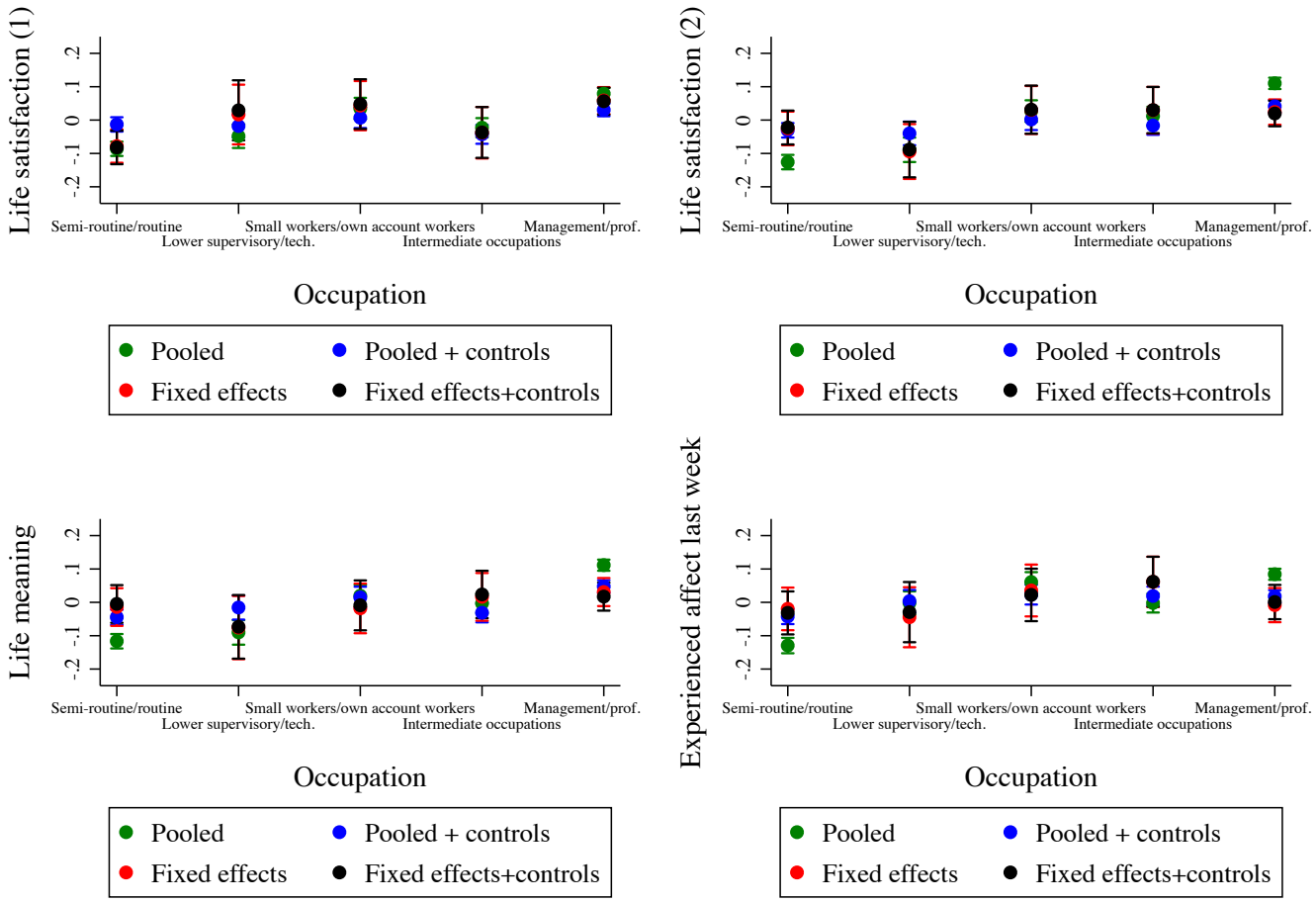

Figure 3.10: Predicted values of SWB in ELSA at each occupation group holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	se	p	b	se	p	b	se	p	b	se	p
	Life satisfation (1)											
Lower supervisory and technical occupations	0.04	0.02	0.07*	-0.005	0.02	0.81	0.90	0.05	0.06	0.11	0.05	0.03*
Small workers and own account workers	0.12	0.02	7.96E-10	0.02	0.02	0.31	0.12	0.05	0.02*	0.13	0.05	0.009*
Intermediate occupations	0.06	0.02	5.59E-04	-0.03	0.02	0.10	0.04	0.05	0.45	0.05	0.05	0.40
Higher manag., admin., and prof. occupations	0.17	0.01	9.43E-32	0.04	0.02	6.56E-03	0.14	0.04	0.0009*	0.14	0.04	0.0009*
Constant	-0.09	0.01	4.26E-15	-4.80	0.33	1.04E-49	-0.078	0.03	2.18E-03	-6.8	0.92	9.23E-14
r2	0.005			.12			0.001			0.02		
N	32250			32250			32250			32250		
	Life satisfation (2)											
Lower supervisory and technical occupations	0.04	0.02	0.09*	-0.009	0.02	0.66	-0.07	0.05	0.17	-0.07	0.05	0.20
Small workers and own account workers	0.15	0.02	1.59E-14	0.03	0.02	0.10	0.06	0.05	0.28	0.05	0.05	0.30
Intermediate occupations	0.14	0.02	3.16E-14	0.01	0.02	0.42	0.06	0.05	0.27	0.05	0.05	0.29
Higher manag., admin., and prof. occupations	0.24	0.01	2.28E-63	0.07	0.02	6.95E-06	0.05	0.04	0.22	0.04	0.04	0.30
Constant	-0.13	0.01	3.73E-30	-2.5	0.32	6.42E-15	-0.025	0.03	0.33	-1.1	0.84	0.19
r2	0.01			0.12			0.0003			0.008		
N	32250			32250			32250			32250		
	Life meaning											
Lower supervisory and technical occupations	0.03	0.02	0.23	0.03	0.02	0.18	-0.06	0.06	0.30	-0.07	0.06	0.25
Small workers and own account workers	0.14	0.02	9.45E-12	0.06	0.02	3.42E-03	-0.004	0.05	0.94	-0.004	0.05	0.94
Intermediate occupations	0.11	0.02	6.87E-10	0.01	0.02	0.47	0.03	0.05	0.56	0.03	0.05	0.58
Higher manag., admin., and prof. occupations	0.23	0.01	9.82E-60	0.09	0.02	1.21E-08	0.05	0.05	0.33	0.02	0.05	0.63
Constant	-0.12	0.01	5.15E-26	-4.5	0.33	4.55E-41	-0.014	0.03	0.62	-3.0	1.00	3.39E-03
r2	0.0092			0.08			.00017			0.01		
N	32250			32250			32250			32250		
	Experienced affect last week											
Lower supervisory and technical occupations	0.13	0.02	1.78E-09	0.05	0.02	0.02*	-0.03	0.06	0.67	0.00	0.06	0.97
Small workers and own account workers	0.19	0.02	4.73E-23	0.07	0.02	6.52E-04	0.06	0.06	0.33	0.05	0.06	0.35
Intermediate occupations	0.13	0.02	7.81E-12	0.06	0.02	8.39E-04	0.08	0.06	0.15	0.09	0.06	0.09
Higher manag., admin., and prof. occupations	0.21	0.01	3.81E-49	0.06	0.02	1.89E-04	0.01	0.05	0.84	0.03	0.06	0.55
Constant	-0.13	0.01	2.88E-28	-3.10	0.32	9.15E-22	-0.02	0.03	0.55	-1.80	0.99	0.07
r2	0.01			.095			0.0002			.011		
N	32250			32250			32250			32250		

Table 3.10: Results of ELSA regressions explaining variance in SWB from occupational class. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models. Robust standard errors. Reference is semi-routine and routine occupations. *Not robust to multiple imputation.

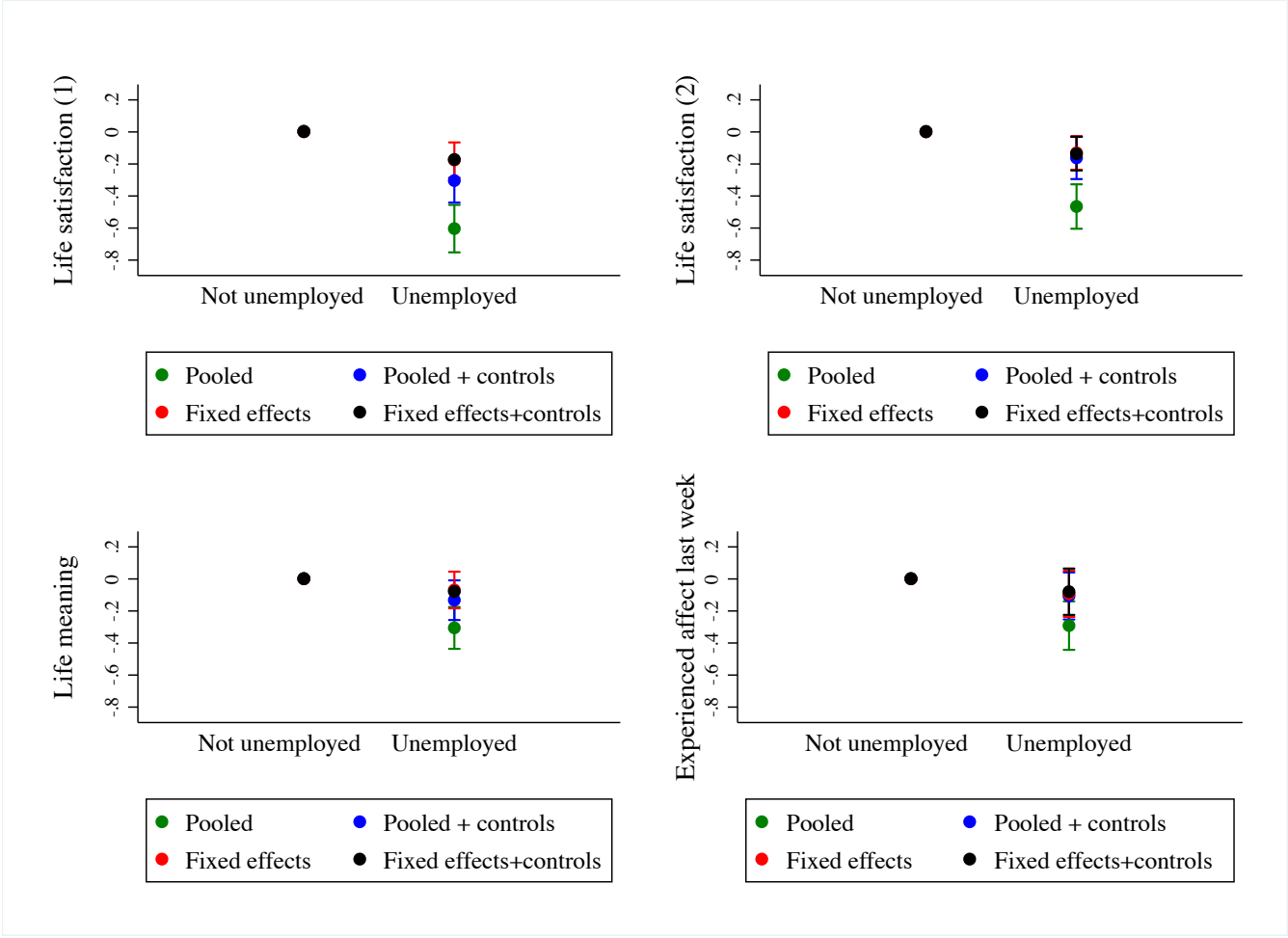

Figure 3.11: Predicted values of SWB in ELSA for those who are not unemployed and those who are unemployed holding covariates at their sample mean across pooled, pooled plus controls, fixed effects and fixed effects plus controls models.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Unemployed	-0.61	0.08	1.04E-15	-0.31	0.07	1.34E-05	-0.18	0.06	1.77E-03	-0.17	0.06	2.25E-03
Constant	0.005	0.006	0.37	-4.90	0.33	4.40E-50	0.002	0.0005	1.78E-03	-6.80	0.92	1.04E-13
r2	0.003			0.12			0.0005			0.02		
N	32250			32250			32250			32250		
	Life satisfation (2)											
Unemployed	-0.47	0.07	3.84E-11	-0.16	0.07	0.02	-0.13	0.05	0.01	-0.14	0.05	0.01
Constant	0.004	0.01	0.49	-2.50	0.32	2.80E-15	0.001	0.0005	0.01	-1.10	0.84	0.18
r2	0.002			0.12			0.0003			0.008		
N	32250			32250			32250			32250		
	Life meaning											
Unemployed	-0.31	0.07	4.08E-06	-0.13	0.06	0.04	-0.07	0.06	0.24	-0.08	0.06	0.19
Constant	0.003	0.01	0.65	-4.50	0.33	3.43E-41	0.0006	0.0005	0.24	-3.10	1.00	2.96E-03
r2	0.0008			0.08			0.00007			0.01		
N	32250			32250			32250			32250		
	Experienced affect last week											
Unemployed	-0.29	0.08	1.49E-04	-0.11	0.08	0.16	-0.09	0.07	0.21	-0.08	0.07	0.28
Constant	0.002	0.01	0.66	-3.10	0.32	1.96E-21	0.0008	0.00061	0.21	-1.80	0.99	0.07
r2	0.0007			0.10			0.0001			0.01		
N	32250			32250			32250			32250		

Table 3.11: Results of ELSA regressions explaining variance in SWB from unemployment. Across pooled, pooled plus controls, fixed effects and fixed effects plus controls models. Robust standard errors. Reference is not unemployed.

3.4 Discussion

The analyses in this chapter explored the relationship of absolute income, wealth, education and unemployment with the various dimensions of SWB. They largely suggest that higher socio-economic status is not linked to higher SWB. There are exceptions – for life evaluation and negative affect in the cross-section of ATUS, higher household and earnings income are associated with higher SWB, and the unemployed certainly evaluate their lives worse than other employment groups. Those with higher wealth, and those in higher managerial, administrative and professional occupations also reported better evaluations than those in roles of a lower occupational class in ELSA; however, these differences were smaller or non-existent in the experiential SWB models. For most other measures of socio-economic status and other dimensions of SWB, there is largely no relationship between socio-economic status and SWB, and there is even some evidence that people with higher socio-economic status are worse off.

The results from ATUS showing that income is more closely associated with negative affect than happiness confirm the findings from Kushlev, Dunn and Lucas (2015) and Stone, Schneider, Krueger, Schwartz & Deaton (2016), who also used ATUS. Their analytic methods, however, concealed some of the more nuanced relationships revealed in this research. Although the authors used the same categorical income variable, they treated it as continuous. By treating household income as a categorical variable in these analyses, it became apparent that although there is no relationship between income and SWB among most categories of income, those earning $100K+ are less happy and they experience less meaning than some lower income groups (even with controls). When restricting the sample to employed workers and using the logged earnings income variable in ATUS, higher earnings are associated with a bit less happiness (though only without controls), and are not associated with any other experiential SWB measures without or with controls. In ELSA, there was no relationship of benefit-unit level household income or solely earnings income with any measure of SWB after introducing fixed effects.

The finding from ELSA that income is not associated with any measure of SWB after introducing fixed effects is unusual in the literature but not completely absent (Peasgood

2007). On the one hand, this result and the ATUS results for income support the idea that the trade-offs people make to achieve high status do not translate into SWB payoffs, including identity for the socially mobile (Akerlof and Kranton 2010), leisure time (Hamermesh and Lee 2007) and values (Stephens et al. 2011). It could also be that as people increase their socio-economic attainment, their reference standards change, and so their SWB is not or negatively affected by higher attainment. But there are limitations to what these data can show. It may be that people with higher incomes started off with lower happiness levels in the first place, and thus self-selected into certain income groups. In this case, income would not be a causal agent in their wellbeing. Regardless, these data do highlight that the measure matters. A key contribution of this thesis was to assess experiences of purpose, and without doing so, we would not see that high incomes can be associated with less meaningful experiences in the ATUS.

To emphasise again (p. 150), household data like ATUS and ELSA are also not very good at capturing the tails of the income distributions. People in institutions and without addresses are excluded from these sample populations, which omits populations such as the homeless, and those living in nursing homes and prisons. Importantly, existing studies that do sample those with very low incomes do find that low income is associated with low SWB (e.g. Biswas-Diener and Diener 2006; Ahmad, Mansor and Paim 2016). In ATUS and ELSA, top incomes are also not well sampled. In ATUS the highest household income values were $150K+ (with only $100K+ analysed due to uneven income categories, see p. 85), and for earnings the highest was less than $290K. In ELSA, the highest income and earnings were not over £500K. Thus, it is unclear whether we see the very affluent, such as millionaires, represented in these samples – and whether or how this might affect results such as those with $100K+ having lower experiences of pleasure and purpose than some other income groups.

Wealth in ELSA was, however, still associated with better life evaluations for both the life satisfaction measures and life meaning after introducing fixed effects (though for life meaning, the result was not robust to multiple imputation, suggesting these data cannot illustrate a robust effect here). Wealth was not, however, associated with more positive affect in the fixed effects models. This is consistent with the results of Kahneman and

Deaton (2010), who found that income was more closely associated with evaluations than experiences of SWB. In this sample, wealth was not strongly associated with experiences of SWB at all, but wealth was associated with evaluations. The closer relationship of wealth with evaluations of SWB than income could be because wealth is more stable than income, as discussed on p. 152.

Usually, including controls and fixed effects reduced the size of the coefficients in these results except for education, where they sometimes increased and changed sign. For example, in ATUS, those with MSc/PhD levels of education reported higher scores on the Cantril ladder than those with less than a high school degree without controls, but they had lower scores after introducing controls. In ELSA, those with NVQ4/NVQ5-equivalent or higher education had higher scores than those with no/foreign/other qualifications on the second life satisfaction measure, frequency of feeling satisfied with the way life had turned out. But this group had worse scores after introducing fixed effects. This suggests that education matters for wellbeing because of what it brings, such as higher earnings and better health (Dolan, Peasgood and White 2008; Molnar and Kapitány 2010; Deaton 2013). When these things are held constant and not allowed to vary between individuals in ATUS or even within individuals in ELSA over time, then education does not benefit SWB. Put in simplified and direct terms – and ignoring problems like the ecological fallacy (Schwartz 1994) and reverse causality – if education doesn't get you something other than your degree, these results suggest it is not worth pursuing for your SWB and could even make you worse off.

Supplementary analyses in ATUS additional to those reported in the prior section confirm the idea that the benefits of education are in what accompanies a degree (or in what accompanied the pursuit of a degree). In the model with controls, where the MSc/PhD-educated had lower Cantril ladder scores than those with less than a high school diploma, removing certain controls rendered the negative relationship positive. These controls were health status (self-rated general health, whether they took pain medicine on the diary day and how rested they felt, and whether they have hypertension), income and labour force status. The effect of education on SWB is, therefore, seemingly best understood in the

context of what else it affords learners, which supports prior findings on education and SWB (Dolan, Peasgood and White 2008; Molnar and Kapitány 2010; Deaton 2013).

Occupational class was, arguably, more closely associated with SWB than income and education. In ATUS, those in management and professional occupations had better evaluations of life than those in service, sales and office occupations, and farming, construction and production – but they were less happy than the unemployed, and did not experience any more or less negative affect or meaning than other occupational groups. In ELSA, and considering the most causal results with fixed effects and controls, those in higher managerial, administrative and professional occupations expressed more frequent feelings that they were satisfied with the way their life had turned out, the second life satisfaction measure, than those in lower supervisory and technical occupations. There were more differences between occupation groups in these models on the first life satisfaction measure but these did not withstand multiple imputation. So, again, the measure does matter, even according to wording differences for the life satisfaction measures (Dolan, Kudrna and Stone 2017).

Life meaning and positive affect did not differ in ELSA across occupational groups with controls and fixed effects, although there were some benefits without controls. Thus, higher occupational class – ceteris paribus – is associated with thoughts that life is going better (in terms of life satisfaction) but not experiences that it is. This could be further evidence, in addition to the evidence for income and education, that there are costs – or at least not benefits – to achieving. It could also again be, however, that a better job does not bring better experiences of SWB unless there are other benefits that go along with the job, such as health. There is a well-established occupational gradient in health, with those in lower class roles experiencing worse health (Marmot et al. 1991), perhaps due to poor material working conditions or feelings of low control and autonomy over what they do (Marmot and Wilkinson 2001). By controlling for health status, the benefits of higher occupation for SWB may be underestimated. Indeed, in supplemental analyses excluding health from the controls in the fixed effects models, those in semi-routine and routine occupations reported less life meaning than those in higher managerial and professional roles and intermediate

occupations. There could be other mechanisms at play here, and future research could explore these.

Unemployment was clearly to detrimental people's evaluations of life, confirming the results of numerous other studies (Clark and Oswald 1994; Dolan, Peasgood and White 2008). Interestingly, however, those who had transitioned out of unemployment had worse SWB scores on the Cantril ladder as compared to those who remained not unemployed – though it was still better to move out of unemployment versus remaining unemployed. The CPS interviews were conducted between two and five months before the ATUS interview, and so this is capturing a recent transition. Most panel studies look at changes on a year-to-year basis, and so it may be that the SWB differences between groups who do and do not change their employment status over shorter periods of times are masked by the year-long intervals of analysis in other research (Maennig and Wilhelm 2012). People may overestimate how happy they will be after receiving a job offer, consistent with research on affective forecasting, and there may also be uncertainty about whether or not the job will work out, which can negatively impact SWB (Wilson and Gilbert 2003). Thus, it may be that this gap between expectations and lived experiences results in poor evaluations of life during the transition to employment. Another possible explanation is poor working conditions.

Unemployment was not associated with worse SWB in ATUS on any measure of experience nor in ELSA after introducing controls. This is in contrast to the results of Krueger and Mueller (2012), who found that the unemployed experienced more sadness than the employed, and that this reduced around the time of re-employment – though this result was found when not adjusting for the duration of sadness. When Krueger and Mueller (2012) accounted for the duration of emotional experiences, the unemployed had similar emotional experiences to the employed. Sadness was not associated with unemployment in ATUS either, as shown by Dolan, Kudrna and Stone (2017) – though these analyses, like the analyses in this thesis, did adjust for the duration of the activity length by using the survey weights (see p. 125).

Supplementary analyses additional to those reported in the results above show that without the survey weights, the unemployed do have worse negative affect than most other employment groups – managers and professionals; those employed in farming, construction and production occupations; and those not in the labour force. Looking at sadness specifically, the unemployed experienced more sadness than all other occupational groups without the survey weights except for those not in the labour force where there was no difference. These results are then largely consistent with the results of Krueger and Mueller (2012), who found that the unemployed experience a greater intensity of negative emotional experiences before adjusting for the duration of emotional experience. It is important, however, to remember that the survey weights in ATUS adjust for more than activity length and also adjust for oversampling of certain demographic groups. Thus, the difference between the results with and without weights could be due to a factor other than time use.

The lack of an association of employment status with experiences of meaning is particularly surprising given that working is a highly meaningful activity (White and Dolan 2009). Luhmann et al. (2012) found that the effects of unemployment on experiences of pleasure are heterogeneous between studies, ranging from strongly negative to moderately positive, although the overall average effect was negative. In this research, one might speculate that the unemployed have already adapted to their circumstances, but accounting for the duration of unemployment did not affect the relationship of change in employment with meaning. A better explanation is that the unemployed use their time in differently meaningful ways.

The results do provide some indication that this may be the case – when controlling for the activity that people were doing in their diaries along with the other full controls in the supplementary analyses, those who became unemployed experienced slightly more meaning than those who remained not unemployed.[9] And in supplementary analyses

[9] This is likely evidence of a suppression effect, which occurs when two explanatory measures are associated but only one has an effect on the outcome of interest without controlling for the other (Conger, 1974). In this case, change in unemployment status was not associated with experienced purpose alone but it was when including the activity that people reported doing – and activities are associated with SWB (White & Dolan, 2009). Thank you to Professor Alex Wood and Dr Jennifer Sheehy Skeffington for making and discussing this suggestion.

without the survey weights additional to those reported in the results – so, analyses without adjusting for the duration of the activity in ATUS – the unemployed experienced less meaning than those in farming, construction and production occupations but more meaning than those in management and professional roles. Taken together, these results suggest that the activities people do affect the relationship of unemployment with SWB, and in such a way that the unemployed have similar SWB to the employed in their experiences. Future research could investigate which activities affect the relationship of unemployment with SWB, as well as how they affect the relationship. This is already underway, with Krueger (2017) showing that unemployed men but not women experience less meaning in their daily activities than the employed in ATUS, possibly due to gender differences in participation in household activities but also in health (see also Chadi and Hetschko 2017).

Nevertheless, the unemployed as a whole do not generally feel different in their experiences to other occupational groups when accounting for the duration of their activities as well as the intensity of their emotional experience – apart from feeling happier than those in higher managerial roles in ATUS, or at least no differently happy, with a less generous interpretation of statistical significance. Combined with the finding that transitions out of unemployment are associated with relatively worse evaluations of life in these data versus remaining not unemployed, these results suggest that the transition from unemployment is a time of relatively low wellbeing. Future research could explore why this is the case and policies could seek to improve SWB during this transition to encourage re-employment.

Chapter summary

The results in this chapter highlighted that high SWB does not necessarily accompany the achievement of high socio-economic status. Although higher income was associated with better evaluations of SWB at one point in time in ATUS, it was not directly and more causally associated with better evaluations of SWB over time in ELSA. Higher income was even associated with worse experiences in ATUS and was not associated with positive affect in ELSA, although wealth was associated with better evaluations over time in ELSA for life satisfaction. Education did not bring much benefit for SWB and its effect largely depended on the controls used. Although the unemployed had much lower evaluations of

SWB, their experiences were not worse than those who were not unemployed, and the transition out of unemployment was associated with relatively low evaluations of SWB in ATUS. These results could be due to the costs of achievement, such as identity, time use and values; however, another explanation is that people make comparisons to others' higher socio-economic attainment, and these comparisons may cancel out the benefits of high absolute socio-economic attainment. This is the focus of the next chapters.

4. Scoping in on age and 'society' – the effects of relative socio-economic status on SWB

Summary

In the last chapter, we saw that high socio-economic achievement does not consistently benefit SWB in absolute terms. This chapter asks, what is the role of others' socio-economic achievement for SWB? First, different theories on how relative socio-economic status might affect our SWB are critically appraised. Relative income and deprivation theories predict a negative effect of relative socio-economic status on SWB via the damaging effects of upward social comparisons; however, social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect' all predict a positive effect of relative socio-economic status on SWB. The results show that 33 out of the 307 reference group measures of relative status are significantly associated with SWB after applying the Bonferroni correction and conducting multiple imputation. These are mostly from ELSA. Richer and more educated reference groups have a negative impact on SWB, as does the unemployment rate. Better perceived standpoints are associated with better SWB; however, rank earnings in one's family income group in ATUS is associated with *worse* happiness, which is unusual in the context of prior literature – but consistent with the results in the prior chapter. All of relative income, earnings, wealth, education and unemployment are statistically significantly associated with SWB in at least one dataset. There are significant relative effects on all dimensions of SWB apart from experiences of purpose, although the effects are largely on evaluations of SWB. One measure is associated with all dimensions of SWB in ELSA – perceptions of socio-economic standing relative to those in 'society' – and the scope age group mattered across measures of relative status in both datasets. The relative models usually fit better than the absolute models according to AIC and BIC tests of model fit except in ATUS. In contrast to predictions, standpoint measures of relative status were not more consistently associated with SWB than summary measures. These results are discussed in terms of their fit with theories about the relationship between relative socio-economic status and SWB, as well as psychological theories of perception, and what they tell us about how future researchers should go about selecting reference group scopes. Methodologically, future researchers in this area should report collinearity diagnostics for their models.

Structure of chapter

The question of to whom we compare ourselves is longstanding across disciplines and it is often acknowledged that there is not yet enough empirical evidence to answer this question (e.g. Nikolaev 2016a). This chapter approaches this issue, as well as the issue of how we make these comparisons, by exploring which reference groups affect SWB most and how. This addresses the 'relative' portion of research questions one and two. The second set of research questions is also addressed by considering whether absolute or relative socio-economic status matters more for SWB (see p. 31).

First, previous literature on theories suggesting the direction (positive, negative or neutral) of the effect of relative socio-economic status on SWB is reviewed. The main new theoretical perspectives considered are social capital theory, the mixed neighbourhood hypothesis, the tunnel effect, relative income and deprivation theories, equity theory and social distance theory. These are considered through the lens of social norm and identity theory from section 1.2. Next, how these theoretical predictions are borne out in the empirical evidence across scope, summary and standpoint measures, and across different aspects of relative socio-economic status, is discussed. Then, predictions are made for whether relative income, wealth, education or unemployment are likely to be most closely associated with SWB. How the relationship of relative socio-economic status with SWB might differ depending on how SWB is conceptualised and measured is considered throughout, and the last section of the literature review considers whether absolute or relative socio-economic status affects SWB more.

4.1 Literature review

Previous literature on theories suggesting the direction of the effect of relative socio-economic status on SWB

The diversity and breadth of the theoretical predictions about how relative socio-economic status might affect SWB is remarkable. As discussed in the Introduction (p. 40), it is sometimes argued that changes in socio-economic inequality in and of themselves do not matter unless the consequence of these changes to inequality is greater socio-economic deprivation for some people. To recap, this is consistent with the idea, once popular in economics (largely for modelling purposes), that people only derive utility from their own and not others' consumption – implying that relative socio-economic status should not have any impact upon SWB. Even early economists, however, recognised the interdependence of utility. Adam Smith observed that Scottish men of the "lowest rank" could walk around barefoot without being discredited whereas French men could not (Smith 1843, p. 368).

Other prominent early thinkers have also made similar observations. Aristotle referred to envy over 2000 years ago, distinguishing between envy that motivates people to improve themselves and envy that creates the desire to take away something good from others (Salovey 1991). Karl Marx noted that a little house, when placed next to a palace, "shrinks to a hut" (1933, p. 33). David Hume (1748) thought that soldiers compare themselves to sergeants and corporals but not to generals, in that "a great disproportion… keeps us from comparing ourselves with what is remote" (pp. 377-378). Following Immanuel Kant (1996 translation), John Rawls (1971) maintained that although people care about their relative position, envy is a personal vice that is beyond the remit of policy (see also Sugden 1984). There is also a wide literature on the evolutionary bases of social comparison (Gilbert, Price and Allan 1995). There are many theories where positional concerns are central. This section integrates some of these theories with a focus on the effect of those at the top of the socio-economic distribution on the rest.

On the one hand, there are theories that suppose others' (higher) socio-economic status has beneficial effects for others' SWB. According to social capital theory, popular in sociology,

knowing and interacting with people of a high socio-economic status should provide benefits by expanding the resources available to people; for example, by providing networking opportunities for jobs and improved knowledge about how to negotiate educational systems (Lin 2002). This theory has been discussed in relation to physical and mental health (Browne-Yung, Ziersch and Baum 2013; Song 2015). Social capital theory shares similarities with the mixed neighbourhood hypothesis in the epidemiological literature, which argues that socio-economic inequality within a neighbourhood can have beneficial effects by counteracting problems typically associated with poorer areas, such as norms of worklessness and substance abuse (Musterd and Andersson 2005; Marshall et al. 2014).

A difference between these theories is that social capital theory focusses upon the positive resources afforded by networks of high socio-economic status individuals, whereas the mixed neighbourhood hypothesis focusses upon alleviating the problems associated with poor areas. These theories do not appear to focus on the SWB loss that could be incurred from making comparisons to those who are doing better than you, or to a social norm that you do not fit into, which would be predicted by identity theory (see section 1.4). Instead, they are about how being around others who are doing better than you can lift you up, alleviate the problems associated with low socio-economic status and provide additional resources for you to do well in life. They seem to assume that being different to the norm and making comparisons to those who are different to you do not affect wellbeing – or at least do not affect it negatively (see also Drakopoulos 2016, p. 77).

Another theory with a similar prediction but a different motivation is referred to as Hirschman and Rothschild's (1973) "tunnel effect". In discussing society's tolerance for socio-economic inequality as a result of rapid economic development, these authors proposed that others' higher socio-economic status is a positive and beneficial signal to others that they soon will attain a higher socio-economic position, too:

> Suppose I drive through a two-lane tunnel, both lanes going in the same direction, and run into a serious traffic jam. No car moves in either lane… I am in the left lane and feel dejected. After a while the cars in the right lane begin to move. Naturally, my spirits lift considerably, for I know that the jam

> has been broken and that my lane's turn to move will surely come any moment now (Hirschman and Rothschild, 1973, p. 29).

Unlike social capital theory and the mixed neighbourhood hypothesis, social comparisons are a mechanism in the tunnel effect. People see others doing better than them, compare to them and then infer that they, too, will do better – just as the driver infers his future prospects from that of others'. This has been discussed as 'information dominating comparison' (Senik 2004; Caporale et al. 2009); however, as discussed in section 1.2, social comparisons can have both postive and negative effects on SWB. The comparison effect, therefore, could be positive, and a positive effect of relative socio-economic status on SWB does not necessarily mean that people are only taking in information about others without making a comparison.

An information-only effect would suggest that people are simply acquiring information about others' socio-economic status but not comparing it to something else any way, which is unlikely (Kahneman and Miller 1986; Mussweiler, Rüter and Epstude 2004; see section 1.2). For this information to affect SWB, it should mean something to the person assimilating information about others' socio-economic status in terms of their identity and how well they fit into a norm. And it does – that their future prospects (which are identity-related) will be better (which is norm-related). Technically, then, the comparison is between one's future self and the present other's socio-economic status. This tunnel effect has been cited in economic studies when researchers find a positive effect of relative socio-economic status on SWB, such as in transition economies in eastern Europe (e.g. Senik 2004; Caporale et al. 2009; see below p. 216). It does not, however, preclude the notion that people are making social comparisons. It also suggests that deviation in one's identity from a norm – in terms of current socio-economic status – can have a positive effect on SWB if people believe that, in the future, they too will be part of the norm. This does not appear to be the focus of what is discussed in the identity economics literature.

On the other hand, there are theories that suppose others' socio-economic status has detrimental effects on SWB. As discussed in the Introduction, Veblen (1899) and Duesenberry (1949) were early proponents of the idea that individuals are motivated to keep up with the consumption of others. According to these theorists, the utility individuals

derive from their own consumption is based on what others consume, and utility is decreased if their consumption is lower than that of others. Thus, these 'relative income' theories predict that others' high socio-economic status should negatively impact upon SWB. Similarly, relative deprivation theory (see p. 66) argues that when people see that others have more than them, they feel deprived and that this negatively impacts upon their SWB either through material pathways – where the deprived lack the ability to access material goods and participate in society – or psychosocial pathways, where the deprived experience feelings of stress and frustration (Runciman 1966; Adjaye-Gbewonyo and Kawachi 2012).

Unlike social capital theory and the mixed neighbourhood hypothesis, but like the tunnel effect, these theories incorporate the idea that people make a comparison to a norm and then internalise it based on their identity. They experience disutility from deviating from a norm – high socio-economic status – when they make a comparison to someone who is doing better than them in some domain (like income) but similar to them in another (like age). In support of this idea, Beshai et al. (2016) find that negative thoughts about one's self such as "My future is bleak" and "I am no good" fully mediate the association between perceptions of relative deprivation and symptoms of depression. People compare to others and then feel bad about themselves when they don't live up to – or don't expect that they can or will live up to – what they see.

Relative income and relative deprivation theories share many similarities but there are some differences. In relative income theories, the consequences of relative socio-economic status for SWB appear to be less theoretically developed than in the relative deprivation literature – the latter looks at effects on physical and mental health outcomes, whereas the former was focussed upon behaviours due to the lack of interest in subjective mental states at the time relative income theory was developed (see p. 58). In relative income theories, there appears to be the assumption that low utility drives people to consume more because there are costs associated with the absence of consumption. For example, Veblen (1899) writes the following about expensive tastes:

> Without reflection or analysis, we feel that what is inexpensive is unworthy… 'A cheap coat makes a cheap man'… there is probably no one who does not feel the convincing force of [this] maxim (pp. 95, 104).

Yet it could also be that people consume more not because they have low utility but because they want to increase their utility – without their utility being low in the first place. They are doing well, and see other people doing very well – as in the tunnel effect – and aim to do better, too, and so they also drive through the tunnel. As possible evidence for this, some people spend more when they are in a good mood (Sherman, Mathur and Smith 1997); however, the specific role of others' consumption behaviour in the relationship between emotional experience and consumption does not appear to be very clear from the available empirical evidence to date.

According to Parducci's 1965 range-frequency theory (see p. 41), standpoint rank measures of socio-economic status should outperform measures of the distance from the average or median (that is, outperform in terms of being associated with SWB). This is because the theory shows that people rely upon the frequency and range of a set of attributes in their judgements about where a stimulus fits into a particular set. But this body of work is not focussed on socio-economic status – instead, it is largely based on attributes of objects, such as size and weight or numbers. Socio-economic status is not as simple as a number. Income, for example, can be inferred from how people speak and what they buy, and education from what leisure activities people participate in or whether they are wearing clothes from their alma mater (Argyle 1994; Bjornsdottir and Rule 2017). These judgements are not as straightforward as "small" or "large", or "heavy" or "light". Thus, distance from average measures may be more suitable for capturing the effect of relative socio-economic status on SWB if perceptions of socio-economic status are interpreted more as an average than as a range and frequency. This is tested in this chapter by comparing distance from average and median to rank measures of socio-economic status, following some prior research that suggests already that rank measures are more closely associated with SWB (Boyce, Brown and Moore 2010; Wood et al. 2012; Kifle 2014; Daly, Boyce and Wood 2015).

There is a large literature on relative income effects and SWB, with different names given to different approaches to studying relative income such as the 'average income hypothesis' or the 'rank income hypothesis' (Kifle 2014; Wood et al. 2012). The average income hypothesis assumes that people make comparisons to a norm (an average), whereas the rank income hypothesis incorporates the role of an individual's own status into these comparisons in measurement (e.g. one's rank in the distribution of income – a standpoint measure). The differences between these assumptions in terms of scope, summary and standpoint aspects of reference groups were discussed in section 1.2, and, to recap, one important point was that summary (like average) and standpoint (like rank) aspects of relative socio-economic status are not categorically equivalent. This is because standpoint measures account for an individual's place in the distribution of socio-economic status, and summary measures do not. Importantly, a key to social comparisons affecting SWB is whether or not they are used to infer a social norm, and whether or not this norm is congruent with one's own identity (see section 1.4). In addition to range-frequency theory, this is further reason to suspect that standpoint measures overall will perform better than different summary measures in terms of their association with SWB because they incorporate a proxy of identity in terms of one's own position in the distribution of resources.

There are many other related theories that make similar predictions to those discussed in this section. For example, equity theory implies that others' socio-economic status will negatively impact wellbeing when others are perceived as being 'unfairly' compensated relative to their effort and/or skills (Adams 1963), and according to social distance theory, large gaps between one's own and others' socio-economic attainment leads to a lack of social trust, reducing wellbeing (Argyle 1994; Orton and Rowlingson 2007). These theories are particularly relevant for the summary measures of 'the top' in this chapter, such as the share of income held by the top 1% of income earners and the proportion of people with top incomes and wealth. If people think that those at the top are unfairly compensated, this provides a more nuanced reason for why what is happening at the top of the socio-economic distribution affects SWB – people compare to others and are not doing as well as them; however, these comparisons negatively affect SWB because those they are comparing to are in an unfairly better position. Unlike with the tunnel effect, they do not

compare and see their future self as being able to attain this level of socio-economic status. They are socially distant and perceive themselves as immobile, which reduces their SWB.

Important for all of these theories, however, is that people can make strategic social comparisons by selecting to whom they compare themselves. This was discussed in section 1.2. To recap, social comparisons can be made automatically and below conscious awareness; however, people also strategically choose to compare themselves to those who are doing better or worse than themselves. The idea of strategical social comparisons is situated within self-enhancement theory, which draws on evidence suggesting that people will compare themselves to certain others in order to feel better about themselves (Sedikides and Gregg 2008, see also p. 258 of this thesis). Thus, there may be some self-selection in terms of different comparison targets, and the underlying tendency to choose certain comparison targets could account for the effect of relative socio-economic status on SWB rather than relative socio-economic status itself.

It is not possible to fully resolve the issue of endogeneity with these data (see p. 74); however, the analyses do control for the socio-economic conditions of the environment with housing costs in ATUS and the index of multiple deprivation in ELSA (see pp. 120, 121). This is to account for the notion that people may self-select into areas with more favourable (perhaps downward) comparison targets, and to somewhat account for shared public goods. There is some evidence that people do prefer to live in areas where they earn more than those around them; however, the behavioural evidence to support this stated preference research is seemingly lacking (Solnick and Hemenway 1998; Celse 2017).

How theoretical predictions are borne out in the empirical evidence across scope, summary and standpoint measures, and across different aspects of relative socio-economic status

How well do these theories hold up in the face of empirical evidence? A positive effect of relative socio-economic status on SWB would be most consistent with social capital theory, the mixed neighbourhood hypothesis, and the tunnel effect, whereas a negative effect would be more consistent with relative income, deprivation, equity and social distance theories. It may be, however, that multiple effects are at play and so a positive or negative

effect merely shows which one most likely dominates. Note that the focus here is on large population datasets, which are also utilised in this research.

In the relative income and wealth literatures the effect on SWB is largely negative. In a well-cited study, Luttmer (2005) shows that the higher the average income of US residents' neighbours, the lower evaluations of SWB they report. This is a summary measure of relative status, and many other studies also employing summary measures find negative effects of relative income and wealth on both evaluations and experiences of SWB (Putnam 2001; McBride 2001; Blanchflower and Oswald 2004; Bygren 2004; Ferrer-i-Carbonell 2005; Caporale et al. 2009; Layard, Mayraz and Nickell 2010; Card et al. 2012; Hudson 2013; Cheung and Lucas 2016; Helliwell and Huang 2014; Burkhauser, De Neve and Powdthavee 2015; Clark, Senik and Yamada 2017).[10] Most of these studies use average or median – or predicted average or median – summary measures of relative income and wealth; however, there are a couple of important exceptions. Card et al. (2012) show that making Californians aware of their colleagues' salary lowers their evaluations of SWB about work if they earn less than the median salary. In this case, lists of salaries were available for respondents to see. Burkhauser, De Neve and Powdthavee (2015) look at the share of income held by the top 1% of earners in 24 different countries, and find a negative association of increasing shares with SWB that is strongest in European countries.

There are also studies that find a positive association of relative income and wealth with SWB. These studies would, therefore, support the predictions made by social capital theory, the mixed neighbourhood hypothesis and the tunnel effect. One set of studies finds that in small local geographic areas, such as zipcodes in the USA, there is a positive association of relative status with SWB (Graham and Felton 2006; Kingdon and Knight 2007; Knies, Burgess and Propper 2008; Firebaugh and Schroeder 2009; Clark, Westergaard-Nielsen and Kristensen 2009; Dittmann and Goebel 2010; Deaton and Stone 2013; Brodeur and Flèche 2012; Ifcher, Zarghamee and Graham 2017; Bhuiyan 2017). Many of these studies show

[10] There are also studies that directly measure consumption finding similar effects – higher relative consumption in a reference group is associated with others' worse SWB (Winkelmann 2012; Bellet 2017; Wang, Cheng, and Smyth 2017). One study finds no effect of relative consumption in Ethiopia (Shifa and Leibbrandt 2017). Although such research is a more direct test of the relative income hypothesis (see discussion on p. 62), measures of consumption are not used in this thesis so these studies are not focussed upon.

that when the geographic scope is widened, the association of relative status with SWB becomes negative instead of positive. It is very difficult to estimate local area effects reliably, however, because absolute and relative income in small local areas can be highly correlated. It could be that these results are driven by multicollinearity between absolute and relative income or wealth (see pp. 92, 133).

There are also studies that find a positive effect of summary measures of relative income and wealth on SWB but outside of small local areas. Using gender and age groups within US states as the scope, relative income among Blacks (but not Whites) is positively associated with evaluations of SWB (Davis and Wu 2014; see also p. 64). Blacks may see other Blacks as a signal that they, too, will earn more income in the future, as predicted by the tunnel effect – perhaps fuelled by a norm of solidarity in this group that does not exist for Whites. There may also be resource sharing occurring that is not captured by the survey methods used in the study, or methodological problems of multicollinearity, although the authors do mention the latter issue and report adjusting their analyses accordingly. In Russia, Eastern Europe, rural China and South Africa, studies have shown a positive association of relative income with SWB (Senik 2004, 2008; Caporale et al. 2009; Knight, Song and Gunatilaka 2009; Bookwalter and Dalenberg 2010). There is perhaps more uncertainty about future incomes in these than in other regions like the United States or the United Kingdom, and so it is possible that people in these countries are more optimistic about their future prospects. This would then create a positive effect of relative status on SWB if people use others' incomes as a way to infer their own future prospects. It is, however, difficult to explain Senik's (2008) finding of a positive effect of relative income on SWB in the United States, which is in contrast to other literature in this country – but results from the United States are sometimes exceptional in contrast to other countries such as European countries (e.g. Blanchflower and Oswald 2009). The analyses in this section add to the foregoing mixed evidence about the effect of relative income on SWB in the United States.

Then, there are studies of relative income and wealth employing summary measures that find no association of relative status with SWB within some scopes (Diener et al. 1993; Clark, Westergaard-Nielsen and Kristensen 2009; Deaton and Stone 2013; Kifle 2014; Luo,

Wang and Huang 2016). It may well be that in these samples using certain reference group scopes, there is not an effect of relative income or wealth on SWB, and any positive or negative effects may have cancelled each other out. It is also possible, however, that the reference group scope was mis-specified in the sense that it did not include the people that matter for income and wealth comparisons. This point is returned to in the next sub-section of this chapter in the review of studies that vary the scope of reference groups, and in the Discussion section of this chapter on p. 265.

There are far fewer studies investigating the effects of relative education on SWB than there are the effects of relative income or wealth. Outside the SWB literature, however, education – especially higher education – has been conceptualised as having positional advantages beyond absolute effects. Educational qualifications might signal to employers that degree-holders are hardworking or diligent even if these are not characteristics that the degree specifically represents, for example – signalling can be an aspect of positionality – and the marginal benefit of a degree in terms of productivity and wages may be less when many people have the same degree (Shavit and Park 2016). Turning to the SWB literature, in data from 11 OECD countries, there is no association between education and SWB in the highest income group, where higher education is more prevalent, but there is a positive association in lower income groups (Salinas-Jiménez, Salinas-Jiménez and Artés 2011). In South Africa, Botha (2014) shows that people below the mean education level of their subjective income group have less positive evaluations of SWB than those above. These studies could be suggestive of positional concerns for education.

In another study in South Africa, Kingdon and Knight (2007) also show that the average years of education within geographic districts is positively associated with residents' evaluations of SWB. The authors do not appear to control for absolute education, however, and thus it is possible the results reflect absolute and not relative effects. In other words, without holding absolute education constant, it is possible that higher individual-level education is captured by the variable for relative education, which is in turn associated with higher SWB. Putnam (2001) reports that there is no association of average state education with SWB in the US; however, there is a positive association of average county education

with SWB – but again it is not clear whether absolute education is controlled for in the analyses.

In recent work by Andrew Clark (private correspondence 2017) using data from Australia, Germany and Great Britain, there is a negative association of average education with evaluations of SWB using a combined scope of region, year and age group. Nikolaev (2016a) uses Australian data and looks at two summary measures of relative education – average years of education and proportion of people with higher degrees in their sex-age cohort (the proportional measure is similar to one used in the present analyses). The effect of each of these measures on evaluations of SWB is negative. On balance, these relative education studies suggest some of the benefits to education may be positional and largely support theories of relative income and deprivation, as well as social norm and identity theory in that being different to the norm (average education) is usually associated with worse SWB.

Turning now to unemployment, there is generally a negative association between relative (national) unemployment rates and SWB (Clark and Oswald 1994; Di Tella, MacCulloch and Oswald 2001; Wolfers 2003; Alesina, Di Tella and MacCulloch 2004). There are exceptions, however. Eggers, Gaddy and Graham (2006) find across eight Russian regions that higher local unemployment is associated with better evaluations of SWB. An interpretation of their results is 'schadenfreude', or feeling better due to others' misfortune. Böckerman and Ilmakunnas (2006) find no association between national unemployment and evaluative SWB in Finland, which could be due to their relatively large welfare state. A negative effect of higher relative unemployment on SWB is more consistent with social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect' because these theories predict a positive effect of better socio-economic status in the reference group, and relative unemployment studies show the complementary effect – a negative effect of worse socio-economic status in the reference group.

The results can also depend on whether or not someone is employed, which is consistent with identity theory. Using data on psychological functioning, a scale largely of evaluative and experiential pleasure items, Clark (2003) shows that British unemployment is

negatively associated with the SWB of the employed, but positively associated with the SWB of the unemployed (see also Powdthavee 2007; Clark, Knabe and Rätzel 2010; Stutzer and Lalive 2004; Shields and Price 2005; Shields, Price and Wooden 2009). This suggests that people who are employed are negatively affected by the pressure of labour market competition, whilst the unemployed consider themselves to be better off when there are more people in a similar situation to them – that is, when the norm is unemployment. This point is returned to in the next chapter (p. 275).

Clark, Knabe and Rätzel (2010) find similar results with German data but also provide evidence that the key difference is not between those who are employed and unemployed, but rather between the securely employed with good job prospects and the insecurely employed with poor job prospects. When people are worried about the prospect of becoming unemployed and perceive it as difficult to find new work, then they, too, are positively affected by regional unemployment. The evidence is, however, not conclusive (see Chadi 2013 and Oesch and Lipps 2012 for conflicting evidence, and a further discussion of this and other evidence on p. 275).

Finally, we can consider standpoint measures of relative status – rather than summary measures. Recall that standpoint measures of relative status account for an individual's own position in the distribution of resources. These can be classified into two groups – perceived and 'actual'. Perceived measures ask people where they stand on some aspect(s) of socio-economic status within some scope(s). 'Actual' measures calculate an individual's position in the income or wealth distributions, such as by using a rank, subtracting an individual's income from the average income, or taking the ratio of an individual's income to an average in some scope.

Across perceived standpoint measures of various aspects of socio-economic status, better perceived standpoint is associated with better SWB (McBride 2001; Singh-Manoux, Marmot and Adler 2005; Knies, Burgess and Propper 2008; Mayraz, Wagner and Schupp 2009; Senik 2009; Knight, Song and Gunatilaka 2009; Layard, Mayraz and Nickell 2010; Bookwalter and Dalenberg 2010; Anderson et al. 2012; Callan, Kim and Matthews 2015).[11]

[11] An exception is Fang and Niimi (2015), which is discussed in the next chapter on p. 271.

In ‘actual’ standpoint measures, better standpoint is usually associated with better SWB (Blanchflower and Oswald 2004; Ferrer-i-Carbonell 2005; Graham and Felton 2006; Clark, Westergard-Nielsen and Kristensen 2009; Boyce, Brown and Moore 2010; Dittmann and Goebel 2010; Pérez-Asenjo 2011; Wood et al. 2012; Dolan and Lordan 2013; Botha 2014; Hounkpatin et al. 2015; Kifle 2014; Bhuiyan 2017; Gero et al. 2017). There are, however, exceptions.

In one exception, Li et al. (2011) show that relative income among Chinese twins is positively associated with SWB. In this study, absolute income was held constant, and the income difference between the twins was calculated. Smaller income differences were associated with better SWB, which is consistent with the predictions made by social norm and identity theory in that deviations from the norm are associated with worse SWB. There could also be resource sharing between twins that was not accounted for by the methods used in the study, or other mechanisms as would be predicted by social capital theory, the mixed neighbourhood hypothesis or the tunnel effect – e.g. twins use each other to infer their future prospects.

In another exception, Cortés Aguilar et al. (2011) show that being below average wealth has a positive effect on evaluations of SWB in Latin American countries. It is possible that shared public goods account for this effect because it does not appear there was an effort made to control for these, as discussed by the authors. This is unlike in the present research, where housing costs and the index of multiple deprivation are used for a ‘cleaner’ test of social comparisons (see pp. 120, 121). Hadjar and Samuel (2015) use Swiss and British panel data to look at how changes in intra and intergenerational class mobility affect evaluations of SWB. They find that only upward intergenerational mobility in the British sample is significantly associated with SWB – and it is negatively associated, which is consistent with the discussion of the costs of achievement in the last chapter.

Another important exception comes from the 1990s Moving to Opportunities experiment in the United States. In this experiment, a random selection of low-income public housing residents were provided housing vouchers that allowed them to move into areas where less than 10% of their neighbours were poor. After the move, the teenagers in the study

answered a perceived standpoint measure about where they and their families were located socio-economically relative to others in the scopes neighbourhood and schools. There was no effect of the programme on ratings on this measure; however, the mental health of teenage girls (but not boys) who received the voucher improved as a result of the programme (Clampet-Lundquist et al. 2011). This is important evidence because it is a causal field experiment, but it is still possible that the scope was mis-specified in this study. Neighbourhoods and schools may not be the reference group scopes that mattered for these teens' SWB. Or, it could be that there were gender differences concealed by the overall averages in the study on the perceived measure of status, just as there were for mental health.

The majority of the studies in this section rely on evaluations of SWB, especially life satisfaction. Some also include assessments of positive and/or negative affect, but none include experiences of purpose, which this research does include in order to move our understanding forward using a more complete picture of SWB. One study that includes both positive and negative affect is Burkhauser, De Neve and Powdthavee (2015), and they found that the share of income held by the top 1% of earners negatively impacted both evaluations of SWB and negative affect; however, there was not an association with positive affect (similar to the ATUS results in the last chapter for absolute income). Anderson et al. (2012) combined evaluations and experiences of SWB into one measure, finding better perceived standpoint to be associated with better SWB. Diener et al. (1993) used a scale combining measures of positive and negative affect and found no effect of relative income on SWB. The use of experiential SWB measures in that study could explain why they found no effect if relative socio-economic status is more weakly associated with experiences than evaluations of SWB. Deaton and Stone (2013), however, find that relative income in the US (using states as the reference group scope) is negatively associated with experiences of SWB in terms of positive affect, but positively associated with evaluations of SWB (see further discussion of this study on p. 265).

This is similar to what Tay, Morrison and Diener (2014) find in Gallup data from 158 countries. They show that while national income is positively associated with evaluations of life, it is also associated with worse daily experiences of worry and anger – so, higher

relative income, more negative experiences, similar to the worse experiences of happiness associated with higher relative income in Deaton and Stone (2013). Tay et al. (2014) argue that the faster, more stressful pace of life that accompanies economic prosperity is felt in people's experiences of negative affect, whereas their evaluations are more affected by infrastructure and modern conveniences. It could also be that the negative effects of social comparisons more so than (positive effects of) social networks affect people at the experiential level, whereas the benefits of social networks affect people more so at the evaluation level than do social comparisons (though this is not what prior theory and research would predict, see p. 229).

There was, however, a small positive association with positive affect in Tay et al. (2014). This could suggest that social networks affect experiences of positive but not negative affect – however, the discrepancy with Deaton and Stone (2013) suggests more evidence is needed to inform the discussion. Irrespective of the explanation, it appears that high national income is associated with thinking that life is going well rather than experiencing that life is going well. Put in simplified and direct terms, in Tay et al. (2014), people may want economic growth but they do not feel better when they get it and may even feel worse.

Moving through the scopes

An important limitation of most of these studies is that the reference group may have been mis-specified. Typically, researchers use one scope or vary the scope of the reference group in only a few ways within studies. For example, Cheung and Lucas (2016) use only US counties as a scope. Wood et al. (2012) use three scopes – 19 geographical regions of the UK, those of a similar age and those of a similar education and gender. Deaton and Stone (2013) use seven scopes but all solely geographical – all of the USA, zipcode, county, congressional district, MSA (Metropolitan Statistical Area), state and the world. These variations are sometimes referred to as 'robustness tests' to show that the results don't change when the reference group scope changes. But the reference group scope itself is of interest. It could be that some reference group scopes affect SWB positively and others negatively, and this impacts the conclusions we reach about how people react to the structure of society and the optimal distribution of resources within societies.

There are some exceptions to the general rule that researchers do not investigate the effect of different reference group scopes on SWB. One set of exceptions are studies that ask people to whom they compare themselves. Hyman (1942) did this, although he did not assess SWB. There are limitations to this approach. For one, it may be that people do not always compare themselves to the people they are asked to compare themselves. They may be prompted by the survey to think about the comparisons they might make, which would be aligned with the focussing effect (see p. 72). Another limitation is that social comparisons can occur unconsciously and still have an impact (see p. 34), which limits the extent to which we can be confident that the groups people say they care about and compare to are the groups they do care about and compare to. The results are interesting nevertheless and a few are briefly discussed in what follows.

In one such study, Clark and Senik (2010) analysed a sample of about 19,000 Europeans in paid work who were asked how happy they were, whose income they would be most likely to compare with and how important these comparisons were. Out of the options work colleagues, family members, friends, others and don't compare, most people selected work colleagues or don't compare, and those who reported that it was important to make comparisons' with others' income were less happy. Using a similar approach with a sample of about 200 bank clerks in Hong Kong, Law and Wong (1998) also reported comparisons with colleagues to be important predictors of pay satisfaction. But in a survey of former Soviet countries, Senik (2009) finds that comparisons to one's past situation are the most important for life satisfaction, although former schoolmates and colleagues are important, too. In China, Knight, Song and Gunatilaka (2009) analysed questions that asked respondents to whom they compare – neighbours, relatives, people in the village, people in the township, people in the county, people in the city, all of China and nobody. Most people reported making comparisons with their village, neighbours or nobody – but the association of these questions with SWB does not appear to be analysed in their study.

Dornstein (1988) asked a sample of about 140 blue and white-collar workers in industrial occupations in Israel how much they would care if certain other occupational groups received a pay rise, as well as about their job satisfaction. Overall, the results suggested that

increased comparisons were associated with decreased job satisfaction. They also found that blue collar workers reported frequent comparisons to outsider officials, who were frequently cited as a group the workers thought were paid more than they deserved, consistent with equity theory (Adams 1963); that those who perceived themselves as receiving a low pay frequently compared to other low pay workers, consistent with self-enhancement theory (Sedikides and Gregg 2008); that white collar workers who thought that their work was less respectable than their fathers' compared to others dissimilar in status and occupation; and that those who believed they had opportunities to be socially mobile were more likely to compare with others similar in status and occupation. This study only investigated occupational reference groups, however, and does not tell us about how other reference groups such as geography or age might affect SWB.

An arguably better method than asking people to whom they compare themselves, and the one adopted in this research, is to compare how variations in the scope of reference groups affect SWB without asking people. This avoids the focussing effect and any prompt by the survey to engage in social comparisons, as discussed earlier, as well as the problem that social comparisons could be unconscious. Despite the promises of this approach, it is not a methodological panacea, because it cannot be assumed that the reference groups consciously selected by researchers such as myself correspond with those that actually impact upon SWB either.

In one study adopting this approach, Bygren (2004) analysed a Swedish national survey that asked respondents how satisfied they were with their pay. Four reference groups were created: (1) the monthly earnings of all employees in the same workplace with the same educational level and work experience, (2) the pay of all those in the sample in the respondent's occupation with similar educational level and work experience, (3) the pay of all employees in the sample in all workplaces and (4) the respondents' historical earnings. Unfortunately, it is not clear whether net, average, or another summary measure was used to construct the reference groups. Results showed that (2) and (3) were most closely – and negatively – associated with pay satisfaction, especially (2) for women and (3) for men. In contrast to the aforementioned studies that ask people to whom they compare themselves, the (1) workplace reference group was not significantly associated with pay satisfaction,

with the differences to prior research likely due either to sampling or methodology. Regardless of current pay, (4) was positively associated with pay satisfaction, suggesting that forming high expectations about current pay based on one's past pay is good for pay satisfaction even if these expectations are not fulfilled – though this is not consistent with some other research on expectations and happiness (Nickerson et al. 2003). The Bygren study is limited in that it only looks at occupational reference groups and not any other scope.

Pérez-Asenjo (2011) conducts a more thorough investigation using a national US survey. The study looks at the relationship of standpoint measures of relative socio-economic status – rank income, and the ratio of individual income divided by reference group income. Out of the reference group scopes age, sex, race, educational degree, city/country, work status, marital status, occupation, prestige, religion, political views and geographic region, relative standpoint status in the reference groups age, sex, race and religion were most closely – and positively – associated with evaluations of pleasure.

There have been several more studies on rank wealth, showing that higher rank is associated with better physical and mental health outcomes – including in one of the datasets in this research, ELSA. These researchers have varied the scopes within studies and find that their results are robust to difference scopes, such as gender, education, age and geographical area (Boyce, Brown and Moore 2010; Wood et al. 2012; Hounkpatin et al. 2015; Daly, Boyce and Wood 2015).

There have also been some attempts to look at how more local reference groups affect SWB utilising standpoint measures of perceived status within various reference group scopes. Callan, Kim and Matthews (2015) investigate the effects of perceptions of one's own money, education and jobs relative to others in the United States versus those who are 'like you' on physical and mental health, finding that those who are 'like you' matter more than those in the United States. In Anderson et al. (2012), the authors find that perceived 'sociometric status' (respect and admiration by one's peers) is more important for SWB (a combined measure of evaluation and experience) than household income and education. Sociometric status has also been called 'accorded status', as distinct from 'objective' and

'subjective' status (Hyman 1942). Socio-metric status, however, is not a measure of relative status as defined in this research because it is about far more than doing socio-economically better than one's peers. Instead, it is about the consequences of doing better than one's peers – respect, admiration and influence. This research does not assume that these are the mechanisms underlying the relationship of relative socio-economic status with SWB.

It is important, however, to interpret the results of studies investigating perceptions of relative socio-economic status and SWB with caution because of common method variance. Common method variance occurs during the process of answering a survey, and it is the tendency to answer questions in a similar format in a similar way. Both self-ranked socio-economic status and SWB items ask participants to rate themselves on a scale, and this means that the items might be associated simply because they are both scale items (Lindell and Whitney 2001). Still, perceptions are important because they can show how people react to and interpret the distribution of socio-economic resources and their place within it – even if these perceptions are not always accurate (Norton 2013; Hauser and Norton 2017).

Aside from evidence on how different reference group scopes affect SWB there is also evidence on how they affect behaviour and change according to the situation. For example, Neumark and Postlewaite (1998) found that women are more likely to be employed if their husband earns less than their sister's husband. Pérez-Asenjo (2011) shows that the lower one's income is relative to age, sex and race reference groups, as well as a combination group including these reference groups and religious reference groups, the more hours one spends working. Psychologists have suggested that social comparisons are dynamic and can depend on the situation; for example, people may be more likely to compare to others who are worse off than them if they are in a difficult situation as a way of managing that situation – such as someone who received a low pass on a test comparing to those who failed (Suls, Martin and Wheeler 2002, see also p. 38). This could make it difficult to find reference groups that consistently affect SWB if they change according to context, although there may be generalisations of context.

Notwithstanding such difficulties, this chapter adds to the literature on to whom we compare ourselves by using over 300 different reference group measures that vary in terms of their scope and summary, as well as the individual's standpoint in the reference group, and then investing their relationship with the different dimensions of SWB. A key contribution is to examine the relationship of relative socio-economic status with experiential as well as evaluative SWB, as the latter SWB measure currently dominates the literature in this area.

Predictions for whether relative income, wealth, education or unemployment are likely to be most closely associated with SWB

The theories discussed earlier in this section rest on one important assumption: that others' socio-economic attainment is visible at either a conscious or unconscious level. Indeed, as Luttmer (2005) points out, "at a conceptual level, relative consumption rather than relative income or earnings affects well-being" (p. 965, footnote four; see p. 62 of this thesis). This is because consumption is more visible than income or earnings: clothes, cars and a holiday tan are more easily seen by other people than bills in a wallet or a bank account, notwithstanding any information about others' socio-economic status that people could derive from the media or other public sources. Relative socio-economic status is thus likely to matter more than absolute socio-economic status for those aspects of socio-economic status that are most visible, either in a physical sense – because these are physically perceived – or in a social sense, because they are talked about.

As discussed in sections 1.2 and 1.4, for social comparisons to matter for SWB, they should also be on a domain relevant for a person's identity so that when a stimulus-centred judgement (p. 20) is made it is relevant to one's self. It is assumed that all of the aspects of socio-economic status assessed in this thesis in terms of income, earnings, wealth, education and unemployment are relevant but to varying degrees due to their visibility, as discussed in what follows.

Which of income or earnings, wealth, education or unemployment are likely to be most visible? It is not straightforward to make this prediction, in part because these aspects of

socio-economic status are related between individuals. Out of the four, however, educational attainment seems the least visible. Unlike income or wealth, it cannot be spent directly and transferred into visible consumption, such as a new car or house. Education could be inferred from how someone behaves, such as their accent – especially in England, for ELSA – or the topics they discuss (Argyle 1994). This is, however, also true of income, wealth and employment status. It is thus predicted that relative education is the least likely to matter more than absolute education when compared to absolute and relative income, wealth and unemployment (see Table 4.1 below on p. 233 for a summary of the predictions in this chapter).

Like education, unemployment status also cannot be spent directly and translated into visible consumption. It is predicted to be more likely than education, however, to be inferred from what somebody talks about and their behaviour. Being asked, "So, what do you do?" is common in social settings, and some occupational identities – especially being employed, rather than taking care of a home or looking for work – are more socially valued than others (Unruh 2004). Relative unemployment is also likely to be more visible than relative education because unemployment statistics are regularly published in the US and the UK in the media from official government sources. These countries have official monthly unemployment rates (CPS 2016; ONS 2016c), but there is no official monthly graduation rate. This assumption is, of course, dependent on the extent to which information about the unemployment rate is visible to people, such as through the news or through knowing unemployed people in their social networks.

Relative income or earnings and wealth are better candidates for mattering more for SWB than absolute income and wealth, respectively, because income and wealth are more easily translated into visible consumption. It is possible to spend income or earnings on visible goods and services like beauty treatments, luxury transport and dining, and wealth can be in the form of visible goods such as art, jewellery and housing (note that what constitutes a visible good or service is not always clear-cut, nor is the difference between income and wealth, see e.g. Hirsch 1995). But it is difficult to say whether income or wealth is more visible, and income can be turned into wealth through expenditure, such as through the purchase of a home.

Looking to the literature, Heffetz (2012) conducted a survey about the visibility of different consumer expenditures, some of which are, arguably, more closely related to income than wealth. In the survey, around 400 people reported how soon they thought they would notice different aspects of the consumption of someone who was similar to them – except that this person spends more than they do on certain goods. There were 31 goods asked about, and, of these, most would be considered income expenditures, such as food, clothing, tobacco, recreation and charitable donations. Several could be classified as wealth: housing; home furnishings and household items, like furniture; jewellery; and life insurance, endowments and annuities. Of these, jewellery was the fourth most visible, home furnishings the ninth, housing the 13th, and life insurance, endowments and annuities the 28th. Of course, what people think they notice could be different to what they actually do, and to what affects their SWB. Still, this survey suggests that many income expenditures are more visible than wealth. It is thus tentatively predicted that relative income or earnings are more likely to matter more than absolute income or earnings for SWB than relative wealth is to matter for SWB when compared to absolute wealth.

Can any predictions be made about how relative socio-economic status might affect SWB differently on certain dimensions of SWB? We have already seen and discussed evidence above that relative status affects both experiences and evaluations of SWB (e.g. Deaton and Stone 2013). Theoretically, social comparisons are inherently evaluative in nature, requiring a judgement about how one's self is doing compared to others (Mussweiler 2003). Thus, relative socio-economic status should be more closely associated with evaluations than experiences of SWB. But this prediction would not be supported if social network pathways – rather than social comparison processes or material resources – are a key mechanism between relative socio-economic status and SWB. Again, as Kahneman et al. (2004) has argued, what we do and who we spend time with is more closely related to our experiences, whereas our personal characteristics are more closely related to our evaluations. According to this argument, then, lack of access to resources would most affect our evaluations, but lack of social participation (as in social capital theory and the mixed neighbourhood hypothesis, above) would likely most affect our experiences. It is thus not

entirely clear whether relative socio-economic status is likely to matter more than absolute socio-economic status for evaluations than for experiences.

Should relative socio-economic status matter more for pleasure or purpose? Again, it is not immediately clear from existing theory or evidence. On the one hand, there are many studies showing that social comparisons impact experiences and evaluations of pleasure (Smith 2000; Clark, Frijters and Shields 2008). Despite the lack of evidence about relative socio-economic status and either experiences or evaluations of purpose, there are theoretical reasons to suppose purpose matters. Others' socio-economic attainment can help us judge how well we are doing as a way to make sense of our lives, and this sense-making process could feel quite meaningful. Chater and Loewenstein (2016) argue that sense-making is an impulsive drive, "similar to hunger, thirst and sexual desire" (p. 145). Interpreted through the framework of Kahneman and Miller (1986) and the lens of socio-economic status (see p. 20 of this thesis), we are driven to make stimulus-centred judgements that incorporate our own and/or others' socio-economic status into the reference category. We don't just notice our own and others' income; instead, we driven to make sense of it. One way to make sense of our own socio-economic status is by comparing it to something else, such as the norm for socio-economic status, which can be inferred by what aspects of socio-economic status are visible.

If we aren't doing as well as we think we should be based on our standards or according to others, we might feel angry or unhappy – measures of pleasure – but equally, we might feel as if our lives or activities are not as worthwhile or meaningful as they could be - measures of purpose. Or, if others' socio-economic attainment serves as a signal that we will do better in the future, we could feel hopeful and happy – measure of pleasure – and that what we are doing to get there is worthwhile and meaningful – measures of purpose. As with evaluations and experiences, whether absolute or relative socio-economic status matters more for pleasure or purpose is unclear. Again, the predictions tested in this chapter are shown in Table 4.1 at the end of this chapter.

Will absolute or relative socio-economic status affect SWB more?

Finally, we can consider the question of whether absolute or relative socio-economic status is more important for SWB. This question is about whether our SWB is more determined by who we are or who we are around – or both.

We saw in section 1.4 (p. 61) that interest in the absolute-relative debate in economics was re-instigated by the discovery of the Easterlin paradox. To recap, this paradox shows that although incomes have increased over time, SWB has not (Easterlin 1974; Easterlin 1995). One of the explanations for this paradox is the effect of relative income. If relative income matters more than absolute income, increases in income over time within a country will not benefit overall SWB. This may be because people make income comparisons that negatively affect their SWB, and that dominates the positive effect of increases in absolute income on SWB. Empirical evidence supporting the existence of this paradox has come under intense scrutiny (Sacks, Stevenson and Wolfers 2012). Really, however, it is not necessary for the Easterlin paradox to exist for the effects of relative income to matter. Income comparisons may still affect SWB – even more than absolute income – but in such a way that increases in overall income over time are not related to increases in overall SWB (Boyce et al. 2013a; De Keulenaer et al. 2017).

We have already seen that sometimes relative socio-economic status does not affect SWB, which supports the strong absolutist position. At other times, relative socio-economic status does matter for SWB. This would support a mix of the relative and absolute position if absolute socio-economic status continues to matter for SWB alongside relative socio-economic status – and the strong relative position if only relative matters. As discussed in the Introduction (p. 27), the heterogeneity in these results suggest that there are likely to be some circumstances under which absolute socio-economic status matters more than relative socio-economic status, others when relative socio-economic status matters more than absolute and still others when they both matter. What is now needed is a better understanding of when absolute or relative socio-economic status matters most.

It is difficult to know whether absolute or relative status matters most in part because of methodological issues. As discussed on p. 136, mediation analyses – especially with non-experimental secondary data like in this research – can produce misleading results (Maxwell and Cole 2007; Bullock, Green and Ha 2010). Following Wood et al. (2012), alternative tests of model fit (AIC and BIC tests) between models containing only relative or absolute socio-economic status are considered. While the contest between absolute and relative status has been considered before, this is the first time it has been considered with hundreds of ways of conceptualising and measuring relative socio-economic status. This will add to the evidence about when absolute or relative socio-economic status matter most.

The aspect of socio-economic status
1. Relative education least likely to matter more for SWB vs. absolute education when compared to absolute vs. relative income, wealth and unemployment 2. Relative unemployment second least likely to matter more for SWB vs. absolute unemployment when compared to absolute vs. relative education, income and wealth 3. Relative wealth second most likely to matter more for SWB vs. absolute wealth when compared to absolute vs. relative income, education and unemployment 4. Relative income/earnings most likely to matter more for SWB. vs. absolute income/earnings when compared to absolute vs. relative wealth, education and unemployment
The component of SWB
5. No prediction based on mixed theory
Summary vs. standpoint
6. Standpoint measures of relative socio-economic status will be more closely associated with SWB than summary measures but which standpoint measure is not predicted

Table 4.1: Summary of predictions in chapter four.

4.2 ATUS results

Descriptive statistics, including means and standard deviations, for the relative variables are shown in Appendix C, Table 4.1 (descriptive statistics for all of the other variables, as previously mentioned, are in Appendix B). The correlations between the relative variables are shown in Appendix C, Table 4.2, and the results of bivariate regressions explaining variance in SWB from the relative variable are shown in Appendix C, Tables 4.3-4.6.

Turning now to the relative models with controls, 53 relative variables showed evidence of multicollinearity with other predictors. These are shown in Table 4.2 below, and they were excluded from further analyses in this chapter because multicollinearity can inflate the standard errors and cause sign reversals in coefficients. The VIF cutoff of ten was used. Although a VIF of ten or higher does not in and of itself indicate that multicollinearity is a problem (O'Brien 2007), preliminary analyses showed that many of these variables had relatively large coefficients and were positive in regressions with controls, which is in contrast to much of the prior research on relative socio-economic status and SWB. VIFs on weighted and unweighted estimates produced identical conclusions, and the unweighted VIFs are reported here.

It was not possible to exclude the variables that were collinear with the relative variables because often the collinearity was with the absolute socio-economic status variable or the variable used to create the reference group scope. For example, average earnings in gender group in state was collinear with earnings and gender. Without controlling for earnings and gender, the relative coefficient could pick up some of the variation in absolute earnings or gender, which is not the focus of the research questions. An alternative solution to multicollinearity is ridge regression, but this introduces bias into the coefficients, making them difficult to interpret in order to answer the research questions. Ridge regression is a controversial and not universally accepted procedure (García et al. 2016).

Multivariate techniques that reduce the variables into a smaller number of latent factors would not show which aspects of reference groups are most important for SWB, which is essential for the research questions. Changing the reference group scopes (e.g. four instead

of three categories for marital status) did not solve the problem of multicollinearity. Thus, the only choice was to exclude the collinear variables. There were 54 relative variables left in ATUS after excluding those that were collinear with another predictor. For these relative variables, it is not that they are not associated with SWB; rather, that it is not possible to assess how they are associated with SWB in these data.

Variable name	VIF
Rank education in state	297.96
Distance from median education in state	247.82
Rank education in gender group in state	218.45
Rank education in unemployment group in state	194.55
% top education in occupation group in state	112.27
Rank education in race group in state	109.46
Distance from median education in unemployment group in state	87.98
Rank education in marital group in state	78.98
Rank education in parent group in state	74.17
Distance from median education in gender group in state	57.91
Distance from median education in parent group in state	56.25
Distance from median education in occupation group in state	56.08
Median education in occupation group in state	46.52
% top earnings in state	43.9
Distance from median education in race group in state	40.86
% top education in income group in state	36.39
Rank education in income group in state	34.25
Rank education in age group in state	30.58
Average income in marital group in state	30.53
% top income in state	29.21
% top education in state	28.61
Average earnings in gender group in state	28.21
Average earnings in income group in state	28.17
Distance from median education in income group in state	27.45
Distance from median education in marital group in state	27.24
Rank education in occupation group in state	25.94
% top earnings in income group in state	25.86
% top income in gender group in state	25.42
Average earnings in state	24.81
% top income in unemployed group in state	24.23
Average earnings in occupation group in state	23.61
Average income in occupation group in state	22.79
% top income in education group in state	21.96
% top income in occupation group in state	21.8
Average income in education group in state	21.37
Average income in unemployed group in state	20.92
Average earnings in education group in state	20.34
Average income in state	20.34
% top income in marital group in state	20.1
Average earnings in marital group in state	20.07
% top education in marital group in state	19.82
% top education in unemployment group in state	19.39
Distance from median education in age group in state	19.38
Average income in gender group in state	18.33
% top earnings in gender group in state	17.87
% top education in gender group in state	15.81
Median education in state	14.23
% top earnings in education group in state	13.75
% top earnings in occupation group in state	12.9
Median education in income group in state	12.59
% top earnings in marital group in state	11.94
% share income of 1% by state	11.44
% top income in race group in state	10.25

Table 4.2: The relative variables in ATUS with a VIF >= 10 from models including absolute socio-economic status. From OLS regressions with controls and clustered standard errors.

The results for the regressions including controls are discussed in what follows. Only these relative coefficients are discussed because the effect of relative socio-economic status should be interpreted when controlling for absolute socio-economic status. Otherwise, the relative coefficient could absorb some of the effect of absolute socio-economic status and that is not what the research questions this chapter is addressing are about (see p. 217). As a reminder, the control variables are shown in Appendix B, Table 2.3. All control variables are the same between models except for the relative earnings models, which also include earnings as a control variable. The other models do not include earnings because earnings information was missing for many respondents (see section 2.4).

In this chapter, there are 54 relative variables in ATUS that are used to explain variance in four measures of SWB. Thus, in total, there are (54*4) = 216 comparisons made. As discussed in section 2.4, the Bonferroni-adjustment is applied to the tests of statistical significance within datasets in this chapter, which consists of dividing the p-value 0.05 by 216 for a new critical p-value of 0.00023.

Cantril ladder

As shown in Table 4.3 below, only the proportion of people that were unemployed in age groups in states was significantly associated with the Cantril ladder (the full results are in Appendix C, Tables 4.7-4.10 for all measures). For this (older) unemployment variable, an increase in the unemployment rate by 1% is associated with a 0.025 decrease in the ladder (se=0.007, p=6.64E-04). For the new unemployment variable, an increase in the unemployment rate by 1% is associated with a similar 0.023 decrease in ladder scores (se=0.008, p=2.2E-03) but this was marginally not statistically significant with the Bonferroni correction (see Appendix C, Table 4.7). The similar association of these relative unemployment measures with SWB is reassuring and satisfies the robustness check discussed on p. 87.

Relative variable	Cantril ladder				
	b	se	p	r2	n (activities)
% unemployed (old) in age group in state	-2.53	0.74	6.64E-04	0.20	63402

Table 4.3: The ATUS relative variable statistically significantly associated with the Cantril ladder. From an OLS regression with controls and clustered standard errors.

Happy

The only relative variable statistically significantly associated with happiness was rank earnings in income group in state, and increasingly higher rank was associated with increasingly less happiness (b=-0.55, se=0.15, p=2.52E-04; see Table 4.4). This result was robust to multiple imputation, as shown in Appendix C, Table 4.4_MI. It was also robust to random effects, and analyses without and with survey weights and/or controls. It held even when using the 'egen rank' command in STATA using the ATUS dataset instead of the formula from section 2.3 and incorporating the CPS. Around a third of the sample rated their happiness as a six on the zero to six scale, and these happy people were not found in the highest 10% of ranks (only around 2% had high ranks, whereas around 28% did not).

Relative variable	Happy				
	b	se	p	r2	n (activities)
Rank earnings in income group in state	-0.55	0.15	2.52E-04	0.13	34184

Table 4.4: The ATUS relative variable statistically significantly associated with happiness. From an OLS regression with controls and clustered standard errors.

Negative affect

The only relative variable significantly associated with negative affect was the proportion of people with high incomes in age groups in states. A higher proportion of top income earners was associated with increasingly worse negative affect (b=1.03, se=0.22, p=3.31E-06). This is shown in Table 4.5 below

Relative variable	Negative affect				
	b	se	p	r2	n (activities)
% top income in age group in state	1.03	0.22	3.31E-06	0.30	63402

Table 4.5: The ATUS relative variable statistically significantly associated with negative affect. From an OLS regression with controls and clustered standard errors.

Meaning

There was no relative variable statistically significantly associated with experienced meaning, as shown in Appendix C, Table 4.10.

The absolute versus relative contest in ATUS

In thinking about whether absolute or relative socio-economic status matters more for SWB, we consider (1) a model with controls and absolute socio-economic status but without *relative* socio-economic status (the models from chapter three), and (2) models with controls and relative socio-economic status but without *absolute* socio-economic status. For example, the model for average income in age group in state for (1) would include all controls and absolute income, and (2) would include average income in age group in state with controls but without absolute income. As discussed in section 2.4, these models will be compared using AIC and BIC tests of model fit.

For the models in (2) we need to calculate new VIFs because aspects of absolute socio-economic status are excluded from the models, which should reduce problems of multicollinearity. It does. There are only 35 variables with VIF >= 10 in ATUS when absolute socio-economic status is excluded, as shown in Table 4.6 below. Again, it is not that these variables are not important for SWB – or even that they are not more important than absolute socio-economic status – but rather that their effect cannot be estimated reliably with these data.

Relative variable	VIF
% top education in occupation group in state	112.2
Median education in occupation group in state	46.43
% top earnings in state	45.31
% top education in income group in state	36.33
Average income in marital group in state	30.49
Average earnings in income group in state	29.84
% top income in state	29.2
Average earnings in gender group in state	28.63
% top education in state	28.61
% top earnings in income group in state	26.77
% top income in gender group in state	25.42
Average earnings in state	24.46
% top income in unemployed group in state	24.23
Average earnings in occupation group in state	23.44
Average income in occupation group in state	22.74
% top income in education group in state	21.88
% top income in occupation group in state	21.74
Average income in education group in state	21.35
Average earnings in education group in state	21.31
Average income in unemployed group in state	20.92
Average income in state	20.34
% top income in marital group in state	20.06
% top education in marital group in state	19.8
% top education in unemployment group in state	19.39
Average earnings in marital group in state	18.82
Average income in gender group in state	18.33
% top earnings in gender group in state	17.87
% top education in gender group in state	15.8
Median education in state	14.23
% top earnings in education group in state	14.06
% top earnings in occupation group in state	12.85
Median education in income group in state	12.58
% top earnings in marital group in state	11.73
% share income of 1% by state	11.42
% top income in race group in state	10.24

Table 4.6: The relative variables in ATUS with a VIF >= 10 from models excluding absolute socio-economic status. From OLS regressions with controls and clustered standard errors.

There are 72 relative variables remaining in ATUS after excluding those that are collinear. We can now consider whether models with these relative variables fit better than models with only absolute socio-economic status. Following Kass and Raftery (1995), the relative model was considered to fit worse than the absolute model if the BIC difference was less than zero, slightly better but not worth more than a "bare mention" (p. 777) if the difference was between zero and two, slightly better if it was between two and six, moderately better if it was between six and ten and strongly better if it was greater than ten. Lower BIC scores reflect better model fit. Following Kuha (2004), AICs are also presented (the AIC is an alternative assessment of model fit). Again, lower AICs reflect better fit. These results are displayed and discussed in detail in Appendix C, Tables 4.11-4.17. A summary of the results is shown in Tables 4.7 below.

Dimension considered	Proportion of relative models that fit better than absolute socio-economic status
Socio-economic status	
Household income	0%
Individual earnings income	40.63%
Education	0%
Unemployment	4.69%
Subjective wellbeing	
Cantril ladder	23.61%
Happy	25.00%
Negative affect	5.56%
Meaning	4.17%
Summary or standpoint	
Summary	6.25%
Standpoint	22.92%

Table 4.7: Summary of the ATUS results of AIC and BIC tests of model fit. The relative was considered better than the absolute fit if both the **Δ**AIC and **Δ**BIC >=2.

From Table 4.7, we can see that the relative models fit better than the absolute models for individual earnings income especially (40.63% of models), less so for unemployment (4.69% of models) and not at all for household income or education (0% in each case). In terms of SWB, the relative fit better than the absolute models for the Cantril ladder and happiness especially (23.61% and 25%, respectively), and less so for negative affect (5.56%) and experiences of meaning (4.17%). The models with standpoint relative measures fit better than the absolute model more often than for summary relative measures (22.92% and 6.25%, respectively).

4.3 ELSA results

Descriptive statistics, including means and standard deviations, for the ELSA relative variables are shown in Appendix C, Table 4.17. Recall that descriptive statistics for all of the other variables are in Appendix B. The correlations between the relative variables are shown in Appendix C, Table 4.18, and the bivariate associations of the relative variables with SWB are shown in Appendix C, Tables 4.19-4.22.

For the same reasons as described for ATUS in the last section, there were 60 variables in ELSA that were excluded because they had a VIF >= 10, as shown in Table 4.8 below. These VIFs are from linear regressions models that include dummies for wave, which account for the idea that wave fixed effects could be collinear with the relative variables. There were 140 relative variables left in ELSA after excluding those that were collinear with the fixed effects and/or control(s). There are four measures of SWB in ELSA, and to make the Bonferonni correction, the calculation is (140 X 4) = 560, 0.05 / 560 = 0.000089. Thus, the level of statistical significance for the ELSA analyses in this section is 0.000089.

Because we are interested in causal estimates for the reasons discussed in section 2.1, we turn now to the fixed effects models with controls. For the interested reader, the OLS regressions with controls are in Appendix C, Tables 4.23-4.26, and the fixed effects regressions without controls are in Appendix C, Tables 4.27-4.30. Only the relative measures that had a VIF < 10 are shown in these tables, however, because relative effects should not be interpreted in the absence of controlling for absolute effects (see discussion on pp. 217, 237).

Relative variable	VIF
Rank education in unemployment in GOR	164
Rank education in race in GOR	159.8
Rank education in parent in GOR	124.39
Rank education in religion in GOR	114.81
Rank education in gender in GOR	104.47
Rank education in political in GOR	79.29
Rank education in marital in GOR	75.2
% top education in occupation in GOR	47.31
Distance from median education in unemployment in GOR	35.55
Distance from median education in religion in GOR	34.05
% top wealth in gender in GOR	33.69
Distance from median education in occupation in GOR	29.03
Distance from median education in race in GOR	28.68
Rank earnings in race in GOR	27.72
Distance from median education in political in GOR	27.59
Distance from median education in marital in GOR	27.04
Rank earnings in gender in GOR	27.03
Rank earnings in parent in GOR	25.69
Median education in occupation in GOR	25.19
Average earnings in age in GOR	25.11
% top wealth in unemployment	23.81
Distance from median education in parent in GOR	23.75
Distance from median education in age in GOR	23.22
Rank earnings in religion in GOR	22.81
Rank education in occupation in GOR	21.22
Average wealth in unemployment	20.8
Rank earnings in occupation in GOR	20.65
Distance from median education in gender in GOR	20.14
% top wealth in political in GOR	19.77
% top wealth in occupation in GOR	19.38
% top wealth in race in GOR	18.87
% top wealth in marital in GOR	18.76
Rank earnings in political in GOR	18.71
Average wealth in gender in GOR	16.65
Rank earnings in marital in GOR	16.57
% top wealth in religion in GOR	16.26
Average income in occupation in GOR	16.06
% top education in gender in GOR	16.01
Rank earnings in education in GOR	15.49
% top wealth in parent in GOR	15.47
% top education in political in GOR	15.19
% top wealth in age in GOR	14.62
Rank education in income in GOR	14.56
Average earnings in marital in GOR	13.59
Rank earnings in wealth in GOR	13.32
Average wealth in parent in GOR	12.61
Average income in political in GOR	12.4
Average wealth in occupation in GOR	12.09
Average income in education in GOR	11.97
Average wealth in race in GOR	11.78
Average wealth in political in GOR	11.71
Average wealth in marital in GOR	11.15
Average income in gender in GOR	11.15
Average earnings in gender in GOR	11.07
% top education in marital in GOR	11.02
% top education in race in GOR	10.7
Average wealth in education in GOR	10.65
Rank education in LA	10.23
Average income in marital in GOR	10.18
% top wealth in education in GOR	10.05

Table 4.8: The relative variables in ELSA with a VIF >= 10 from linear regression models including absolute socio-economic status. Includes wave dummies, other controls and robust standard errors.

Life satisfaction (1)

The statistically significant relationships of relative socio-economic status with the first life satisfaction measure are shown in Table 4.9 below (the results of all these models for all SWB measures and relative variables are in Appendix C, Tables 4.31 to 4.34). There were 37 relative variables significantly associated with life satisfaction (1) using the critical p-value of 0.000089 (8.9E-05). Better perceptions of relative standing on the MacArthur ladder and relative to those 'nearby' were associated with better life satisfaction (b=0.01, se=0.001, p=3.2E-38 and b=0.07, se=0.01, p=4.10E-08, respectively). All of the other relationships with life satisfaction (1) were negative. Higher proportions of people with top earnings in marital, gender, race, age, religion, parent, political, occupation and education groups in GORs were associated with worse life satisfaction (e.g. % top earnings in marital in GOR, b=-4.17, se=0.36, p=2.33E-31). Higher average earnings in race, parent, occupation, political, religion and education groups in GORs was associated with worse life satisfaction (e.g. average earnings race in GOR, b=-3.75E-05, se=3.46E-06, p=3.36E-27). Higher median education in religion, unemployment, race, political, gender, parent, age and marital groups in GORs was associated with worse life satisfaction (e.g. median education in religion in GOR, b=-0.09, se=0.009, p=3.32E-22). A higher proportion of people with top education in unemployment, religion, age and parent groups in GORs was associated with worse life satisfaction (e.g. % with top education in unemployment in GOR, b=-2.38, se=0.32, p=4.02E-14). Higher average wealth in religion and age groups in GORs was associated with worse life satisfaction (e.g. average wealth in religion in GOR, b=-6.25E-07, se=1.19E-07, p=1.72E-07). Higher average income in race, religion and parent groups in GORs was associated with worse life satisfaction (e.g. average income in race in GOR, b=-2.16E-05, se=4.86E-06, p=8.83E-06). A higher proportion of people with top incomes in race, gender and religious groups in GORs was associated with worse life satisfaction (e.g. % top income in race in GOR, b=-3.23, se=0.59, p=4.13E-08).

Of these 37 relative variables, seven were not significantly associated with SWB using the critical p-value in this chapter in the multiple imputation results (see Appendix C, Table 4.9_MI). These were % with top income in race and religion groups in GORs; average

income in race, religion and parent in GORs; and average wealth in age and religion groups in GORs.

Relative variable	Life satisfaction (1)				
	b	se	p	r2	n
MacArthur Ladder	0.01	0.001	3.02E-38	0.03	31255
% top earnings in marital in GOR	-4.17	0.36	2.33E-31	0.02	32250
% top earnings in gender in GOR	-5	0.44	2.02E-29	0.02	32250
Average earnings in race in GOR	-3.75E-05	3.46E-06	3.36E-27	0.02	32250
Average earnings in parent in GOR	-3.57E-05	3.44E-06	4.19E-25	0.02	32250
% top earnings in race in GOR	-4.69	0.45	4.87E-25	0.02	32250
Median education in religion in GOR	-0.09	0.009	3.32E-22	0.02	32250
% top earnings in age in GOR	-4.17	0.43	6.13E-22	0.02	32250
Median education in unemployment in GOR	-0.08	0.008	3.20E-21	0.02	32250
% top earnings in religion in GOR	-3.47	0.39	4.23E-19	0.02	32250
% top earnings in parent in GOR	-3.59	0.40	4.87E-19	0.02	32250
Median education in race in GOR	-0.07	0.008	1.18E-18	0.02	32250
Average earnings in occupation in GOR	-2.32E-05	2.63E-06	1.49E-18	0.02	32250
Median education in political in GOR	-0.07	0.008	1.10E-17	0.02	32250
Median education in gender in GOR	-0.08	0.009	1.25E-17	0.02	32250
Average earnings in political in GOR	-2.29E-05	2.89E-06	2.52E-15	0.02	32250
% top earnings in political in GOR	-2.56	0.33	1.65E-14	0.02	32250
% top education in unemployment in GOR	-2.38	0.32	4.02E-14	0.02	32250
Average earnings in religion in GOR	-2.26E-05	2.99E-06	4.82E-14	0.02	32250
Median education in parent in GOR	-0.06	0.009	1.86E-13	0.02	32250
% top education in religion in GOR	-1.96	0.27	8.16E-13	0.02	32250
% top education in age in GOR	-2.13	0.30	2.57E-12	0.02	32250
Average earnings in education in GOR	-1.58E-05	2.26E-06	2.96E-12	0.02	32250
% top education in parent in GOR	-2.15	0.31	9.01E-12	0.02	32250
% top earnings in occupation in GOR	-1.74	0.27	1.40E-10	0.02	32250
Median education in age in GOR	-0.06	0.009	1.97E-10	0.02	32250
% top earnings in education in GOR	-1.58	0.26	1.69E-09	0.02	32250
Well off nearby	0.07	0.01	4.10E-08	0.02	18289
% top income in race in GOR*	-3.23	0.59	4.13E-08	0.02	32250
Average wealth in religion in GOR*	-6.25E-07	1.19E-07	1.72E-07	0.02	32250
% top income in gender in GOR	-3	0.60	4.94E-07	0.02	32250
Average income in race in GOR*	-2.16E-05	4.86E-06	8.83E-06	0.02	32250
Median education in marital in GOR	-0.05	0.01	1.09E-05	0.02	32250
Average income in religion in GOR*	-1.86E-05	4.27E-06	1.34E-05	0.02	32250
Average income in parent in GOR*	-1.81E-05	4.18E-06	1.45E-05	0.02	32250
Average wealth in age in GOR*	-5.79E-07	1.39E-07	3.04E-05	0.02	32250
% top income in religion in GOR*	-1.62	0.41	7.79E-05	0.02	32250

Table 4.9: The ELSA relative variables statistically significantly associated with the first life satisfaction measure. From fixed effects regressions with controls and robust standard errors. *Not robust to multiple imputation.

Life satisfaction (2)

The relationship of the relative variables statistically significantly associated with the second life satisfaction measure are shown in Table 4.10. There were 18 variables associated with the second life satisfaction measure. All of these measures were associated with life satisfaction (1) in Table 4.9. Better perceptions of relative standing on the MacArthur ladder were again associated with higher life satisfaction scores (b=4.92E-03, se=0.0005, p=8.45E-23). Again, all of the other relationships were negative. Higher proportions of people with top education in parent, age, religion and unemployment groups in GORs were associated with worse life satisfaction scores (e.g. % top education in parent in GOR, b=-1.78, se=0.31, p=9.07E-09). Higher average earnings in occupation groups in GORs was associated with worse life satisfaction (b=-1.43E-05, se=2.51E-06, p=1.17E-08). Higher median education in unemployment, political, race, religion, age, parent and gender groups in GORs was associated with worse life satisfaction (e.g. median education in unemployment in GOR, b=-0.05, se=0.009, p=1.61E-08). Higher proportions of people with top earnings in age, gender, occupation, religion and marital groups in GORs was associated with worse life satisfaction (e.g. % to income in age in GOR, b=-2.08, se=0.43, p=1.06E-06).

In the multiple imputation results (see Appendix C, Table 4.10_MI) there were three relative variables not significantly associated with life satisfaction (2). These were % top education in parent in GOR, and % with top earnings in occupation and religion groups in GORs.

Relative variable	Life satisfaction (2)				
	b	se	p	r2	n
MacArthur Ladder	4.92E-03	0.0005	8.45E-23	0.01	31255
% top education in parent in GOR*	-1.78	0.31	9.07E-09	0.01	32250
Average earnings in occupation in GOR	-1.43E-05	2.51E-06	1.17E-08	0.01	32250
Median education in unemployment in GOR	-0.05	0.009	1.61E-08	0.01	32250
Median education in political in GOR	-0.05	0.009	4.03E-08	0.01	32250
Median education in race in GOR	-0.05	0.008	9.13E-08	0.01	32250
Median education in religion in GOR	-0.05	0.01	1.14E-07	0.01	32250
% top education in age in GOR	-1.58	0.30	2.31E-07	0.01	32250
% top earnings in age in GOR	-2.08	0.43	1.06E-06	0.01	32250
% top earnings in gender in GOR	-2.11	0.44	1.81E-06	0.01	32250
% top education in religion in GOR	-1.28	0.28	3.92E-06	0.009	32250
Median education in age in GOR	-0.04	0.009	3.97E-06	0.01	32250
% top earnings in occupation in GOR*	-1.16	0.26	1.02E-05	0.009	32250
Median education in parent in GOR	-0.04	0.009	1.04E-05	0.009	32250
% top education in unemployment in GOR	-1.45	0.34	1.61E-05	0.01	32250
Median education in gender in GOR	-0.04	0.009	5.03E-05	0.009	32250
% top earnings in religion in GOR*	-1.53	0.38	6.40E-05	0.009	32250
% top earnings in marital in GOR	-1.45	0.37	8.12E-05	0.009	32250

Table 4.10: The ELSA relative variables statistically significantly associated with the second life satisfaction measure. From fixed effects regressions with controls and robust standard errors. *Not robust to multiple imputation.

Life meaning

Only the MacArthur ladder was significantly associated with life meaning (b=4.27E-03, se=0.001, p=2.94E-15), as shown in Table 4.11 below. This relationship was robust to multiple imputation (b=0.007, se=0.005, p=1.91E-25, n=42984).

Relative variable	Life meaning				
	b	se	p	r2	n
MacArthur Ladder	4.27E-03	0.001	2.94E-15	0.02	31255

Table 4.11: The ELSA relative variable statistically significantly associated life meaning. From a fixed effects regression with controls and robust standard errors.

Experienced affect last week

Only perceptions of relative standing relative to those nearby and the MacArthur ladder were associated with experienced affect last week, as shown in Table 4.12 (b=0.08, se=0.02, p=3.44E-08 and b=3.06E-03, se=0.001, p=2.59E-07, respectively). These results were robust to multiple imputation (b=0.06, se=0.009, p=3.66E-06 and b=0.004, se=0.0006, p=1.1E-10, respectively).

Relative variable	Experienced affect last week				
	b	se	p	r2	n
Well off nearby	0.08	0.015	3.44E-08	0.02	18289
MacArthur Ladder	3.06E-03	0.001	2.59E-07	0.01	31255

Table 4.12: The ELSA relative variables statistically significantly associated with experienced affect last week. From fixed effects regressions with controls and robust standard errors.

The absolute versus relative contest in ELSA

As in ATUS, we can look at whether the relative variables statistically significantly associated with SWB fit SWB models better or worse than the variables reflecting absolute socio-economic status. First, again, VIFs are obtained for models with relative socio-economic status but without absolute socio-economic status. These are shown in Table 4.13, and are from linear regression models with dummies for wave (as for Table 4.8, described on p. 243). There are 32 relative variables that are excluded because they show signs of multicollinearity, which is an improvement from 60 that were excluded in Table 4.8. Again, these are excluded because it is not possible to interpret a 'relative' effect in the absence of controlling for an absolute one if referring to the relative effects (see p. 217).

Relative variable	VIF
% top education in occupation in GOR	47.18
% top wealth in gender in GOR	33.68
Median education in occupation in GOR	25.16
Average earnings in age in GOR	24.67
% top wealth in unemployment	23.8
Average wealth in unemployment	20.8
% top wealth in political in GOR	19.77
% top wealth in occupation in GOR	19.38
% top wealth in race in GOR	18.87
% top wealth in marital in GOR	18.76
Average wealth in gender in GOR	16.65
% top wealth in religion in GOR	16.26
Average income in occupation in GOR	16.04
% top education in gender in GOR	15.99
% top wealth in parent in GOR	15.47
% top education in political in GOR	15.17
% top wealth in age in GOR	14.62
Average earnings in marital in GOR	13.59
Average wealth in parent in GOR	12.61
Average income in political in GOR	12.39
Average wealth in occupation in GOR	12.08
Average income in education in GOR	11.94
Average wealth in race in GOR	11.78
Average wealth in political in GOR	11.71
Average wealth in marital in GOR	11.15
Average income in gender in GOR	11.15
Average earnings in gender in GOR	11.07
% top education in marital in GOR	11
% top education in race in GOR	10.7
Average wealth in education in GOR	10.65
Average income in marital in GOR	10.18
% top wealth in education in GOR	10.05

Table 4.13: The relative variables in ELSA with a VIF >= 10 from models excluding absolute socio-economic status.

The full results are shown and discussed in detail in Appendix C, Tables 4.36-4.40. A summary of the results is shown in Table 4.14. The relative education models most often fit better than the absolute education models (60.12%), followed by earnings (37.80%), income (35.90%), wealth (30.83%) and unemployment (6.25%). The models for life satisfaction (1) fit best (74.40%), followed by life meaning (36.31%), life satisfaction (2) (34.52%) and experienced affect last week (17.86%). Summary measures of relative status fit better than the absolute models more often than did standpoint measures (51.43% and 35.90%, respectively).

Dimension considered	**Proportion of relative models that fit better than absolute socio-economic status**
Socio-economic status	
Income	35.90%
Earnings	37.80%
Wealth	30.83%
Education	60.12%
Unemployment	6.25%
Subjective wellbeing	
Life satisfaction (1)	74.40%
Life satisfaction (2)	34.52%
Life meaning	36.31%
Experienced affect last week	17.86%
Summary or standpoint	
Summary	51.43%
Standpoint	35.90%

Table 4.14: Summary of the ELSA results of AIC and BIC tests of model fit. The relative was considered better than the absolute fit if both the **Δ**AIC and BIC >=2.

Summaries of all the results in this chapter are in Tables 4.15 and 4.16.

Scope	Summary: Top 1% income shares	Average income	% income 100K+	Average earnings	% earnings 100K+	Median education	% degree+	% unemployed (old)	% unemployed (new)	Standpoint: Rank earnings	Distance from average earnings	Rank education	Distance from median education
State								WC,UH, UNWM	WC,UH, UN,WM	BC,WH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Age group in state		WC,WH, WN,WM	WC,UH, WN,WM	WC,WH, UN,UM	WC,UH, UN,BM	WC,WH, WN,WM	WC,WH, WN,UM	WC,UH, UN,WM	WC,UH, UN,WM	BC,BH, UN,UM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Gender group in state						WC,WH, WN,WM		WC,UH, UNWM	WC,UH, UN,WM	BC,BH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Marital group in state						WC,WH, WN,WM		WC,UH, UN,WM	WC,UH, UN,WM	BC,BH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,UH, WN,WM
Race group in state		WC,UH, WN,WM		WC,WH, UN,WM	WC,BH, BN,WM	WC,WH, WN,WM	WC,WH, WN,WM	WC,UH, UN,WM	WC,UH, UN,WM	BC,WH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Parent group in state		WC,WH, WN,WM	WC,WH, WN,WM	WC,BH, UN,BM	WC,UH, UN,BM	WC,WH, WN,WM	WC,WH, WN,UM	WC,UH, UN,WM	WC,UH, BN,WM	BC,BH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Occupation group in state										BC,BH, UN,UM	BC, BH, UN, WM	WC,WH, UN,WM	WC,WH, UN,WM
Income group in state								WC,UH, UN,WM	WC,UH, UN,WM	WC,BH, UN,WM	BC, BH, UN, WM	WC,WH, WN,WM	WC,WH, WN,WM
Education group in state								WC,UH, BN,WM	WC,UH, BN,WM	BC,BH, UN,WM	BC, BH, UN, WM		
Unemployment group in state						WC,WH, WN,WM						WC,WH, WN,WM	WC,WH, WN,WM

Key	
W = Worse fit than absolute model on AIC/BIC	C = Cantril ladder
B = Better fit than absolute model on AIC/BIC	H = Happy
U=Mixed +/- AIC, BIC, or AIC/BIC between 0 and |2|	N = Negative affect
	M = Meaning
Not a meaure	
Collinear in both Tables 4.2 and 4.6	
Sig. neg. associated with the Cantril ladder only	
Sig. neg. asociated with happy only	
Sig. pos. associated with negative affect only (+ = worse affect)	
Tested for statistical significance and fit, not sig.	
Tested only for model fit	

Table 4.15: Summary of the ATUS results from chapter four. These are Bonferroni-corrected within datasets for the number of comparisons made in this chapter.

		Summary									Standpoint									
		Average income	% income £46K+	Average earnings	% earnings £46K+	Average wealth	% wealth £450K+	Median education	%NVQ4/NVQ5/ Degree+	% Unemployed	Rank income	Distance from average income	Rank earnings	Distance from average earnings	Rank wealth	Distance from average wealth	Rank education	Distance from median education	Perception of money, education, job	Perception of financial situation
Scope	Local authority	U1,U2,UM,WE	U1,B2,UM,WE	B1,U2,BM,UE	U1,U2,UM,UE	W1,W2,WM,UE	W1,W2,WM,UE	B1,B2,UM,UE	B1,U2,UM,BE	W1,W2,BM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,WM,UE	U1,U2,WM,UE	W1,W2,BM,UE	W1,W2,WM,UE	B1,U2,BM,BE	B1,U2,UM,UE		
	Age in GOR	B1,U2,UM,WE	B1,B2,UM,BE		B1,B2,WM,BE	B1,W2,WM,BE*		B1,B2,UM,UE	B1,B2,UM,BE	W1,W2,UM,WE	U1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	U1,U2,UM,UE	U1,U2,BM,UE	W1,W2,WM,UE	B1,U2,UM,UE	B1,U2,UM,UE		
	Gender in GOR		B1,B2,BM,WE		B1,B2,BM,UE			B1,B2,BM,BE		W1,W2,WM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,UM,UE	B1,B2,BM,BE	W1,W2,WM,UE	B1,U2,BM,UE	B1,U2,BM,BE		
	Marital in GOR		B1,B2,BM,WE		B1,B2,BM,UE			B1,B2,BM,UE		W1,W2,UM,BE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,UM,UE	B1,B2,BM,UE	W1,W2,WM,UE	B1,U2,BM,UE	B1,U2,UM,UE		
	Race in GOR	B1,U2,BM,BE*	B1,B2,BM,WE*	B1,B2,BM,BE	B1,B2,BM,BE			B1,B2,UM,UE		W1,W2,UM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,WM,UE	B1,B2,BM,UE	W1,W2,WM,UE	B1,U2,BM,UE	B1,B2,BM,UE		
	Parent in GOR	B1,B2,UM,WE*	B1,B2,BM,UE	B1,B2,BM,UE	B1,B2,UM,UE			B1,B2,BM,UE	B1,B2,BM,BE^	W1,W2,WM,UE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,WM,UE	B1,B2,BM,BE	W1,W2,WM,UE	B1,U2,BM,UE	B1,U2,BM,UE		
	Occupation in GOR		B1,B2,UM,UE	B1,B2,UM,BE	B1,B2,WM,BE^					W1,W2,UM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,UM,UE	B1,B2,BM,UE	W1,W2,WM,UE	B1,U2,UM,UE	B1,U2,BM,UE		
	Income in GOR					W1,W2,WM,UE	W1,W2,WM,UE	B1,B2,UM,UE	B1,B2,BM,BE	W1,W2,UM,WE					U1,U2,BM,BE	W1,W2,WM,UE	B1,U2,BM,UE	B1,U2,BM,UE		
	Wealth in GOR	U1,B2,UM,WE	U1,B2,BM,WE	B1,U2,UM,UE	B1,U2,WM,UE			B1,U2,UM,BE	B1,U2,BM,BE	W1,W2,BM,UE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	U1,U2,WM,UE			B1,U2,UM,UE	B1,U2,UM,BE		
	Education in GOR		B1,U2,UM,WE	B1,B2,UM,UE	B1,B2,UM,UE					W1,W2,UM,UE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	B1,U2,UM,UE	W1,W2,BM,BE	W1,W2,WM,UE				
	Unemployment in GOR							B1,B2,BM,UE	B1,B2,BM,BE						B1,B2,BM,UE	W1,W2,WM,UE	B1,U2,BM,UE	B1,B2,BM,UE		
	Religion in GOR	B1,U2,UM,WE*	B1,B2,BM,WE*	B1,B2,BM,UE	B1,B2,UM,UE^	B1,W2,WM,BE*		B1,B2,BM,UE	B1,B2,BM,BE	W1,W2,UM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	U1,U2,WM,UE	B1,B2,BM,BE	W1,W2,WM,UE	B1,U2,BM,UE	B1,B2,BM,UE		
	Political in GOR		B1,B2,BM,WE	B1,B2,UM,UE	B1,B2,UM,UE			B1,B2,BM,UE		W1,W2,WM,WE	B1,U2,UM,WE	B1,U2,UM,WE	B1,U2,UM,UE	U1,U2,UM,UE	B1,B2,BM,UE	W1,W2,WM,UE	B1,U2,BM,UE	B1,B2,BM,UE		
	Society																		B1,B2,BM,BE	
	Friends																			B1,B2,BM,BE
	Colleagues																			B1,B2,BM,UE
	Nearby																			B1,B2,BM,BE

Key
W = Worse fit than absolute model on AIC/BIC
B = Better fit than absolute model on AIC/BIC
U=Mixed +/- AIC, BIC, or AIC/BIC between 0 and |2|
1 = Life satisfaction (1)
2 = Life satisfaction (2)
M = Life meaning
E = Experienced affect last week
Not a meaure
Collinear in both Tables 4.8 and 4.13
Sig. neg. associated with life satisfaction (1) only
Sig. neg. associated with life satisfaction (1) and (2)
Sig. pos. associated with all SWB measures
Sig. pos. associated with life satisfaction (1) and experienced affect last week
Tested for statistical significance and fit, not sig
Tested only for model fit

Table 4.16: Summary of the ELSA results from chapter four. These are Bonferroni-corrected within datasets for the number of comparisons made in this chapter. *Not robust to multiple imputation for life satisfaction (1), ^ not robust to multiple imputation for life satisfaction (2).

4.4 Discussion

Does relative socio-economic status affect SWB? These results suggest that yes, it does – even when accounting for absolute socio-economic status, after adjusting for multiple comparisons, using causal methods such as fixed effects and conducting multiple imputation. Out of the 107 relative measures in ATUS, only three were associated with SWB; however, out of the 200 measures in ELSA, 30 were associated with SWB. Every aspect of SWB was affected by relative socio-economic status except for experiences of meaning, and there were effects on SWB for all of relative income, earnings, wealth, education and unemployment in at least one dataset. Only the scopes age and income mattered in ATUS, whereas every scope except for local authority, income groups in GORs, wealth groups in GORs, and (perceptions of) friends and colleagues mattered in ELSA (see Tables 4.15 and 4.16). Both summary and standpoint measures of relative status mattered for SWB; however, the evidence was weighted towards summary measures in terms of statistical significance. Most of the statistically significant relative effects explained variance in SWB better than absolute socio-economic status, especially in ELSA.

It is difficult to dismiss the idea that relative socio-economic status affects SWB from these results. In what follows, the results from this chapter are integrated with the literature review from section 4.1 by addressing the direction of the effect of relative socio-economic status on SWB and effects across scopes; effects across the dimensions of socio-economic status, SWB and summaries vs. standpoints; and whether absolute or relative socio-economic status matters more for SWB. A final section discusses the importance of care in selecting the reference group scope in investigations of relative socio-economic status and SWB.

The direction of the effect of relative socio-economic status on SWB and effects across scopes

For the majority of the measures of relative status, higher socio-economic status in a reference group was associated with worse SWB in these results. This was the case for proportion with top incomes in age groups in states in ATUS and negative affect; and in

ELSA, for average income, earnings, wealth and median education, as well as proportion with top incomes, earnings and education across several scopes for the life satisfaction measures (see Table 4.16). These results are consistent with what would be predicted by relative income, deprivation, equity and social distance theories, which were discussed earlier in section 4.1 of this chapter (see p. 210). People see others doing better than they are, and then they feel worse.

There were exceptions to the trend that higher relative status in a reference group was associated with worse SWB. In ATUS, higher rank earnings in income group scopes in states was associated with less happiness. This is in contrast to previous research on rank socio-economic status and SWB, which shows that higher rank is associated with better SWB (Boyce, Brown and Moore 2010; Pérez-Asenjo 2011; Wood et al. 2012; Hounkpatin et al. 2015; Daly, Boyce and Wood 2015). It also contrasts with the results from ELSA showing that better perceptions of relative standing were associated with better SWB. This ATUS result further supports the ideas introduced in the last chapter that there are costs associated with high socio-economic achievement in terms of identity, leisure time, values and/or conformity. Methodologically, because the rank earnings measure was drawn from the CPS and not only the ATUS, it adds robustness to the finding that higher earnings was not associated with better experiences of SWB in the last chapter (see chapter two, p. 105 for further information about the creation of the rank earnings measure). Here, we see that although absolute earnings is not associated with experiences of SWB, higher rank earnings is associated with worse SWB.

Any beneficial effects of downward social comparisons do not appear to dominate the happiness of those who have achieved high earnings relative to those with similar incomes to them. As mentioned earlier (p. 214), this does not mean that social comparison effects are not at play. Instead, it likely means that the negative effects associated with the costs of high socio-achievement dominate in this particular instance. That people with higher rank earnings are less happy, and that a higher proportion of people with top incomes is associated with increased negative affect, illustrates that high achievement has costs for both individuals who achieve and the people who see them achieve.

The other exception to the general trend that higher status in a reference group is associated with worse SWB is for relative unemployment in ATUS, which was associated with worse Cantril ladder scores in the scope age groups in states. This result is more consistent with social capital theory and the 'tunnel effect', as discussed earlier in section 4.1 of this chapter (pp. 209, 218). These theories would predict that people feel better when others are also doing well, and these results show the complementary effect – that people feel increasingly worse when there are increasing numbers of people who are not doing well (in socio-economic terms of high unemployment) in their reference groups. An overall negative effect of relative unemployment on SWB is consistent with most (Di Tella, MacCulloch and Oswald 2001; Wolfers 2003; Alesina, Di Tella and MacCulloch 2004; Clark and Oswald 1994) but not all previous research (Eggers, Gaddy and Graham 2006; Böckerman and Ilmakunnas 2006). The next chapter will consider how these relative effects might differ between unemployed and employed groups, and incorporate an identity and social norm perspective in interpreting them.

Can we know from these results which reference group scopes matter most for our SWB? These results should not be considered in isolation. As discussed earlier in the thesis (pp. 89, 93), when using a similar methodology to the one in this chapter, Pérez-Asenjo (2011) found that the reference group scopes age, sex, race and religion mattered most for evaluations of SWB. All of these reference groups mattered for life satisfaction in ELSA, and in ATUS, age mattered for negative affect and the Cantril ladder. Because age mattered in Pérez-Asenjo (2011)'s study and in both ATUS and ELSA in this research, age is a recommended reference group scope. Future researchers could consider combining age with sex, race, religion – or income in the US, which mattered in ATUS, or any of marital status, parent status, occupation, education, unemployment, or political groups, which also mattered in ELSA. Because there is not a theoretical reason to use rigid age-cutoffs (see p. 95), age groups should be made relative to individuals' own age like in this research (e.g. five or ten years above and below; McBride 2001).

Importantly, however, many comparisons between the relative measures could not be made due to a high degree of collinearity between a relative measure and the absolute measure of socio-economic status or the variable used to create the reference group. These are shown

in the dark grey and light blue boxes in Tables 4.15 and 4.16. For example, average earnings in gender group in state was collinear with earnings and gender in ATUS. This inflated the standard errors and caused coefficients to become positive instead of negative. It could be that some of the aforementioned studies finding a positive effect of relative socio-economic status on SWB are instead reporting a coefficient that is collinear with another variable, rather than an effect that is truly likely to be positive in the population (Putnam 2001; Knies, Burgess and Propper 2008; Knight, Song and Gunatilaka 2009; Firebaugh and Schroeder 2009; Clark, Westergard-Nielsen and Kristensen 2009; Bookwalter and Dalenberg 2010; Dittmann and Goebel 2010; Li et al. 2011). Collinearity statistics such as variation inflation factors, which were used in this study, should be reported as standard in future research into relative socio-economic status and SWB – especially when there is a positive effect of relative socio-economic status on SWB.

It is also important to remember that it cannot be assumed that any relationship of relative socio-economic status with SWB is causal, just as the relationships of absolute socio-economic status with SWB in the last chapter cannot be assumed to be causal. Although people likely don't have much of a direct influence on the socio-economic status attained by their reference groups (unless they work in a human resources capacity or share resources), they can select to whom they make social comparisons. As discussed on p. 214, this is one idea underlying self-enhancement theory (Sedikides and Gregg 2008), where people strategically compare to certain others in order to feel better about themselves. It could be that people choose to compare to others of a similar age, for example, and this makes them feel worse – and that this effect would not occur if people did not choose to compare to others of a similar age. In this example, people are comparing to others that make them feel worse, rather than better, as discussed in self-enhancement theory.

Effects across dimensions of SWB, aspects of socio-economic status and summaries vs. standpoints

No prediction was made for which dimension of SWB would be most affected by relative socio-economic status (see Table 4.1). In this research, the only measure of SWB not to show a significant impact of relative socio-economic status was experiences of meaning in

ATUS. It does not appear that people incorporate information about others' socio-economic attainment in judgements about whether or not their experiences are meaningful, which was one possibility discussed earlier (see p. 230 of this thesis; Chater and Loewenstein 2016). But because there was a positive association of perceptions of relative status with life meaning in ELSA on the MacArthur ladder, these results suggest that others' socio-economic status may be used as information to judge whether one's own life is meaningful – rather than one's experiences.

It is important, however, to interpret the ELSA results showing an impact of relative socio-economic status across all measures of SWB bearing in mind the impact of common method variance (Lindell and Whitney 2001; see p. 226 of this thesis). Only the MacArthur ladder and perceived standing relative to 'those nearby' were associated with SWB, and it is possible this is due to similar question formats between relative status and SWB measures rather than a 'true' effect of relative status. It is also possible that the MacArthur ladder simply captures absolute socio-economic status better than more objective measures, and it is not perception or standpoint per se that really matters (discussion with Sir Michael Marmot, October 2014). That the scopes friends and colleagues did not matter for SWB on perceived standpoint measures could be due to the smaller sample sizes analysed for these measures (see pp. 108, 404).

As with absolute socio-economic status, relative socio-economic status mattered most for people's evaluations of life overall, their experiences of negative affect and happiness, and least for their experiences and evaluations of meaning.[12] This lends credibility to the results in terms of consistency, and highlights that both absolute and relative socio-economic status matter for both how people think about their lives and how they feel during the experience of their lives. Experiences of meaning, however, are more affected by absolute than relative socio-economic status. And as with absolute socio-economic status (see p. 201), even subtle changes in how SWB is conceptualised and measured affect the conclusions that are reached about what affects SWB. Going from asking about whether or

[12] This claim is based on the result that no relative measure was associated with experiences of meaning in ATUS, only perceived standpoint on the MacArthur ladder was associated with life meaning in ELSA and % with top incomes was associated with negative affect in ATUS. It is also supported by the AIC and BIC tests of model fit, which show that relative fit better than absolute models most often for the Cantril ladder and happiness in ATUS, and life satisfaction (1) in ELSA (Tables 4.7 and 4.14).

not people agreed with the statement 'I am satisfied with my life' to asking about how frequently they felt satisfied with the way that their life had turned out reduced the number of relative socio-economic status variables by about half. While differences in the wording of experiential measures were not compared, this could be taken as evidence that life satisfaction is not a reliable construct. It could also be that people include their experiences in their evaluations (see further discussion on p. 354).

Because both evaluations and experiences of SWB are affected by relative socio-economic status, these results suggest that both social comparisons and social experiences may be mechanisms between relative socio-economic status and SWB. As discussed earlier (p. 229), social comparisons are inherently evaluative because they require a judgement about one's self relative to others (Mussweiler 2003). Most of the effects of relative socio-economic status were on evaluations of SWB, supporting the idea that social comparisons are playing a role. But social experiences seem to matter, too, because experiences of SWB were also affected. These results support the possibility that social exclusion or distance play a role in the negative effect of relative status on SWB because time spent (or not spent) with others is likely to be more closely associated with our experiences than our evaluations (Kahneman et al. 2004 – though note the discrepant results from Tay et al. 2014, p. 221 of this thesis for positive affect).

The worsening of negative affect with higher proportions of people with top incomes in age groups in states in ATUS is particularly interesting in the context of the discussion from earlier, "If we aren't doing as well as we think we should be based on our standards or according to others, we might feel angry or unhappy – measures of pleasure – but equally, we might feel as if our lives or activities are not as worthwhile or meaningful as they could be - measures of purpose" (p. 230). This result suggests that the impact is on our experiences of pleasure in terms of negative affect rather than our experiences of purpose in terms of experienced meaning. It could reflect anger or unhappiness with perceived unfair gaps between the rich and the poor, consistent with equity theory, or the experience of social distance between groups. It is interesting that, in ATUS, the proportion at the top mattered for SWB even when average measures did not. While this might suggest that proportional measures at the top are capturing something that average does not, in ELSA,

both measures of proportion at the top and average mattered for SWB. It does not appear from these data that one is better than another. Moreover, these are quite closely associated within scopes (see Appendix C, Table 4.18).

Which of relative income or earnings, wealth, education or unemployment explained variance in SWB better than absolute socio-economic status? In terms of statistical significance, relative income, earnings and unemployment mattered in ATUS (but not education), and relative income, earnings, wealth and education (but not unemployment) mattered in ELSA. This chapter went beyond statistical significance, however, to consider whether absolute or relative models fit better using AIC and BIC criteria of model fit.

It was predicted was that relative education was least likely to matter more for SWB vs. absolute education when compared to absolute vs. relative income, wealth and unemployment (see p. 227). The prediction is supported by ATUS evidence, where none of the relative education models fit better than the absolute models. But it was not supported in ELSA, where over 60% of the relative education models fit better than the absolute education models (see Table 4.14). Overall, the relative education models fit best in ELSA compared to the absolute models. But why not in ATUS? One possibility is that higher education confers more of an advantage in the UK; however, the proportions of adults achieving tertiary education in the UK and the US are similar – if anything, higher education is slightly more common in the UK (OECD 2015). This would suggest education is less positional in the UK than in the US, and should, therefore, be less and not more visible and noticeable because it is more common. Another possibility is that education is discussed more in the UK than in the US in the news, or that it is more visible from patterns in speech or clothing style (Argyle 1994).

The second prediction was that relative unemployment was second least likely to matter more for SWB vs. absolute unemployment when compared to absolute vs. relative education, income and wealth. This prediction was only partially supported. In ATUS, relative unemployment mattered more than absolute unemployment for only 4.69% of the relative models – more than household income or education but less than individual earnings income; in ELSA, relative unemployment mattered more than absolute

unemployment for only 6.25% of models, less than any other set of relative models. In ELSA, it may simply have been that there were too few people in the sample analysed who reported being unemployed (n=233) for there to have been much of an effect. Future research could seek to import unemployment information into a survey with SWB measures, as was done for ATUS and the CPS, to improve the reliability of the estimates.

The third prediction in this chapter was that relative wealth was second most likely to matter more for SWB vs. absolute wealth when compared to absolute vs. relative income, education and unemployment. Wealth information was only available in ELSA and not in ATUS. In ELSA, wealth was about as likely to matter for SWB as was income – 30.83% for wealth versus 35.90% for income and 37.80% for earnings. This does not suggest that there is much of a visibility difference between income or earnings and wealth, although the tests of statistical significance were more often significant for income and earnings than for wealth in ELSA.

Finally, relative income and earnings were predicted to be most likely to matter more for SWB. vs. absolute income when compared to absolute vs. relative wealth, education and unemployment. In ATUS, this prediction was supported – although none of the relative household income models fit better than the absolute income models in ATUS, 40.63% of the relative earnings income models fit better than the absolute earnings models – more than for any other aspect of socio-economic status. The differences between income and earnings appeared to be largely driven by the inclusion of standpoint measures for earnings income, which fit these data well for the Cantril ladder, and were not included for family income because this variable is categorical (see p. 107). It could also be because earnings is more visible than income or because earnings information was more current than income information in ATUS (see p. 85). In ELSA, this prediction was not supported because, as discussed, relative income and earnings mattered more than absolute income and earnings about as often as relative wealth mattered more than absolute wealth – and less often than for relative education, but more often than for relative unemployment.

Of course, relative income, wealth, education and unemployment are not wholly exogenous because, again, people can select to whom they make comparisons (Sedikides and Gregg

2008). In ATUS, the sample is cross-sectional, and so reverse causality and omitted variables could bias the results. It is certainly possible that there are other individual characteristics that affect one's propensity to be in a particular socio-economic group, including prior levels of SWB (Lyubomirsky, King and Diener 2005) and also differences in motivation or even personality, which can change throughout the life course (Boyce et al. 2013b). Some of the nuance in socio-economic trajectories, however, is lost by only considering a fixed effects specification as in this research. It could be that different patterns in income or wealth accumulation over time – e.g. sliding up and then down the socio-economic ladder versus down and then up – have unique associations with changes in SWB over time (Dolan and Lordan 2013; Hadjar and Samuel 2015; Lacey et al. 2016). Losses in status negatively affect SWB more so than gains in status positively affect SWB but these analyses do not investigate these changes (Boyce et al. 2013a; De Keulenaer et al. 2017). This is an issue future research could explore.

This chapter also predicted that standpoint measures of relative socio-economic status would be more closely associated with SWB than summary measures; however, no prediction was made about which standpoint measure. This was based on the idea that for relative status to affect SWB, it should incorporate the level of socio-economic attainment an individual has achieved – consistent with identity theory. Although Parducci's (1965) range-frequency theory suggests that rank measures should be more closely associated with SWB than other standpoint measures such as distance from the average, this theory was developed based on exposure to stimuli like shapes rather than socio-economic status (see p. 212). Thus, it was not clear whether it also applies to socio-economic status.

Overall, the results suggest that standpoint measures of relative socio-economic status were not more consistently associated with SWB than summary measures. The only standpoint measures significantly associated with SWB were rank earnings in ATUS, and perceptions of relative standing relative to 'society' and those 'nearby' in ELSA. Other rank and all distance from the average measures were not significantly associated with SWB, and so it did not make sense to compare them. It's not as if these didn't matter at all for SWB, because some were still 'significantly' associated with SWB if adjusting less harshly for

multiple comparisons.[13] They just didn't appear to matter as much. The only support for the prediction that standpoint measures should be more closely associated with SWB than summary measures comes from ATUS, where the proportion of relative that fit better than absolute models was higher for standpoint than for summary measures (it was the opposite in ELSA). Overall, these results do not strongly support Parducci's (1965) range-frequency theory that rank is what matters; however, it may be that the scopes were too large in this research to capture the effects of rank socio-economic status (see pp. 44, 347).[14]

Does absolute or relative socio-economic status affect SWB more?

A key question that this chapter sought to answer was whether relative mattered more than absolute socio-economic status or vice versa. The answer to this question is that relative usually matters more than absolute socio-economic status – but not always.

In support of the idea that relative matters more than absolute socio-economic status, all of the statistically significant effects of relative socio-economic status on SWB in ELSA were also shown to explain variance in SWB better than absolute socio-economic status according to AIC and BIC model tests of fit. In other words, any significant relative effect in ELSA also fit the data better than a model without the relative effect. This was also the case for rank earnings in ATUS. Therefore, in ELSA, the distribution of socio-economic resources matters more for SWB than one's absolute position when the distribution is summarised as average income, earnings or wealth; median education; or proportion with top incomes, earnings or wealth – as well as when perceptions of relative standing relative to those 'nearby' and in 'society' are considered. In ATUS, one's rank earnings within income groups is more important for SWB than one's absolute level of earnings.

The two exceptions requiring the caveat 'not always' come from ATUS. The relative models for proportions with top incomes and unemployed in age groups in states did not fit

[13] For example, rank earnings in local authority in ELSA just missed the p-value cutoff for life satisfaction (1), as shown in Appendix D, Table 4.31, p. 588.

[14] The estimation method also makes a difference here. Rank wealth in all scopes except local authority and education groups in GORs was positively associated with life satisfaction (2) in ELSA when an "i." was not placed before the categorical control variables in STATA. This was also true for distance from the median education in several scopes in ELSA and life satisfaction (2), and in ATUS, for rank and distance from average earnings, and rank and distance from median education, across several scopes for the Cantril ladder.

these data better than a model without these measures of relative status. These results suggest that relative unemployment and income (in ATUS) are not more important for an individual's SWB than whether or not an individual is unemployed or what income they have, but their standpoint earnings are more important. In sum, therefore, neither the strong absolutist nor relativist positions are supported in these datasets. The answer seems to be that both matter – but with more 'wins' for relative than absolute effects.

Scoping in on the wrong group

One important contribution of this thesis was to explore how variations in the reference group scope affect the relationship of relative socio-economic status with SWB (see p. 33). The significant results across 14 out of 27 scopes – even after adjusting for multiple comparisons and conducting multiple imputation – suggest that prior research finding no effect of relative socio-economic status on SWB may have mis-specified the scope (Diener et al. 1993; Böckerman and Ilmakunnas 2006; Clark, Westergard-Nielsen and Kristensen 2009; Oesch and Lipps 2012; Clampet-Lundquist et al. 2011; Deaton and Stone 2013; Luo, Wang and Huang 2016).[15]

Take, for example, the results of Deaton and Stone (2013). A selection of these are in Table 4.17 below. They also analyse the Cantril ladder, as in ATUS, as well as a single-item measure of whether or not the respondent experienced a lot of happiness yesterday (yes or no). Their data come from the Gallup World Poll. Like in the analyses in chapter three, they look at the effect of absolute income on the ladder and happiness in the US, finding absolute log income to be positively associated with the ladder and happiness.

They then look at the effect of average income in zipcode, county, congress district, MSA (Metropolitan Statistical Area) and state on *average SWB* in zipcodes, counties, congress districts, MSAs, states and countries. This is different to the present analyses, which are at the individual-level. Although they do not control for absolute income at the person-level, they argue that if the overall effect on SWB of relative income is negative, then a negative

[15] For Diener et al. (1993), this appears to be a more likely explanation than the fact that experiential SWB measures were used because relative socio-economic status affected evaluations and experiences of SWB in this thesis (see p. 221 of this thesis).

sign will appear for average income in the reference group scopes because the negative average relative income effect will essentially absorb the positive effect of absolute income. This does not really address the negative effect that absolute socio-economic status could have on SWB, nor the positive effect that relative status could have. Nevertheless, in their results, the effect across all scopes is always positive except for average income in state for happiness, where the effect is negative. They argue, "our results should highlight that the relative income story is inconsistent with at least these data, and cannot be used to support the view that income generates externalities for others, or that universal growth will leave wellbeing unaffected" (p. 594).

What if, however, it is not geographic scopes alone that matter for SWB, and instead the scopes income or age within geographies that matter, as in these analyses? They also argue, "there is no evidence that average zipcode income has a depressing effect on evaluative wellbeing and yet it is surely here, among people that one is most likely to know, that relative income theory has the greatest plausibility" (p. 594). Can it really be assumed, however, that we are most likely to know our neighbours? While other research has found effects of relative socio-economic status on SWB in geographic scopes alone (e.g. Luttmer 2005), it may be that these are not the most reliable scopes that matter in terms of the relationship of relative socio-economic status with SWB. According to a Pew Research poll from 2009, a third of American adults report never having met their neighbours (Pew Research Center 2016). This could even be a high estimate if people who are more likely to respond to a poll are also more likely to talk to their neighbours because they are more sociable. In these analyses in ELSA, relative socio-economic status in the scope local authority never mattered for SWB, even though perceptions of 'those living nearby' did. The scope state alone in ATUS never mattered for SWB. Before we can dismiss the relative income hypothesis, we must consider the scope within which this hypothesis is considered – as well as the standpoint within which one is situated in scopes.

Self-reported well-being and relative income

	Ladder			Happiness		
USA	***β***	**s.e.**	**# obs**	***β***	**s.e.**	**# obs**
Person level data	**0.508**	**(0.002)**	**1,083,971**	**0.043**	**(0.0004)**	**1,084,890**
Averages by:						
Zipcode	0.627	(0.011)	7,735	0.037	(0.002)	7,735
County	0.507	(0.018)	2,353	0.031	(0.003)	2,353
Congress District	0.491	(0.032)	470	0.023	(0.004)	470
MSA	0.401	(0.039)	365	0.012	(0.005)	365
State	0.419	(0.136)	51	−0.010	(0.015)	51
World						
Person level data	0.554	(0.003)	639,431	0.054	(0.0008)	504,543
Country averages	0.675	(0.078)	160	0.034	(0.034)	160

Notes: Regressions have either the ladder or happiness as the dependent variable, and we report the coefficient on log income. Regressions include controls for sex, age groups, and white/non-white (US only), either individual or average. Person level US (world) regressions contain zipcode (country) dummies. Counties and zipcodes are excluded if there are fewer than 50 people in the sample. The happiness question was not asked in all rounds of the World Poll, which accounts for the fewer number of observations in the world data.

Table 4.17: The effects of relative income on SWB from Deaton and Stone (2013).

Chapter summary

In this chapter, we have seen that relative socio-economic status matters for SWB – and usually more than absolute socio-economic status. We now have a better understanding of when and how relative socio-economic status matters for SWB. All of relative income, earnings, wealth, education and unemployment mattered for SWB. All dimensions of SWB were affected apart from experiences of meaning, although the most frequently significant effects were on evaluations of SWB. Higher socio-economic status in a reference group was associated with worse SWB with the exceptions of relative unemployment and rank earnings in ATUS, which were negatively associated with the Cantril ladder and experiences of happiness, respectively. Relative status in the scope age group was consistently associated with SWB across datasets, perceptions of relative standing in the scope 'society' affected all measures of SWB in ELSA and – in contrast to predictions – standpoint measures of relative status did not outperform summary measures in terms of their association with SWB. We next consider how individual characteristics affect the relationship of socio-economic status with SWB. Because relative usually mattered more than absolute socio-economic status, the focus of the next chapter is on how a selection of the relative effects from this chapter differ according to individual characteristics – rather than how absolute effects differ according to individual characteristics. Differences according to individual levels of SWB, absolute socio-economic position, gender and age are investigated.

5. Going beyond the average only to come back again: relative socio-economic status matters to most

Summary

If relative socio-economic status largely negatively impacts SWB, who is most negatively affected? This is the focus of this final empirical chapter of this thesis. It is important if relative status only affects those with high SWB. If so, relative effects may be less of a policy concern because this group is already doing well. This is not the case. Relative socio-economic status negatively affects SWB among those with the lowest SWB, as well as across SWB measures. While relative income theories tend to focus on the effects of relative status among those with high socio-economic wellbeing, and relative deprivation theories among those with low socio-economic wellbeing, neither are entirely misdirected – relative status matters for both those of high and low socio-economic status, as well as those in the middle. Prior literature suggests that women tend to be more relational than men generally, but less competitive and affected by others' socio-economic attainment than men. These results, however, suggest relative status affects both genders – although women were slightly more affected than men on standpoint measures considering both ATUS and ELSA. The unemployed in ATUS were not affected by relative unemployment. This is consistent with social norm theory and some prior research suggesting that people who are employed are more affected by the pressure of labour market competition than the unemployed. Overall, even though there are theoretical reasons to suspect that the effect of relative socio-economic status on SWB differs according to SWB, socio-economic attainment, gender and age, the average results generally held across these different groups, and largely the results suggest that going beyond the average only takes us back to it again.

Structure of chapter

In the prior chapters, we saw that the effects of absolute and relative socio-economic status on SWB differ according to how both absolute socio-economic status and SWB are conceptualised and measured. The effects of relative status are largely negative, consistent with most prior findings in economics and psychology, and so this chapter focuses on the issue of for whom these negative effects are most likely to matter. The result from ATUS that higher rank earnings in income groups in states is associated with higher SWB in terms of happiness is also explored further. Although there are potentially many individual differences that could affect the relationship of relative socio-economic status with SWB, differences according to SWB are important because these directly suggest whether it is the most or least miserable who are most impacted by relative status, and consequently, they affect the policy conclusions that can be drawn from this research. Socio-economic characteristics are important because these illustrate whether the socio-economically advantaged or disadvantaged in society are most impacted and, indirectly but according to a prominent account of wellbeing dominant in some domains, whether it is those who are doing the best or worst that are impacted by relative status (see prior discussion on p. 29). Gender is selected because women are typically more sensitive to social network information than men, except in the domain of socio-economic status, which are both focal areas of this thesis. Age is significant given that ELSA is a sample of older adults only, and prior evidence from domains other than SWB suggests that the importance of social comparisons varies across the life course.

5.1 Literature review

Subjective wellbeing

More people agree that the goal of policy should be to reduce misery than to improve happiness (Dolan 2011). Given the focus of contemporary social policies on improving people's wellbeing, and public support for the idea that policies should reduce misery, it is of interest whether it is the most or least miserable who are most affected by relative socio-economic status. If it is only people with high SWB who are negatively affected by income comparisons, for example, this may suggest that relative income is not very important for policy because it is the people who are already doing well that are negatively impacted by the distribution of socio-economic resources in society. If it is people who are most miserable that are most impacted, on the other hand, this could suggest that relative effects could matter more for policy because they compound the misery of those who are already the least well off.

Many studies have looked at how the effect of absolute socio-economic status differs at different levels of the SWB distribution. In general, income, education and unemployment have stronger effects among those with lower (evaluations of) SWB (Böckerman and Ilmakunnas 2006; Binder and Coad 2011; Graham and Nikolova 2013; Binder and Coad 2015; Lamu and Olsen 2016; Salinas-Jiménez, Artés and Salinas-Jiménez 2016; Fang 2017). Seemingly only one study has investigated the effect of relative income at different points of the SWB distribution. In Japan, Fang and Niimi (2015) investigate perceptions of feeling relatively rich and relatively poor compared to 'others' (the reference group scope is not further specified). They find that the negative effects of perceptions of feeling relatively poor on evaluations of happiness are most pronounced among those who have low SWB. Thus, perceived low relative income appears to compound the misery of the most miserable.

In Fang and Niimi (2015)'s study, feeling relatively rich had positive effects on SWB among those with the lowest SWB only. There were, however, negative effects of feeling rich at the top of the SWB distribution. This is seemingly difficult to explain because

feeling rich should feel good and not bad regardless of one's initial SWB. The authors state, "the happiest group of people even feel unhappy about their superiority" (p. 24). This negative effect could also be a result of controlling for absolute socio-economic status. That is, among people who are relatively happy, if they perceive that they are relatively rich but their incomes are not actually any higher – because absolute income was controlled for in the analyses – then they are less happy. They need to actually be and feel superior, or else feeling relatively rich negatively affects their happiness because they are not rich. This is somewhat consistent with an effect of cognitive dissonance, which predicts that people feel uncomfortable when there is a mismatch between their beliefs, attitudes and behaviour – although in this case the mismatch is not between a belief and a behaviour but rather a belief and a socio-economic characteristic (Festinger 1957). This research will extend the work by Fang and Niimi (2015) by considering more dimensions of SWB and aspects of socio-economic status, looking outside Japan to the US and the UK, and considering non-perceptual measures.

Socio-economic characteristics

On average, most of the effects of relative socio-economic status on SWB have been negative in ATUS and ELSA. This is consistent with most prior research on relative socio-economic status and SWB. Are there some socio-economic groups, however, for whom these negative effects are likely to be larger or smaller? Is it only the rich that care if people are doing better than them, for example, or only the poor who feel bad when they see others surpassing them? Veblen (1899), whom we met in the Introduction and earlier chapters, focussed his writings on a wealthy leisure class. According to him, these people engaged in unproductive conspicuous consumption and leisure while the other, hardworking classes, contributed productively to society. Although his emphasis was on the wasteful consumption of the rich and the unhappiness it caused, he did discuss the impact of these leisure class habits on the working class, too:

> This vicarious consumption practised by the household of the middle and lower classes can not be counted as a direct expression of the leisure-class scheme of life, since the household of this pecuniary grade does not belong within the leisure class… members of each [social] stratum accept as their ideal of decency the scheme of life in vogue in the next higher stratum, and

> bend their energies to live up to that ideal… they must conform to the accepted code, at least in appearance (p. 52).

According to his writings, the middle and lower classes would consume like the upper classes if only they had the resources to do so. Finding that the wealthy and well-educated are most affected by relative socio-economic status would be most consistent with his account of the leisure class and relative income, although it would not be inconsistent with Veblen's writings to find that those of a lower socio-economic status are affected, too.

Duesenberry (1949) focussed less on the rich in his writings about relative income. In attempting to explain why the wealthy were more likely to save at one point in time but wealthier countries were not more likely to save than poorer countries, he argued that both the wealthy and the poor consume and save not as a function of their own income, but as a function of those around them (Cohn 2015). Seemingly, then, all income groups should be affected by relative socio-economic status, but he did qualify his predictions. As Ferrer-i-Carbonell (2005) points out, Duesenberry (1949, Ch 2) also argued that wealthy individuals are less affected by income comparisons than are the poor.

Relative deprivation theory focusses upon all of those who have less as compared to those who have (seemingly) more. There is often a connection made with poverty and political and social movements that respond to the oppression of marginalised groups (Subramanyam et al. 2009). Thus, unlike Veblen's (1899) and Duesenberry's (1949) main focus, it is those of the lowest socio-economic status who are likely to be most affected by relative deprivation. Like Veblen's (1899) work, however, the potential impact of relative socio-economic status on SWB is not only limited to this group. Runciman (1966) was careful to explain that individuals may feel deprived relative to their ingroups (those within the scope of the black circle in Figure 1.1) – or that their ingroup is deprived relative to other outgroups (those outside the scope of the black circle in Figure 1.1). Thus, the well-off could feel deprived relative to other well-off people in their ingroup, i.e. relative to other well-off people (see also Hecht 2017). It would, therefore, not be inconsistent with relative deprivation theory to find that the well-off are also affected by relative socio-economic comparisons, although Runciman did focus on the relatively deprived.

What does the existing empirical evidence say about the socio-economic characteristics of those who are most affected by relative socio-economic status? Regarding income, it is possible to find a study in this vast literature confirming nearly any prediction – even if only focussing on one country. Take the US. Luttmer (2005) shows that evaluative SWB is negatively affected by relative regional income regardless of whether individuals are above or below the median income within their region, suggesting relative income effects on SWB operate at all income levels. But Card et al. (2012) show that the effect of relative income is limited to lower income groups, finding that the job satisfaction of Californian employees is only negatively impacted by learning about others' salaries if they are below the median income (see also Cheung and Lucas 2016). McBride (2001) shows the opposite, that relative income matters most for the rich: the negative effect of relative income on evaluative SWB among people of a similar age is weaker at lower income levels, where absolute income matters more. There do not appear to be any studies from England that disaggregate the results by absolute socio-economic status (Clark and Oswald 1994; Boyce, Brown and Moore 2010; Wood et al. 2012; Hounkpatin et al. 2015; Daly, Boyce and Wood 2015; Hadjar and Samuel 2015; Singh-Manoux, Marmot and Adler 2005). Given the breadth and variety of evidence in this area, and the lack of evidence for England, this chapter provides more empirical evidence to inform the discussion.

In the relative education literature, Botha (2014) found that the SWB of both higher and lower educational groups are affected by relative education. This is based on the result that being above the mean level of education in the reference group is associated with higher evaluative SWB and being below with lower SWB. Nikolaev (2016a) finds that the average negative effect of relative education decreases with increasing education, consistent with the predictions of Duesenberry (1949) and relative deprivation theory.

As discussed in the last chapter (p. 218), the negative effect of higher unemployment in a reference group is most consistent with social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect'. But the economic concept of employment hysteresis is also relevant here (Heap 1980). Employment hysteresis suggests that the overall rate of unemployment is accelerated by high unemployment, emphasising that the past unemployment rate affects the current rate.

Clark (2003) argues that social norms play a role in employment hysteresis, whereby unemployment becomes an acceptable norm as more and more people become unemployed, and this reduces the motivation of the unemployed to seek and return to work. As discussed earlier (p. 218), Clark provides evidence for this by showing that the psychological health (GHQ-12) of the unemployed is positively affected by reference group unemployment, with reference group scopes defined at the regional, household and partner level in the UK. Because unemployed people with high (evaluations of) SWB are less likely to look for a job (Mavridis 2010), his results suggest that employment hysteresis could be at play. Thus, employment hysteresis uniquely predicts a positive effect of unemployment on the SWB of the unemployed. This is consistent with social norm and identity theory because people should have higher SWB when they are more similar to a norm according to this theory. The more unemployed people there are, the stronger the norm for unemployment is – and, therefore, the better their SWB.

A positive effect of relative unemployment on the SWB of the unemployed has also been shown by Stutzer and Lalive (2004) in Switzerland, Powdthavee (2007) in South Africa, Shields and Price (2005) in England (using district health authorities as the scope, differing from Clark 2003), and among men in Australia (Shields, Price and Wooden 2009) and Germany (Clark, Knabe and Rätzel 2010). Another study using cross-country data that supports a positive effect of relative unemployment on the unemployed looks at the wellbeing gap between unemployed and employed groups, which is lower when unemployment is higher (Helliwell and Huang 2014; working paper version only). This was also shown in the UK by Clark and Oswald (1994). These results suggest that the unemployed have higher SWB when unemployment is higher, although it could also be that the employed have lower SWB. The unusual positive average effect of higher relative unemployment on SWB in Russia is stronger for the unemployed (Eggers, Gaddy and Graham 2006).

There are exceptions to the finding that higher relative unemployment is associated with better SWB for the unemployed. One exception is Chadi (2013), who found that becoming unemployed when regional unemployment is high is worse for evaluative SWB than when

it is low; this was found using the same German dataset as Clark, Knabe and Ratzel (2009) but a different estimation method that separated the country into East and West Germany. Using German and Swiss data, Oesch and Lipps (2012) show no effect of regional unemployment on the unemployed except for women, who appear to suffer more from higher regional unemployment than do employed women. Di Tella, MacCulloch and Oswald (2003) look across Europe and the US, finding that the wellbeing gap between employed and unemployed groups is higher when the unemployment rate is higher, rather than lower as in Helliwell and Huang's (2014) working paper and in Clark and Oswald (1994). These results are more consistent with social capital theory, the mixed neighbourhood hypothesis and the tunnel effect because people feel worse when others are also doing 'badly' in terms of being unemployed (see p. 218). The analyses in this chapter will test whether effects consistent with these theories dominate SWB, or whether employment hysteresis and social norm effects explain these data better.

Gender

A large body of psychological research has established that women feel more connected to others and define themselves through social relationships more so than do men (Guimond et al. 2006). An entire philosophical literature has even developed around the finding that women care more than men do about their relationships with others (Gilligan 1982). It is surprising, then, that some of the effects of relative socio-economic status on SWB are stronger or limited solely to men. For example, the finding that relative unemployment can be beneficial, or at least less harmful, for the unemployed's SWB is, significantly, mostly limited to men (Clark 2003; Shields, Price and Wooden 2009; Clark, Knabe and Rätzel 2010; for exceptions see Oesch and Lipps 2012, where women are affected more than men; and Eggers et al. 2006, and Chadi 2013, where there are no gender differences). A potential explanation, supported by neurological evidence, is that social comparisons are domain-specific (Swencionis and Fiske 2014). Men may care more about others in the domain of employment specifically, perhaps fuelled by social norms that define men more so than women through their occupations (Akerlof and Kranton 2010).

A range of evidence supports the notion that men are more affected by high-achieving others than are women. For example, men are more likely to report comparing themselves to famous people than are women (Ladd Wheeler and Miyake 1992). After reading about a high-achieving male when perusing dating profiles, men rate themselves as less desirable but women do not change their own desirability ratings after reading about a high-achieving woman (Gutierres, Kenrick and Partch 1999). Frick (2011) reviews the large literature in this area, concluding that men are more competitive than women in domains ranging from running professionally to solving mazes. This is especially the case in Western countries, although the gender gap in competitiveness appears to be decreasing in recent years. This decrease suggests differences in competitiveness between genders are not innate, biological differences, and instead that they are most likely the result of differing socialisation processes and/or a decreasing gender gap in payment for performance over time – that is, if women are paid to compete and win just as men are paid to do so, then they will compete to a similar extent as men. Changes over time, however, do not speak directly to the lack of innate differences – only that there is some malleability that may or may not be grounded in innate differences.

If men are most affected by relative unemployment, are they also most affected by relative income, wealth and education? After all, these are also achievement domains where men are likely to be more affected by others' achievement given the aforementioned literature. In the relative income and wealth literatures, there are examples of where men are more affected than women (Mayraz, Wagner and Schupp 2009; Knight, Song and Gunatilaka 2009; Hudson 2013), and women more than men (Ifcher, Zarghamee and Graham 2017), but there is also research that has failed to find any significant gender differences (Senik 2004; Singh-Manoux, Marmot and Adler 2005; Luttmer 2005; Davis and Wu 2014; Burkhauser, De Neve and Powdthavee 2017). Gero et al. (2017) show that the effect of gender depends on absolute income – whereas women with high incomes are most affected by their relative rank, men with the lowest incomes are the most affected. In the only relative education study appearing to test for gender differences, Botha (2014) finds none. It is not clear how the identity of being male or female interacts with social comparison processes to affect SWB in the domains of income, wealth and education due to the mixed evidence or the absence of evidence.

A rare and important insight into relative socio-economic status and experiential (as opposed to evaluative) SWB comes from Else-Quest et al. (2012). They conduct a meta-analysis of gender differences in self-conscious emotions, such as guilt and shame, across a range of domains. The key is that they differentiate the results according to whether or not these emotions were measured with evaluative as opposed to experiential indicators. Gender differences in self-conscious emotions were more pronounced in evaluative measures, with women experiencing more shame than men. This is some evidence that social comparisons – inasmuch as they are linked to self-conscious emotions – are more likely to operate at the evaluative than the experiential level. Thus, it is (tentatively) expected that gender differences are likely to be more pronounced in evaluations than experiences of SWB.

Age

Another potentially important individual difference in the relationship of relative socio-economic status with SWB is age. Age usually has a quadratic association with SWB for evaluations (decreasing until about the 40s and 50s and then increasing again) but it has been shown to have both linear and quadratic association for experiences (Blanchflower and Oswald 2008; Stone et al. 2010; Carstensen et al. 2011; Dolan, Kudrna and Stone 2017). The mechanism behind age-related changes in SWB, however, is not well understood.

One theory is that these changes are biological in nature, but why these patterns in age and SWB might have evolved is not clear (Weiss et al. 2012). Another is that expectations about future SWB shape the relationship. When people believe they will have higher SWB in the future relative to their SWB now, their SWB decreases, which is the pattern that occurs until the 50s. From the 50s, people start to believe they will have lower SWB in the future than they have now, and then their SWB increases (Schwandt 2016). Yet another theory suggests that emotional experiences improve with age because people's attention becomes more focused on the positive as they become aware that they have increasingly

less time to live (Carstensen 1992; Carstensen, Fung and Charles 2003). This has been supported with evidence from eye-tracking studies (Isaacowitz et al. 2006).

It may also be that differences in the tendency to engage in social comparison affects the relationship between age and SWB. Evidence for this comes from the domain of physical height. Carrieri and De Paola (2012) show that men have lower evaluative and experiential SWB the shorter they are relative to other men in the same geographic region who are of a similar age and educational status. But this negative impact decreases with increasing age, suggesting comparisons with others' height become less frequent or important as people get older. But again, the domain matters. Cheng, Fung and Chan's (2007) research suggests that older people benefit more in terms of self-perceived health from (downward) comparisons to others' physical health than do younger people. Physical health is, of course, not strictly SWB, although health is related to SWB (Dolan, Peasgood and White 2008).

Even though this thesis is not specifically interested in why SWB might change with age, the fact that social comparisons are not static across the life course is of interest because social comparisons are theorised as one of the ways in which relative socio-economic status affects SWB. Studies have shown that age matters. For example, McBride (2001) provides evidence that relative income among those of a similar age can completely account for the relationship between age and SWB, suggesting that SWB does not change with age but rather with age-related changes in the importance of relative income. Luttmer (2005) finds that the relative income effect appears least strong among those under 30 years, which may be because this age group is less settled and thus compare with their neighbours less. It could also be because their socio-economic identity is not as salient at these ages because they have not yet reached peak earnings age, and norms regarding salary are less defined because salaries are not yet at their peak (Murphy and Welch 1990). Other studies finding that relative income effects differ by age include Clark and Senik (2010), who find that the scope people report using changes with age – self-reported comparisons to colleagues and others increase after 25 years, and comparisons to family members and friends decrease, and Senik (2008), who shows that the positive effect of relative income in Eastern Europe on SWB is stronger among younger people. Studies on relative wealth do not appear to test

for age effects (Graham and Felton 2006; Senik 2009; Cortés Aguilar et al. 2011; Becchetti and Pisani 2012; Hudson 2013; Bhuiyan 2017).

In the relative education and unemployment literatures, differences by age are usually not investigated. An exception is Eggers, Gaddy and Graham (2006), who find that the positive effect of relative unemployment on SWB in Russia holds for both younger and older adults. Age is still important in the relative unemployment literature, largely because analyses focus on working-age adults. If people are not in the labour force because they are young or retired it is likely that they will be less affected by relative unemployment, although it does not appear that this has been explicitly tested. People who are unemployed and subsequently retire show improvements in SWB but it is not clear whether this is down to a change in identity, social comparisons or other mechanisms (Hetschko, Knabe and Schöb 2014). Given the foregoing literature, it is predicted that relative unemployment effects will be strongest for those of working age.

The costs of high socio-economic achievement

Although others' higher socio-economic attainment usually negatively affected SWB in the last chapters, higher rank earnings in income groups in states in ATUS was associated with worse happiness. In this case, more people doing better should improve happiness – rank income goes down, and so SWB should go up. How is this exceptional result expected to differ according to SWB, absolute socio-economic status, age or gender? In considering SWB, we can turn to the only study looking at how the effect of relative status differs according to SWB – Fang and Niimi (2015). Although this research did not investigate rank, they did find feeling relatively rich negatively impacted SWB at the top of the SWB distribution. We might, therefore, expect the negative effects of rank to be more prominent at the top of the SWB distribution. In terms of absolute socio-economic status and gender, the evidence is mixed (see above), and so it is not possible to make a prediction; however, we might expect this effect to be strongest among people who are working age, as was predicted above for the other relative status measures.

5.2 ATUS results

Selecting the reference groups

There were only three reference group measures of relative status significantly associated with SWB in the analyses in the last chapter. Effects by SWB, absolute socio-economic status, gender and age are investigated for all of these reference group measures. They are shown in Table 5.1.

Relative variable	Summary or Standpoint	Aspect of socio-economic status	Scope	Associated dimension (s) of SWB
% unemployed (old) in age group in state	Summary	Unemploy-ment	Age	Cantril ladder
Rank earning in income group in state	Standpoint	Earnings	Income	Happiness
% top income in age group in state	Summary	Income	Age	Negative affect

Table 5.1: The relative variables analysed in chapter five from ATUS. Incudes whether they are a summary or standpoint measure, the aspect of socio-economic status they assess, the reference group scope and the dimension of SWB they were associated with in chapters three and four with the Bonferroni correction.

Subjective wellbeing

To assess differences in the effects of relative socio-economic status at different levels of SWB, quantile regressions were conducted. Following the methodology discussed in Binder and Coad (2011), the relationship of relative socio-economic status with SWB is estimated for those at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles of the distribution – that is, where 10% 25%, 50%, 75% and 90% of the SWB scores are lower, respectively. Higher quantiles reflect higher SWB except for negative affect, where higher quantiles reflect worse SWB. Note that it is not as if the sample is split according to groups with different levels of SWB, such as those with the worst 10% of scores. Doing this would create a

number of problems, including different numbers of respondents between groups, and prior research has shown that estimates can be biased using such an approach (Heckman 1979). Quantile regression uses the whole sample and can be thought of as weighting those who are further away from a certain quantile less heavily – and, likewise, those who are closer more heavily.

These regressions are run with controls, and separately for each of the three reference group variables. Again, standard errors are clustered at the individual level; however, these analyses are conducted without the sampling weights. This is because it was not clear how to estimate the covariance matrix for quantile regression with both clustering and weights at the time of writing (see Silva 2016; Parente and Silva 2016).

The implication of conducting the quantile regressions without weights is that certain groups may be over-represented in the estimates, such as non-minority ethnic populations (see section 2.4, p. 125). When the research questions are analytic in nature – as they are presently – it is not always considered necessary to use sampling weights; however, it does improve the representativeness of the estimates of the sample population – in this case, the US population (Pfeffermann 1993, 2011). When weights are not used, the estimates can still be interpreted analytically in terms of the research question but the parameters should not be taken as point estimates in the population. Thus, these results should not be taken to be representative of the US population.

The average results without and with weights are shown in Table 5.2. As would be expected, the standard errors are smaller without weights, and the coefficients change in magnitude. For happiness and negative affect, the coefficients without and with weights are around 50% different in magnitude. The results of the quantile regressions are shown in Table 5.3. From this Table we can see that relative unemployment in age groups in states significantly negatively impacted all but those with the highest Cantril ladder scores (e.g. quantile 10, b=-3.9, se=1.20, p=0.001; quantile 90, b=-1.20, se=0.71, p=0.08). Rank earnings in income group in state affected all but the least (quantile 10, b=0.09, se=0.19, p=0.61) and most happy (b=-2.10E-15, se=0.01, p=~1). For example, at quantile 25, b=-0.36 (se=0.15, p=0.02). Increasing negative affect with increasing proportions of top

incomes in age groups in states was evident across the SWB distribution except for those with the highest SWB (quantile 10, b=1.6E-13, se=005, p=~1; recall negative affect is reverse coded). The magnitude of the effects increased with better SWB (e.g. quantile 25, b=0.26, se=0.09, p=0.01; quantile 90, b=0.62, se=0.26, p=0.02).

Model	b	se	p	r2	n (activities)
% unemployed (old) in age group in state	**Cantril ladder**				
With weights	-2.53	0.74	6.64E-04	0.2	63402
Without weights	-2.82	0.54	1.50E-07	0.21	63402
Rank earnings in income group in state	**Happy**				
With weights	-0.55	0.15	2.52E-04	0.13	34184
Without weights	-0.22	0.08	8.07E-03	0.11	34184
% top income in age group in state	**Negative affect**				
With weights	1.03	0.22	3.31E-06	0.3	63402
Without weights	0.51	0.13	1.24E-04	0.3	63402

Table 5.2: Results of ATUS regressions explaining variance in SWB from the three relative variables associated with SWB in chapter four, with and without weights. With controls and clustered standard errors.

Model	Cantril ladder				Happy				Negative affect			
	% unemployed (old) in age group in state				Rank earnings in income group in state				% top income in age group in state			
	b	**se**	**p**	**n**	**b**	**se**	**p**	**n**	**b**	**se**	**p**	**n**
Average effect (without weights)	-2.82	0.54	1.50E-08	63402	-0.22	0.08	0.008	34184	1.03	0.22	3.31E-06	63402
Quantile 10	**-3.9**	**1.2**	**0.001**	**63402**	-0.09	0.19	0.61	34184	1.60E-13	0.05	~1	63402
Quantile 25	**-4**	**0.66**	**2.10E-09**	**63402**	**-0.36**	**0.15**	**0.02**	**34184**	**0.26**	**0.09**	**0.01**	**63402**
Quantile 50	**-4**	**0.66**	**2.10E-09**	**63402**	**-0.39**	**0.1**	**1.39E-04**	**34184**	**0.47**	**0.13**	**3.12E-04**	**63402**
Quantile 75	**-2.1**	**0.6**	**5.40E-04**	**63402**	**-0.26**	**0.09**	**0.002**	**34184**	**0.58**	**0.17**	**7.02E-04**	**63402**
Quantile 90	-1.2	0.71	0.08	63402	2.10E-15	0.01	~1	34184	**0.62**	**0.26**	**0.02**	**63402**

Table 5.3: Results of ATUS quantile regressions. These explain variance in the Cantril ladder from % unemployed (old) in age group in state, in happiness from rank earnings in income group in state and in negative affect form % with top income in age group in state. Without weights, with controls and clustered standard errors. Significant effects at quantiles shown in **bold**.

Socio-economic characteristics

To illustrate how the effect of relative socio-economic status differs according to absolute socio-economic status, the average relationships of relative unemployment, rank earnings, and proportions with top incomes by unemployment, earnings and income, respectively, were assessed. For unemployment and income, this was achieved using STATA's subpopulation command for unemployment and income groups, which adjusts the standard errors for the complex survey design using the whole sample rather than just a sub-sample where the survey weights would not be valid (see Royston and Sauerbrei 2009; West et al. 2008). For the relative earnings model, an interaction term between relative and (log) absolute earnings was created. These results are shown in Table 5.4.

From Table 5.4 we can see that the negative effect of proportion unemployed in age groups in states holds only for the not unemployed (b=-2.79, se=0.77, p=2.69E-07). For the unemployed, the effect is positive; however, it is not statistically significant (b=1.32, se=2.93, p=0.65). We can also see that there is not a significant interaction between rank earnings in income group in state and log earnings (b=0.07, se=0.08, p=0.41). This result was robust to multiple imputation, as shown in Appendix D, Table 5.4_MI. The effect of proportion with top incomes in age groups in states on negative affect holds most strongly for those with the lowest incomes, less than $25K (b=2.04, se=0.47, p=1.66E-05). The effect is less strong and not significant for those with higher incomes (p>0.05).

It would also be possible to consider effects of rank earnings by income, and proportion with top incomes by earnings. These supplementary analyses show that for rank earnings, the effects on happiness only hold among those with the highest and lowest incomes of $100K+ (b=-0.48, se=0.21, p=0.02) and less than $25K (b=-2.5, se=0.98, p=0.01). Effects for other income groups were not significant – $75K to less than $100K (b=-0.33, se=0.32, p=0.30), $50K to less than $75K (b=-0.50, se=0.33, p=0.13) and $25K to less than $50K (b=-0.50, se=0.45, p=0.27). Note that these estimates were also calculated using STATA's sub-population command. The interaction of proportion with top incomes by earnings was significant. The positive average effect was b=1.98 (se=0.74, p=0.007), and this decreased with increasingly higher earnings (b=-0.15, se=0.06, p=0.02). All of these were robust to

multiple imputation, though p=0.057 for the earnings interaction (full results available upon request).

Model	b	se	p	r2	n (activities)
% unemployed (old) in age group in state			**Cantril ladder**		
Not unemployed	-2.79	0.77	2.69E-04	0.2	63402
Unemployed	1.32	2.93	0.65	0.27	63402
Rank earnings in income group in state			**Happy**		
Rank earnings in income group in state	-1.2	1.05	0.26		
Log earnings	0.07	0.03	0.01	0.11	34184
ank earnings in income group in state X log earnings	0.07	0.08	0.41		
% top income in age group in state			**Negative affect**		
less than $25K	2.04	0.47	1.66E-05	0.37	63402
$25K to less than $50K	0.98	0.43	0.24	0.3	63402
$50K to less than $75K	0.8	0.47	0.09	0.3	63402
$75K to less than $100K	0.48	0.51	0.34	0.3	63402
$100K+	0.3	0.42	0.48	0.3	63402

Table 5.4: Results of ATUS regressions explaining variance in SWB from relative socio-economic status according to absolute socio-economic status. Specifically, regressions explain variance the Cantril ladder from % unemployed in age group in state by employment group, in happiness from rank earnings in income group in state with an interaction for log earnings, and in negative affect from % with top income in age group in state by income group. With controls (and survey weights), and clustered standard errors. For effects by employment and income groups, estimates are obtained with STATA's subpopulation command, which uses the whole sample to calculate standard errors.

Gender

As with unemployment and income, separate regressions were conducted using STATA's subpopulation command on subsamples of women and men to examine effects of relative socio-economic status on SWB by gender. These results are shown in Table 5.5. The effect of proportion unemployed in age groups in states on the Cantril ladder is limited to women (b=-3.15, se=0.96, p=1.09E-03). For men, the effect is not significant (b=-1.89, se=1.10, p=0.09). The effect of rank earnings in income groups in state on happiness is (arguably) limited to women (b=-0.75, se=0.21, p=2.86E-04). The coefficient for men is smaller and marginally not significant (b=-0.40, se=0.21, p=0.055); however, it is significant in the multiple imputation analyses in Appendix D, Table 5.5_MI (b=-0.45, se=0.20, p=0.02). Both women and men are affected by the proportion of people with top incomes in age groups in states, although the coefficient for women (b=0.88, se=0.30, p=3.51E-03) is smaller than the coefficient for men (b=1.18, se=0.31, p=1.74E-04).

Model	b	se	p	r2	n (activities)
% unemployed (old) in age group in state	**Cantril ladder**				
Women	-3.15	0.96	1.09E-03	0.21	63402
Men	-1.89	1.1	0.09	0.2	63402
Rank earnings in income group in state	**Happy**				
Women	-0.75	0.21	2.86E-04	0.13	34184
Men	-0.4	0.21	0.055	0.15	34184
% top income in age group in state	**Negative affect**				
Women	0.88	0.3	3.51E-03	0.31	63402
Men	1.18	0.31	1.74E-04	0.29	63402

Table 5.5: Results of ATUS regressions explaining variance in SWB from relative socio-economic status by gender. Specifically, regressions explain variance in the Cantril ladder from % unemployed in age group in state by gender, in happiness from rank earnings in income group in state by gender, and in negative affect from % with top income in age group in state by gender. With controls (and survey weights), and clustered standard errors. Estimates are obtained with STATA's subpopulation command, which uses the whole sample to calculate standard errors.

Age

Age usually has a quadratic association with SWB for evaluations but it has been shown to have both linear and quadratic association for experiences (see p. 278). Moreover, the

effects can be different for the US (Blanchflower and Oswald 2009). Therefore, the relationships of relative socio-economic status with SWB by age are investigated using both sub-group analyses, which do not make much of an assumption about the shape of the relationship of age with SWB, and linear and non-linear interactions. The linear and non-linear interactions with age are from one single model. Following Dolan, Kudrna and Stone (2017), the groups are 15-24 years, 25-34, 35-44 years, 45-54 years, 55-64 years, 65-74 years and 75-85 years. The results of these analyses are shown in Table 5.6.

From Table 5.6 it is evident that the negative effect of proportion unemployed (old) in age groups in states on the Cantril ladder is only significant for those aged 25-34 years (b=-4.91, se=2.18, p=0.02) and 35-44 years (b=-5.26, se=1.73, p=2.38E-03). The negative effect of higher rank earnings on happiness holds only for those aged 45-54 years (b=-0.8, se=0.31, p=0.01). Only the youngest are significantly affected in terms of negative affect by the proportion with top incomes in age groups in states (b=3.18, se=1.11, p=4.18E-03). Looking at the interactions, these are only significant for proportion unemployed in age groups in states and the Cantril ladder. This interaction is shown graphically in Figure 5.1.

From Figure 5.1 it is evident that the slope for younger age groups is smaller than the slope for older age groups. For those aged 20 years it appears to be zero or slightly positive, and it becomes increasingly negative with increasing age - though less so with increasing age. For example, the difference between the slopes of those aged 20 years and 30 years appears larger than the slope difference between those aged 30 and 40 years. The slope for those aged 40 years is similar to the slope of those aged 50 years, 60 years and 70+ years. This is not consistent with the strongest effects in the separate age regressions being 25-44 years, which makes it difficult to draw any conclusions.[16] The age results in this section were robust to multiple imputation, as shown in Table 5.6_MI in Appendix D.

A summary of the ATUS results for this chapter are shown in Table 5.7.

[16] Such discrepancies are most likely because all control variables are interacted with age group in the separate regressions as a consequence of the estimation method. However, we are interested in causal estimates for the reasons discussed in section 2.1. Effects that are not robust to controls with interactions, therefore, do not speak to robustly causal effects.

	Cantril ladder					Happy					Negative affect				
	% unemployed (old) in age group in state					Rank earnings in income group in state					% top income in age group in state				
Model	**b**	**se**	**p**	**r2**	**n**	**b**	**se**	**p**	**r2**	**n**	**b**	**se**	**p**	**r2**	**n**
Age groups															
15-24 years	2.79	1.96	0.15	0.14	63402	-0.44	0.6	0.47	0.2	34184	**3.18**	**1.11**	**4.18E-03**	**0.26**	**63402**
25-34 years	**-4.91**	**2.18**	**0.02**	**0.21**	**63402**	-0.3	0.32	0.35	0.21	34184	-0.73	0.86	0.39	0.29	63402
35-44 years	**-5.26**	**1.73**	**2.38E-03**	**0.24**	**63402**	-0.07	0.27	0.78	0.17	34184	0.97	0.79	0.22	0.31	63402
45-54 years	-4	2.44	0.1	0.27	63402	**-0.8**	**0.31**	**0.01**	**0.17**	**34184**	-0.21	0.88	0.81	0.35	63402
55-64 years	-4.44	2.72	0.1	0.29	63402	-0.13	0.36	0.72	0.24	34184	-0.1	1.05	0.93	0.38	63402
65-74 years	-1.2	4.31	0.78	0.27	63402	-0.45	0.54	0.41	0.34	34184	0.43	1.15	0.71	0.36	63402
75-85 years	11.93	9.63	0.22	0.25	63402	1.44	2.46	0.56	0.65	34184	-0.98	1.66	0.55	0.35	63402
Age interactions															
Relative variable	**5.1**	**2.1**	**0.01**			-0.42	0.74	0.57			**2.2**	**0.91**	**0.02**		
Age	4.00E-03	6.50E-03	0.5			-0.01	0.01	0.6			0.01	6.90E-03	0.08		
Age squared	2.00E-06	5.60E-05	0.97	0.20	63402	9.70E-05	1.20E-04	0.44	0.13	34184	-1.40E-04	6.70E-05	0.04	0.30	63402
Relative variable X age	**-0.32**	**0.1**	**1.03E-03**			-0.01	0.03	0.74			-0.05	0.04	0.16		
Relative variable X age squared	**0.0025**	**0.0012**	**4.00E-02**			0.00016	0.00034	0.64			0.00057	0.0004	0.16		
Constant	-1.27	0.54	0.02			0.46	0.55	0.41			1.35	0.48	0.01		

Table 5.6: Results of ATUS regressions explaining variance in SWB from relative socio-economic status by age. Specifically, variance is explained in the Cantril ladder from % unemployed in age group in state by age, in happiness from rank earnings in income group in state by age, and in negative affect from % with top income in age group in state by age. With controls (and survey weights), and clustered standard errors. The age group estimates are obtained with STATA's subpopulation command, which uses the whole sample to calculate standard errors. The interaction estimates do not use this command. Significant effects show in **bold.**

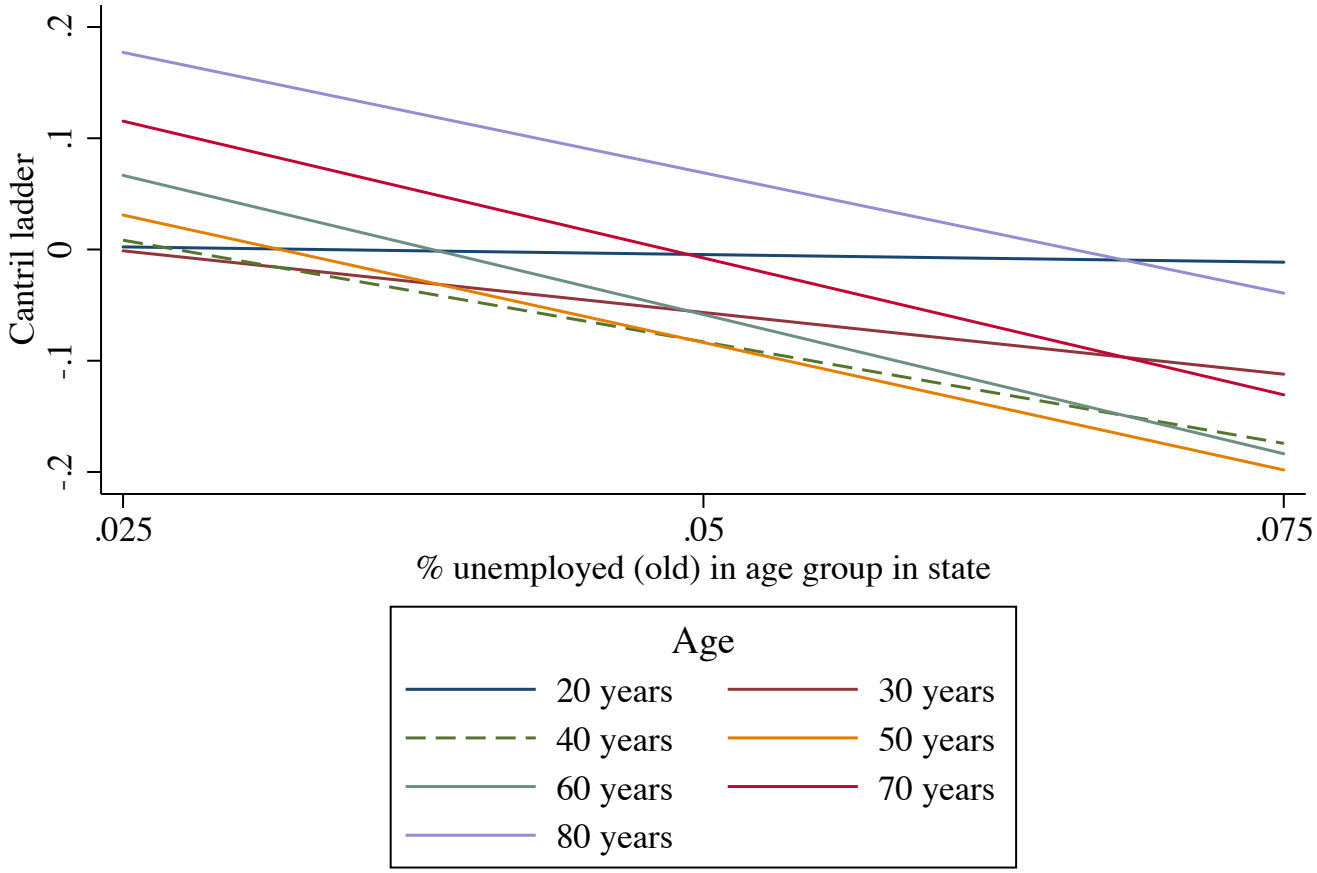

Figure 5.1: Predicted values of the Cantril ladder from proportion unemployed (old) in age groups in states at selected values of age. From a model including proportion unemployed interacted with both age and age squared. With controls (at their means) and clustered standard errors.

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Relative variable	Associated SWB dimension(s)	Effects by….			
		SWB	Socio-economic status	Gender	Age
% unemployed (old) in age group in state	CL	All but highest SWB	Only for not unemployed	Stronger and only sig. for women	Only 25-44 years; sig. interactions show stronger effects at ages 30+
Rank earning in income group in state	H	All but highest and lowest SWB	No interaction with earnings, holds only for <$25K & $100K+	Stronger and only sig. for women	Only 45-54 years, no sig. interactions
% top income in age group in state	NA	All but highest SWB	Holds only for <$25K, weakens with increasing earnings	Affects both women and men	Only 15-24 years, no sig. interactions

Table 5.7: Summary of ATUS results from chapter five. CL= Cantril ladder, H=Happiness, NA= Negative affect.

5.3 ELSA Results

Selecting the reference groups

There were 30 ELSA measures of relative status significantly associated with SWB in the last chapter that withstood multiple imputation (see p. 245). Five of these are further explored in this section for the reasons described in what follows. A principle components analysis was considered to reduce the measures of relative status into a smaller number of associated latent components. Combining some of the reference groups (e.g. average income in race and parent group in state) was also considered as a possibility for these analyses. A number of interesting average effects were discovered the prior chapters using the reference groups already created, however, and these are worthy of further exploration in their own right. Moreover, one of the main conclusions of this thesis so far – that the reference group scope can affect the conclusions we draw about the effect of relative socio-economic status on SWB – would be somewhat obscured because the scopes would no longer be defined based on just two characteristics (i.e. geography and one of the other scope characteristics like gender or age; see pp. 92, 96).

The logic was to select those that were significantly associated across a range of SWB measures, include both summary and standpoint aspects of reference groups, all aspects of socio-economic status (e.g. income, earnings, wealth), focus on the scopes gender and age (of interest in this chapter), maintain consistency with prior literature and investigate unusual associations (e.g. those associated with experienced affect). Although we are interested in differences by socio-economic status in addition to gender and age, all of the measures reflect socio-economic status. Therefore, the scope socio-economic status was not highly prioritised because socio-economic status is already reflected across all measures. 'Well off nearby' and the MacArthur ladder stand out because they are the only relative measures significantly associated with life meaning and experienced affect last week (see Tables 4.11 and 4.12). They are also the only standpoint measures, and so these are included in this section (see Table 5.8).

There were three measures of relative status incorporating the scope gender that were significantly associated with SWB in the last chapter (see p. 245) - % top earnings in gender in GOR, median education in gender in GOR and % top income in gender in GOR. For the scope age, there were also three – % top earnings in age in GOR, % top education in age in GOR and median education in age in GOR. Prior research has used measures of central tendency to summarise relative education (Botha 2014; Nikolaev 2016a; Clark private correspondence 2017), and so median education in gender in GOR is selected based on the principle of comparability with prior literature.

Now that a relative education measure has been selected, we can consider the other aspects of socio-economic status. For income, % top income in gender in GOR is selected because it is the only relative income measure with an age or gender scope significantly associated with SWB. For earnings, proportion with top earnings in gender in GOR and proportion with top earnings in age in GOR are both about earnings; however, we already have gender as a scope and so proportion with top income in age in GOR is selected. No measure of relative wealth or unemployment was significantly associated with SWB in the last chapter and withstood the multiple imputation.

Relative variable	Summary or Standpoint	Aspect of socio-economic status	Scope	Associated dimension (s) of SWB
MacArthur ladder	Standpoint (perception)	Money, education and jobs	Society	LS (1), LS (2), LM, EA
Well off nearby	Standpoint (perception)	Financial situation	'Living around here'	LS (1), EA
Median education in gender in GOR	Summary	Education	Gender	LS (1), LS (2)
% top income in gender in GOR	Summary	Benefit-unit level income	Gender	LS (1)
% top earnings in age in GOR	Summary	Benefit-unit level earnings	Age	LS (1), LS (2)

Table 5.8: The relative variables analysed in chapter five from ELSA. Includes whether they are a summary or standpoint measure, the aspect of socio-economic status they assess, the reference group scope, and the dimension of SWB they were associated with in chapter four. LS= Life satisfaction, LM = Life meaning, EA = Experienced affected last week.

Subjective wellbeing

As in ATUS, quantile regressions were conducted at the 10th, 25th, 50th, 75th and 90th quantiles of SWB. These were fixed effect panel quantile regressions with robust standard errors. Many of the models were not estimable using the default Nelder-Mead method in STATA, and so the Markov Chain Monte Carlo methods (MMC) method was used instead (Baker and others 2016). These results are shown in Tables 5.9 and 5.10. Many of the p-values were highly significant (e.g. p<1.00e-40 across all quantiles for the MacArthur ladder on life satisfaction 1). It may be that the estimation method still failed to calculate standard errors for these coefficients accurately, however, it was the only estimation method that produced results at all quantiles of SWB. They should, therefore, be interpreted with some caution.

The MacArthur ladder had a positive average effect on SWB across all SWB measures (e.g. life satisfaction (1), b=0.01, se=0.001, p=3.02E-38). The relationship of the MacArthur ladder was significant across all quantiles; however, sometimes the association was very small and/or negative rather than positive. This was the case for quantiles 50 and 75 and life satisfaction (1) (e.g. quantile 50, b=-1.6E-16, se=1.4E-19, p<1.00E-40), and quantiles 25, 75 and 90 for life satisfaction (2) (e.g. quantile 25, b=-5.8E-16, se=1.8E-19, p<1.00E-40). For life meaning and experienced affect last week, the effects were also very small and/or negative for quantiles 50+ (e.g. quantile 50 for life meaning, b=-5.4E-16, se=4.0E-20, p<1.0E-40). The most robust effects for the ladder, therefore, are across SWB measures for quantile 10, across all but life satisfaction (2) for quantile 25, on life satisfaction (2) for quantile 50, none for quantile 75 and for life satisfaction (1) at quantile 90.

Turning now to 'well off nearby', the most robust effects for both life satisfaction (1) and experienced affect last week were at quantiles 10 and 25 (e.g. quantile 25, experienced affect last week, b=0.10, se=0.001, p<1.00E-40). At higher quantiles the effects were still statistically significant but they were very small in magnitude (e.g. quantile 90, life satisfaction (1), b=3.8E-15, se=5.8E-17, p<1.00E-40).

For the median education in gender in GOR, on life satisfaction (1) the most robust effects were again at the 10th and 25th quantiles (b=-0.15, se=0.002, p<1.00E-40 and b=-0.08, se=7.6E-04, p<1.00E-40). The coefficients of higher quantiles were very small in magnitude (e.g. quantile 90, b=1.2E-14, se=4.5E-17, p<1.00E-40). On life satisfaction (2) there were only very small effects and these are not interpreted as being practically significant (e.g. quantile 90, b=5.6E-18, se=3.5E-20, p<1.00E-40). Quantile 10 was not even significant for life satisfaction (2) (b=6.5E-15, se=5.7E-15, p=0.25).

Turning now to Table 5.10 and proportion with top income in gender in GOR, the effects on life satisfaction (1) were highest in magnitude for quantiles 10 and 25 (b=-7.9, se=0.10, p<1.00E-40 and b=-3.2, se=0.05, p<1.00E-40). Effects at higher quantiles were very small. For proportion with top earnings in age in GOR, the most robust effects were again for life satisfaction (1) at quantiles 10 and 25 (b=-7.8, se=0.06, p<1.00E-40 and b=-5.1, se=0.03, p<1.00E-40, respectively). Effects at higher quantiles were very small. On life satisfaction (2) the effects across all quantiles were very small and not practically significant (e.g. quantile 90, b=1.1E-14, se=7.4E-18, p<1.00E-40).

Model	Life satisfaction (1)			Life satisfaction (2)			Life meaning			Experienced affect last week		
	MacArthur Ladder											
	b	se	p	b	se	p	b	se	p	b	se	p
Average effect	0.01	0.001	3.02E-38	4.92E-03	0.0005	8.45E-23	4.27E-03	0.001	2.94E-15	3.06E-03	0.001	2.59E-07
Quantile 10	0.03	6.30E-05	p<1.00E-40	0.02	5.60E-05	p<1.00E-40	0.02	7.00E-05	p<1.00E-40	0.02	3.00E-04	p<1.00E-40
Quantile 25	0.02	1.30E-05	p<1.00E-40	-5.80E-16	1.70E-19	p<1.00E-40	0.02	1.60E-05	p<1.00E-40	0.008	5.50E-05	p<1.00E-40
Quantile 50	-1.60E-16	1.40E-19	p<1.00E-40	0.01	0.003	2.24E-04	-5.40E-16	4.00E-20	p<1.00E-40	7.70E-20	6.80E-22	p<1.00E-40
Quantile 75	1.30E-17	1.20E-20	p<1.00E-40	-9.10E-16	1.50E-19	p<1.00E-40	3.50E-18	1.90E-21	p<1.00E-40	-9.40E-19	5.70E-22	p<1.00E-40
Quantile 90	0.009	2.60E-05	p<1.00E-40	3.70E-18	9.40E-22	p<1.00E-40	-4.50E-18	7.40E-22	p<1.00E-40	2.10E-18	4.30E-21	p<1.00E-40
	Well off nearby											
Average effect	0.07	0.01	4.10E-08	*Intentionally blank*						0.08	0.02	3.44E-08
Quantile 10	0.28	0.01	p<1.00E-40							0.27	0.003	p<1.00E-40
Quantile 25	0.26	0.007	p<1.00E-40							0.10	0.001	p<1.00E-40
Quantile 50	-4.10E-15	3.00E-18	p<1.00E-40							6.20E-17	3.10E-20	p<1.00E-40
Quantile 75	-1.00E-16	9.10E-20	p<1.00E-40							4.70E-17	9.20E-20	p<1.00E-40
Quantile 90	3.80E-15	5.80E-17	p<1.00E-40							-5.70E-17	3.90E-18	p<1.00E-40
	Median education in gender in GOR											
Average effect	-0.08	0.009	1.25E-17	-0.04	0.009	5.03E-05	*Intentionally blank*					
Quantile 10	-0.15	0.002	p<1.00E-40	6.50E-15	5.70E-15	0.26						
Quantile 25	-0.08	7.60E-04	p<1.00E-40	8.90E-15	4.50E-18	p<1.00E-40						
Quantile 50	3.90E-15	3.20E-18	p<1.00E-40	1.10E-14	2.70E-17	p<1.00E-40						
Quantile 75	4.70E-17	9.20E-20	p<1.00E-40	1.40E-16	5.50E-20	p<1.00E-40						
Quantile 90	1.20E-14	4.50E-17	p<1.00E-40	5.60E-18	3.50E-20	p<1.00E-40						

Table 5.9: Results of set one ELSA quantile fixed effects regressions with controls explaining variance in SWB from relative socio-economic status at selected SWB quantiles. The relative measures here are the MacArthur ladder, well off nearby and median education in gender in GOR. With controls and robust standard errors. MMC optimisation method.

Model	Life satisfaction (1)			Life satisfaction (2)		
	% top income in gender in GOR					
	b	se	p	b	se	p
Average effect	-3	0.6	4.94E-07	*Intentionally blank*		
Quantile 10	-7.90	0.10	p<1.00E-40			
Quantile 25	-3.20	0.05	p<1.00E-40			
Quantile 50	-4.20E-13	1.60E-16	p<1.00E-40			
Quantile 75	3.00E-14	1.40E-17	p<1.00E-40			
Quantile 90	1.10E-12	6.80E-14	p<1.00E-40			
	% top earnings in age in GOR					
Average effect	-4.17	0.43	6.13E-22	-2.08	0.43	1.06E-06
Quantile 10	-7.80	0.06	p<1.00E-40	-8.30E-12	7.80E-14	p<1.00E-40
Quantile 25	-5.10	0.03	p<1.00E-40	-2.80E-13	1.90E-16	p<1.00E-40
Quantile 50	4.90E-15	1.30E-16	p<1.00E-40	-4.60E-12	8.20E-16	p<1.00E-40
Quantile 75	1.00E-15	4.00E-18	p<1.00E-40	-2.90E-14	3.80E-17	p<1.00E-40
Quantile 90	8.60E-13	2.30E-14	p<1.00E-40	-1.10E-14	7.40E-18	p<1.00E-40

Table 5.10: Results of set two ELSA quantile fixed effects regressions with controls explaining variance in SWB from relative socio-economic status at selected SWB quantiles. The relative measures here are % top income in gender in GOR and % top earnings in age in GOR at selected SWB quantiles. With controls and robust standard errors. MMC optimisation method.

Socio-economic status

For looking at effects according to absolute socio-economic status, we begin with the summary measures because these are less complex to analyse than the standpoint measures (see below in this section). The effects of relative income, earnings and education according to absolute socio-economic status were assessed by creating interaction terms with measures of relative income, earnings and education, respectively. These results are shown in Table 5.11 and Table 5.12.

As shown in Table 5.11, the only significant interaction between median education in gender group in GOR was on the first life satisfaction measure. The negative average effect of median education in gender group in GOR (b=-0.08, se=0.01, p=7.36E-11) was higher for those with NVQ2-equivalent education than for those with no/foreign other education (b=0.04, se=0.02, p=0.04), NVQ-3 equivalent education (b=0.05, se=0.03, p=0.05) and NVQ4/5/Degree+ education (b=0.05, se=0.02, p=0.02). As can be seen in Figure 5.2, this indicates that those with NVQ2-equivalent education are less affected by relative education than (most) other educational groups. The slope for those with those with NVQ2-equivalent education is smaller than for other educational groups. These results were not, however, robust to the multiple imputation, as shown and discussed in Appendix D, Table 5.11_MI.

From Table 5.12, it is evident that interaction of proportion with top income in gender in GOR with income was not significant for the first life satisfaction measure (b=-0.61, se=0.45, p=0.17). There was a significant interaction between proportion with top earnings in age groups in GORs and log earnings for the first life satisfaction measure only. The negative average effect of proportion with top earnings in age groups in GORs (b=-4.24, se=0.43, p=8.25E-23) was increasingly negative with increasingly higher log earnings (b=-0.21, se=0.06, p=2.35E-04). This is a relatively small decrease, as illustrated in Figure 5.3. This interaction was not significant on the second life satisfaction measure (b=-0.002, se=0.06, p=0.97). These results were robust to the multiple imputation, as shown in Appendix D, Table 5.12_MI.

	Life satisfaction (1)			Life satisfaction (2)		
	b	se	p	b	se	p
Median education in gender in GOR	-0.08	0.01	7.36E-11	-0.03	0.01	0.01
Education						
NVQ1/CSE	0.02	0.09	0.85	0.05	0.09	0.58
NVQ2/GCE O Lev	-0.03	0.05	0.55	-0.02	0.05	0.75
NVQ3/GCE A Lev	0.05	0.06	0.38	-0.04	0.07	0.53
Higher ed (below deg)	-0.03	0.06	0.56	-0.02	0.06	0.74
NVQ4/NVQ5/Degree+	0.05	0.05	0.36	-0.08	0.05	0.13
Median education in gender in GOR…						
X NVQ1/CSE	0.001	0.04	0.98	-0.02	0.05	0.65
X NVQ2/GCE O Level	0.04	0.02	0.04*	-0.001	0.02	0.95
X NVQ3/GCE A Level	-0.02	0.03	0.56	-0.01	0.03	0.79
X Higher ed (below degree)	0.02	0.02	0.36	-0.01	0.02	0.64
X NVQ4/NVQ5/Degree+	-0.01	0.02	0.49	-0.004	0.02	0.83
Constant	-4.2	0.58	2.91E-13	-1.6	0.54	2.17E-03
r2	0.02			0.009		
N	32250			32250		

Table 5.11: Results of ELSA fixed effects regressions with controls explaining variance in SWB from median education in gender in GOR with an interaction by educational group. Reference is none/foreign/other education. Robust standard errors. *Not robust to multiple imputation.

	Life satisfaction (1)			Life satisfaction (2)		
	b	**se**	**p**	**b**	**se**	**p**
% top income in gender in GOR	2.9	4.42	0.51	*Intentionally blank*		
Log income	0.03	0.02	0.12			
% top income X log income	-0.61	0.45	0.17			
Constant	-4.2	0.61	5.17E-12			
r2		0.02				
N		32250				
% top earnings in age in GOR	-4.24	0.43	8.25E-23	-2.1	0.43	9.67E-07
Log earnings	0.01	0.003	7.00E-05	-0.001	0.003	0.84
% top earnings X log earnings	-0.21	0.06	2.35E-04	-0.002	0.06	0.97
Constant	-4.4	0.57	2.94E-14	-1.7	0.53	1.26E-03
r2		0.02			0.01	
N		32250			32250	

Table 5.12: Results of ELSA fixed effects regressions with controls explaining variance in SWB from proportion with top income in gender in GOR by income and % top earnings in age in GOR by earnings. Robust standard errors.

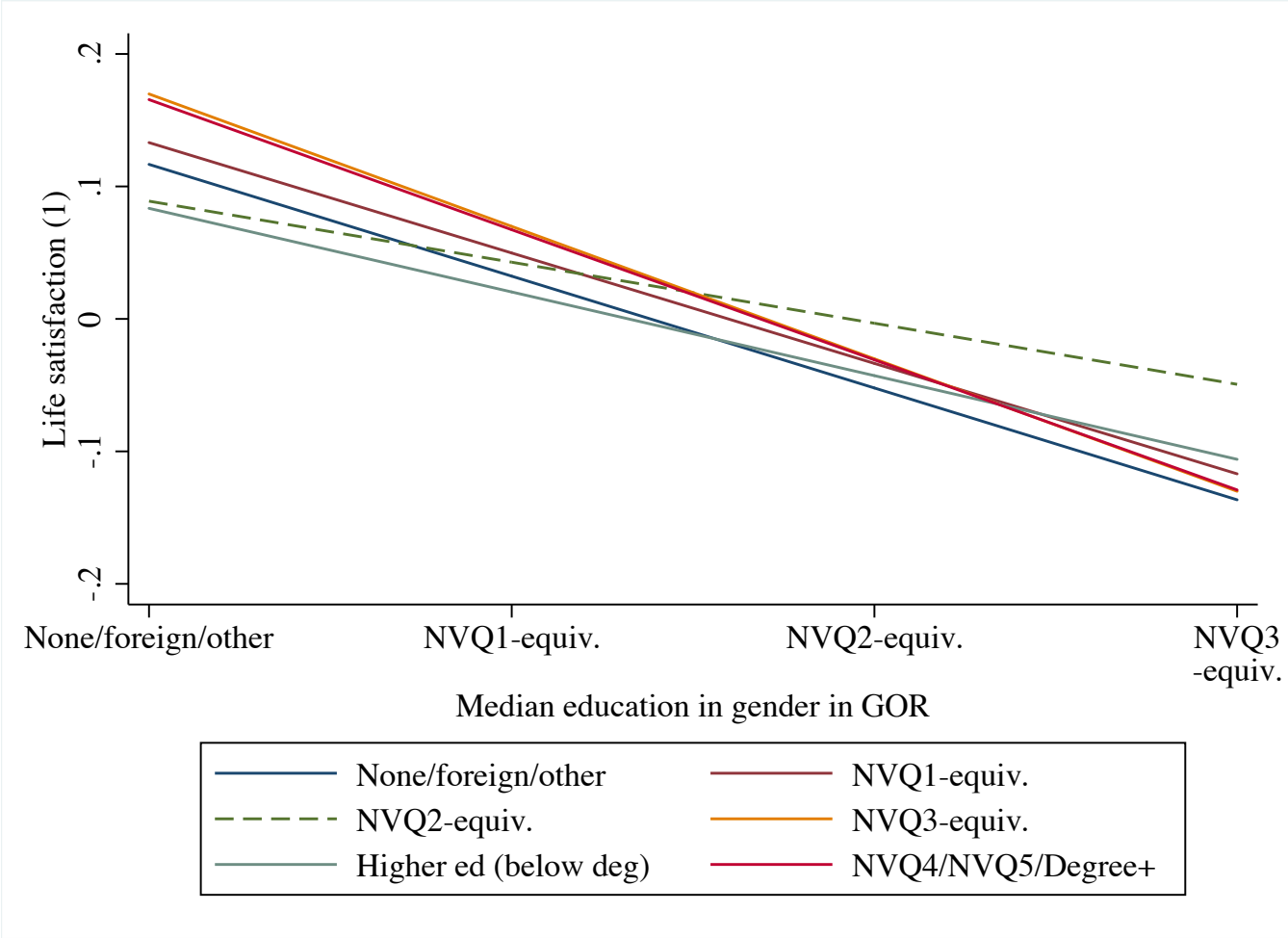

Figure 5.2: Predicted values of life satisfaction (1) at selected values of median education in gender group in GOR at all educational groups. Model includes fixed effects, controls and robust standard errors. Not robust to multiple imputation.

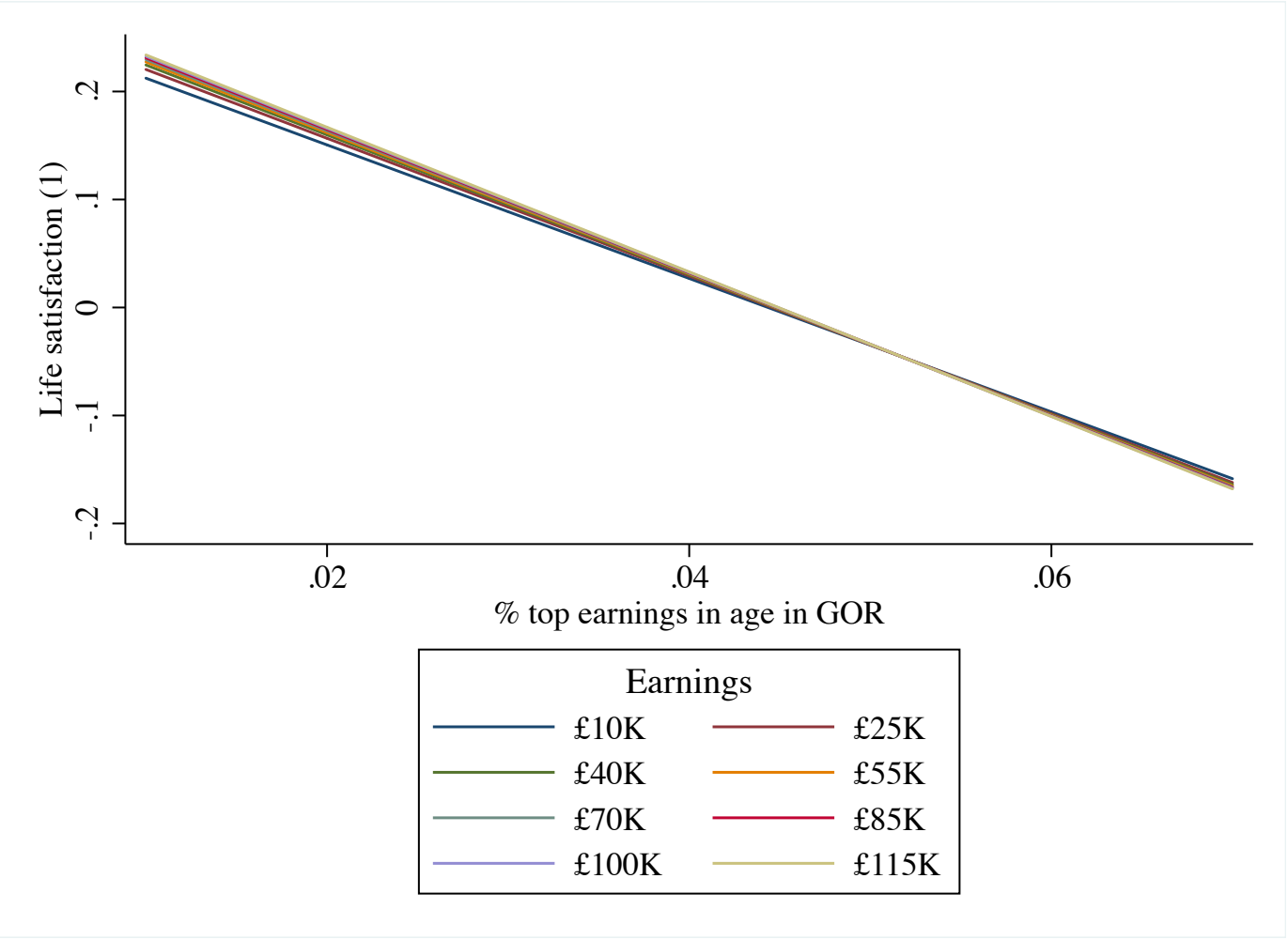

Figure 5.3: Predicted values of life satisfaction (1) at selected values of % with top earnings in age group in GORs and selected values of log earnings. Covariates at means. Labels show unlogged values. Model includes fixed effects, controls and robust standard errors.

For the MacArthur ladder, more complex models containing interactions with all of income, earnings, wealth, education and unemployment are shown in Tables 5.13 and 5.14. For 'well off nearby', interactions with income, earnings and wealth are shown in Table 5.15.[17]

Starting with income in Table 5.13, the interaction was not significant across life satisfaction (1) and (2) and life meaning ($p>0.05$). For experienced affect last week, the positive average association (b=0.02, se=0.004, p=4.25E-04) was weaker with increasing log income (b=-0.001, se=4.5E-04, p=4.08E-03). For earnings, there was a significant interaction for life satisfaction (1) and (2) but the interactions were not significant for life meaning and experienced affect last week ($p>0.05$). On life satisfaction (1), the positive average association of the MacArthur ladder (b=0.01, se=0.001, p=8.16E-39) was increasingly positive with increasingly higher log earnings (b=1.4E-04, se=5.9E-05, p=0.02). This was also the case for life satisfaction (2), where the positive average association (b=0.005, se=5.00E-04, p=3.81E-23) was stronger with increasingly higher earnings (b=1.10E-04, se=5.6E-05, p=0.05).

For log wealth, the interaction was significant for life satisfaction (1) and life meaning but not life satisfaction (2) or experienced affect last week ($p>0.05$). On life satisfaction (1), the positive average association of the MacArthur ladder (b=0.01, se=0.002, p=3.3E-09) was weaker with increasing log wealth (b=-3.300E-04, se=1.4E-04, p=0.03). The same was the case for life meaning, where the positive average association (b=7.4E-03, se=1.5E-03, p=1.24E-06) was weaker with increasingly higher log wealth (b=-2.8E-04, se=1.2E-04, p=0.02).

For unemployment, the interaction was significant for life satisfaction (2) only. The average positive effect of the MacArthur ladder (b=0.005, se=0.001, p=3.76E-22) was stronger for people who were unemployed versus those who were not unemployed (b=0.007, se=0.004, p=0.04).

[17] The MacArthur ladder asks about 'money, education, and jobs'; therefore, all of income, earnings, wealth, education, occupation and unemployment are considered. 'Well off nearby' asks people about their household's financial situation; therefore, income, earnings and wealth are considered. See Table 2.4 for the wording of these items.

Looking to the interaction with education in Table 5.14, there was a significant interaction effect on experienced affect last week. The positive average effect of the MacArthur ladder (b=0.004, se=0.001, p=1.45E-05) was weaker for those with NVQ3-equivalent education than those with no, foreign, or other education (b=-0.004, se=0.002, p=0.05). On life satisfaction (1), the positive average effect of the MacArthur ladder (b=0.01, se=0.001, p= 2.55e-15) was stronger for those with higher education but below a degree than for those with NVQ4/5/Degree+ education (b=0.004, se=0.001, p=0.043).

None of the interactions in Tables 5.13-5.14 were robust to multiple imputation (see Appendix D, Tables 5.13_MI-5.14_MI), however, and so they should be interpreted with caution. They are shown graphically in Appendix D, Figures 5.1 – 5.4.

	Life satisfaction (1)			Life satisfaction (2)			Life meaning			Experienced affect last week		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
MacArthur Ladder	0.01	0.003	6.35E-03	0.006	0.003	0.06	0.003	0.004	0.4	0.02	0.004	4.25E-04
Log income	0.02	0.02	0.4	0.007	0.02	0.75	-0.006	0.03	0.82	0.09	0.03	3.37E-03
Ladder X log income	-2.40E-04	3.40E-04	0.49	-1.50E-04	3.50E-04	0.66	1.00E-04	4.10E-04	0.81	-0.001	4.50E-04	4.08E-03*
Constant	-4.4	0.6	4.81E-13	-1.8	0.57	1.67E-03	-2	0.63	1.68E-03	-4	0.68	3.85E-09
r2		0.026			0.014			0.017			0.014	
MacArthur Ladder	0.01	0.001	8.16E-39	0.005	5.00E-04	3.81E-23	0.004	0.001	2.78E-15	0.003	0.001	2.30E-07
Log earnings	-0.01	0.004	0.1	-0.01	0.004	0.04	-0.002	0.004	0.67	-0.001	0.005	0.85
Ladder X log earnings	1.40E-04	5.90E-05	0.02*	1.10E-04	5.60E-05	0.05*	-7.00E-06	6.10E-05	0.91	3.40E-05	6.90E-05	0.62
Constant	-4.2	0.57	1.24E-13	-1.7	0.53	1.17E-03	-2	0.57	4.04E-04	-3.3	0.64	2.15E-07
r2		0.027			0.014			0.017			0.013	
MacArthur Ladder	0.01	0.002	3.03E-09	0.006	0.002	3.11E-05	7.40E-03	1.50E-03	1.24E-06	0.005	0.002	0.01
Log wealth	0.02	0.008	6.64E-03	0.02	0.007	0.02	0.02	7.30E-03	6.23E-03	1.00E-02	0.009	0.26
Ladder X log wealth	-3.00E-04	1.40E-04	0.03*	-1.20E-04	1.20E-04	0.33	-2.80E-04	1.20E-04	0.02*	-1.50E-04	1.60E-04	0.33
Constant	-4.4	0.58	3.11E-14	-1.8	0.54	9.41E-04	-2.2	0.58	1.68E-04	-3.4	0.64	1.48E-07
r2		0.027			0.014			0.017			0.013	
MacArthur Ladder	0.01	0.001	9.75E-38	0.005	0.001	3.76E-22	0.004	0.001	5.87E-15	0.003	0.0006	4.74E-07
Unemployed	-0.4	0.19	0.02	-0.47	0.2	0.02	-0.26	0.2	0.18	-0.44	0.28	0.11
Ladder X unemployed	0.01	0.003	0.11*	0.007	0.004	0.04*	0.004	0.003	0.24	0.007	0.005	0.14
Constant	0.57	1.71E-13	-1.7	0.53	1.35E-03	-2	0.58	4.12E-04	-3.3	0.64	2.29E-07	2.29E-07
r2		0.027			0.014			0.017			0.013	
N		31255			31255			31255			31255	

Table 5.13: Results of ELSA fixed effects regressions explaining variance in SWB from the MacArthur ladder and its interactions with income, earnings, wealth and unemployment. With controls and robust standard errors. *Not robust to multiple imputation.

	Life satisfaction (1)			Life satisfaction (2)			Life meaning			Experienced affect last week		
	b	se	p	b	se	p	b	se	p	b	se	p
MacArthur Ladder	0.01	0.001	2.55E-15	0.005	0.001	2.94E-08	0.004	0.001	6.35E-05	0.004	0.001	1.45E-05
Education												
NVQ1/CSE	-0.01	0.17	0.94	0.02	0.12	0.9	-0.09	0.19	0.61	0.16	0.19	0.39
NVQ2/GCE O Lev	0.02	0.09	0.87	0.01	0.09	0.92	-0.04	0.09	0.62	0.19	0.11	0.07
NVQ3/GCE A Lev	-0.02	0.12	0.9	-0.24	0.13	0.06	-0.12	0.12	0.3	0.28	0.15	0.05*
Higher ed (below deg)	-0.16	0.11	0.14	-0.11	0.1	0.27	-0.06	0.1	0.59	-0.07	0.12	0.58
NVQ4/NVQ5/Degree+	0.09	0.11	0.43	-0.18	0.11	0.08	0.05	0.11	0.66	0.09	0.14	0.53
MacArthur ladder…												
X NVQ1/CSE	3.50E-04	0.002	0.88	-1.90E-04	0.002	0.93	0.002	0.003	0.46	-0.002	0.003	0.4
X NVQ2/GCE O Lev	-3.10E-07	0.001	0.99	-0.001	0.001	0.66	1.90E-04	0.001	0.88	-0.002	0.002	0.19
X NVQ3/GCE A Lev	1.40E-04	0.002	0.94	0.003	0.002	0.16	0.003	0.002	0.15	-0.004	0.002	0.05
X Higher ed (below deg)	0.002	0.002	0.16	0.001	0.001	0.59	0.002	0.002	0.16	0	0.002	0.83
X NVQ4/NVQ5/Degree+	-0.002	0.002	0.32	0.001	0.001	0.45	-3.10E-04	0.002	0.84	-0.001	0.002	0.47
Constant	-4.2	0.57	1.87E-13	-1.7	0.53	1.17E-03	-2	0.58	4.04E-04	-3.3	0.64	1.39E-07
r2	0.03			0.01			0.02			0.01		
N	31255			31255			31255			31255		

Table 5.14: Results of ELSA fixed effects regressions explaining variance in SWB from the MacArthur ladder and its interaction with education. Reference is no/foreign/other education. With controls and robust standard errors. *Not robust to multiple imputation.

For well off nearby, in Table 5.15, the interaction with log income is significant for experienced affect last week but not for life satisfaction (1) ($p>0.05$). On experienced affect last week, the positive average association ($b=0.37$, $se=0.12$, $p=0.002$) is weaker with increasing log income ($b=-0.03$, $se=0.01$, $p=0.01$). For earnings, there is a significant interaction on for life satisfaction (1) but not experienced affect last week ($p>0.05$). The average positive association of well off nearby with life satisfaction (1) ($b=0.07$, $se=0.01$, $p=1.55E-07$) is stronger with increasing log earnings ($b=0.01$, $se=0.002$, $p=0.002$); however, this is not significant in the imputation analyses (see Appendix D, Table 5.15_MI). For log wealth, the interaction is significant for life satisfaction (1) but not experienced affect last week ($p>0.05$, though this was significant in the imputation analyses). On life satisfaction (1), the positive average association of well off nearby ($b=0.18$, $se=0.04$, $p=5.28E-06$) is weaker with increasing log wealth ($b=-0.01$, $se=0.003$, $p=0.002$). The interaction with earnings is shown in Appendix D, Figure 5.5, and the interactions with income and wealth are shown in Figures 5.4 and 5.5 below.

	Life satisfaction (1)			Experienced affect last week		
	b	**se**	**p**	**b**	**se**	**p**
Well off nearby	0.22	0.09	0.02	0.37	0.12	0.002
Log income	0.04	0.03	0.17	0.11	0.04	0.01
Well off X log income	-0.02	0.01	0.11	-0.03	0.01	0.01
Constant	-1.2	1.1	0.27	-6.2	1.3	8.12E-07
r2	0.03			0.02		
Well off nearby	0.07	0.01	1.55E-07	0.08	0.02	6.14E-08
Log earnings	-0.02	0.01	0.01	-0.004	0.01	0.59
Well off X log earnings	0.01	0.002	0.002*	0.002	0.002	0.22
Constant	-0.84	1	0.42	-5.4	1.2	6.43E-06
r2	0.03			0.02		
Well off nearby	0.18	0.04	5.28E-06	0.15	0.05	0.001
Log wealth	0.03	0.01	0.003	0.02	0.01	0.1
Well off X log wealth	-0.01	0.003	0.002	-0.01	0.004	0.08*
Constant	-1.1	1	0.3	-5.5	1.2	3.58E-06
r2	0.03			0.02		
N	18289			18289		

Table 5.15: Results of ELSA fixed effects regressions explaining variance in SWB from well off nearby and its interaction with log income, log earnings and log wealth. With controls and robust standard errors. *Not robust to multiple imputation.

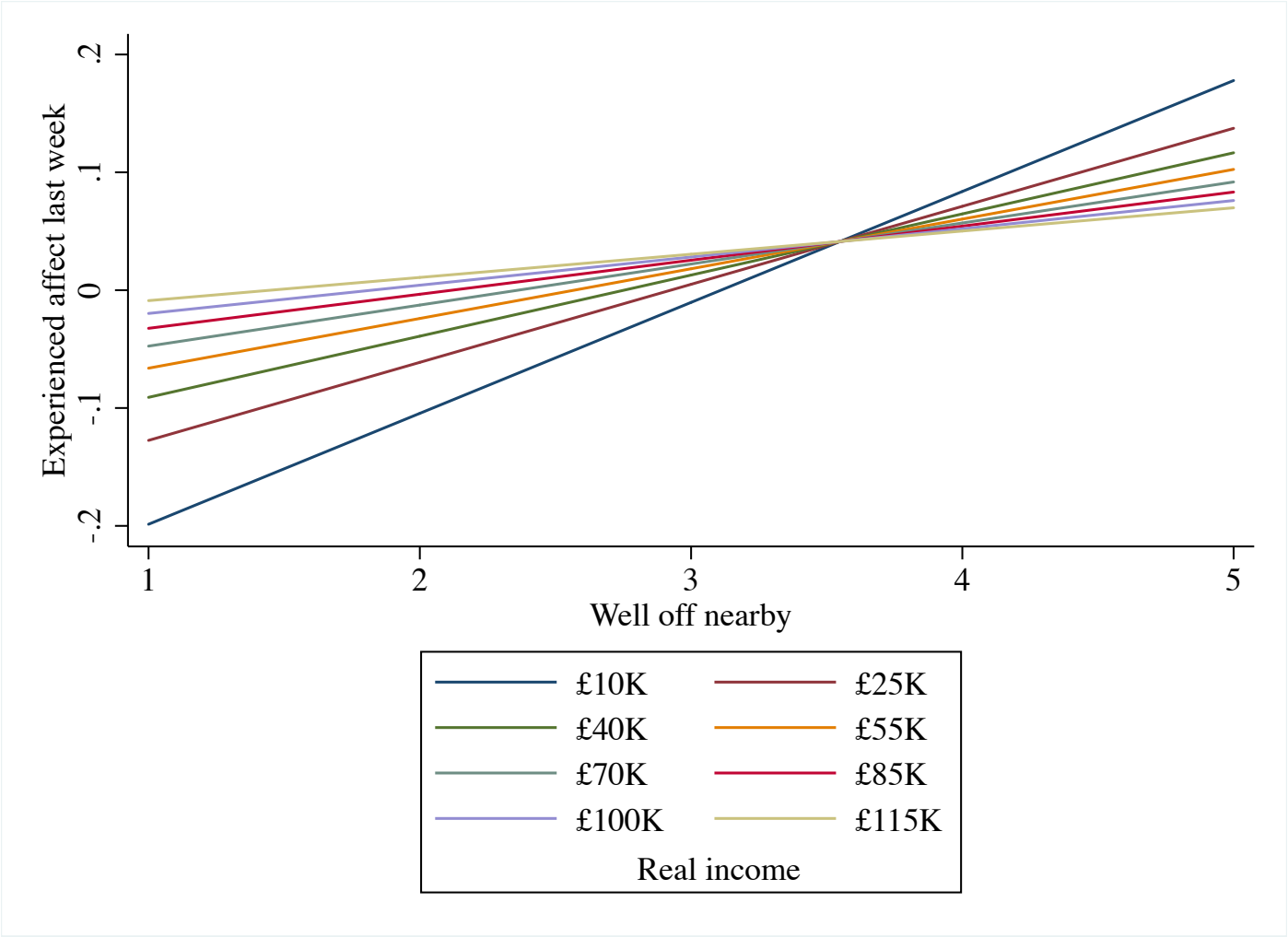

Figure 5.4: Fitted values of experienced affect last week at selected values of well off nearby and log income. Labels show unlogged values. Covariates at means. From fixed effects regressions with controls and robust standard errors.

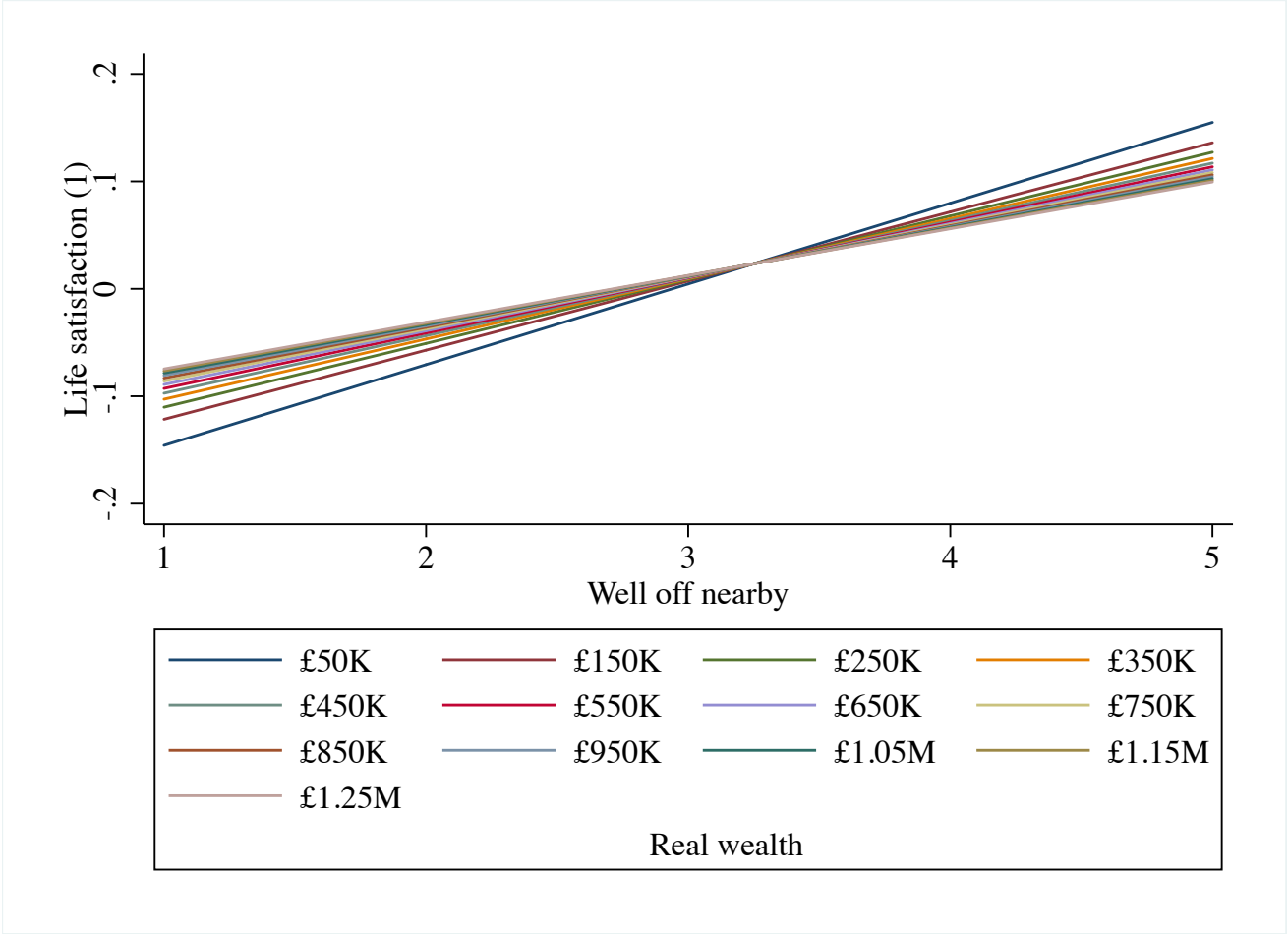

Figure 5.5: Fitted values of life satisfaction (1) at selected values of well off nearby and log wealth. Labels show unlogged values. Covariates at means. From fixed effects regressions with controls and robust standard errors.

Gender

As in ATUS, to explore how the relationships of relative socio-economic status with SWB differed according to gender, separate regressions were conducted for women and men. Gender was not included as an interaction term because it does not vary over time and is thus modelled by the fixed effects (see p. 132). These results are shown in Table 5.16, and coefficient plots corresponding to these models are in Figures 5.6-5.8. In all instances in Table 5.16, relative socio-economic status was significantly associated with SWB for both women and men. Their coefficients were always overlapping, as shown in Figures 5.8-5.10. For example, for proportion with top income in gender groups in GORs for women, b=-3.10 (se=0.88, p=3.42E-04). For men, this effect was b=-2.90 (se=0.81, p=3.15E-04). The associated confidence intervals are -4.85, -1.42 and -4.53, -1.33, respectively, which overlap.

At first glance, this is not strong evidence of gender differences. However, there are some patterns to the results. On the standpoint measures, the coefficient for women was always the same or higher in magnitude as the coefficient for men. For example, for life satisfaction (1) and the MacArthur ladder, the coefficient for women and men was identical (b=0.01, se=0.001, p=6.17E-23 and b=0.01, se=0.001, p=8.19E-17, respectively). On experienced affect last week for 'well off nearby', the coefficient for women was more strongly positive than for men (b=0.10, se=0.02, p1.42E-05 and b=0.06, se=0.02, p=3.07E-04, respectively). This pattern was also the case in the multiple imputation results, as shown in Appendix D, Table 5.16_MI.

In contrast, on the summary measures of relative socio-economic status, the picture was more mixed. Sometimes, the coefficient for women was more strongly negative than the coefficient for men. For example, for life satisfaction (1) and proportion with top income in gender in GOR, the coefficient for women was b=-3.1 (se=0.88, p=3.42E-04), and men's was b=-2.9 (se=0.81, p=3.15E-04). Other times, the coefficient for men was more strongly negative than the coefficient for women. For example, for life satisfaction (2) and the proportion with top earnings in age groups in GORs, the coefficient for women was b=-1.9 (se=0.58, p=0.001), and for men it was stronger at b=-2.27 (se=0.62, p=2.27E-04). And in

the multiple imputation analyses (Appendix D, Table 5.15_MI), the relative size of the coefficient between genders was sometimes different for the summary measures. For example, again for life satisfaction (2) and the proportion with top earnings in age groups in GORs, in the imputation analyses, the coefficient for men was weaker and not stronger (b=-1.50, se=0.64, p=0.02) than the coefficient for women (b=-2.20, se=0.57, p=1.04E-04).

	b	se	p	r2	n
MacArthur Ladder	**Life satisfaction (1)**				
Women	0.01	0.001	6.17E-23	0.03	17024
Men	0.01	0.001	8.19E-17	0.03	14231
Well off nearby					
Women	0.08	0.02	4.48E-05	0.03	9910
Men	0.07	0.02	3.28E-04	0.03	8379
Median education in gender in GOR					
Women	-0.08	0.01	3.24E-13	0.02	17629
Men	-0.07	0.02	3.59E-05	0.02	14621
% top income in gender in GOR					
Women	-3.1	0.88	3.42E-04	0.02	17629
Men	-2.9	0.81	3.15E-04	0.02	14621
% top earnings in age in GOR					
Women	-4	0.58	7.03E-12	0.02	17629
Men	-4.4	0.64	1.41E-11	0.02	14621
MacArthur Ladder	**Life satisfaction (2)**				
Women	0.01	0.001	1.78E-14	0.02	17024
Men	0.005	0.001	1.13E-09	0.01	14231
Median education in gender in GOR					
Women	-0.03	0.01	0.01	0.01	17629
Men	-0.06	0.02	5.56E-04	0.01	14621
% top earnings in age in GOR					
Women	-1.9	0.58	0.001	0.01	17629
Men	-2.27	0.62	2.27E-04	0.01	14621
MacArthur Ladder	**Life meaning**				
Women	0.005	0.001	4.52E-11	0.02	17024
Men	0.004	0.001	6.43E-06	0.02	14231
MacArthur Ladder	**Experienced affect last week**				
Women	0.004	0.001	3.08E-05	0.01	17024
Men	0.002	0.001	2.76E-03	0.02	14231
Well off nearby					
Women	0.10	0.02	1.42E-05	0.03	9910
Men	0.06	0.01	3.07E-04	0.02	8379

Table 5.16: Results of ELSA fixed effects regressions explaining variance in SWB from selected measures of relative socio-economic status, conducted separately for women and men. With controls and robust standard errors.

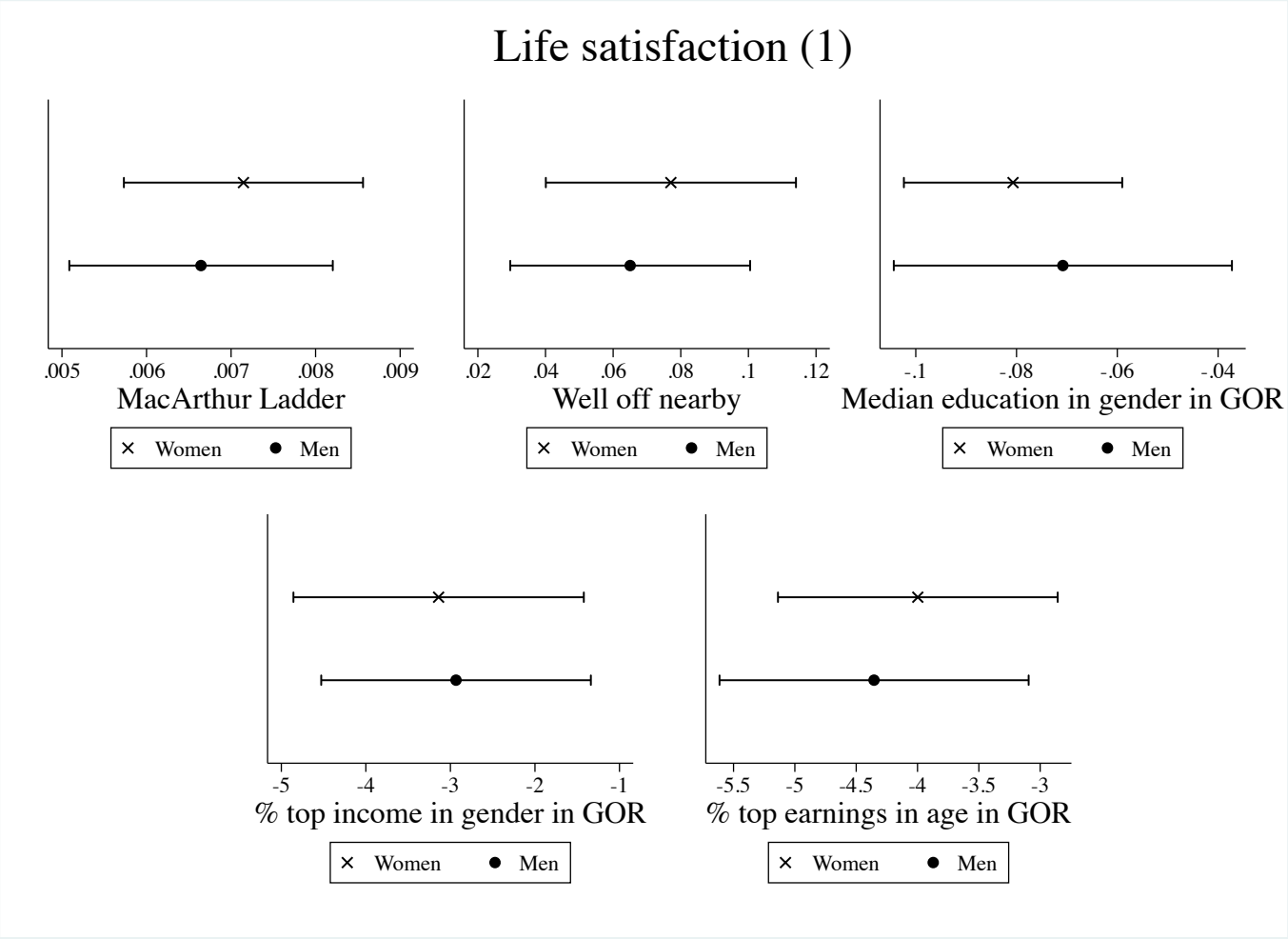

Figure 5.6: Plotted coefficients from fixed effects regressions explaining variance in life satisfaction (1) from selected relative variables, separately for women and men. With controls and robust standard errors. 95% confidence intervals.

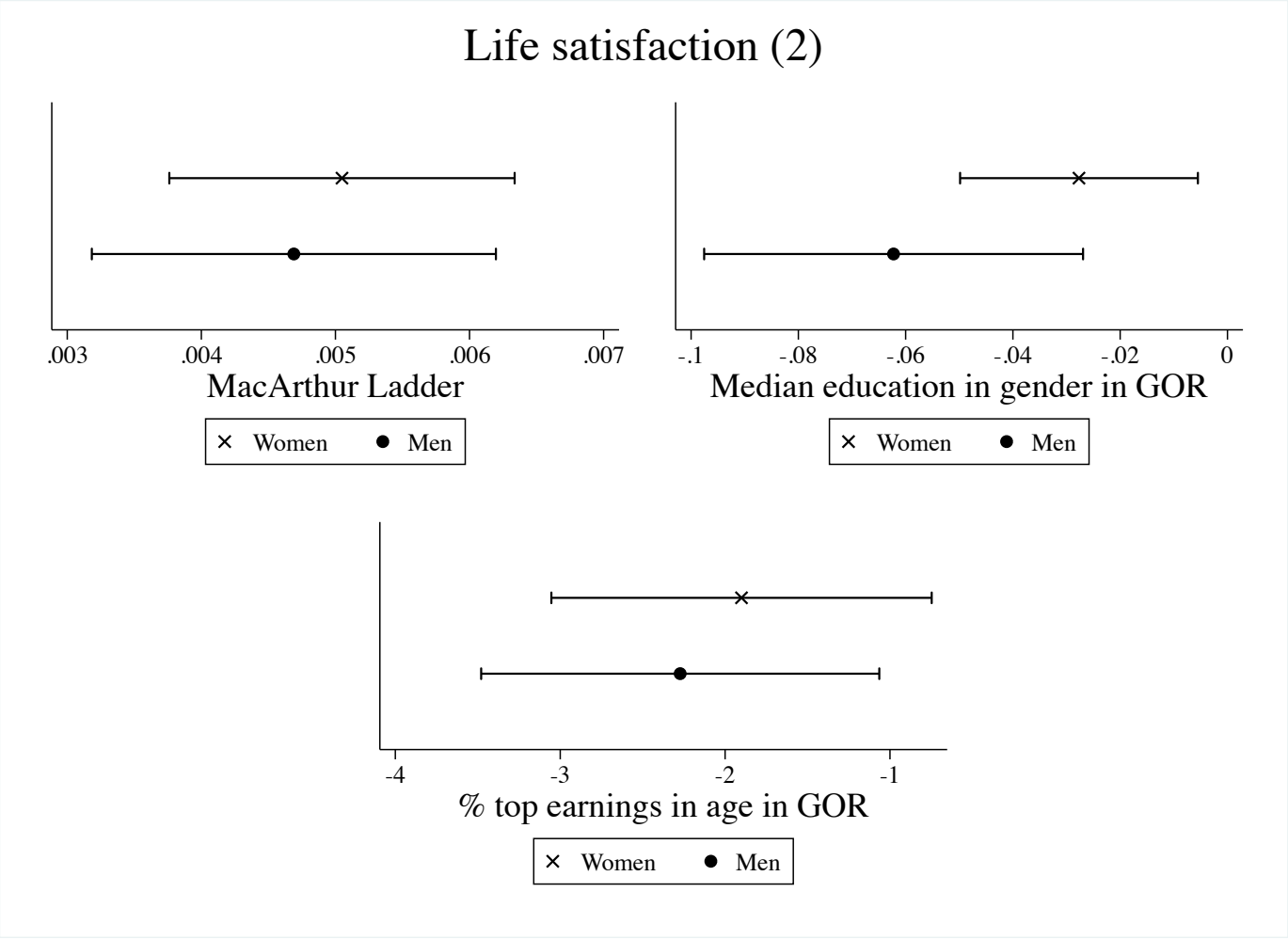

Figure 5.7: Plotted coefficients from fixed effects regressions explaining variance in life satisfaction (1) from selected relative variables, separately for women and men. With controls and robust standard errors. 95% confidence intervals.

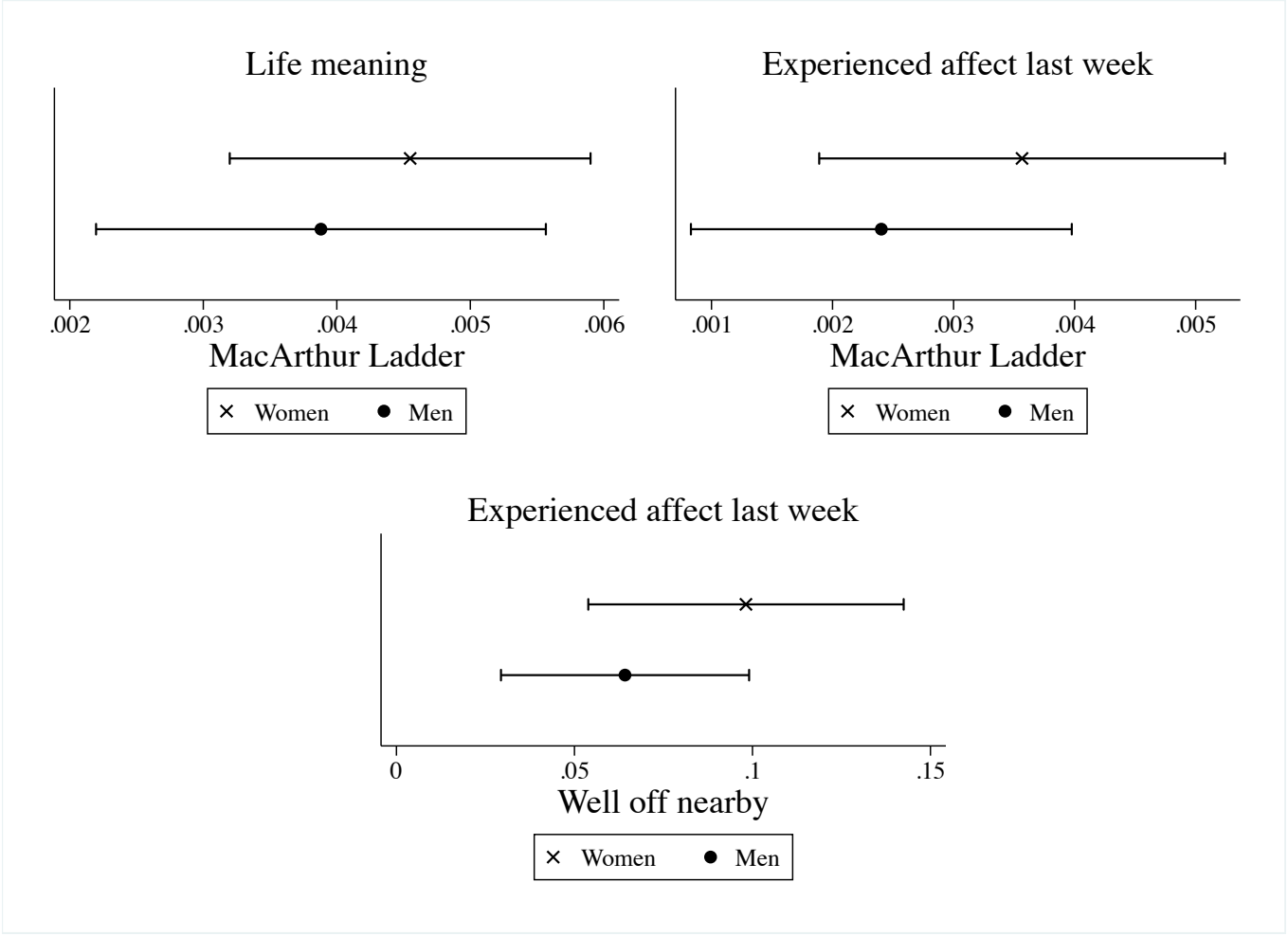

Figure 5.8: Plotted coefficients from fixed effects regressions explaining variance in life meaning and experienced affect last week from the MacArthur ladder and 'well off nearby', separately for women and men. With controls and robust standard errors. 95% confidence intervals.

Age

As in ATUS, no assumption was made about the relationship of age (i.e. linear, quadratic) and SWB. Therefore, interactions of relative socio-economic status with age and age squared are calculated, and separate regressions were conducted for separate age groups. The youngest age in the sample of ELSA analysed was 50 years (see p. 126); thus, to maintain comparability with ATUS, the youngest age group is 50-54 years, followed by 55-64 years, 65-74 years and 75+. The results of the interactions are in Tables 5.17 and 5.18, and the results by age group are in Table 5.19.

The MacArthur ladder never significantly interacted with age or age squared on life satisfaction (1) and (2) in Tables 5.17 and 5.18 (although there was a significant interaction in the multiple imputation analyses for both age and age squared, see Appendix D, Tables 5.17-5.18_MI). In Table 5.19, there were significant effects for all age groups on life satisfaction (1) with smaller effects at 65+ years (e.g. 50-54 years, b=0.01, se=0.003, p=0.002; 75+ years, b=0.002, se=0.001, p=0.05). On life satisfaction (2), there were only significant effects for the two middle age groups (2) (e.g. 55 - 64 years, b=0.006, se=0.001, p=2.94E-13). There were effects across all age groups on life meaning (e.g. 55-64 years, b=0.005, se=9.31E-04, p=8.2E-09), and for only the two youngest age groups on experienced affect last week (e.g. 50-54 years, b=0.01, se=0.003, p=0.01). In the multiple imputation results, there were significant effects for all ages on life satisfaction (2), and for 75+ years on experienced affect last week, as discussed in Appendix D.

For well of nearby across Tables 5.17 and 5.18, the age interactions were significant for both life satisfaction (1) and experienced affect last week. Starting with life satisfaction (1), the positive average association of well off nearby was b=1.62 (se=0.65, p=0.01), and this deceased with increasing age (b=-0.04, se=0.02, p=0.03), but increased with increasing age squared (b=2.85E-04, se=1.44E-04, p=0.047). In Table 5.19, we see that the effect is strongest among those aged 50-54 years (b=0.16, se=0.06, p=0.01), less strong for those aged 55-64 years (b=0.07, se=0.02, p=0.001), and insignificant for those aged 65+ years (p>0.05), though the effects were significant in the multiple imputation analyses, see Appendix D, Table 5.19_MI). This interaction is shown graphically in Figure 5.9. The

slopes are most positive at 50 and 60 years, consistent with the results of the separate regressions by age group.

Turning now to experienced affect last week and well off nearby in Table 5.18, the positive average effect was b=1.67 (se=0.67, p=0.01). This decreased with increasing age (b=-0.05, se=0.02, p=0.02) and increased with increasing age squared (b=3.33E-04, se=1.45E-04, p=0.02). But these effects were not significant in the multiple imputation analyses (see Appendix D, Table 5.18_MI). In the separate age regressions in Table 5.19, there was a significant association at all ages but it was strongest at the tails of age (50-54 years, b=0.13, se=0.06, p=0.03; 55-64 years, b=0.07, se=0.03, p=0.005; 65-74 years, b=0.05, se=0.03, p=0.04; 75+ years, b=0.11, se=0.03, p=5.57E-04). In the multiple imputation analyses, the association for those aged 65-74 years was not significant (see Appendix D, Table 5.19_MI). The interaction is shown graphically in Figure 5.10, where it is confirmed that the strongest effect is at 50 years. The slopes of the other age groups appear relatively similar. The most strong and robust effect across both estimation methods is that younger ages in ELSA, in their 50s, are most affected by how they perceive their financial situation relative to those nearby.

For median education in gender in GOR, there is a significant interaction with age for life satisfaction (1) but not life satisfaction (2). The negative average effect on life satisfaction (1) was b=-1.13 (se=0.34, p=0.001), which became less negative with increasing age (b=0.03, se=0.01, p=0.003) but more negative with increasing age squared (b=-2.11E-04, se=7.46E-05, p=0.005 - not robust to multiple imputation, see Appendix D, Table 5.17_MI). This interaction is shown graphically in Figure 5.11. Again, the strongest negative effect is for those aged 50 years, which is consistent with the results in Table 5.19. In this table, all age groups had a significant negative association with life satisfaction (1) but the strongest negative association was for those aged 50-54 years (b=-1.84, se=0.83, p=0.03, though this did not withstand multiple imputation). Median education in gender in GOR did not significantly interact with age on life satisfaction (2) in Table 5.18 (p>0.05). In Table 5.19, the effect was similar in magnitude and significant at all ages except for 50-54 years where the effect was not significant (p>0.05; e.g. 55-64 years, b=-0.03, se=0.01, p=0.01).

Looking now to the proportion of people with top incomes in gender groups in GORs and life satisfaction (1) in Table 5.17, the age interactions were significant. Again, the negative average effect (b=-73.01, se=25.51, p=0.004) became less negative with increasing age (b=1.97, se=0.76, p=0.01) but more negative with increasing age squared (b=-0.01, se=0.01, p=0.01). These interactions, however, did not withstand multiple imputation, as shown in Appendix D. The interaction is shown in Figure 5.12, where the strongest negative effect is again at 50 years. But in Table 5.19, the effect for those aged 50-54 years is not significant (b=0.44, se=3.31, p=0.89). And the negative effect is increasing with increasing age (e.g. 50-64 years, b=1.75, se=0.95, p=0.06; 75+ years, b=-7.31, se=1.53, p=1.94E-06). It is difficult to interpret these contrasting results from the different estimation methods (but see footnote on p. 290).

Finally, the proportion of people with top earnings in age groups in GORs did not significantly interact with age or age squared for life satisfaction (1) or (2) (p>0.05). In Table 5.19, there were significant negative effects at all ages for life satisfaction (1) except 75+ years (p>0.05; e.g. 50-54 years, b=-7.18, se=3.3, p=0.03). The effects were smaller with increasing age on life satisfaction (1) before becoming insignificant for 75+ years (e.g. 55-64 years, b=-4.79, se=0.75, p=2.34E-10). On life satisfaction (2) the effects were only significant for those aged 55-74 years (55-64 years, b-2.05, se=0.74, p=0.006; 65-74 years, b=-2.97, se=0.87, p=6.71E-04).

A summary of the ELSA results is in Table 5.20.

	Life satisfaction (1)				
	b	**se**	**p**	**r2**	**n**
MacArthur ladder	0.05	0.02	0.04	0.03	31255
Age	0.17	0.04	8.26E-05		
Age squared	-0.001	3.17E-04	2.52E-04		
Ladder X age	-0.001	0.001	0.23*		
Ladder X age squared	3.25E-06	4.81E-06	0.50*		
Constant	-6.7	1.51	9.08E-06		
Well off nearby	1.62	0.65	0.01	0.03	18289
Age	0.19	0.07	0.01		
Age squared	-0.001	0.001	0.004		
Well off X age	-0.04	0.02	0.03		
Well off X age squared	2.85E-04	1.44E-04	0.047		
Constant	-5.75	2.32	0.01		
Median education in gender in GOR	-1.13	0.34	0.001	0.02	32250
Age	0.09	0.02	1.69E-04		
Age squared	-0.001	1.74E-04	1.84E-04		
Med. education X age	0.03	0.01	0.003		
Med. education X age squared	-2.11E-04	7.46E-05	0.005*		
Constant	-2.95	0.8	2.44E-04		
% top income in gender in GOR	-73.01	25.51	0.004	0.02	32250
Age	0.06	0.03	0.09		
Age squared	-4.72E-04	2.43E-04	0.05		
% top income X age	1.97	0.76	0.01*		
% top income X age squared	-0.01	0.01	0.01*		
Constant	-1.66	1.11	0.13		
% top earnings in age in GOR	-7.62	19.38	0.69	0.02	32250
Age	0.13	0.02	2.27E-07		
Age squared	-0.001	1.70E-04	1.47E-09		
% top earnings X age	-0.14	0.56	0.8		
% top earnings X age squared	0.003	0.004	0.51		
Constant	-3.73	0.9	3.33E-05		

Table 5.17: Results of ELSA fixed effects regressions explaining variance in life satisfaction (1) from selected relative variables and their interactions with age and age squared. With controls and robust standard errors. *Not robust to multiple imputation.

	Life satisfaction (2)				
	b	**se**	**p**	**r2**	**n**
MacArthur ladder	0.03	0.02	0.23*		
Age	0.07	0.04	0.09		
Age squared	-4.66E-04	3.05E-04	0.13	0.02	31255
Ladder X age	-3.47E-04	0.001	0.58*		
Ladder X age squared	6.46E-07	4.55E-06	0.89*		
Constant	-3.05	1.42	0.03		
Median education in gender in GOR	0.21	0.35	0.55		
Age	0.06	0.02	0.01		
Age squared	-0.001	1.75E-04	0.004	0.01	32250
Med. education X age	-0.01	0.01	0.45		
Med. education X age squared	6.11E-05	7.76E-05	0.43		
Constant	-2.14	0.79	0.01		
% top earnings in age in GOR	7.84	18.69	0.68		
Age	0.06	0.02	0.01		
Age squared	-0.001	1.71E-04	0.002	0.01	32250
% top income X age	-0.33	0.54	0.54		
% top income X age squared	0.003	0.004	0.49		
Constant	-1.97	0.88	0.02		
	Life meaning				
MacArthur ladder	0.02	0.02	0.43*		
Age	0.09	0.05	0.04		
Age squared	-0.001	3.33E-04	0.02	0.02	31255
Ladder X age	-3.54E-04	0.001	0.61*		
Ladder X age squared	2.15E-06	5.05E-06	0.67*		
Constant	-2.9	1.55	0.06		
	Experienced affect last week				
MacArthur ladder	0.04	0.03	0.17*		
Age	0.13	0.05	0.02		
Age squared	-0.001	3.81E-04	0.04	0.01	31255
Ladder X age	-0.001	0.001	0.27*		
Ladder X age squared	5.08E-06	5.55E-06	0.36*		
Constant	-5.33	1.8	0.003		
Well off nearby	1.67	0.67	0.01		
Age	0.28	0.07	1.35E-04		
Age squared	-0.002	0.001	3.04E-04	0.02	18289
Well off X age	-0.05	0.02	0.02*		
Well off X age squared	3.33E-04	1.45E-04	0.02*		
Constant	-10.33	2.51	3.86E-05		

Table 5.18: Results of ELSA fixed effects regressions explaining variance in life satisfaction (2), life meaning and experienced affect last week from selected relative variables and their interactions with age and age squared. With controls and robust standard errors. *Not robust to multiple imputation.

Relative variable	*Age*	Life satisfaction (1)			Life satisfaction (2)			Life meaning			Experienced affect last week		
		b	se	p	b	se	p	b	se	p	b	se	p
MacArthur Ladder	50-54	**0.01**	**0.003**	**0.002**	0.01	0.003	0.07*	**0.01**	**0.003**	**0.02**	**0.01**	**0.003**	**0.01**
	55-64	**0.01**	**0**	**8.62E-26**	**0.006**	**0.001**	**2.94E-13**	**0.005**	**9.31E-04**	**8.20E-09**	**0.005**	**0.001**	**3.53E-05**
	65-74	**0.005**	**0.001**	**9.78E-07**	**0.004**	**9.63E-04**	**1.77E-04**	**0.004**	**0.001**	**6.97E-04**	4.52E-05	0.001	0.97
	75+	**0.002**	**0.001**	**0.05**	0.001	0.001	0.22*	**0.005**	**0.001**	**6.71E-04**	0.002	0.001	0.12*
Well off nearby	50-54	**0.16**	**0.06**	**0.01**	*Intentionally blank*			*Intentionally blank*			**0.13**	**0.06**	**0.03**
	55-64	**0.07**	**0.02**	**0.001**							**0.07**	**0.03**	**0.005**
	65-74	0.03	0.02	0.28*							**0.05**	**0.03**	**0.04***
	75+	0.05	0.03	0.1							**0.11**	**0.03**	**5.57E-04**
Median education in gender in GOR	50-54	**-1.84**	**0.83**	**0.03***	-0.05	0.07	0.43	*Intentionally blank*			*Intentionally blank*		
	55-64	**-0.05**	**0.01**	**4.36E-04**	**-0.03**	**0.01**	**0.01**						
	65-74	**-0.08**	**0.01**	**1.15E-07**	**-0.06**	**0.02**	**5.74E-05**						
	75+	**-0.12**	**0.02**	**5.33E-11**	**-0.04**	**0.02**	**0.04**						
% top income in gender in GOR	50-54	0.44	3.31	0.89	*Intentionally blank*			*Intentionally blank*			*Intentionally blank*		
	55-64	-1.75	0.95	0.06									
	65-74	**-4.35**	**0.96**	**5.95E-06**									
	75+	**-7.31**	**1.53**	**1.94E-06**									
% top earnings in age in GOR	50-54	**-7.18**	**3.3**	**0.03**	-1.76	3.23	0.59	*Intentionally blank*			*Intentionally blank*		
	55-64	**-4.79**	**0.75**	**2.34E-10**	**-2.05**	**0.74**	**0.006**						
	65-74	**-6.03**	**0.8**	**6.96E-14**	**-2.97**	**0.87**	**6.71E-04**						
	75+	0.88	0.82	0.28	-0.18	0.79	0.82						

Table 5.19: Results of ELSA fixed effects regressions explaining variance in SWB from selected relative variables, separately by age group. With controls and robust standard errors. Significant effects in **bold.** *Not robust to multiple imputation.

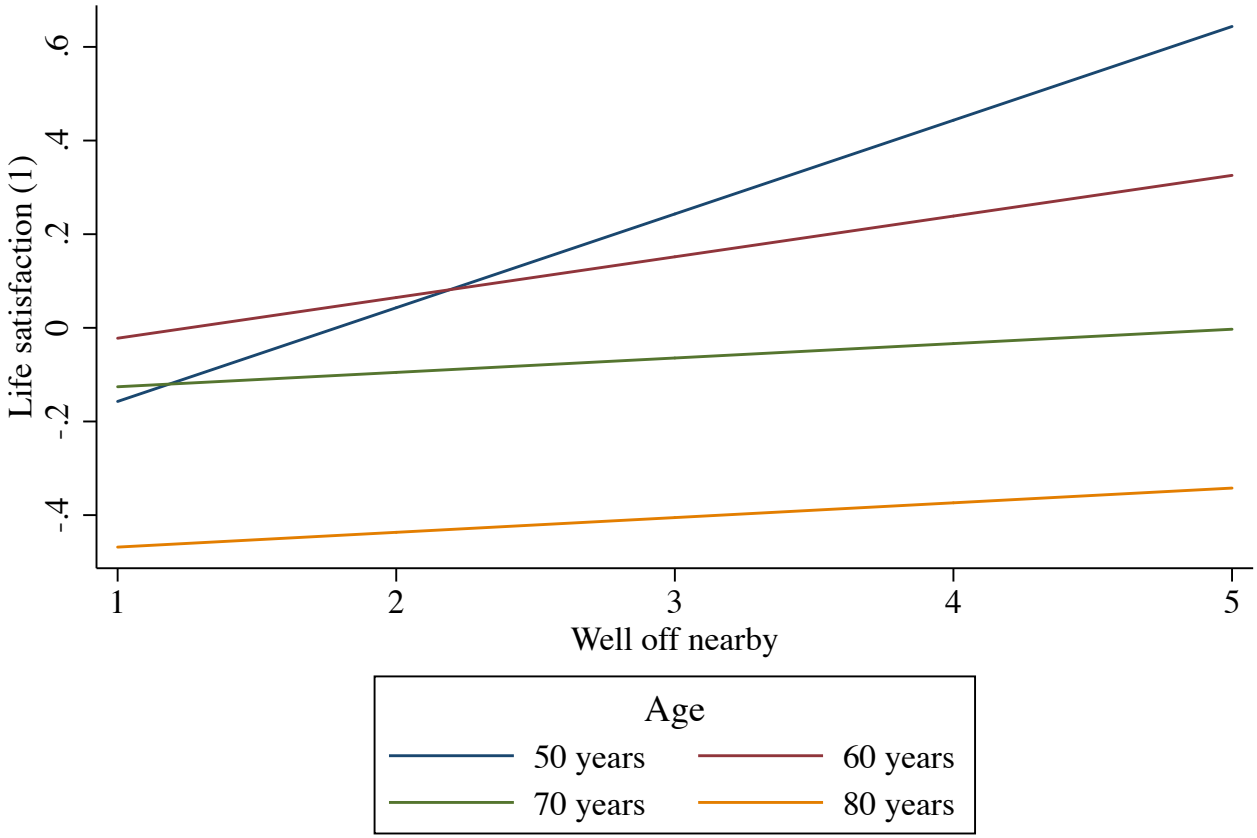

Figure 5.9: Fitted values of life satisfaction (1) at selected values of well off nearby and age from models including interactions of well off nearby with age and age squared. Covariates at means. From fixed effects regressions with controls and robust standard errors.

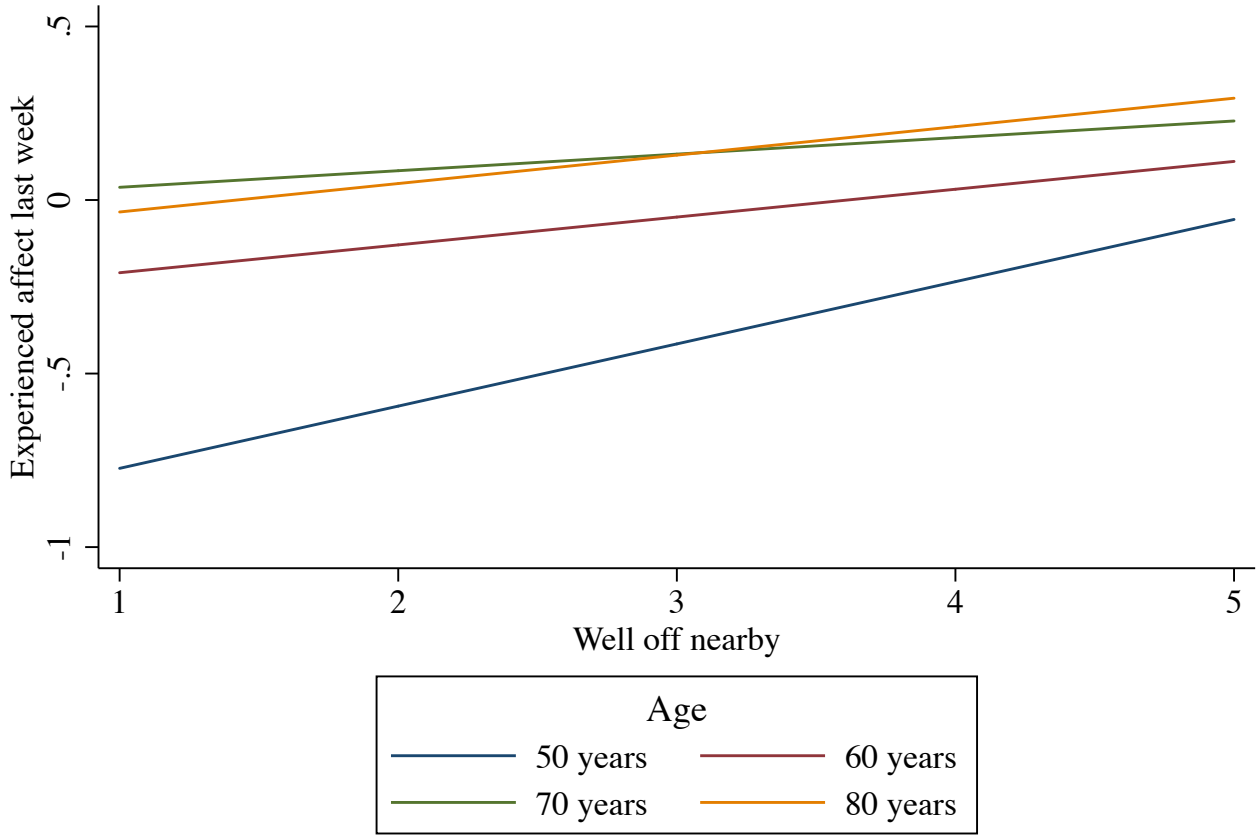

Figure 5.10: Fitted values of experienced affect last week at selected values of well off nearby and age from models including interactions of well off nearby with age and age squared. Covariates at means. From fixed effects regressions with controls and robust standard errors.

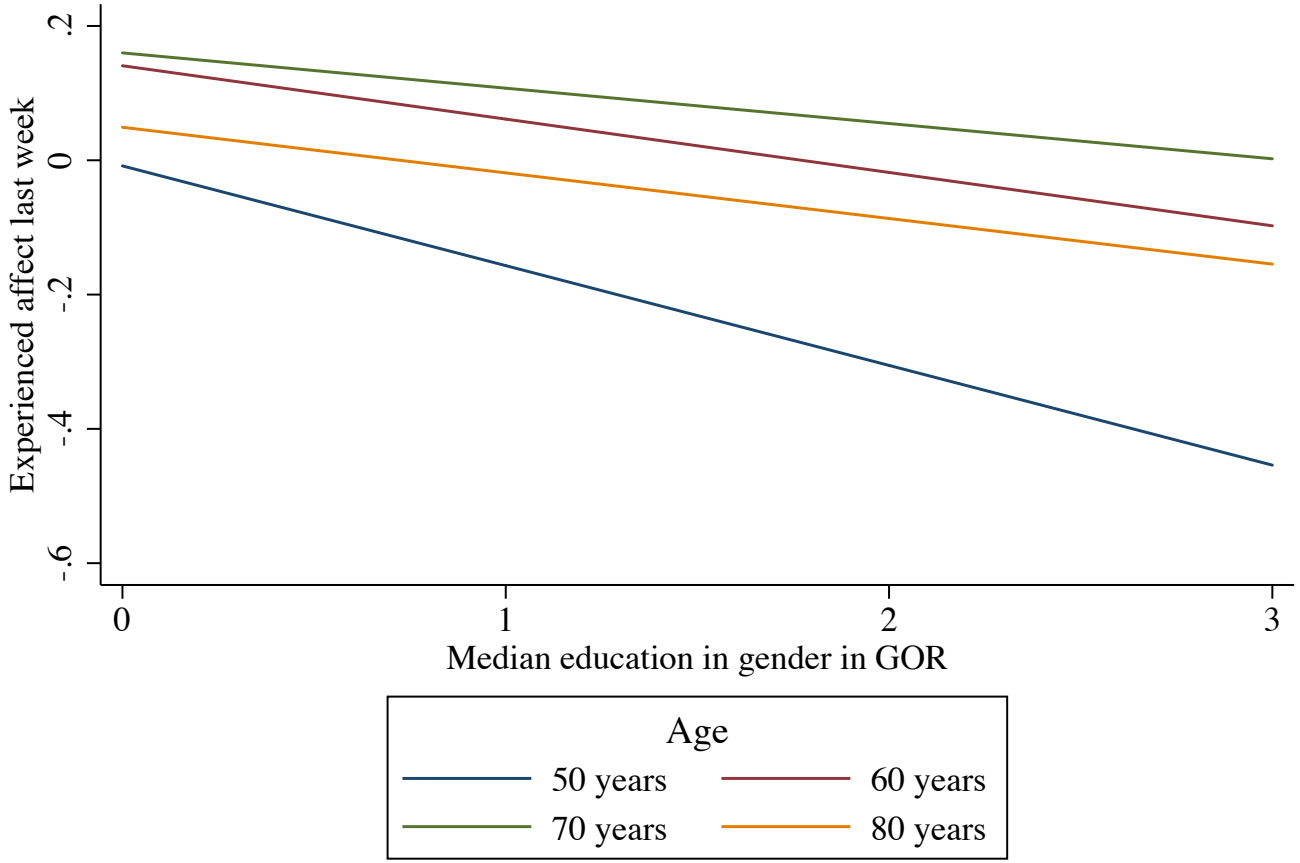

Figure 5.11: Fitted values of life satisfaction (1) at selected values of median education in gender in GOR and age from models including interactions of median education with age and age squared. Covariates at means. From fixed effects regressions with controls and robust standard errors.

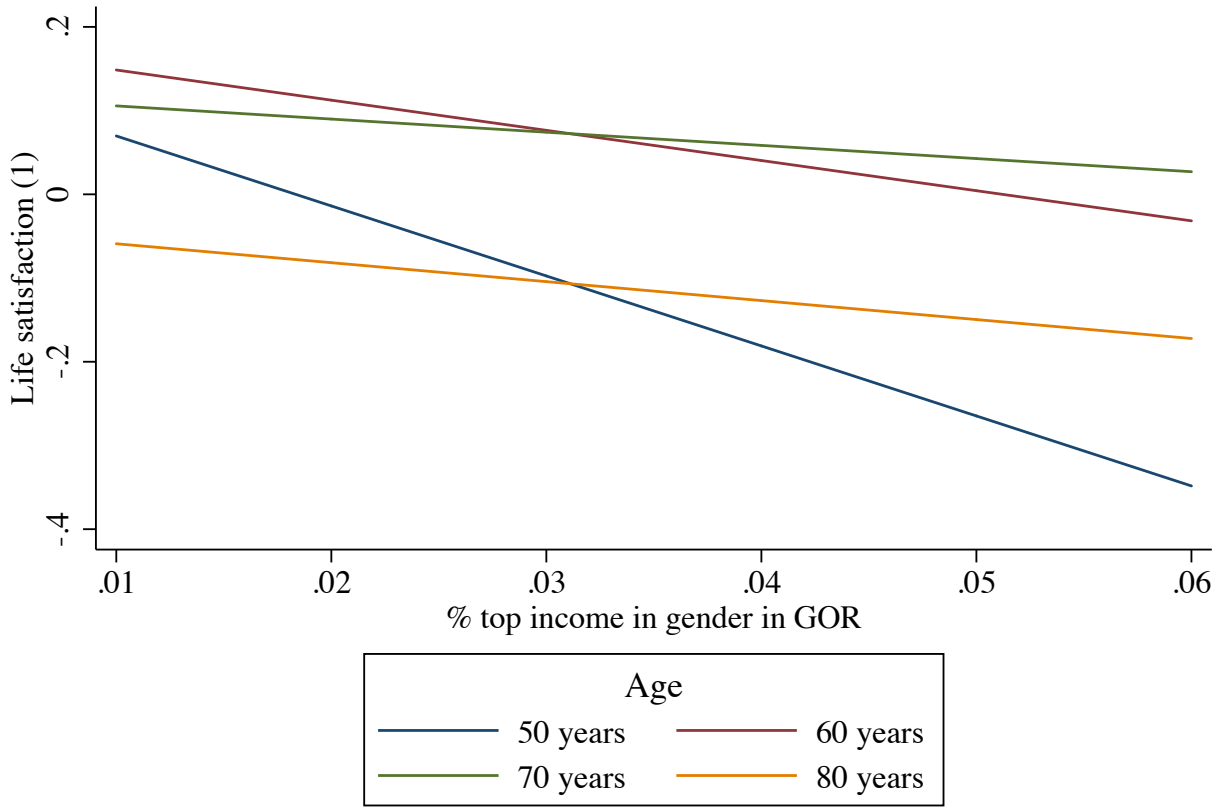

Figure 5.12: Fitted values of life satisfaction (1) at selected values of % top income in gender in GOR and age from models including interactions of % with top income with age and age squared. Covariates at means. From fixed effects regressions with controls and robust standard errors.

Relative variable	SWB	Effects by….			
		SWB	Socio-economic status	Gender	Age
MacArthur ladder	LS1, LS2, LM, EA	Most robust effects are across SWB measures for quantile 10, across all but LS (2) for quantile 25, on LS (2) for quantile 50, none for quantile 75 and for LS (1) at quantile 90.	EA, weaker with + log income; LS1 & 2, stronger with + log earnings; LS1 & LM, weaker with + log wealth; LS2, stronger for unemployed; LS1, stronger for higher ed but below degree vs. NVQ4/5/Degree+; EA, weaker for NVQ3-equiv. versus none/foreign/other (but none of the foregoing robust to MI)	Similar for LS1&LM, stronger for women on LS2&EA	No interactions, not robust to MI. LS1=all ages, LS2 = only 55-74 years, LM = all ages, EA = only 50-64 years (but not robust to MI)
Well off nearby	LS1, EA	Most robust at quantiles 10 and 25 for LS1 & EA	LS1, stronger with + log earnings (not robust to MI) and weaker with + log wealth; EA, weaker with + log income	Similar for LS1, stronger for women on EA	LS1 & EA, sig interactions with age (+) and age squared (-). LS1 = only 50-64 years, EA= sig. at all ages but strongest for the age tails (but not robust to MI)
Median education in gender in GOR	LS1, LS2	Only LS1 at quantiles 10 and 25	NVQ2 less negatively affected on LS1 only (not robust to MI)	Similar on LS1, stronger for men on LS2 (difference not robust to MI)	Sig. interaction with LS1 (not robust to MI) but not LS2. LS1=strongest in 50s (not robust to MI); LS2 not sig. 50-54 years but sig at all other ages
% top income in gender in GOR	LS1	LS1, quantiles 10 and 25	No interaction with income	Slightly stronger for women on LS1	No robust effects across estimation methods
% top earnings in age in GOR	LS1, LS2	Only LS1 at quantiles 10 and 25	Slightly worse negative effect with higher earnings for LS1 only	Stronger for men on LS1&2 (difference not robust to MI)	No interactions with age or age squared on LS1 & 2. LS1 = all sig. except 75+, LS2 = only sig. for 55-74 years

Table 5.20: Summary of ELSA results from chapter five. LS1= Life satisfaction (1), LS2 = Life satisfaction (2), LM = Life meaning, EA = Experienced affect last week, MI = Multiple imputation.

5.4 Discussion

It is difficult to escape being negatively affected by the higher socio-economic attainment of others. The relationship of relative socio-economic status with SWB across different relative measures was evident across the distributions of SWB and socio-economic status, for both genders and across age groups. There were still some patterns in the results, however, which are discussed in what follows.

Relative socio-economic status negatively impacts those with low SWB. This was especially the case in ELSA, where the strongest and most robust effects on SWB across all measures were at quantiles 10 and 25. In ATUS, both the proportion unemployed and the proportion of those with top incomes in age groups in states affected SWB at low SWB levels; however, rank earnings in income groups in state did not affect those with low SWB. That those with low SWB are affected is important because this suggests that the way in which society is structured matters for policy. As discussed on p. 271, one of the goals of social policy is to influence people's wellbeing, and there is public support for policy interventions that reduce misery. Instead of focussing solely on individual attainment, then, policies should also take care of how they influence the distribution of socio-economic attainment. Even though one could argue that the most miserable should simply stop comparing themselves to others, it is difficult for people who have low SWB to do this. One of the hallmark features of anxiety and depressive disorders is increased sensitivity to and negative comparison with others (Gibbons 1986; see also Wheeler 2000). People who are depressed cannot simply 'snap out of it' (Mayo Clinic 2016), and as has been mentioned several times throughout this thesis (e.g. pp. 34, 214, 223), social comparison process can occur automatically and below conscious awareness but still impact how people view themselves (Mussweiler, Rüter, and Epstude 2004), and, potentially, their SWB. Thus, people will react to how society is structured, and the results in this thesis suggest that the reaction is almost always negative when others are doing better than them.

The negative effects of others' higher socio-economic status on SWB among those with the lowest SWB were evident for both evaluations and experiences – only on the Cantril ladder

in ATUS, but in ELSA, on both life satisfaction measures, life meaning and experienced affect last week. In this case, the measure of SWB doesn't strongly matter to the conclusions we reach about whom is affected by relative socio-economic status – even though it has mattered in earlier chapters; for example, for absolute income in the ATUS in chapter three. Thus, both sides of the SWB debate on whether it is our evaluations or our experiences that should be prioritised in assessments of wellbeing can take away the same conclusion – that relative socio-economic status matters, even for the most miserable (Benjamin et al. 2012; Dolan and Kudrna 2016; Dolan, Kudrna and Stone 2017; see pp. 49, 351). Both summary and standpoint aspects of reference groups negatively impacted SWB at the lowest parts of the SWB distribution. For example, in ELSA, the standpoint measure the MacArthur ladder affected all SWB measures at the lowest SWB quantile, and all of the summary measures in ELSA affected life satisfaction (1) at the lowest quantiles.

Both the relative income and deprivation literatures were correct in that those with the most and least socio-economic resources, respectively, are affected by relative socio-economic status – though recall that it would not be inconsistent with these theories to find effects across the distribution of socio-economic status (p. 272). For example, on 'well off nearby' and life satisfaction (1) in ELSA, the effect became stronger with higher earnings but weaker with log wealth, and the former was not robust to multiple imputation (even further calling into question any robust differences across the distribution). In ATUS, the effect of the proportion with top earnings in age groups in states appeared strongest at lower levels of earnings, more in support of relative deprivation theories. But in ELSA, the effect of proportion with top earnings in age groups in GORs on the first life satisfaction measure became worse with increasing income – so, stronger negative effects among those with higher socio-economic status. These effects are more in support of relative income theories. Moreover, relative effects mattered 'in the middle' of the distribution, too, as suggested by instances where there was no interaction between absolute and relative socio-economic status – e.g. proportion with top income in gender in GOR did not significantly interact with absolute income in ELSA. We can take away that relative socio-economic status affects SWB across the distribution of absolute socio-economic status, at least for some measures of relative socio-economic status and SWB.

It is also of interest whether people are affected by the socio-economic attainment of their own socio-economic groups – do people feel relatively deprived by their own socio-economic ingroup (see pp. 213, 273)? This can be most clearly seen from instances where relative effects were broken down by categories of absolute socio-economic status rather than continuous interactions, and this was done for income in ATUS and education in ELSA. In ATUS, for proportion with top incomes in age groups, it is evident that people feel relatively deprived by their (income-based) outgroups. The lowest income group, less than $25K, was most strongly negatively affected by the proportion of people with incomes of $100K+ in age groups in states. This is consistent with a social distance explanation of the negative effects of relative socio-economic status on SWB (see pp. 213, 260) because when there are more people distant to those of incomes with less than $25K then their SWB is lower. It is also consistent with social norm and identity theory – in that being different to a norm is bad for SWB – because when there are more people with incomes of $100K+, the norm for high income is stronger and the SWB of those with incomes of less than $25K is lower. In ELSA, those with NVQ2 education were least affected by the median education in their gender group in GORs – though this result did not withstand the multiple imputation, which calls into question its robustness. Still, NVQ2 was around the average of median education; therefore, if robust and replicated in other research, this result is also consistent with social norm and identity theory because people closest to the norm of education have the highest SWB. Instead of looking at 'high' or 'low' education groups like Botha (2014), or linear interactions like Nikolaev (2016a), future research could consider looking at whether people are close to the average or not.

Do these results confirm a social norm effect of unemployment? The answer is largely yes. Taking unemployment status at the ATUS interview, the negative effect of relative unemployment in age group in state on the Cantril ladder held only for those who were not unemployed. This does not directly show a positive effect of relative unemployment on SWB among the unemployed, as in some prior research (Clark 2003; Stutzer and Lalive 2004; Eggers, Gaddy and Graham 2006; Powdthavee 2007; Shields and Price 2005; Shields, Price and Wooden 2009; Clark, Knabe and Rätzel 2010). But it does suggest that any negative effect of relative unemployment on SWB is limited to those who are not unemployed. Those who are not unemployed feel worse when there is more pressure in

terms of labour market competition, while the unemployed do not – perhaps because there are more people around in a similar situation to them, and so the social norm of unemployment is stronger.

A (relatively small) difference across standpoint and summary measures emerged for gender. Women's SWB was more affected by their perceived standpoint on the MacArthur ladder and 'well off nearby' for some SWB measures, whereas it was difficult to find a pattern for gender on the summary measures. In ATUS, the one standpoint measure associated with SWB was rank earnings in income group in state, which also affected women more than men – though one of the two summary measures affected women more strongly, too: proportion unemployed in age groups in states. Still, women appear, overall, to care slightly more about their standpoint and less about summary distributions of socio-economic resources. These results are consistent with the idea introduced earlier (p. 276) that they care more about their relationships with others than do men. Standpoint measures capture more directly how people fare relative to others in the distribution, and so it makes sense that women would be more affected based on the greater emphasis they place on relationships. But men care more about their socio-economic achievement relative to others than do women in the foregoing literature, and so this cannot be the only explanation. Future research could seek to discover whether these gender differences across standpoint measures replicate, as well as investigate the mechanisms in this relationship. Gender differences were not more pronounced for evaluations than for experiences, as would have been expected based on Else-Quest et al. (2012) (see p. 278); however, the measures were very different in this study.

In terms of age, it is difficult to find an age group that is never affected by relative socio-economic status. It cannot even be argued that those of working age are the most affected. In ATUS, the strongest effect of proportion with top incomes in age groups in states on negative affect was among those aged 15-24 years who are likely to be just entering the workforce or still in education – not firmly of working age. In ELSA, the proportion with top earnings in age groups in GORs had a significant effect on the first life satisfaction measure at all ages except among the oldest, whereas for median education in gender groups in GORs, there was an effect on the oldest and most other age groups. It is possible

to speculate on reasons for these effects across the age distribution. For example, young people might use information about their relative socio-economic position to infer their future prospects (see p. 209), and older ages might care about how their children are doing. Future researchers might bear in mind that even those not of working age can be affected by relative socio-economic status when considering the samples that they analyse.

In ELSA, there again were some differences across the life satisfaction measures (see p. 201, 259). For example, for proportion with top earnings in age groups in GORs, there was a slightly worse negative effect with higher earnings for the first but not the second life satisfaction measure. This could be interpreted as a lack of robustness for life satisfaction measures. Just as we saw in chapter four that going from asking about whether or not people agreed with the statement 'I am satisfied with my life' to asking about how frequently they felt satisfied with the way that their life had turned out reduced the number of relative socio-economic status measures associated with life satisfaction by nearly half, to find earnings differences for the effect of relative socio-economic status on SWB for one but not another measure of life satisfaction could suggest they are not reliable. Again, however, differences in the wording of experiential measures were not compared in this research (see further discussion of this issue in section 6.2).

Finally, we have also learned more about when there are positive effects of relative socio-economic status on SWB for rank earnings in ATUS. This effect was strongest for those in the middle of the SWB distribution – it does not affect those who are the most and least happy already. This is not consistent with the finding of Fang and Niimi (2015) that feeling relatively rich most impacted those at the top of the SWB distribution, and underscores the point that relative socio-economic status matters across the distribution of SWB. There was no interaction with age; however, separate age regressions did show stronger effects for those aged 45-54 years – somewhat consistent with the idea that those of working age are most affected, although the different results across estimation methods warrant caution in applying these findings only to those in their 40s and 50s. It is interesting that only the tails of the income distribution are affected by their rank earnings. People with low and high incomes might be more sensitive to social comparisons because the scarcity of income for those with low income draws their attention to it (Mullainathan and Shafir 2013), and

people with high incomes may be pre-disposed to be more competitive and make more comparisons to others because of their high achievement status (Hecht 2017). But this finding did not generalise to other measures of relative status – for example, the proportion with top incomes in age groups in states affected those with the least but not most income, and the proportion with top incomes in gender groups in in GORs did not depend on income. The general conclusion is that the effects of relative socio-economic status on SWB can be found across the socio-economic distribution when considering several relative measures.

Chapter summary

This chapter has taken us beyond the average effects of relative socio-economic status on SWB to investigate whether and how they depend on individual levels of SWB, socio-economic characteristics, gender and age. Largely, the effects of relative status don't depend on these differences. They matter for people with high, middle and low SWB and across SWB measures, across the socio-economic distribution – including those in the middle of the distribution – and for both genders and most ages. We did see some patterns, however – women were slightly more affected than men by standpoint measures, and a social norm effect of unemployment was largely supported. In the next, final and concluding chapter of this thesis, it is important to keep in mind that the negative effects of relative status hold across a host of individual differences. It suggests they are difficult to avoid, which is important for policy to consider in terms of the conclusions of this research being generalisable, and for future researchers interested in the psychology of individual differences – or the lack thereof.

6. Get over it: discussion, conclusions, policy implications and future directions

Summary

This chapter summarises the overall results of the thesis in terms of what we now know about the relationship between socio-economic status and SWB. All of absolute and relative income, wealth, education and unemployment had some impact on some aspect of SWB – even after robustness tests; however, evaluations were largely impacted more so than experiences of SWB. These results are interpreted in terms of social norm and identity theory, as well as the psychology of social comparisons and stimulus judgements. It is argued that policy and people should prioritise assessments of experiential more so than evaluative SWB because of the difficulty of answering evaluative questions, duration neglect in our evaluations, comprehension problems in life satisfaction judgements and the similarity of evaluative SWB to the preference satisfaction account of wellbeing. Still, because some aspects of experiential SWB were impacted by socio-economic status, it matters for SWB even when the experiential dimension is prioritised. The question of whether or not people should just 'get over it' – in terms of being negatively affected by the comparisons they make to others – is posed. It is argued that it is difficult for people to simply get over it because psychological research shows that we automatically make social comparisons to other people; however, society can be structured in such a way that social comparisons can benefit SWB – especially if people perceive they have control over their socio-economic attainment. Even if one accepts the argument that policy decisions should be cleansed of psychological processes such as envy, the absolute effects of socio-economic status on SWB warrant caution about pursuing socio-economic achievement to excess. Methodological limitations are discussed, including the problem of multicollinearity, endogeneity, mechanisms and missing data. Future research directions are explored, such as the need to consider SWB within and between generations, longitudinal data on people's experiences of SWB alongside measures of socio-economic status, and the distribution of SWB within scopes and not just the distribution of socio-economic status.

6.1 What we now know

This thesis began with the aim of looking at the relationship of a prominent account of wellbeing in policy and private lives, socio-economic wellbeing (Atherton 2017), with a newer account of wellbeing in terms of shaping social policies, SWB. There were challenges to address and gaps in the literature to fill, with a main theme being that the relationships could differ depending on how socio-economic status and SWB are conceptualised and measured – especially considering the role of reference group scopes and experiences of meaning – and also according to individual differences in SWB, absolute socio-economic status, gender and age. We now know some of these things are more important than the others but that they do matter, both absolutely and relatively so.

Absolutely

The relationship of absolute socio-economic status with SWB clearly depended upon the aspects of socio-economic status assessed in terms of income, wealth, education and unemployment. Yet the way in which it depended also depended, in turn, on how SWB was conceptualised and measured in the research. These issues are relevant for the absolute component of research questions one and two, which asks about how the relationships of absolute and relative socio-economic status depend on how socio-economic status and SWB are conceptualised and measured (the research questions and key results are summarised in Table 6.1 below on p. 350 – see also key results in Tables 4.15 and 4.16, pp. 253, 254).

In ELSA, strikingly, income and earnings were never associated with any dimension of SWB after introducing fixed effects. It is rare to find that socio-economic status provides little or no indication of SWB at all (Peasgood 2007), and suggests that there is some some time invariant aspect(s) of individuals that completely accounts for the relationship of absolute socio-economic status with all dimensions of SWB among these older adults in England. Future research could explore this issue in this and other samples, for example, by modelling the fixed effects according to observed information in the sample, such as the

many measures of health available because income, health and SWB are linked (Dolan, Peasgood and White 2008).

Wealth was, however, positively and robustly associated with both the life satisfaction measures in ELSA. Among older ages, it may be that in fact income does not directly matter for their thoughts about how well life is going. Instead, it is the wealth they have accumulated rather than the income they earn from work or receive in benefits that matters, which is consistent with prior research showing that wealth matters more for life evaluations than does income (see p. 118). Wealth is more stable than income and it may be that this stability matters for SWB, too, especially in light of evidence that losses and gains in income unevenly affect SWB (see p. 61 – there are greater negative effects for losses than positive effects for gains, Boyce et al. 2013a, De Keulenaer et al. 2017).

In ATUS, absolute income and earnings were more closely associated with SWB than in ELSA. Of course, this is only a cross-sectional sample, and so causal inference is more limited. Consistent with previous research using this dataset (Kushlev, Dunn and Lucas 2015; Stone et al. 2016), in ATUS, higher income was associated with improved evaluations of SWB on the Cantril ladder and less negative affect even with controls – and, for negative affect, especially at lower levels of income. Higher earnings was only associated with better Cantril ladder scores without and with controls, and not with better experiences of SWB. At the same time, however, those in the highest income group – $100K+ - were less happy than some of those with lower household incomes and reported experiencing less meaning. While it has been shown before in other data that high income improves evaluations but not experiences of SWB (Kahneman and Deaton 2010), it is unusual for high income to be associated with lower SWB (but see McBride 2001; Peasgood 2007). Future research should seek to replicate this effect to ascertain whether it is reliable, like the relationship of income with evaluations of SWB, or an anomaly, as Peasgood (2007) has documented. As it stands, it seems that $50-100K is optimal in the ATUS in terms of experienced SWB. This is enough to prevent misery (in terms of negative affect); however, not high enough to harm experiences of happiness or meaning.

The findings for the effect of income on happiness and meaning in ATUS cannot be due to 'overcontrolling' for the benefits of income, such as health, because the relationships were still present without controls. Instead, this research has suggested several possible explanations for the lower happiness and experienced meaning reported by people with high incomes in ATUS. As discussed in chapter three (p. 146), there are differences between socio-economic groups in identity, leisure time, values and conformity in ways that could benefit SWB. To recap, the identities of the socio-economically mobile could be challenged on the way up the socio-economic ladder, and the mobile may feel as if they do not fit into the norms of their new socio-economic group; those with higher incomes have less leisure time to enjoy than those with lower incomes; lower socio-economic groups are more generous and empathetic than others, which are behaviours positively associated with SWB; and lower socio-economic groups are more likely to conform to a norm than are other groups, which is predicted to be positively associated with SWB by social norm and identity theories (see p. 62).

Importantly, however, these results cannot be taken to be representative of the very poor or rich (see p. 150). Household surveys like ATUS and ELSA do not capture people who are homeless or living in institutions such as care homes and prisons, and do not sample the top of the socio-economic distribution very well. There are also unresolvable issues of endogeneity in that people who have achieved socio-economically may have started off with lower experiential SWB – and even pursued socio-economic attainment because of this – and their SWB could be even lower without their achievements (see p. 74). Still, these results suggest that high socio-economic attainment in absolute terms is not associated with benefits for the way in which people experience their lives and can even harm it, even if it improves their thoughts about how well life is going.

In both ATUS and ELSA, the relationship of education with SWB depended strongly on whether or not there were controls (in ATUS) and/or fixed effects (in ELSA). Although there were some benefits for SWB from higher education, these benefits largely disappeared and higher education even negatively impacted SWB with controls (see p. 200). As discussed in chapter three, and as was suggested by supplementary analyses of ATUS, this suggests that the benefit of education is in what accompanies education – or in

what drives people to pursue a degree in the first place – rather than education in and of itself. Education matters because it brings along better income, jobs and health, rather than because there is some inherent benefit in having higher education.

These results are relevant for policies that encourage people to pursue more education (Social Mobility and Child Poverty Commission 2013; Ahterton 2017). Policy influencers should take note that education alone does not appear to be sufficient to improve wellbeing in the results in this thesis, and that there also need to be opportunities for better jobs and more earnings, alongside good health, for education to improve people's wellbeing. This is supported by recent evidence from Nafilyan (2017). In a working paper using a regression discontinuity design exploiting a compulsory school reform from 1972, it is shown that young people in Britain who stayed in school one year longer reported more mental health problems a decade later. Similar results were found in another study by Clark and Jung (2017) for life satisfaction. Why might this be the case? Nafilyan (2017) reviewed the literature and showed that this group also did not benefit in terms of earnings, which is one explanation. Another possible explanation is that this group experienced some disutility from being different to the norm, as would be predicted by identity theory. Regardless, education in and of itself does not always benefit SWB even when applying more causal methods.

There were some parallels with the results for income, earnings and education in the results for absolute occupational class in ATUS and ELSA. Consistent with the idea that achievement can be a detriment to experiences of SWB but a benefit for evaluations of SWB, those in management and professional occupations in ATUS reported less happiness than people who were unemployed – although they still had better evaluations on the Cantril ladder (see p. 201). There were no differences in positive affect and life meaning in ELSA across occupational groups with controls and fixed effects, although those in higher managerial, administrative and professional occupations reported better evaluations of life than some lower occupational groups. Again, attainment occupationally mattered more for thoughts that life was going better, at least in terms of life satisfaction, but not experiences that it was.

This theme was again confirmed with unemployment, where the unemployed evaluated their lives as being worse than the employed but did not report any worse experiences. Unlike income, however, employment was not associated with less negative affect, and supplementary analyses showed that transitioning out of unemployment (after being unemployed before the ATUS interview) was associated with worse scores on the Cantril ladder versus remaining unemployed. While *being* employed is associated with better evaluations of life, *becoming* employed is (relatively) not. It was suggested (p. 204) that affective forecasting and uncertainty may play a role; however, this was not empirically tested. Future research could explore these mechanisms, as well as explore others, such as working conditions.

Absolutely, then, socio-economic attainment was largely only associated with better evaluations of life and improved negative affect, but not better experiences of pleasure or purpose and sometimes worse experiences of pleasure and purpose. This answers the first part of research questions one and two, as shown in shown in Table 6.1, p. 350. These absolute effects may be particularly compelling to those who believe that social welfare functions should be cleansed of psychological factors like envy (Kant 1996 translation; Rawls 1971; Sugden 1984; see p. 208 of this thesis); however, there are some reasons to suppose that they should not – it is difficult to avoid comparing to others, and the relative effects often mattered more than the absolute ones for SWB, as discussed in the next section.

Relatively

Chapter four took us to the second part of research questions one and two – how does how the relationship of relative socio-economic status with SWB depend on how socio-economic status and SWB are conceptualised and measured? This is important because prior research finding no effect of relative socio-economic status on SWB may have not looked at a certain, relevant dimension of socio-economic status or SWB (Diener et al. 1993; Böckerman and Ilmakunnas 2006; Clark, Westergard-Nielsen and Kristensen 2009; Oesch and Lipps 2012; Clampet-Lundquist et al. 2011; Deaton and Stone 2013; Luo, Wang and Huang 2016). The analyses showed that relative socio-economic status did matter for

SWB; however, not for all dimensions of SWB in all reference group scopes (see Figure 1.1, p. 23 for a reminder of what is meant by the scope, summary and standpoint aspects of reference groups).

In general, the effects of others' higher relative socio-economic status on SWB were negative, consistent with the predictions of relative income, deprivation and other theories that people make social comparisons to others and then feel bad when they do not live up others' levels of socio-economic attainment (Veblen 1899; Duesenberry 1949; Runciman 1966; see pp. 213).[18] In ATUS, higher proportions of people with top incomes in age groups in states was associated with more negative affect, and in ELSA, there were 30 relative variables that robustly supported a negative effect of relative socio-economic status on SWB. These effects were especially pronounced for the first life satisfaction measure, which asked about people's satisfaction with their lives (as opposed to the second life satisfaction measure, frequency of feeling satisfied with the way their lives had turned out, see p. 113). Age group was a consistent scope that mattered for SWB and ATUS and ELSA, and it is recommended that future researchers consider this scope in investigations of relative socio-economic status and SWB. This is a key contribution of this thesis because, in prior research, reference group scopes are heterogeneous between studies (see p. 222). This result confirms the finding of Pérez-Asenjo (2011), who also found that the scope age group was important when comparing multiple scopes.

In ELSA, there were more scopes that mattered for SWB than in ATUS, such as gender, occupation and unemployment groups in GORs (see Tables 4.15-4.16). The associations were, however, primarily only for the first two life satisfaction measures, and for the second life satisfaction measure there were only about half as many reference group variables associated as compared to the first (see further discussion of this result later on p. 354). One reference group measure was associated with all measures of SWB, which was perceptions of relative socio-economic standing on the MacArthur ladder (Adler et al. 2000). This item asked people where they saw themselves relative to others in the scope society in terms of their money, education and jobs. How they saw their household's

[18] Such effects would not be inconsistent with the predictions of evolutionary theories pointing to negative SWB effects of low rank if rank were the mechanism between summary measures of relative socio-economic status and SWB (see p.44).

financial situation comparing to others 'living around here' was associated with the first life satisfaction measure and experienced affect last week (see p. 109). Thus, the perceived scopes society and 'living around here' were especially relevant in ELSA.

There were some exceptions to the general trend that higher socio-economic status in a reference group was associated with worse SWB. In ATUS, higher proportions of people who were unemployed in age groups in states were associated with worse scores in the Cantril ladder. In this instance, higher socio-economic status in a reference group (in terms of more people who are not unemployed) is associated with better SWB. This is consistent with much prior research into relative unemployment and SWB, and supports social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect' more so than relative income or deprivation theories (see pp. 218, 274). But social norm and identity theory also explain this result well because the effects were only found for those who were not unemployed in chapter six (p. 333). When people are increasingly different to a norm – which is the case for people who are not unemployed and when unemployment increases – then their SWB is lower. These results did not confirm a positive effect of relative unemployment among the unemployed, as in some prior research, but rather the absence of an effect of relative unemployment among the unemployed. This is some support of a social norm effect of relative unemployment.

The other exception to the trend of higher socio-economic status in a reference group being associated with worse SWB was for rank earnings in income groups in ATUS and happiness. Here, higher rank earnings was associated with worse happiness, echoing the absolute effect of income and earnings on happiness (without controls for earnings) in chapter three. While this result could seem supportive of social capital theory, the mixed neighbourhood hypothesis and the 'tunnel effect' more so than relative income or deprivation theories, equally, the costs of achievement discussed throughout chapter three also seem relevant here – though the effect also held among those with low incomes (see discussion on p. 335). Rank earnings is a standpoint measure, and rather than reflecting just how people feel about others' earnings, this also likely reflects how people feel as a result of their own earnings. Overall, what the relative effects suggest is that the predictions of relative income and deprivation theory are most consistently supported – but there is also

some evidence of positive effects of relative socio-economic status on SWB, and these speak to effects predicted by social capital theory, the mixed neighbourhood hypothesis, the 'tunnel effect' and/or the costs of achievement (p. 146). As discussed earlier (pp. 214, 256), there are likely multiple pathways through which relative socio-economic status affects SWB. Overall effects only show which one dominates, and here, effects consistent with relative income and deprivation theories dominate.

As with the absolute effects, an important caveat to interpreting these relative results is the risk of endogeneity. For one, area and group-level effects are very difficult to estimate reliably. Relative socio-economic status might positively impact upon SWB not because others have a particular level of earnings or type of employment but because of other characteristics of the group that are associated with the neighbour's income or education, such as better infrastructure in terms of hospitals, schools or roads, or more social capital (Lin 2002). Although median housing cost by state was controlled for in ATUS, the effects of better infrastructure and social capital were not fully controlled for, but these may be of interest in and of themselves. The same applies to the index of multiple deprivation in ELSA, though perhaps less so because it is a more complex measure (pp. 120, 121).

In the analyses of chapter four, however, many measures – around a third – of relative status were excluded due to multicollinearity (O'Brien 2007). This a significant problem affecting analyses of the relationship of relative socio-economic status with SWB. It is not possible to isolate the effect of relative from absolute socio-economic status without including both in a single regression model (pp. 217, 237); however, these aspects of socio-economic status are often related. In a modelling sense, when they are too highly related, the standard errors become large and there is a failure to detect a relationship that might be important (pp. 92, 133). More importantly, however, the sign of the coefficient can change from positive to negative or vice versa. This research tested for multicollinearity with VIFs and excluded all models that showed evidence of multicollinearity.

Excluding models with significant multicollinearity, however, led to a limitation of this research. This is that there may have been some measures of relative socio-economic status that are important for SWB but that could not be estimated with these data. For example,

average income in gender group in GORs in ELSA was always collinear in a model with absolute income and had to be excluded from these analyses (see Tables 4.15 and 4.16). Average income in education group in state in ATUS suffered from the same problem. There was not a good compromise between relaxing the criterion for collinearity, which was necessary in order to prevent sign reversals in the coefficients, and ensuring all relationships could be estimated. Good solutions for the problem of multicollinearity that do not involve removing a predictor do not exist (Allison 2012). In this case, removing absolute socio-economic status from the model would lead to a failure to isolate the effect of relative socio-economic status.

Future research could seek to address the methodological problem of collinearity. Until then, studies finding a positive effect of relative socio-economic status on SWB should report collinearity diagnostics such as VIFs. For the set of studies finding positive effects of relative socio-economic status on SWB in small geographical areas, this is particularly important (see p. 257). Within narrow reference group scopes like these, it is more likely that absolute and relative socio-economic status are more highly correlated. It may be that quantitative methods are not that well-suited to discovering the effect of relative socio-economic status on SWB in small local areas because of collinearity. Other methods, such as qualitative research, might speak better to these effects and the processes through which they unfold – notwithstanding problems such as the focussing effect and confirmation bias (see p. 72).

In the contest between absolute and relative socio-economic status in chapter five, which addressed research questions three and four, collinearity was less of a problem. This is because models with relative but without absolute socio-economic status were compared using AIC and BIC tests of model fit, following Wood et al. (2012). This allowed the inclusion of some measures – all standpoint measures – that were previously excluded due to collinearity. In ATUS, measures of rank and distance from the median education were included but they did not fit these data better than absolute education (see Table 4.15). In ELSA, several measures of rank earnings, rank education and distance from the median education were included, and in all cases, the relative fit was better for the first life satisfaction measure (with mixed results for the other SWB measures – see Table 4.16).

Even though it was not possible to isolate the relative effect of these measures with these data on SWB, this is still some suggestion that they matter for SWB. Usually, in ELSA, and especially for the first life satisfaction measure, the statistically significant relative effects mattered more than absolute socio-economic status – but this was not the case in ATUS, where only one of the three measures significantly associated with SWB fit these data better than absolute socio-economic status (rank earnings and happiness). So, both absolute and relative effects are important for SWB.

Overall, it was the summary and not standpoint measures of relative status that were most consistently associated with SWB. These results, therefore, speak to theories about how we perceive others' socio-economic status. It has been proposed that rank measures are more suitable than average measures of socio-economic status partly because, according to range-frequency research, people incorporate both the range of a stimulus set and the frequency with which certain values appear in a stimulus set into their judgements about whether a certain stimulus is small or large (see p. 41). The initial studies were based on judgements of shapes, and, as discussed by Boyce, Brown and Moore (2010), have been extended to other social and economic judgements including of probabilities (Stewart, Chater and Brown 2006), the fairness of distributions of salaries (Mellers 1986) and prices (Niedrich, Sharma and Wedell 2001).

The perception of others' socio-economic status, however, is still different to the perception of shapes, probabilities, salaries, and prices. There are many perceptual channels through which socio-economic information about a member or members of a reference group could be communicated. Humans have (at least) five senses, and socio-economic information could, possibly, be communicated through all of them – visually, e.g. from the sight of someone's clothing; auditorily, e.g. from their accent; smell, e.g. from the quality of their perfume; touch, e.g. from someone's hand that is calloused from a job requiring manual labour; even taste, e.g. from what they use to cook (Argyle 1994). How is all of this formulated into our perception, the comparisons we make to others and our SWB? The predictions of range-frequency theory were not strongly supported by these data, although in ATUS, rank earnings did matter for SWB, and standpoint measures fit these data better than summary measures from AIC and BIC tests of model fit (but not in ELSA, see p. 264).

In ELSA, only summary and perceived standpoint measures of relative status significantly mattered for SWB – not rank or distance from average or median.

It may be that rank socio-economic status matters for SWB but that the scopes were too large in these analyses. As discussed in the Introduction (p. 44), the theoretical underpinnings of the association of rank socio-economic status with SWB are drawn from research conducted with smaller scopes such as families (Gilbert, Price and Allan 1995). Other research, however, has found that rank socio-economic status still matters for SWB in larger scopes (e.g. Pérez-Asenjo 2011; Wood et al. 2012). The results of this thesis should be interpreted in the context of this other research, and, therefore, the idea that rank matters in larger scopes should not be entirely dismissed. It is also possible that the parameterisation of the rank variable and income may have affected the results. Hounkpatin et al. (2015), for example, used the constant relative risk aversion (CRRA) formulation transform absolute income, which is a way to more flexibly capture nonlinearities between income and SWB. Future research might consider selecting reference group scopes for rank socio-economic status based on those in which rank fits best using such alternative parameterisations.

One of the focal points of this thesis was on the effects of those at the 'top' of the socio-economic distribution on others (p. 40). The top, however, only mattered in terms of proportion of people at the top. Unfortunately, the share of income held by the 1% across states was excluded due to collinearity in chapter four. In supplementary analyses not reported here, which used a less strict VIF cutoff and allowed the inclusion of the share of income held by the 1%, the relationship still did not reach statistical significance using the criteria in this thesis. This is not consistent with equity or social distance theories (see p. 178). It may be, however, that the scope was not accurate in this research in terms of what mattered for SWB. As we saw, geographic scopes alone never mattered in ATUS and ELSA. Future research could consider looking at the effect of top income shares within non-geographic scopes, or geographic scopes mixed with another scope like age, where possible.

Finally, all of these effects were evident in most sub-groups for at least some reference group measures. They occurred across the distribution of socio-economic status, among both genders and across age groups. Women were slightly more affected by the standpoint measures than men, consistent with the idea that they care more about their relationships with others than do men – but not with the idea that men care more about their socio-economic attainment than do women (see pp. 276, 334). Relative status mattered for those with the lowest SWB, which is important for policy. These groups should be targeted – even if not publicly branded as such in order to avoid stigma – given that social policies are concerned with people's wellbeing, and there is public support for policies that intervene to reduce people's misery (p. 271). Moreover, consistent effects within groups suggests that there can be confidence in the average effects of relative socio-economic status on SWB, and policies that affect relative socio-economic status will impact most people in largely similar ways – at least, according to the group differences examined in this thesis.

How do the relationships of absolute and relative socio-economic status with SWB depend on…	
1. …how socio-economic status is conceptualised and measured – that is, as (a) income, (b) wealth, (c) education or (d) unemployment, and across variations in the (e) scope, (f) summary and (g) standpoint aspects of reference groups?	-Absolute income, wealth, education and unemployment were more consistently and positively associated with evaluations than experiences of SWB. Sometimes the association with experiences on SWB was negative - high income was associated with less happiness and meaning, and moving out of unemployment with relatively worse evaluations of SWB in ATUS -The scope age was especially relevant across ATUS and ELSA, as well as the perceived scopes 'society' and 'nearby' in ELSA. Geographic scopes alone (in states and local authorities) did not matter for SWB. Relative status was only relevant for the Cantril ladder, happiness and negative affect but not experiences of meaning in ATUS, and particularly relevant for the first life satisfaction measure in ELSA
2. …how SWB is conceptualised and measured – that is, as (a) evaluations of pleasure, (b) evaluations of purpose, (c) experiences of pleasure, and (d) experiences of purpose?	-Summary measures of relative status were associated with worse SWB. Only perceived - rather than 'actual' - standpoint measures mattered for SWB in ELSA, and better perceptions were associated with better SWB. Exceptionally, higher rank earnings in income groups in states was associated with worse SWB in ATUS. Higher relative unemployment associated with worse SWB evaluations in ATUS.
How does whether absolute or relative socio-economic status matters more for SWB depend on…	
3. …how socio-economic status is conceptualised and measured as (a) income, (b) wealth, (c) education or (d) unemployment, and across variations in the (e) scope, (f) summary and (g) standpoint aspects of reference groups?	-In ATUS, relative earnings most often fit better than the absolute earnings models, and the relative fit better than the absolute models for the Cantril ladder, happiness and standpoint measures especially
4. …how SWB is conceptualised and measured – that is, as (a) evaluations of pleasure, (b) evaluations of purpose, (c) experiences of pleasure and (d) experiences of purpose?	-In ELSA, relative education most often fit better than the absolute education models, especially for life satisfaction (1), and for summary measures of relative status
How does the relationship of relative socio-economic status with SWB depend on…	
5. …SWB, conceptualised and measured as evaluations and experiences of pleasure and purpose?	-Impacts across the SWB distribution
6. absolute socio-economic position of income, wealth, education and unemployment?	-Impacts across the socio-economic distribution, although unemployed less negatively affected by relative unemployment
7. …gender?	-Impacts on both genders - women slightly more so on standpoint
8. …age?	-Impacts across age distribution

Table 6.1: Summary of research questions and a selection of key findings in answer to research questions

6.2 Evaluations or experiences?[19]

Given that there were different effects of absolute and relative socio-economic status on the different dimensions of SWB, it is of interest which effects we should care more about. This section argues that it is our experiences that should matter most. Note that the discussion in this section is not based on the empirical findings in this thesis except for the paragraph on pages 354-355 discussing the two different life satisfaction measures used in this research and evidence contained within the sub-section 'the implications' on page 357.

As discussed in the Introduction (p. 16), policymakers around the world are increasingly interested in using measures of happiness to monitor national progress and to inform resource allocation decision. Most of the policy research to date has been conducted using questions that reflect overall evaluations, such as life satisfaction, and we have already seen that what affects people's evaluations and experiences can be quite different. This means that our conclusions about who is doing well and about who should get priority in the race for scarce resources might be different if measures of experience were used instead.

Does this matter? We contend that there are good conceptual and empirical reasons to suppose it does, and that researchers and policymakers should be paying more serious attention to experience-based measures of happiness than they are currently. This is not an uncontroversial position to take. It is far cheaper and easier for statistical agencies to ask high-level evaluative questions than it is to ask about specific feelings and activities. Still, as we discuss in detail in this section, we believe there are good reasons to favour experiences over evaluations.

Certainly, for researchers especially, the happiness measure does depend on the research question: for questions about experiences of happiness, experiential indicators are more suitable, and for questions about evaluations of happiness, evaluative items are more appropriate. We do not mean to imply that experiential indicators are better for all types of

[19] This section is from Dolan, P, and L Kudrna. 2016. "Sentimental Hedonism: Pleasure, Purpose, and Public Policy." In *Handbook of Eudaimonic Well-Being*, edited by J Vittersø, 437–52. Springer International Publishing. Note that because this section is a jointly authored contribution, at times, the pronoun 'we' is used.

research questions; rather, that the types of questions asked about happiness should more often be about experiential happiness inasmuch as researchers want to understand how well people's lives are going. This is our overarching criterion in this discussion: whether experiential or evaluative indicators better reflect how well people's lives are really going.

It might initially appear as though evaluative questions that ask about life overall are preferable to experiential questions that ask about only a moment in time. "How happy are you feeling right now?" only tells us how well people's lives are going at that moment, whereas "how happy are you with your life overall?" seemingly informs about life as a whole. Unfortunately, it does not appear that people actually aggregate information about their lives as a whole when they answer a question about their life overall. It takes a similar amount of time for people to answer a life satisfaction question as it does a question about their emotions, four to five seconds (Vittersø, Oelmann and Wang 2009). This is an issue because the length of time it takes to answer a question can be associated with the depth with which people process that question (Krosnick 1999; Slovic et al. 2002, 2007). Whilst understanding how well people's lives are going overall is a laudable aim, it does not appear that a single question can achieve that aim.

Given that people answer overall questions about their happiness so quickly, is not surprising that people appear to rely on readily available information to construct responses to evaluative happiness questions. For example, being asked about one's political views before being asked about life satisfaction affects reports of satisfaction as much as becoming unemployed does, and life and relationship satisfaction are more highly correlated if the relationship question comes before the life satisfaction question rather than after (Schwarz, Strack and Mai 1991; Deaton 2011). The task of evaluating how well life is going overall is a demanding one and so what is prominent at the time of the assessment will drive responses, similar to the way that people facing the task of recalling how many alcoholic drinks they have had over a period of weeks or months will tend to recall the most prominent drinks, such as regularly having two beers at the bar every Friday (Del Boca and Darkes 2003). It is also difficult to make an assessment of life overall without making comparisons to other people because the question is so broad, whereas reports of feelings in

the moment are arguably more absolute – the pain you feel in your leg is not as affected by the pain others are feeling, although this is an active research area (Meng et al. 2013).

Another reason why we favour experiences to evaluations is that overall evaluations are rarely considered in our daily lives; perhaps they are only ever really triggered in studies that measure them (Schwarz, Strack and Mai 1991; Feldman 2004; Haybron 2008). People do not often appear to ask themselves how happy or satisfied they are overall, or how much purpose they have in life, and such specific evaluative happiness questions will likely arise more often in the context of a survey interview than in daily life. We need more research into people's thoughts and where their attention is directed, however, to truly know the degree to which people think about whether they are happy or satisfied overall. There are, of course, likely to be individual differences in the extent to which people consider overall evaluations of their lives. Some people may be more prone to think about them than others, such as those who have high trait anxiety, frequently ruminate on the past or often worry about the future (Watkins 2008). To understand how well people's lives are going, we maintain that it is preferable to use measures aligned with what people are most likely to consider most often as they go about their lives, rather than momentary snapshots that do not feature as frequently in their considerations.

Moreover, evaluative judgements do not adequately capture the duration of our happiness, which is a problem because our happiness depends on how long our feelings last as well as on their valence and intensity. Someone who reports feeling happy throughout the day is happier than someone who reports feeling happy for only one minute in the day. Recall from earlier that people's evaluations of how they felt on a particular day were more intense than the duration-weighted average of their emotions on the same day (p. 53). Given that the encoding and retrieval of emotional information are largely unconscious processes, it is likely that at least some of the tendency to neglect the duration of an emotional experience in an overall evaluation of it is also unconscious (Wyer, Clore and Isbell 1999; Robinson and Clore 2002). So, drawing conscious attention to the difference between evaluation and experience may not fully resolve the issue of duration neglect in the former. Although people who feel more happiness in their experiences report more happiness in their evaluations, capturing experiential variability is important. Consider for

instance, those people whose happiness is more susceptible to positive and negative environmental influences (see Pluess 2015): their happiness is likely to fluctuate more than others' during a period of time, as environments constantly change over time. Yet this experienced variability might not transpire in people's global evaluations, which would then be less informative for policy purposes. Similar issues apply to people with mental health conditions, such as bipolar disorder, which are characterised by extreme fluctuations in mood over time.

There are also concerns with the use of the word 'satisfaction' in many of the evaluative questions. Confusingly, there are several interpretations of satisfaction: it could mean feeling happy in some general sense, or it might indicate the perception of having 'just enough'. For example, a qualitative investigation of how people understood the question, 'How satisfied are you with your life nowadays?' revealed that the term 'satisfaction' was interpreted positively by some people and negatively by others, and among those who interpreted it negatively, it was reported that satisfaction was "something not to aim for or that it meant something that was neither good nor bad" (Ralph, Palmer and Olney 2011, p. 5). As further evidence of such problems with the comprehension of life satisfaction questions, people who are older, poorer and less educated are more likely to provide 'ten out of ten' ratings for their satisfaction with life than those saying 'nine out of ten'. The evidence related to age supports the idea that life satisfaction measures are capturing an endorsement of one's life when approaching the end of life, rather than an actual evaluation of one's life (Oishi, Diener and Lucas 2007; Dolan, Layard and Metcalfe 2011). We argue that endorsements of life are not good indicators of how well people's lives are really going.

In this research, two measures of life satisfaction were used – agreement with the statement 'I am satisfied with my life' versus how frequently they felt satisfied with the way that their life had turned out. Different results were found for these measures (see pp. 201, 259, 335). For example, around half of the reference group measures associated with the first life satisfaction measure were not associated with the second life satisfaction measure in chapter four, and some of the interaction effects in chapter five held for the one but not the other life satisfaction measure. It is possible that asking people about the degree to which

they agree that they are satisfied with their life really is different to the frequency with which they feel satisfied with the way their life has turned out. The latter statement asks about feelings, and is thus also about experiential SWB. Because absolute and relative socio-economic status were less closely associated with experiences of SWB, asking about 'feelings' in the second life satisfaction measure could be turning people's attention towards their experiences – but not entirely, as the experiential measures were not associated with relative socio-economic status in ELSA, apart from the MacArthur ladder and perceptions of one's financial situation relative to those nearby. The second life satisfaction measure suffers from category confusion between evaluations and experiences of SWB, and the associated measures of relative status support this – more relative status measures were associated with how frequently they felt satisfied than with experienced affect last week, but fewer relative status measures were associated with the second than with the first life satisfaction measure. It could also be taken as evidence, however, that life satisfaction measures are not reliable because small changes in the wording of the question can affect what matters for life satisfaction.

It is also possible that responses to life satisfaction questions capture the degree to which respondents have satisfied their preferences – as opposed to capturing any aspect of their mental state at all. In support of this idea, Akay, Bargain and Xavier (2015) show that people's revealed preferences for income-leisure trade-offs closely correspond to their life satisfaction in that as leisure time increases and income decreases, life satisfaction also decreases in a similar manner. Adler (2012) raises legitimate reasons why life satisfaction might not be a good guide to preferences, primarily due to 'scale heterogeneity', whereby two people with similar preference might use the life satisfaction scale differently, and 'preference heterogeneity', whereby we cannot infer people's preferences over the ranking of bundles of attributes from a single satisfaction response.

But even if life satisfaction may be an imperfect measure of preference satisfaction, this still leaves open the possibility that the ratings better reflect preferences than they do mental states. Indeed, when considering the high respondent burden associated with the direct reporting of preferences and the high survey costs therein, single-item life

satisfaction measures may be a better choice for statistical agencies seeking to capture preferences than people's reports of their preferences (Dolan and Peasgood 2007).

Experiential happiness is not without its own limitations. It is not clear what the best assessment method is. The experience sampling method (ESM) asks people at random times of day how they are feeling. It is typically considered the gold standard for measuring experiential happiness because it does not allow for the possibility that people inaccurately recall how they were feeling as responses are captured 'in-the-moment' (Kahneman et al. 2004; Scollon, Kim-Prieto and Diener 2003). Using the DRM increases the risk of recall bias because it asks people to recall how they felt during various activities over a 24-hour period. But a DRM provides information about an entire day's worth of experiences, whereas experience sampling captures only a few points throughout the day to minimise respondent burden. Moreover, because the ESM asks people to say how happy they are at the moment, they are interrupted from their experiences to report on it. These considerations call into question whether the ESM can really be considered the 'gold standard'. Another issue is that people who report feeling stress do not always show physiological signs of stress (Mauss, Wilhelm and Gross 2004). This is surprising because stress is known to be associated with higher heart rate, respiratory rate and levels of the hormone cortisol. But these findings merely raise the issue of how experiential happiness is best assessed – with the ESM or DRM or other self-reports, or physiological indicators of emotions. It does not call into question whether experiential measures are capturing (the duration of) happiness or another construct such as having 'just enough' or an 'endorsement' of life the same way that the evidence on evaluative measures does. An issue for both evaluations and experiences of happiness is that we do not really know what determines the answer to a survey item about happiness. Cognitive interviews provide some clues but they cannot capture processes people are unaware of (Luhmann, Hawkley and Cacioppo 2014).

Another issue with measures of experiences of SWB relate to perceived duration differing from actual duration. Emotional experiences themselves affect the perception of time: when people report experiencing low purpose, such as boredom, time passes slowly, whereas when people report experiencing high pleasure, such as fun, it passes quickly (Droit-Volet

and Meck 2007). Weighting emotional experiences such that they account for perceived rather than actual duration could affect who appears most happy or unhappy. For example, Knabe et al. (2010) found that unemployed people reported feeling sadder than employed people but that their emotional experiences were similar once duration was accounted for. So, the greater intensity of sadness found among unemployed people might occur in periods that are perceived to last longer than their actual duration, and this could bring down the total happiness experienced by unemployed people relative to employed ones.

The implications

The implication of taking the position that experiences are more important than evaluations of SWB is that the determinants of experiential SWB are more important than those of evaluative happiness. In this research, then, it is worthwhile to focus on the results for experiences of SWB alone. What can we conclude?

In ELSA, there was largely no association of absolute income, wealth, education and unemployment with positive affect (in the fixed effects models with controls). In ATUS, there was even some indication that achieving in absolute socio-economic terms had a negative impact on experiences of SWB. Improving absolute socio-economic attainment does not appear to be a route to improving experiences of SWB in these samples in ways that matter; however, it is important to note that these absolute results were only on average. Other research, discussed in chapter five, shows that absolute socio-economic position matters for those with the lowest SWB, and so it may be that those with the lowest SWB benefit the most from improvements in their socio-economic conditions (see p. 271). Because of the diminishing marginal returns to SWB from income, those with the lowest socio-economic wellbeing benefit the most, too (Clark, Frijters and Shields 2008). We should not stop trying to improve the wellbeing of the worst-off in socio-economic and SWB terms, and improved socio-economic resources are one way to do this. They are not the only way, however, especially given the small amount of variance in SWB explained by absolute socio-economic status.

Other SWB researchers have suggested that improvements in mental health care would make the most difference to SWB out of all of the possible policy tools (Layard and Clark 2015). While improvements in mental health care are important, especially given that they are currently given less priority than physical health in many countries yet matter more for SWB (Dolan and Metcalfe 2012), this research suggests that a complementary focus on the structure of society can also improve SWB – and in ways that matter, for our experiences. In ATUS, higher proportions with top incomes in age groups in states was associated with more negative affect. In ELSA, people who perceived that they were doing better socio-economically than those 'in society' and 'in their local areas' reported better experienced affect over the last week, and this mattered more than their absolute socio-economic position.

While it might be argued that people should simply 'get over it', and envy is not the remit of policy, the research drawn upon throughout this thesis shows that social comparisons occur quite automatically (pp. 34, 331). Policy should go with the grain of human nature (Dolan et al. 2010; Dolan et al. 2012), and humans are wired to compare to others. When these comparisons are made, people need to perceive that achieving similar to others is within their control in order for comparisons to benefit SWB (Buunk et al. 1990; Cheung 2016; Smith 2000; Michinov 2005). Support for control as a potential mechanism between relative socio-economic status and SWB comes from Sheehy-Skeffington and Sidanius (2016), who show that experimentally manipulating people to think that they are of a low relative rank (on an item similar to the MacArthur ladder that uses the United States as a scope) leads to a diminished sense of control and feelings of powerlessness. Overall, it does not appear from this research in this thesis that people do perceive that attaining more is within their control because the summary measures of others' higher relative status negatively and never positively affected experiences of SWB. But because there are positive effects of relative socio-economic status on SWB in other research (see p. 215), policy could have a role in facilitating positive effects by creating real opportunities for all to achieve that positively shape perceptions of control and agency.

There are many policy implications that arise from agreeing that relative status negatively affects SWB and that something should be done. One suggestion is to tax positional goods -

visible manifestations of others' high socio-economic attainment. A tax on conspicuous consumption, however, could also disproportionally affect ethnic minorities, whom evidence suggests spend a higher proportion of their income on positional goods – even though the rich spend more in absolute terms on positional consumption (Charles, Hurst and Roussanov 2007). It is not at all clear from the SWB evidence that any SWB benefits these minority ethnic groups receive from spending conspicuously are cancelled out in the long run by the negative consequences of spending less in domains such as healthcare and education (see also Sheehy-Skeffington 2015). Yes, poor health and debt are generally associated with lower SWB, but lower education is not necessarily - as was confirmed in the results in chapter three (Brown, Taylor and Wheatley Price 2005; Steptoe, Deaton and Stone 2015). We need to tread carefully when assuming what is good for SWB and not, consider the impacts on population sub-groups and also any unintended consequences of interventions.

Even if one does not accept the argument that policies should influence relative socio-economic status, the absolute effects on experiences of SWB in this thesis also highlight the costs of high socio-economic achievement. High socio-economic achievement does not appear to benefit experiences of SWB in these datasets from the US and the UK. It is, therefore, worth considering whether high socio-economic achievers in these countries have achieved enough already. Taxes can be used to redistribute even more from these populations, and towards areas that the market neglects – including international poverty and the environment, notwithstanding problems that accompany redistribution such as corruption and market distortions. Still, taxes could be used to direct funds to addressing such issues.

6.3 Limitations and future directions

Many limitations and areas for future research have already been mentioned throughout this thesis. These include methodological issues, such as the problems of reverse causality (pp. 74, 199, 214, 258), common method variance (pp. 226, 259, 332), multicollinearity (pp. 92, 133, 345), combinations of reference group scopes (pp. 91, 129), socio-economic trajectories (p. 263) and estimating and separating local area from social comparison and

norm effects (pp. 120, 216, 346). There have also been conceptual issues, such as the reification of SWB and identity (pp. 46, 66), the need for research into the mechanisms involved in the relationships of absolute and relative socio-economic status with SWB (pp. 201, 338, 342; see below) and the reduction of complex constructions like socio-economic status and SWB into quantitative assessments – e.g. excluding power relations and debt in measures of socio-economic status (pp. 18, 46, 121). There are also limitations in the extent to which this thesis can inform policy because SWB research can only inform and not fully determine the parameters of a social welfare function (pp. 17, 27, 342).

There has been the issue of sample representativeness (pp. 79, 150, 199), which is worth reiterating one final time. It is both a methodological and a policy issue because these results should not be used to inform outside of the samples and time periods studied unless there are reasons to suspect they will generalise. Future research could seek to replicate these results among other samples at other time periods. Moreover, these results can only speak to SWB within generations. There is the issue of intergenerational SWB, and between-generation equities in SWB, which this research does not address – nor does SWB research generally. What this generation does has consequences for the next; however, the next generation does not yet exist and so they are absent from our analyses of SWB.

There was also the assumption in the research that the effects of relative socio-economic status on SWB were linear. All of the regressions modelled average linear changes in relative socio-economic status. The focus in this research was on variations in the scope, summary and standpoint aspects of reference groups, rather than in whether there might be non-linear effects, such as quadratic effects – as has been shown in the relationship of age with SWB (p. 278). Because age was shown to be an important factor in the relationship of relative socio-economic status with SWB – in terms of being an important scope characteristic – future research could consider modelling different non-linear relationships of relative socio-economic status with SWB, as has been done for age (see also p. 348). All of the analyses were also conducted at the individual level (see p. 123), and analyses at other levels may be of interest. For example, I have conducted preliminary supplementary analyses which show that when SWB is assessed at the average state-level, there is a

negative bivariate association between top 1% income shares by states and state-averages of the Cantril ladder in ATUS (see Appendix E, Figure 6.1).

Methodologically, there is room to learn more about how missing data affects analyses using SWB (p. 127). Multiple imputation by chained equations, used in this research, is considered the most flexible approach (Raghunathan et al. 2001). The approach, however, has a very different theoretical basis and makes different assumptions than the multivariate normal approach to multiple imputation (Van Buuren 2007). There have been several comparisons between the two approaches in a given set of data highlighting the general strengths and weaknesses of the two approaches (Van Buuren et al. 2006; Van Buuren 2007; Yu, Burton and Rivero-Arias 2007; Lee and Carlin 2010), but seemingly none looking at their effect on SWB estimates. Future research could look at this. In terms of future researchers using the ATUS, the earnings imputations never changed the results substantively, suggesting missing data do not affect the relationship of earnings with SWB.

Another methodological point relates to the issue of statistical significance, which may or may not reflect practical significance. Statistical significance entered the field of economics in the 1930s (Duo, 1993). It has been documented that throughout the 1980s and 1990s, economists have over-relied on reporting statistically significant effects at the expense of considering measures of effect size and the practical significance of empirical findings (McCloskey & Ziliak, 1996; Ziliak & McCloskey, 2004). This should change. One way to assess effect size is to report standardised regression coefficients. An advantage of standardising both the predictor and outcome measures in a regression is that heterogeneous predictors on different scales – such as average income in dollars or median educational qualification obtained – can be directly compared in terms of changes in standard deviations. A disadvantage is that the results are less interpretable to general audiences unfamiliar with the language of effect sizes. This research only standardised the outcome SWB measures and not the predictors (see p. 111), which limits the conclusions that can be drawn about the relative importance of different predictors for SWB.[20]

[20] Thank you to Professor Alex Wood for suggesting these points.

There has also been no direct exploration of the mechanisms between socio-economic status and SWB in this research. Many different theories were discussed, however, such as differences between socio-economic groups in terms of identity and values, relative income and deprivation theories, social capital theory, and feelings of control (pp. 209, 358). A good theory will not only describe what effects are occurring but also consider why they occur. As Pawson and Tilley (1997, p. 57) describe, a spark might appear to cause gunpowder to explode. But without oxygen, a spark will not have the same effect: oxygen is an essential causal mechanism in the process from spark to explosion. Relative socio-economic status might seemingly cause a negative effect on SWB, but without media information about those at the top, for example, there might be no effect on SWB at all. Understanding the mechanism(s) between a causal factor and an outcome improves the generalisability of results by helping to understand under which circumstances the effect will occur or not. Future research could consider creating standpoint measures that reflect whether an individual is above or below the 'norm' in a reference group, such as above or below median education. This more refined approach to standpoint measures might suggest, for example, whether upward or downward comparisons are the mechanism between relative socio-economic status and SWB.

In looking to the future, however, there are some even bigger issues to tackle that should greatly help future researchers better understand how absolute and relative socio-economic status relate to SWB. One of these is longitudinal experiential SWB data. There appear to be only a few datasets that contains these. One is a small sample of less than two hundred that does not appear to measure experiences of purpose (Carstensen et al. 2011), and the other is the DRM from Germany by Paul Dolan and Mat White that did not have very many measures of socio-economic status (see p. 80). There is also a new, large mobile phone-based dataset (MacKerron and Mourato 2013); however, the analyses to date appear to focus on the effect of the natural environment on SWB rather than of socio-economic factors, and it does not appear to include experiences of purpose either. With better longitudinal experiential SWB data, and associated measures of socio-economic status, we could then start to understand why, for example, increasing income is associated with less experienced meaning. Is it really that higher income causes people to feel that their experiences are meaningless, or do certain types of people who already experience low

meaning select into higher income groups, perhaps working harder in an attempt to fill their meaningless experiences?

Another relates to time. In ATUS, time spent in different affective states (happy, negative affect, and meaning) was accounted for with the survey weights, which adjusted for how long people reported that they spent doing the different activities that they reported how they felt during (p. 125). In ELSA, the experiential SWB measures asked people to recall how they felt over the last week. When considering duration, people may rely on measures of objective time, such as clocks and calendars, as well on their subjective memory of how long their experiences feel like they last. Everyone, however, experiences time subjectively: one hour of happiness may feel as if it lasts ten minutes, whilst ten minutes of pain may feel like they last an hour (Sackett et al. 2010; Freedman et al. 2014; O'Brien, Anastasio and Bushman 2011). Utilising subjective rather than objective time to weight SWB would more directly capture how long people feel their activities last, rather than how long timekeeping devices suggest they feel like they last. Understanding how long people perceive their SWB experiences to last would provide a better picture of their overall SWB.

Another issue relates to the measurement of experienced purpose. Unlike positive and negative affect, no scales have been developed to measure the multidimensionality of this construct. It is not even clear whether experienced purpose can be positive and negative or aroused and non-aroused, as is the case with experienced pleasure (Watson, Clark and Tellegen 1988). To accomplish this, sampling of words related to experienced purpose from across the literature, or even from qualitative interviews, could be done in order to create a corpus of terms related to this concept (Bauer and Gaskell 2000). Then, associations between these terms could be calculated, perhaps using factor analytic techniques, to discriminate between the dimensions of experienced purpose. If the use of a single-item measure is of interest – perhaps for policy purposes where the cost of inserting SWB items into surveys is a concern – then the item that most closely associates with the other measures of experienced purpose could be selected, assuming it has good face validity. Undertaking this research would improve the overall validity of measures of experienced purpose.

It is also clear that SWB researchers need to move beyond such limited measures of relative socio-economic status. Average, distance from the average, rank, median and proportion are all more or less valid measures for summarising relative socio-economic status (see section 1.3), but their ability to capture what is going on socio-economically in societies pales in comparison to those used by, for example, inequality researchers (Hills 2010). The polarisation of income, wealth, education and jobs is of academic and policy interest (p. 43), as is the growing concentration of income and wealth among the top one percent, but we know little about how changes in these relate to SWB – although some evidence is beginning to emerge (De Neve and Powdthavee 2017). This thesis highlighted that average summary measures of socio-economic status are quite closely associated with proportions at the top, which could explain negative average effects of relative socio-economic status on SWB (p. 261). Future research could also look at how the distribution of resources within households affects SWB, an area that was not addressed by this research (see p. 85).

Finally, this research has only looked at how the distribution of socio-economic wellbeing affects SWB. It has not looked at the distribution of SWB itself, apart from the analyses among the worst-off in chapter six. Ultimately, if we care about differences in how well and badly people are doing, we should care about differences in their SWB. As stated by former British Cabinet Secretary Gus O'Donnell, "Inequality of [self reported] wellbeing matters more than [inequality] of wealth or income" (23 October 2016, HM Treasury, author's report). Recent evidence suggests SWB inequality may be responsible for explaining recent political events, such as the vote by Britain to leave the EU, although more empirical evidence is needed to inform this discussion (What Works Wellbeing 2016). Future research should explore not just the distribution of socio-economic resources in society, but the distribution of SWB – and ideally, according to experiences of pleasure and purpose. This could be contextualised within the framework of scope, summary and standpoint aspects of reference groups – is it rank SWB that matters, for example? Or distance from the average? And within which scopes? Policies could also seek to target those groups with the lowest SWB, and design interventions to address the factors that most impact those with the lowest SWB. All of this will help us move towards a society that doesn't just think it's doing well – it experiences that it is doing well, too.

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Appendix A – Supplement to Chapter Two

Dataset	ATUS			ELSA		
Variable	**Description**	**Coding**	**Item wording/further description**	**Description**	**Coding**	**Item wording/further description**
Income	Annual family income	(0) Less than $25K; (1) $25K to less than $50K; (2) $50K to less than $75K; (3) $75K to less than $100K; (4) $100K+	Which category represents the total combined income of all members of your family during the past 12 months? This includes money from jobs, net income from business, farm or rent, pensions, dividends, interest, social security payments and any other money income received by members of your family who are aged 15 years and older. CPS variable.	Annual benefit unit-level real income (in June 2013 terms)	Ratio-level variable	Net equivalised real income at the benefit unit level, including all employment and self-employment income, private and state pension income, state benefit income, asset income, and any additional income sources; logged
	Annual individual earnings	Ratio-level variable	For those who changed jobs or employers since the final CPS interview, or whose weekly earnings were imputed in the CPS, the interviewer collects data on the respondent's earnings, including any overtime pay. Series of questions leading to, "I have estimated your usual WEEKLY earnings [for your main job] as XXX before taxes or other deductions. Does that sound correct?"; logged	Annual benefit-until level real earnings (in June 2013 terms)	Ratio-level variable	Net real income from primary employment at the benefit unit level; logged
Wealth	N/A	N/A	N/A	Net benefit-unit level wealth	Ratio-level variable	Net non-pension real wealth at the benefit unit level, including savings in non-risky assets, investments in risky assets, physical wealth e.g. from businesses or second properties, and gross housing wealth (housing wealth minus housing debt), and subtracting financial debt e.g. credit card debt
Education	Highest level of school completed/degree attained	(0) 12th grade (no diploma) or less; (1) high school diploma or equivalent; (2) some college but no degree; (3) associate degree; (4) Bachelor's degree; (5) MSc PhD levels or equivalent	What is the highest level of school you have completed or the highest degree you have received? CPS variable.	Highest level of educational qualifications	(0) Foreign/other/no qualification, (1) NVQ1/CSE other grade equiv (2) NVQ3/GCE A Level equiv (3) NVQ2/GCE O Level equiv (4) Higher ed below degree; (5) NVQ4/NVQ5/Degree or equiv	Do you have any of the qualifications listed on this card? (derived variable based on multiple answers)
Unemployment	Employment status, old	(0) Unemployed, (1) other	Series of questions to derive variable, e.g. "In the LAST WEEK, did you do ANY work for [pay/either pay or profit]?" CPS variable.	Employment status	(0) Unemployed, (1) other	Which of these would you say best describes your current employment status?
	Employment status, current	(0) Unemployed, (1) other	Series of questions to derive variable, e.g. "In the LAST SEVEN DAYS, did you do ANY work for [pay/either pay or profit]?" ATUS variable			

Appendix Table 2.1: Further information about the absolute socio-economic status variables in ATUS and ELSA.

Dataset / *Variable*	ATUS			ELSA		
	Description	**Coding**	**Item wording/further description**	**Description**	**Coding**	**Item wording/further description**
Relative income	Proportion of respondents with a family income of $100K+ within reference group scopes	Proportion of people	Imported into ATUS from March Supplement to Current Population Survey	Proportion of respondents with a benefit-unit level income of £46K+ in reference group scopes	Proportion of people	See Appendix Table 2.1
	Average income within reference group scopes	Average	Imported into ATUS from March Supplement to Current Population Survey	Average income within reference group scopes	Average	
	Share of income held by top 1% of income earners within reference group scopes	Income share, proportion	Imported into ATUS from World Wealth and Incomes Database			
	Proportion of respondents with annual earnings of $100K+ within reference group scopes	Proportion of people	Imported into ATUS from March Supplement to Current Population Survey	Proportion of respondents with a benefit-unit level earnings of £46K+ within reference group scopes	Average	
	Average earnings within reference group scopes	Average	Imported into ATUS from March Supplement to Current Population Survey	Average wealth within reference group scopes		
Relative wealth	N/A	N/A	N/A	Proportion of respondents with a benefit-unit level wealth of £475,000+ within reference group scopes	Proportion of people	
				Average wealth within reference group scopes	Average	
Relative education	Proportion of respondents with MSc+ within reference group scopes	Proportion of people	Imported into ATUS from March Supplement to Current Population Survey	Proportion of respondents with NVQ4/NVQ5/Degree or equiv. within reference group scopes	Proportion of people	
	Median education within reference group scopes	Median		Median education within reference group scopes	Median	
Relative unemployment	Proportion of unemployed respondents within reference group scopes	Proportion of people	'Old' - Imported into ATUS from 2011, 12, 13 March Supplement to Current Population Survey	Proportion of unemployed respondents within reference group scopes	Proportion of people	
			'New' - Imported into ATUS from 2012-13 March Supplement to Current Population Survey			

Appendix Table 2.2: Further information about the summary measures of relative socio-economic status in ATUS and ELSA.

Dataset / *Variable*	ATUS 2012/13	ELSA (Waves 2-6)
	Description of measure	**Description of measure**
From Fujiwara and Campbell, 2011 - in all models		
Age, age squared	Age in years; age squared	Age in years; age squared
Gender	Male/Female	Male/Female
Marital status	Never married, married, widowed/divorced/separated	Married inc. civil partnership; single never married; separated/divorced; widowed
Health status	Self-rated general health; whether they took pain medicine on the diary day; whether they were well rested on the diary day; whether has hypertension	Longstanding illness or disability (yes/no)
Social relations	Total minutes during diary day spent alone	Has any friends (yes/no)
Religious affiliation	Total minutes during diary day spent participating in religious practices	Religiously affiliated (yes/no)
Housing and environmental conditions and crime levels in the vicinity	Whether household has a telephone, median housing cost by state (from American Community Survey)	2004 local authority-level Index of Multiple Deprivation (1=least deprived; 5=most deprived); No. of problems with accommodation (0-13, e.g. vandalism, noise, damp)
Children and other dependents, including caring duties	Whether there are children under 18 years living in the household	Whether has any children; whether cared for anyone in the past month
Geographic region	State	Local authority
Personality traits (such as extroversion)	No measure available	No measure available (Big 5 only Wave 4, limits sample so excluded)
Income	Annual family income, annual earnings, see Appendix A, Table 2.1	Annual benefit unit-level real income and annual benefit-level real earnings (in 2012 terms), see Appendix A, Table 2.1

Educational status	Highest level of school completed/degree attained, see Appendix A, Table 2.1	Highest level of educational qualifications, see Appendix A, Table 2.1
Employment status	Employment status at ATUS. Not in labour force; unemployed; employed in management and professional; employed in service, sales and office; employed in farming, construction.	Semi-routine and routine occupations; lower supervisory and technical occupations; small workers and own account workers; intermediate occupations; higher managerial, administrative and professional occupations; and unemployed vs. not unemployed (separate measure)
From further theory literature review - in all models		
Year of interview	Wave	Wave (as a control for OLS models only, also used for fixed effects estimation)
Household size	Number of people living in respondent's household	Number of people in household
Wealth	No measure available	Net benefit-unit level wealth (see Appendix A, Table 2.1)
Race	White/Black and Minority Ethnic	White/Black and Minority Ethnic
Typicality of day's feelings	Whether diary day's feelings were better, the same, or worse than usual	No measure available
Population density	State population / square miles from US Census Bureau (http://www.census.gov/popest/data/historical/2010s/index.html)	Urban/rural
Day of week of interview	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	No measure available
Political affiliation	No measure available	Member of a political party, trade union or environmental group / not a member

Appendix Table 2.3: Further information about the control measures in ATUS and ELSA.

Further information on the scope categories in ATUS

In the ATUS and the CPS, those aged 80-84 were contained in a single value of age to protect their anonymity, as were those 85 years and older. Nevertheless, there were still many reference groups with no people in them in the CPS in some states at older ages. Thus, all those aged 75 years and older were collapsed into a single, upper-aged group. The reference group for this age group included ages 70 years and older. For those 74 years, the age reference group included those aged 69 to 79; for those aged 73 years, the reference group included those aged 68 to 78, and so forth. For those aged 15 to 20 years, the lowest age in the reference group was 15 years because ATUS does not sample those younger than 15 years and the CPS sample was restricted to those aged 15+, as mentioned earlier (p. 82).

In selecting the levels for the variables other than age, gender was coded as either male or female in ATUS and thus this coding was used, which is consistent with Pérez-Asenjo (2011). Marital status originally contained five categories of never married, married, widowed, divorced, and separated. In keeping with Pérez-Asenjo (2011), only divorced and separated were initially combined into one category. Preliminary analyses, however, showed there were very few people in many of the widowed groups, which could reduce the reliability of the results. Thus, the widowed were included along with the divorced and separated, the final categorization was three groups of never married, married, and widowed, divorced or separated.

Race initially had over a dozen different categories, however, again in keeping with Pérez-Asenjo (2011) and Davis and Wu (2013), this was collapsed into White and Black/Minority Ethnic. The most detailed occupation groups in ATUS originally had over 20 types of occupations based on the 2010 Census Occupation Classification System. Pérez-Asenjo (2011) divided occupation into administrative, service, precision and operators, and managers. These divisions did not correspond well with even the least detailed occupation codes in ATUS, which were as follows: management, business and financial; professional and related; service; sales and related; office and administrative support; farming, fishing and forestry; construction and extraction; installation, maintenance and repair; production; and transportation and material moving. For example, is ‘maintenance and repair’ a service occupation or a precision and operator occupation?

To ensure sufficient sample sizes in each group for reliable estimates, the ATUS occupation variable was recoded into three levels of ‘management and professional’ (management, business, financial, professional and related), ‘service, sales and office’ (services, sales and related, office and administrative support), and ‘farming, construction, and other’ (farming; fishing and forestry; construction and extraction; installation, maintenance and repair; production; transportation and material moving).

The income groups corresponded with the absolute income groups for the reasons discussed above, as did the education and unemployment groups for proportion with top education and who are unemployed. This was to ensure that it would be clear whether the individual

was within or outside the reference group scope for the analyses in chapter six. Note that Pérez-Asenjo (2011) did not use income groups, used slightly different categories of education, and used more detailed categories of employment other than unemployed vs. employed – unemployed, retired, student, keeping house and other, and employed. The differences were because 'junior college' was not a level of educational attainment group in ATUS as it was in Pérez-Asenjo (2011)'s US General Social Survey, there were sufficient numbers of people in ATUS to differentiate between BSc and MSc/PhD+ rather than just 'Bachelor and Graduate', and because these results are integrated with the relative unemployment literature – which distinguishes between the employed and unemployed (see pp. 218, 274) – whereas Perez-Asenjo (2011)'s were not situated within the relative unemployment literature.

Further information on the scope categories in ELSA

In ELSA, like in ATUS and following McBride (2001), age group included those five years above and below the respondent in age. The lowest age in the final sample analysed was 50 years (because partners were excluded, see p. 126) and so the group for this age was 50-55 years. The group for those aged 51 years included 50-56 year olds, for those aged 51 years it included 50-57 year olds, and so on. For example, the age group for those aged 60 years was 55-65 years. All ages 90 and older were topcoded to protect confidentiality, so ages 85 and higher included those 90 years+ in their age group.

The second and third exceptions were income and wealth. These are continuous rather than categorical variables, and it is not clear how to 'group' respondents to define the scope conditions. In ATUS the groups were pre-determined by the available data. Following from the theoretical framework, Figure 1.1, the respondents should at least be in their own income and wealth groups. Thus, the question is how wide to draw the black circle around the red person – the individual analysed. £5K above and below? £2K above and £5K below? Percentiles? Unlike age, another continuous variable, prior literature does not provide guidance. To improve the extent to which future research can compare to this research, groups were created with reference to median incomes in national percentiles of income and wealth. Future research could thus extend these results using median incomes in national percentiles without having to convert arbitrary cutoffs like £500 into real or internationally comparable values using exchange rates.

Official information on the distribution of household income in the UK comes primarily from Survey of Personal Incomes, which is drawn from HMRC tax revenue data, and the ONS (2014) Households Below Average Income (HBAI) series, which is drawn from the Family Resources Survey. In ELSA the unit for income is the benefit-unit level, rather than the individual level, and so the latter source is more comparable – although the published information is at the household rather than benefit-until level, and is for the UK and not just England. The cutoffs drawn from the 2012/13 HBAI series are shown in Table 2.4 below.

A similar approach was taken for wealth. Information about wealth in the UK is available from two sources, the Wealth and Assets Survey (WAS) and Personal Wealth Statistics. Because the Personal Wealth Statistics survey may not adequately sample those with top wealth, and it is only based on HMRC tax returns and thus underestimates total wealth (ONS 2016a), estimates are drawn from the Wealth and Assets Survey. These are from July 2012-2014, a slightly wider range than the 2012/13 real wealth values in ELSA. Instead of annual decile group medians, as for income from the HBAI, WAS publishes decile cutoffs (ONS 2015b). Thus, these were used to form the wealth groups, which are shown in Table 2.5 below.

There are certainly many other ways that income and wealth groups could be created, for example, by calculating a scope based on a proportion of the respondent's own income or wealth or of another national figure, tax bands, or considering those who have increased or decreased in wealth from year to year. This approach is only one, initial approach, intended to form a basis for discussion.

Decile	Weekly decile group medians	Annual decile group medians	Income group	Income range (annual)
1	£177	£9204	1	0 to £9204
2	£261	£13572	2	£9204.01 to £13572
3	£310	£16120	3	£13572.01 to £16120
4	£359	£18668	4	£16120.01 to £18668
5	£411	£21372	5	£18668.01 to £21372
6	£469	£24388	6	£21372.01 to £23488
7	£537	£27924	7	£23488.01 to £27924
8	£626	£32552	8	£27924.01 to £32552
9	£763	£39676	9	£32552.01 to £39676
10*	£1117	£58084	10	£39676.01 to £58084
			11	greater than £58084

Appendix Table 2.4: The values of income used to create the income groups in ELSA. Drawn from ONS (2014). Any values between the income range (e.g. 9204.009) were included in the higher group (e.g. group two). *99th percentile

Decile	Cutoff	Wealth group	Wealth range
1	£12550	1	0 to £12550.00
2	£34550	2	£12550.01 to £34550.00
3	£82361.82	3	£34550.01 to £82361.82
4	£146982.66	4	£82361.83 to £146982.66
5	£225089.98	5	£146982.67 to £225089.98
6	£321887.38	6	£225089.99 to £321887.38
7	£451000.00	7	£321887.39 to £451000.00
8	£657475.31	8	451000.00 to £657475.31
9	£1048537.44	9	£657475.32 to £1048537.44
10*	£2872575.00	10	£1048537.44 to £2872575
		11	greater than £2872575

Appendix Table 2.5: The values of wealth used to create the wealth groups in ELSA. Drawn from (ONS 2015b). Any values between the wealth range (e.g. 12550.009) were included in the higher group (e.g. group two). *99th percentile

Multiple imputation in ATUS and ELSA

To impute missing values, the control variables and the Cantril ladder were used to impute information for absolute and relative earnings. The (other) relative variables were not used to impute information for absolute and relative earnings due to high collinearity between these and also with other measures[21]. It was not clear which relative variables should be excluded in order to overcome this problem, and so they were omitted to avoid (my) researcher bias in selecting them. SWB information was not imputed because the proportion of missing values was small and unlikely to bias the estimates, and imputing earnings information alone provides a clean test of whether the results are sensitive to missing earnings information that may inform future research. Based on prior research suggesting less than five imputed data sets are not sufficient to assess the bias from missing information, 20 datasets were created (Graham, Olchowski, and Gilreath 2007).

Importantly, due to collinearity, and the failure of many logistic, ordinal logistic, and multinomial logistic models to converge, all of the variables were treated as continuous in ATUS (and in ELSA, see below) for the imputation. The multiple imputation, therefore, also illustrates what happens to these results when categorical variables are treated as continuous variables. Variables are treated differently to their original measurement in the academic literature, and so these robustness tests help us to better understand what happens both when missing data is accounted for and categorical variables are treated as continuous (Ferrer-i-Carbonell and Frijters 2004; Kushlev, Dunn, and Lucas 2015). For some of the interaction analyses (e.g. unemployment, gender), discussed below, the imputed continuous values were recoded into rounded integers (or else the number of categories would be too high to conduct sub-group analyses).

In ELSA, all of the control and SWB variables contained missing information apart from gender. Recall that partners were excluded because they did not have weights and that wave one was excluded because it did not contain one of the life satisfaction measures (see pp. 117, 126). After creating the relative variables using this dataset of 13,482 unique individuals, people who only completed one wave were excluded. This was done in order to conduct the longitudinal analyses and yet keep the sample sizes consistent across pooled and fixed effects models. This resulted in a new sample size of 11,061 unique individuals comprising a total of 42,984 observations. Of these, there were 958 unique core sample members with missing information on a variable in the analyses. After dropping those with missing data on any of the key variables, there were 10,103 unique individuals in the final sample and 32,250 observations.

Four perceived standpoint measures in ELSA were only asked in some waves or to a sub-set of respondents. Analyses using these measures are conducted with fewer observations. For the MacArthur ladder, n=31,255 observations; ‘well off friends’, n=18,701; ‘well off nearby’, n=18,289; and ‘well off work’, n=6,924. Again, the summary of the stages of

[21]The associations between the relative variables are in Appendix C, Tables 4.2 and 4.18.

exclusion in ELSA is shown in Table 2.4 below. The stages in this section are stages four and five.

Stage	Waves	Sample description	Exclusion reason
1	One - Six	17,981 unique individuals	N/A - only people who did not complete a full or partial interview in person or by proxy are excluded, e.g. those who refused
2	Two - Six	15,891 unique individuals	Excluding wave one because it does not have one of the life satisfaction measures
3	Two - Six	13,482 unique core sample members	Excluding partners because they do not have weights needed to build relative variables
Build relative variables for main analyses			
4	Two - Six	11,061 unique core sample members who completed two or more waves	Excluding those who only participated in one wave for longitudinal analyses and to keep sample sizes consistent across pooled and fixed effects models
5	Two - Six	10,103 unique individuals in the final sample	Excluding those with missing information on any of the variables in the analyses (except for three perceptual standpoint measures, see pages p. 108)

Appendix Table 2.6: The stages of excluding data in ELSA. Missing data was imputed for stages four and five.

The results from ELSA are also assessed for bias due to item non-response with multiple imputation. It would be possible to rebuild the relative variables using all waves and the partners, and to create new relative variables in wave one – thus preserving the original sample size of 17,981 people that took part in an interview in waves one through six as noted above. But this would be creating new data, rather than an imputation of existing missing data, and so it is beyond the scope of this robustness test. Therefore, the sample size from waves two and higher is considered for the base dataset for the multiple imputation – 15,891 unique individuals, which includes the partners. The entire dataset could be rebuilt to include information from the partners, and in analyses not reported here, this was done at one stage. The ELSA survey documentation, however, clearly states that "if none-core sample members are to be analysed, they should be analysed unweighted" (NatCen Social Research 2015, p.17). It is not entirely clear if these partners could be used without weights to create the relative variables prior to the main analyses, and to be cautious about using the weights correctly, partners were excluded prior to the

multiple imputation. Thus, we can now only consider the dataset from stage three of the data exclusion from Table 2.6 – 13,482 core sample members.

With longitudinal data, imputation can be conducted using 'whole-wave' imputation where entire waves are imputed for people who did not respond to one or more waves but did respond to at least one wave. Or, it can be conducted using 'within-wave' imputation where missing values are imputed for particular items that were not answered – either because they were not asked, or because the participant did not answer or the interviewer did not record their response (Young and Johnson 2015). The key questions for the imputation in ELSA are, therefore – should whole waves of information be imputed for participants who didn't participate in some waves? And, should missing information be imputed for participants who do not have answers recorded for some questions within waves?

Prior research provides some guidance. In a simulation study using longitudinal fixed effects models, as in this thesis, it was demonstrated that most of the benefits of multiple imputation come from within- and not whole-wave (Young and Johnson 2015). Thus, information was only imputed within waves. As in ATUS, 20 datasets were created. All 13,482 core sample members were used to create the 20 multiply imputed datasets. Then, those who only participated in one wave were dropped in order to conduct the fixed effects analyses, and to keep the sample sizes consistent between the pooled and fixed effects models. In the final base model for the imputation, there were 11,061 core sample members analysed across 42,984 observations. Most of the relative variables in ELSA were excluded for the multiple imputation because, as in ATUS, there was high collinearity between these variables and also with other variables. Only the relative variables that were significantly associated with SWB in chapters four and five were retained.

In both ATUS and ELSA, only selected key results are assessed for robustness with multiple imputation throughout the thesis. This is done for all of chapter three, the tests of statistical significance in chapter four (so, only the AIC and BIC tests from chapter four are excluded), and most of chapter five. The quantile regression results (discussed below) from chapter five were not imputed because multiple imputation for quantile regression was not supported by STATA at the time of writing.

Appendix B – Supplement to Chapter Three

ATUS - absolute socio-economic status descriptive statistics			
	2012	2013	2012/13
Income	%	%	%
Less than $25K	21.59%	21.49%	21.54%
25K to less than $50K	26.76%	25.13%	25.94%
$50K to less than $75K	19.16%	18.66%	18.91%
$75K to less than $100K	12.62%	12.94%	12.78%
$100K+	19.86%	21.78%	20.82%
Total	100.00%	100.00%	100.00%
Annual Earnings			
Mean	44719.82	45753.93	44719.82
Standard deviation	33837.41	34562.9	34217.50
Minimum	0.52	36.92	0.52
Maximum	149999.72	149999.72	149999.72
Education	%	%	%
12th grade (no diploma) or less	16.27%	15.94%	16.11%
High school diploma or equivalent	29.25%	28.74%	28.99%
Some college but no degree	17.84%	16.24%	17.04%
Associate degree	8.34%	8.59%	8.46%
Bachelor's degree	17.92%	19.81%	18.87%
MSc/PhD levels or equivalent	10.37%	10.68%	10.52%
Total	100.00%	100.00%	100.00%
Unemployment (old, from CPS)	%	%	%
Unemployed	0.0483	0.0463	0.0473
Not unemployed	0.9517	0.9537	0.9527
Total	100.00%	100.00%	100.00%
Unemployment (current, from ATUS)	%	%	%
Unemployed	0.064	0.0582	0.0611
Not unemployed	0.936	0.9418	0.9389
Total	100.00%	100.00%	100.00%

Appendix Table 3.1: Descriptive statistics for the absolute socio-economic status measures in ATUS. Weighted.

ATUS - control variable descriptive statistics			
	2012	2013	2012/13
Age			
Mean	44.76	44.92	44.84
Standard deviation	18.45	18.49	18.47
Minimum	15	15	15
Maximum	85	85	85
Gender	%	%	%
Female	51.66%	51.59%	51.62%
Male	48.34%	48.41%	48.38%
Total	100.00%	100.00%	100.00%
Marital status	%	%	%
Never married	31.09%	31.22%	31.16%
Married	51.77%	51.91%	51.84%
Widowed/divorced/separated	17.14%	16.87%	17.00%
Total	100.00%	100.00%	100.00%
Health status			
Self-rated general health	%	%	%
Poor	3.55%	3.81%	3.68%
Fair	13.33%	12.74%	13.04%
Good	31.46%	30.34%	30.90%
Very good	33.88%	34.89%	34.39%
Excellent	17.78%	18.22%	18.00%
Total	100.00%	100.00%	100.00%
Whether they took pain medicine on the diary day	%	%	%
No	70.85%	71.34%	71.10%
Yes	29.15%	28.66%	28.90%
Total	100.00%	100.00%	100.00%
Whether they were well rested on the diary day	%	%	%
Not at all	5.60%	5.52%	5.56%
A little	13.94%	14.23%	14.08%
Somewhat	39.51%	39.92%	39.72%
Very	40.96%	40.33%	40.64%
Total	100.00%	100.00%	100.00%
Whether has hypertension	%	%	%
No	0.7058	0.7065	0.7061
Yes	0.2942	0.2935	0.2939
Total	100.00%	100.00%	100.00%
Social relations			
Total minutes on diary day spent alone			
Mean	329.5854	331.4485	330.5194
Standard deviation	266.9455	267.4818	267.214
Minimum	0	0	0

Maximum	1380	1440	1440
Religious affiliation			
Total minutes on diary day spent participating in religious practices			
Mean	2.119286	1.814632	1.966565
Standard deviation	17.81158	17.11348	17.46564
Minimum	0	0	0
Maximum	525	680	680
Housing and environmental conditions and crime levels in the vicinity			
Whether household as a telephone	%	%	%
No	0.0307	0.0312	0.031
Yes	0.9693	0.9688	0.969
Total	100.00%	100.00%	100.00%
Median housing cost by state			
Mean	194859.4	196259.1	195561
Standard deviation	80839.8	81683.59	81266.25
Minimum	99800	99800	99800
Maximum	496600	496600	496600
Children and other dependents, including caring duties			
Whether there are children under 18 years living in the household	%	%	%
No	60.11%	60.42%	60.27%
Yes	39.89%	39.58%	39.73%
Total	100.00%	100.00%	100.00%
Geographic region	%	%	%
State			
Alabama	1.52%	1.59%	1.55%
Alaska	0.12%	0.22%	0.17%
Arizona	2.04%	1.88%	1.96%
Arkansas	0.72%	1.01%	0.87%
California	10.58%	11.33%	10.96%
Colorado	1.87%	1.68%	1.77%
Connecticut	1.22%	1.07%	1.15%
Delaware	0.32%	0.38%	0.35%
District of Columbia	0.16%	0.21%	0.19%
Florida	5.78%	5.51%	5.64%
Georgia	3.15%	2.67%	2.91%
Hawaii	0.25%	0.21%	0.23%
Idaho	0.59%	0.52%	0.56%
Illinois	4.13%	4.30%	4.22%
Indiana	2.34%	2.12%	2.23%
Iowa	1.17%	1.16%	1.16%
Kansas	0.95%	1.13%	1.04%

Kentucky	1.78%	1.81%	1.79%
Louisiana	1.24%	1.15%	1.19%
Maine	0.46%	0.41%	0.44%
Maryland	2.15%	1.80%	1.98%
Massachusetts	2.43%	2.02%	2.23%
Michigan	3.59%	3.79%	3.69%
Minnesota	2.19%	2.10%	2.14%
Mississippi	0.81%	0.71%	0.76%
Missouri	1.96%	2.08%	2.02%
Montana	0.30%	0.33%	0.31%
Nebraska	0.66%	0.66%	0.66%
Nevada	0.99%	0.74%	0.87%
New Hampshire	0.43%	0.51%	0.47%
New Jersey	2.68%	3.07%	2.88%
New Mexico	0.43%	0.60%	0.52%
New York	5.18%	5.40%	5.29%
North Carolina	3.05%	3.09%	3.07%
North Dakota	0.26%	0.18%	0.22%
Ohio	3.72%	3.81%	3.77%
Oklahoma	1.22%	1.18%	1.20%
Oregon	1.33%	1.55%	1.44%
Pennsylvania	4.84%	4.53%	4.68%
Rhode Island	0.35%	0.43%	0.39%
South Carolina	1.58%	1.34%	1.46%
South Dakota	0.32%	0.24%	0.28%
Tennessee	1.61%	1.98%	1.79%
Texas	8.28%	8.50%	8.39%
Utah	0.90%	0.98%	0.94%
Vermont	0.18%	0.21%	0.20%
Virginia	2.54%	2.90%	2.72%
Washington	2.46%	2.21%	2.33%
West Virginia	0.74%	0.48%	0.61%
Wisconsin	2.17%	2.05%	2.11%
Wyoming	0.25%	0.16%	0.21%
Total	100.00%	100.00%	100.00%
Occupation	%	%	%
Farming, construction, and other	20.25%	19.88%	20.07%
Service, sales and office	39.85%	38.96%	39.41%
Management and professional	39.89%	41.16%	40.53%
Total	100.00%	100.00%	100.00%
Year of ATUS interview	%		
2012	49.87%		
2013	50.13%		
Total	100%		
Household size			

Mean	3.03	2.96	2.99
Standard deviation	1.61	1.53	1.57
Minimum	1	1	1
Maximum	14	15	15
Race	%	%	%
White	81.70%	81.71%	81.71%
Black and minority ethnic	18.30%	18.29%	18.29%
Total	100.00%	100.00%	100.00%
Typicality of days feelings	%	%	%
Worse	0.1022	0.1046	0.1034
The same	0.6375	0.6303	0.6339
Better	0.2603	0.2651	0.2627
Total	100.00%	100.00%	100.00%
Population density			
State population / square kilometres			
Mean	227.26	235.03	231.15
Standard deviation	407.84	472.54	441.48
Minimum	1.10	1.10	1.10
Maximum	9298.87	9506.60	9506.60
Day of week of ATUS interview	%	%	%
Sunday	14.35%	14.22%	14.28%
Monday	14.12%	14.56%	14.34%
Tuesday	13.90%	14.03%	13.96%
Wednesday	14.45%	14.33%	14.39%
Thursday	14.49%	14.22%	14.35%
Friday	14.34%	14.39%	14.36%
Saturday	14.36%	14.25%	14.31%
Total	100.00%	100.00%	100.00%

Appendix Table 3.2: Descriptive statistics for the control measures in ATUS. Weighted.

ATUS - SWB variable descriptives															
	2012					2013					2012/2013				
	mean	sd	min	max	n (activities)	mean	sd	min	max	n (activities)	mean	sd	min	max	n (activities)
Cantril ladder															
raw	7.13	2.02	0.00	10.00	33181	7.14	1.99	0.00	10.00	30221	7.14	2.01	0.00	10.00	63402
standardised	0.00	1.01	-3.55	1.43	33181	0.00	0.99	-3.55	1.43	30221	0.00	1.00	-3.55	1.43	63402
Happy															
raw	4.38	1.58	0.00	6.00	33181	4.40	1.57	0.00	6.00	30221	4.39	1.58	0.00	6.00	63402
standardised	-0.01	1.00	-2.78	1.02	33181	0.01	1.00	-2.78	1.02	30221	0.00	1.00	-2.78	1.02	63402
Tired															
raw	2.22	1.95	0.00	6.00	33181	2.27	1.94	0.00	6.00	30221	2.25	1.94	0.00	6.00	63402
Stressed															
raw	1.29	1.72	0	6	33181	1.29	1.72	0.00	6.00	30221	1.29	1.72	0.00	6.00	63402
Sad															
raw	0.58	1.30	0	6	33181	0.57	1.28	0.00	6.00	30221	0.57	1.29	0.00	6.00	63402
Pain															
raw	0.91	1.61	0	6	33181	0.89	1.60	0.00	6.00	30221	0.90	1.60	0.00	6.00	63402
Negative affect*															
raw	1.25	1.18	0	6	33181	1.25	1.17	0.00	6.00	30221	1.25	1.17	0.00	6.00	63402
standardised	0.00	1.01	-1.07	4.04	33181	0.00	0.99	-1.07	4.04	30221	0.00	1.00	-1.07	4.04	63402
Experienced meaning															
raw	4.24	1.93	0	6	33181	4.22	1.92	0.00	6.00	30221	4.23	1.92	0.00	6.00	63402
standardised	0.00	1.00	-2.20	0.92	33181	0.00	1.00	-2.20	0.92	30221	0.00	1.00	-2.20	0.92	63402

Appendix Table 3.3: Weighted means and standard deviations, unweighted minimums and maximums, and number of activities for subjective wellbeing measures in ATUS by wave. *Negative affect measure was created by taking the average of tired, stressed, sad and pain

ELSA - Absolute socio-economic status descriptives						
	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	*All waves*
Real income						
Mean	19233.55	20041.36	20795.54	20407.07	21341.38	20386.72
Standard deviation	15245.38	15852.94	15925.41	16663.60	24771.65	18003.22
Maximum	267629.7	274316.6	224075.1	375828.8	574345	574345
Minimum	0	0	0	0	0	0
Real earnings						
Mean	9302.215	10495.08	9669.873	7899.071	6316.338	8737.473
Standard deviation	17657.96	18814.43	18010.82	15979.21	15890.77	17356.29
Maximum	319804	221517.1	249917.8	272653.4	486623.1	486623.1
Minimum	0	0	0	0	0	0
Real wealth						
Mean	373872.80	393738.50	399608.90	378535.60	391891.30	387769.30
Standard deviation	555150.80	698076.90	680577.60	509567.20	643234.20	621613.10
Maximum	11900000.00	25600000.00	23800000.00	11300000.00	14100000.00	25600000.00
Minimum	0	0	0	0	0	0
Education	%	%	%	%	%	%
Foreign/other/no qualification	41.51%	33.85%	31.75%	30.25%	35.51%	34.32%
NVQ1/CSE other grade equiv.	4.24%	4.41%	4.12%	3.77%	3.83%	4.07%
NVQ2/GCE O Level equiv.	18.58%	18.72%	19.79%	19.91%	19.33%	19.30%
NVQ3/GCE A Level equiv.	7.33%	7.88%	8.48%	8.84%	8.49%	8.24%
Higher ed below degree	13.63%	16.43%	16.41%	16.73%	14.86%	15.68%
NVQ4/NVQ5/Degree or equiv	14.71%	18.70%	19.45%	20.50%	17.99%	18.39%
Total	100%	100%	100%	100%	100%	100%
Unemployment	%	%	%	%	%	%
Unemployed	99.35%	99.32%	98.96%	99.07%	99.22%	99.18%
Not unemployed	0.65%	0.68%	1.04%	0.93%	0.78%	0.82%
Total	100%	100%	100%	100%	100%	100%

Appendix Table 3.4: ELSA descriptive statistics for absolute socio-economic status. Unweighted.

ELSA - Control variable descriptive statistics						
Age						
Mean	65.31	65.23	65.75	67.01	68.48	66.36
Standard deviation	8.98	9.762	9.121	8.655	8.289	9.05
Maximum	90	90	90	90	90	50
Minimum	52	50	50	52	54	90
Gender						
Male	45.37%	45.73%	45.42%	44.99%	45.20%	45.34%
Female	54.63%	54.27%	54.58%	55.01%	54.80%	54.66%
Total	100%	100%	100%	100%	100%	100%
Marital status	%	%	%	%	%	%
Married/civil partnership	68.79%	68.00%	68.56%	67.13%	67.82%	68.04%
Single never married	4.81%	5.68%	5.89%	6.04%	5.65%	5.64%
Separated/divorced	10.33%	10.71%	11.17%	11.66%	11.46%	11.09%
Widowed	16.07%	15.61%	14.38%	15.17%	15.07%	15.23%
Total	100%	100%	100%	100%	100%	100%
Health status	%	%	%	%	%	%
Longstanding illness or disability						
No	45.01%	45.67%	46.32%	46.21%	44.78%	45.64%
Yes	54.99%	54.33%	53.68%	53.79%	55.22%	54.36%
Total	100%	100%	100%	100%	100%	100%
Social relations						

Whether has any friends	%	%	%	%	%	%
No	4.10%	4.81%	5.01%	5.96%	5.96%	5.19%
Yes	95.90%	95.19%	94.99%	94.04%	94.04%	94.81%
Total	100%	100%	100%	100%	100%	100%
Religious affiliation						
Whether is religiously affiliated						
No	76.74%	78.78%	79.13%	79.63%	79.33%	78.78%
Yes	23.26%	21.22%	20.87%	20.37%	20.67%	21.22%
Total	100%	100%	100%	100%	100%	100%
Housing and environmental conditions and crime levels in the vicinity						
Index of Multiple Deprivation						
Mean	2.64	2.66	2.62	2.64	2.60	2.63
Standard deviation	1.36	1.36	1.35	1.34	1.33	1.35
Maximum	5	5	5	5		5
Minimum	1	1	1	1		1
Number of problems with accommodation						
Mean	0.49	0.48	0.48	0.47	0.46	0.47
Standard deviation	0.97	0.93	0.94	0.93	0.90	0.93
Maximum	10	9	12	11	8	12
Minimum	0	0	0	0	0	0
Children and other dependents, including caring duties						
Whether has any children	%	%	%	%	%	%

No	12.17%	13.09%	13.40%	13.48%	13.42%	13.14%
Yes	87.83%	86.91%	86.60%	86.52%	86.58%	86.86%
Total	100%	100%	100%	100%	100%	100%
Whether cared for anyone in the past month	%	%	%	%	%	%
No	84.26%	86.06%	86.77%	85.55%	86.50%	85.86%
Yes	15.74%	13.94%	13.23%	14.45%	13.50%	14.14%
Total	100%	100%	100%	100%	100%	100%
Geographic region						
Local authority	%	%	%	%	%	%
1	0.15%	0.11%	0.22%	0.21%	0.23%	0.19%
2	0.29%	0.27%	0.36%	0.33%	0.37%	0.33%
3	0.21%	0.32%	0.29%	0.30%	0.36%	0.29%
4	0.19%	0.16%	0.26%	0.32%	0.31%	0.25%
5	0.52%	0.57%	0.58%	0.47%	0.63%	0.55%
6	0.07%	0.11%	0.09%	0.16%	0.16%	0.12%
7	0.65%	0.52%	0.52%	0.46%	0.53%	0.53%
8	0.29%	0.35%	0.19%	0.29%	0.27%	0.28%
9	0.48%	0.49%	0.50%	0.49%	0.47%	0.49%
10	0.34%	0.38%	0.33%	0.36%	0.23%	0.33%
11	0.26%	0.21%	0.22%	0.20%	0.26%	0.23%
12	0.14%	0.14%	0.14%	0.13%	0.11%	0.13%
13	0.22%	0.25%	0.24%	0.23%	0.18%	0.23%

14	0.31%	0.32%	0.33%	0.33%	0.32%	0.32%
15	0.52%	0.43%	0.50%	0.52%	0.53%	0.50%
16	0.39%	0.43%	0.27%	0.33%	0.31%	0.34%
17	0.43%	0.33%	0.33%	0.29%	0.36%	0.34%
18	0.17%	0.21%	0.19%	0.23%	0.21%	0.20%
19	0.03%	0.05%	0.09%	0.10%	0.06%	0.07%
20	0.31%	0.24%	0.23%	0.26%	0.11%	0.23%
21	0.15%	0.14%	0.14%	0.16%	0.18%	0.16%
22	0.15%	0.21%	0.23%	0.20%	0.18%	0.20%
23	0.52%	0.57%	0.48%	0.42%	0.32%	0.46%
24	0.09%	0.05%	0.03%	0.07%	0.11%	0.07%
25	0.14%	0.19%	0.20%	0.16%	0.19%	0.18%
26	0.19%	0.17%	0.23%	0.21%	0.27%	0.22%
27	0.24%	0.22%	0.17%	0.13%	0.19%	0.19%
28	0.31%	0.33%	0.27%	0.29%	0.21%	0.28%
29	0.07%	0.10%	0.06%	0.10%	0.11%	0.09%
30	0.31%	0.32%	0.45%	0.39%	0.34%	0.36%
31	0.14%	0.11%	0.12%	0.10%	0.10%	0.11%
32	0.10%	0.10%	0.16%	0.17%	0.15%	0.14%
33	0.38%	0.43%	0.46%	0.34%	0.40%	0.40%
34	0.27%	0.22%	0.33%	0.33%	0.29%	0.29%
35	0.31%	0.43%	0.39%	0.43%	0.47%	0.41%
36	0.21%	0.21%	0.13%	0.21%	0.15%	0.18%
37	0.24%	0.17%	0.12%	0.16%	0.13%	0.16%
38	0.05%	0.05%	0.13%	0.11%	0.11%	0.09%
39	0.57%	0.56%	0.37%	0.47%	0.52%	0.49%
40	0.60%	0.52%	0.36%	0.46%	0.42%	0.47%

41	0.41%	0.44%	0.24%	0.32%	0.31%	0.34%
42	0.33%	0.36%	0.30%	0.34%	0.27%	0.32%
43	0.15%	0.08%	0.06%	0.07%	0.06%	0.08%
44	0.77%	0.70%	0.39%	0.57%	0.37%	0.56%
45	0.33%	0.36%	0.33%	0.42%	0.31%	0.35%
46	0.86%	0.65%	0.50%	0.63%	0.55%	0.63%
47	0.79%	0.63%	0.50%	0.47%	0.53%	0.58%
48	0.38%	0.33%	0.32%	0.30%	0.34%	0.33%
49	0.70%	0.79%	0.71%	0.67%	0.68%	0.71%
50	0.58%	0.63%	0.58%	0.47%	0.55%	0.56%
51	0.98%	1.08%	1.09%	1.26%	1.21%	1.13%
52	0.98%	1.03%	0.72%	0.73%	0.58%	0.80%
53	0.43%	0.49%	0.43%	0.43%	0.34%	0.42%
54	0.53%	0.57%	0.53%	0.57%	0.60%	0.56%
55	0.39%	0.35%	0.46%	0.36%	0.37%	0.39%
56	0.77%	0.73%	0.53%	0.53%	0.68%	0.64%
57	1.25%	1.06%	1.24%	1.23%	1.26%	1.21%
58	0.52%	0.48%	0.53%	0.47%	0.52%	0.50%
59	0.65%	0.67%	0.55%	0.56%	0.66%	0.61%
60	0.46%	0.48%	0.45%	0.49%	0.37%	0.45%
61	0.50%	0.56%	0.53%	0.53%	0.57%	0.54%
62	0.24%	0.24%	0.37%	0.39%	0.24%	0.30%
63	0.48%	0.51%	0.48%	0.52%	0.44%	0.48%

64	1.06%	1.14%	0.91%	0.92%	0.86%	0.97%
65	0.29%	0.27%	0.30%	0.29%	0.29%	0.29%
66	1.10%	1.17%	1.11%	1.03%	0.94%	1.07%
67	1.05%	1.05%	0.89%	1.02%	0.90%	0.98%
68	0.77%	0.73%	0.73%	0.77%	0.71%	0.74%
69	0.33%	0.36%	0.32%	0.24%	0.21%	0.29%
70	0.05%	0.06%	0.16%	0.13%	0.15%	0.11%
71	0.26%	0.22%	0.33%	0.32%	0.36%	0.30%
72	0.26%	0.27%	0.23%	0.23%	0.21%	0.24%
73	0.38%	0.46%	0.37%	0.37%	0.36%	0.39%
74	0.22%	0.14%	0.17%	0.19%	0.18%	0.18%
75	0.58%	0.51%	0.36%	0.43%	0.34%	0.44%
76	0.24%	0.22%	0.20%	0.16%	0.21%	0.20%
77	0.34%	0.46%	0.35%	0.37%	0.42%	0.39%
78	0.55%	0.51%	0.58%	0.59%	0.60%	0.56%
79	1.08%	1.03%	0.99%	0.99%	1.13%	1.04%
80	0.10%	0.16%	0.24%	0.19%	0.31%	0.20%
81	0.50%	0.62%	0.63%	0.56%	0.48%	0.56%
82	0.60%	0.57%	0.55%	0.60%	0.52%	0.57%
83	0.39%	0.49%	0.45%	0.47%	0.50%	0.46%
84	0.22%	0.25%	0.48%	0.50%	0.42%	0.38%
85	0.05%	0.08%	0.17%	0.17%	0.16%	0.13%
86	0.31%	0.30%	0.20%	0.14%	0.18%	0.22%

87	0.26%	0.36%	0.39%	0.36%	0.39%	0.35%
88	0.55%	0.54%	0.53%	0.54%	0.53%	0.54%
89	0.22%	0.27%	0.27%	0.26%	0.31%	0.27%
90	0.36%	0.30%	0.36%	0.40%	0.36%	0.36%
91	0.43%	0.56%	0.66%	0.63%	0.48%	0.56%
92	0.55%	0.56%	0.62%	0.52%	0.61%	0.57%
93	0.72%	0.68%	0.68%	0.60%	0.57%	0.65%
94	0.43%	0.41%	0.39%	0.36%	0.42%	0.40%
95	0.21%	0.25%	0.19%	0.24%	0.23%	0.22%
96	0.34%	0.32%	0.27%	0.37%	0.36%	0.33%
97	0.10%	0.11%	0.09%	0.16%	0.15%	0.12%
98	0.21%	0.16%	0.19%	0.19%	0.16%	0.18%
99	0.31%	0.32%	0.33%	0.40%	0.50%	0.37%
100	0.26%	0.24%	0.20%	0.27%	0.26%	0.24%
101	0.38%	0.36%	0.45%	0.33%	0.34%	0.37%
102	0.34%	0.30%	0.33%	0.40%	0.39%	0.35%
103	0.55%	0.57%	0.60%	0.54%	0.60%	0.57%
104	0.27%	0.30%	0.24%	0.21%	0.26%	0.26%
105	0.27%	0.29%	0.30%	0.30%	0.31%	0.29%
106	0.15%	0.19%	0.16%	0.20%	0.19%	0.18%
107	0.17%	0.17%	0.20%	0.16%	0.15%	0.17%
108	0.22%	0.27%	0.32%	0.30%	0.27%	0.28%

109	0.48%	0.48%	0.45%	0.42%	0.37%	0.44%
110	0.45%	0.41%	0.45%	0.49%	0.48%	0.46%
111	0.33%	0.32%	0.42%	0.44%	0.37%	0.38%
112	0.19%	0.19%	0.19%	0.21%	0.23%	0.20%
113	0.22%	0.29%	0.30%	0.27%	0.29%	0.28%
114	0.41%	0.38%	0.37%	0.39%	0.36%	0.38%
132	0.26%	0.22%	0.24%	0.26%	0.26%	0.25%
133	0.43%	0.40%	0.37%	0.42%	0.44%	0.41%
134	0.10%	0.14%	0.09%	0.13%	0.16%	0.12%
135	0.33%	0.29%	0.33%	0.29%	0.27%	0.30%
136	0.09%	0.05%	0.13%	0.13%	0.10%	0.10%
137	0.07%	0.10%	0.04%	0.09%	0.08%	0.07%
138	0.22%	0.16%	0.26%	0.19%	0.19%	0.20%
139	0.22%	0.17%	0.20%	0.16%	0.16%	0.18%
140	0.12%	0.14%	0.20%	0.16%	0.19%	0.16%
141	0.22%	0.22%	0.26%	0.26%	0.27%	0.25%
142	0.31%	0.35%	0.33%	0.33%	0.27%	0.32%
143	0.41%	0.41%	0.52%	0.37%	0.48%	0.44%
144	0.29%	0.19%	0.32%	0.30%	0.21%	0.26%
145	0.10%	0.10%	0.12%	0.13%	0.15%	0.12%
146	0.33%	0.32%	0.32%	0.30%	0.29%	0.31%
147	0.07%	0.06%	0.14%	0.10%	0.06%	0.09%

148	0.64%	0.57%	0.53%	0.59%	0.61%	0.59%
149	0.14%	0.14%	0.16%	0.11%	0.10%	0.13%
150	0.10%	0.11%	0.10%	0.07%	0.10%	0.10%
151	0.22%	0.24%	0.33%	0.32%	0.29%	0.28%
152	0.17%	0.16%	0.10%	0.13%	0.15%	0.14%
153	0.48%	0.40%	0.37%	0.42%	0.36%	0.40%
154	0.03%	0.05%	0.06%	0.09%	0.08%	0.06%
155	0.27%	0.30%	0.33%	0.29%	0.24%	0.29%
156	0.29%	0.27%	0.32%	0.30%	0.32%	0.30%
157	0.07%	0.11%	0.07%	0.07%	0.05%	0.07%
158	0.07%	0.11%	0.16%	0.20%	0.21%	0.15%
159	0.33%	0.32%	0.23%	0.23%	0.18%	0.25%
160	0.12%	0.13%	0.24%	0.33%	0.29%	0.23%
161	0.46%	0.40%	0.37%	0.40%	0.39%	0.40%
162	0.22%	0.43%	0.33%	0.40%	0.36%	0.35%
163	0.03%	0.03%	0.09%	0.11%	0.10%	0.07%
164	0.24%	0.25%	0.17%	0.21%	0.19%	0.21%
165	0.17%	0.21%	0.16%	0.17%	0.19%	0.18%
166	0.39%	0.36%	0.32%	0.32%	0.24%	0.33%
167	0.21%	0.27%	0.30%	0.34%	0.39%	0.30%
168	0.70%	0.68%	0.56%	0.46%	0.53%	0.58%
169	0.14%	0.14%	0.13%	0.13%	0.13%	0.13%

170	0.50%	0.43%	0.42%	0.47%	0.53%	0.47%
171	0.14%	0.14%	0.12%	0.14%	0.11%	0.13%
172	0.26%	0.22%	0.26%	0.30%	0.36%	0.28%
173	0.41%	0.35%	0.27%	0.23%	0.27%	0.30%
174	0.10%	0.16%	0.22%	0.21%	0.21%	0.18%
175	0.38%	0.35%	0.45%	0.42%	0.42%	0.40%
176	0.15%	0.14%	0.14%	0.11%	0.16%	0.14%
177	0.07%	0.06%	0.17%	0.17%	0.18%	0.13%
178	0.12%	0.13%	0.17%	0.19%	0.21%	0.16%
179	0.64%	0.59%	0.45%	0.36%	0.39%	0.48%
180	0.31%	0.30%	0.30%	0.26%	0.27%	0.29%
181	0.10%	0.08%	0.07%	0.04%	0.06%	0.07%
182	0.27%	0.25%	0.27%	0.29%	0.29%	0.28%
183	0.22%	0.21%	0.35%	0.30%	0.31%	0.28%
184	0.00%	0.05%	0.04%	0.04%	0.08%	0.04%
185	0.26%	0.30%	0.22%	0.24%	0.24%	0.25%
186	0.36%	0.35%	0.33%	0.32%	0.31%	0.33%
187	0.31%	0.33%	0.26%	0.29%	0.27%	0.29%
188	0.10%	0.13%	0.17%	0.17%	0.11%	0.14%
189	0.00%	0.03%	0.04%	0.06%	0.06%	0.04%
190	0.09%	0.10%	0.14%	0.16%	0.13%	0.12%
191	0.17%	0.21%	0.22%	0.19%	0.24%	0.20%

192	0.19%	0.21%	0.13%	0.14%	0.11%	0.16%
193	0.21%	0.17%	0.19%	0.16%	0.21%	0.19%
194	0.31%	0.25%	0.19%	0.20%	0.23%	0.23%
195	0.19%	0.17%	0.35%	0.33%	0.36%	0.28%
196	0.29%	0.19%	0.24%	0.29%	0.24%	0.25%
197	0.38%	0.32%	0.27%	0.27%	0.31%	0.31%
198	0.17%	0.17%	0.10%	0.09%	0.11%	0.13%
199	0.03%	0.06%	0.04%	0.03%	0.03%	0.04%
200	0.43%	0.48%	0.46%	0.47%	0.50%	0.47%
201	0.52%	0.49%	0.62%	0.54%	0.65%	0.56%
202	0.22%	0.27%	0.19%	0.27%	0.19%	0.23%
203	0.10%	0.11%	0.10%	0.10%	0.11%	0.11%
204	0.33%	0.32%	0.33%	0.34%	0.36%	0.33%
205	0.31%	0.35%	0.36%	0.32%	0.31%	0.33%
206	0.27%	0.24%	0.29%	0.24%	0.34%	0.28%
207	0.21%	0.27%	0.32%	0.30%	0.29%	0.28%
208	0.14%	0.11%	0.10%	0.13%	0.18%	0.13%
209	0.27%	0.27%	0.32%	0.26%	0.31%	0.29%
210	0.46%	0.43%	0.33%	0.34%	0.34%	0.38%
211	0.09%	0.13%	0.13%	0.13%	0.15%	0.12%
212	0.14%	0.16%	0.17%	0.13%	0.16%	0.15%
213	0.29%	0.24%	0.20%	0.21%	0.19%	0.23%

214	0.29%	0.19%	0.37%	0.39%	0.34%	0.32%
215	0.29%	0.25%	0.23%	0.26%	0.32%	0.27%
216	0.26%	0.25%	0.26%	0.26%	0.23%	0.25%
217	0.36%	0.32%	0.35%	0.30%	0.40%	0.34%
218	0.09%	0.08%	0.09%	0.11%	0.13%	0.10%
219	0.19%	0.11%	0.17%	0.09%	0.08%	0.13%
220	0.43%	0.38%	0.42%	0.36%	0.37%	0.39%
221	0.65%	0.62%	0.49%	0.54%	0.58%	0.57%
222	0.19%	0.13%	0.16%	0.13%	0.13%	0.15%
223	0.14%	0.16%	0.24%	0.23%	0.23%	0.20%
224	0.17%	0.11%	0.13%	0.19%	0.19%	0.16%
225	0.21%	0.22%	0.17%	0.13%	0.19%	0.18%
226	0.21%	0.30%	0.30%	0.30%	0.32%	0.29%
227	0.48%	0.48%	0.43%	0.42%	0.44%	0.45%
228	0.07%	0.06%	0.03%	0.06%	0.06%	0.06%
229	0.53%	0.52%	0.55%	0.47%	0.47%	0.51%
230	0.41%	0.43%	0.43%	0.40%	0.48%	0.43%
231	0.07%	0.10%	0.07%	0.11%	0.13%	0.10%
232	0.09%	0.10%	0.14%	0.16%	0.13%	0.12%
233	0.02%	0.10%	0.13%	0.11%	0.18%	0.11%
234	0.45%	0.36%	0.24%	0.17%	0.13%	0.27%
235	0.00%	0.03%	0.09%	0.07%	0.11%	0.06%

236	0.17%	0.30%	0.29%	0.30%	0.24%	0.26%
237	0.19%	0.21%	0.19%	0.20%	0.19%	0.20%
238	0.09%	0.11%	0.20%	0.17%	0.21%	0.16%
239	0.15%	0.16%	0.16%	0.16%	0.11%	0.15%
240	0.33%	0.33%	0.30%	0.30%	0.29%	0.31%
241	0.58%	0.49%	0.49%	0.44%	0.47%	0.49%
242	0.24%	0.24%	0.23%	0.23%	0.24%	0.24%
243	0.17%	0.19%	0.17%	0.21%	0.21%	0.19%
244	0.39%	0.46%	0.39%	0.34%	0.39%	0.39%
245	0.22%	0.25%	0.24%	0.24%	0.23%	0.24%
246	0.07%	0.11%	0.14%	0.13%	0.05%	0.10%
247	0.09%	0.08%	0.10%	0.07%	0.08%	0.08%
248	0.29%	0.27%	0.24%	0.32%	0.32%	0.29%
249	0.17%	0.21%	0.23%	0.24%	0.26%	0.22%
250	0.22%	0.16%	0.14%	0.14%	0.15%	0.16%
251	0.17%	0.30%	0.30%	0.33%	0.26%	0.28%
252	0.26%	0.19%	0.24%	0.23%	0.24%	0.23%
253	0.22%	0.19%	0.22%	0.29%	0.19%	0.22%
254	0.12%	0.13%	0.10%	0.10%	0.11%	0.11%
255	0.07%	0.02%	0.09%	0.10%	0.10%	0.07%
256	0.21%	0.21%	0.23%	0.24%	0.21%	0.22%
257	0.17%	0.16%	0.16%	0.14%	0.10%	0.15%

258	0.22%	0.25%	0.17%	0.26%	0.24%	0.23%
259	0.27%	0.27%	0.27%	0.09%	0.11%	0.20%
260	0.24%	0.25%	0.37%	0.33%	0.36%	0.31%
261	0.50%	0.49%	0.42%	0.46%	0.50%	0.47%
262	0.19%	0.16%	0.30%	0.32%	0.31%	0.26%
263	0.09%	0.10%	0.19%	0.16%	0.10%	0.13%
264	0.26%	0.22%	0.22%	0.21%	0.18%	0.22%
265	0.05%	0.10%	0.07%	0.13%	0.13%	0.10%
266	0.22%	0.19%	0.16%	0.14%	0.13%	0.17%
267	0.38%	0.43%	0.35%	0.43%	0.45%	0.41%
268	0.19%	0.17%	0.17%	0.17%	0.16%	0.17%
269	0.07%	0.06%	0.09%	0.10%	0.08%	0.08%
270	0.26%	0.17%	0.26%	0.21%	0.19%	0.22%
271	0.46%	0.54%	0.48%	0.30%	0.39%	0.43%
272	0.10%	0.14%	0.30%	0.32%	0.34%	0.24%
273	0.38%	0.38%	0.39%	0.44%	0.39%	0.40%
274	0.21%	0.30%	0.37%	0.39%	0.39%	0.33%
275	0.33%	0.35%	0.35%	0.37%	0.27%	0.33%
276	0.12%	0.13%	0.23%	0.23%	0.24%	0.19%
277	0.29%	0.30%	0.30%	0.29%	0.32%	0.30%
278	0.15%	0.14%	0.20%	0.20%	0.19%	0.18%
279	0.22%	0.27%	0.27%	0.33%	0.24%	0.27%

280	0.15%	0.11%	0.14%	0.14%	0.15%	0.14%
281	0.21%	0.24%	0.20%	0.21%	0.27%	0.23%
282	0.12%	0.14%	0.14%	0.14%	0.13%	0.14%
283	0.05%	0.17%	0.20%	0.17%	0.13%	0.15%
284	0.62%	0.65%	0.56%	0.50%	0.44%	0.55%
285	0.19%	0.17%	0.17%	0.19%	0.18%	0.18%
286	0.12%	0.17%	0.16%	0.14%	0.15%	0.15%
287	0.10%	0.06%	0.07%	0.09%	0.05%	0.07%
288	0.07%	0.06%	0.06%	0.04%	0.03%	0.05%
289	0.17%	0.21%	0.20%	0.20%	0.19%	0.20%
290	0.27%	0.25%	0.22%	0.21%	0.21%	0.23%
291	0.03%	0.05%	0.06%	0.01%	0.06%	0.04%
292	0.29%	0.35%	0.22%	0.24%	0.23%	0.26%
293	0.03%	0.02%	0.01%	0.04%	0.05%	0.03%
294	0.21%	0.19%	0.22%	0.19%	0.23%	0.20%
295	0.19%	0.21%	0.29%	0.32%	0.34%	0.27%
296	0.00%	0.00%	0.01%	0.04%	0.05%	0.02%
297	0.14%	0.17%	0.09%	0.11%	0.11%	0.12%
298	0.12%	0.19%	0.20%	0.21%	0.21%	0.19%
299	0.34%	0.35%	0.26%	0.24%	0.26%	0.29%
300	0.41%	0.33%	0.29%	0.27%	0.37%	0.33%
301	0.41%	0.44%	0.39%	0.36%	0.37%	0.39%

302	0.19%	0.22%	0.30%	0.29%	0.24%	0.25%
303	0.33%	0.40%	0.42%	0.43%	0.39%	0.39%
304	0.27%	0.30%	0.33%	0.30%	0.29%	0.30%
305	0.03%	0.10%	0.17%	0.21%	0.21%	0.15%
306	0.38%	0.24%	0.29%	0.29%	0.24%	0.29%
307	0.31%	0.27%	0.26%	0.29%	0.32%	0.29%
308	0.14%	0.21%	0.16%	0.16%	0.16%	0.16%
309	0.45%	0.54%	0.52%	0.49%	0.47%	0.49%
310	0.22%	0.30%	0.22%	0.24%	0.24%	0.24%
311	0.36%	0.40%	0.49%	0.34%	0.48%	0.42%
312	0.17%	0.13%	0.12%	0.11%	0.11%	0.13%
313	0.12%	0.14%	0.17%	0.19%	0.21%	0.17%
314	0.09%	0.05%	0.10%	0.07%	0.06%	0.07%
315	0.24%	0.27%	0.16%	0.24%	0.21%	0.22%
316	0.24%	0.24%	0.26%	0.24%	0.26%	0.25%
317	0.53%	0.35%	0.48%	0.36%	0.39%	0.42%
318	0.22%	0.27%	0.26%	0.33%	0.29%	0.28%
319	0.58%	0.57%	0.48%	0.52%	0.53%	0.53%
320	0.12%	0.11%	0.26%	0.20%	0.29%	0.20%
321	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
322	0.38%	0.32%	0.29%	0.29%	0.24%	0.30%
323	0.21%	0.27%	0.23%	0.24%	0.29%	0.25%

324	0.26%	0.14%	0.16%	0.14%	0.16%	0.17%
325	0.38%	0.38%	0.40%	0.40%	0.36%	0.38%
326	0.24%	0.21%	0.17%	0.16%	0.19%	0.19%
327	0.15%	0.10%	0.10%	0.13%	0.18%	0.13%
328	0.12%	0.08%	0.12%	0.14%	0.18%	0.13%
329	0.09%	0.11%	0.14%	0.13%	0.13%	0.12%
330	0.27%	0.27%	0.24%	0.24%	0.26%	0.26%
331	0.12%	0.08%	0.09%	0.07%	0.11%	0.09%
332	0.33%	0.29%	0.17%	0.19%	0.18%	0.23%
333	0.24%	0.25%	0.16%	0.30%	0.24%	0.24%
334	0.05%	0.03%	0.13%	0.11%	0.18%	0.10%
335	0.21%	0.24%	0.30%	0.33%	0.39%	0.29%
336	0.24%	0.32%	0.39%	0.39%	0.42%	0.35%
337	0.17%	0.16%	0.17%	0.14%	0.16%	0.16%
338	0.12%	0.17%	0.09%	0.09%	0.03%	0.10%
339	0.58%	0.46%	0.53%	0.49%	0.47%	0.51%
340	0.24%	0.25%	0.19%	0.21%	0.19%	0.22%
341	0.07%	0.05%	0.04%	0.06%	0.03%	0.05%
342	0.24%	0.21%	0.17%	0.20%	0.21%	0.20%
343	0.12%	0.11%	0.14%	0.19%	0.18%	0.15%
344	0.17%	0.14%	0.20%	0.16%	0.13%	0.16%
345	0.31%	0.25%	0.30%	0.20%	0.24%	0.26%

346	0.29%	0.32%	0.32%	0.30%	0.32%	0.31%
347	0.22%	0.14%	0.26%	0.24%	0.23%	0.22%
348	0.17%	0.11%	0.10%	0.11%	0.15%	0.13%
349	0.27%	0.25%	0.23%	0.29%	0.24%	0.26%
350	0.21%	0.19%	0.23%	0.20%	0.24%	0.21%
351	0.39%	0.35%	0.40%	0.32%	0.34%	0.36%
352	0.52%	0.51%	0.42%	0.40%	0.45%	0.46%
353	0.21%	0.22%	0.23%	0.21%	0.26%	0.23%
354	0.53%	0.51%	0.40%	0.43%	0.39%	0.45%
355	0.10%	0.14%	0.22%	0.20%	0.21%	0.18%
356	0.05%	0.10%	0.06%	0.04%	0.06%	0.06%
357	0.19%	0.21%	0.29%	0.21%	0.26%	0.23%
358	0.45%	0.33%	0.46%	0.49%	0.50%	0.45%
359	0.03%	0.05%	0.12%	0.11%	0.06%	0.08%
360	0.12%	0.16%	0.13%	0.13%	0.15%	0.14%
361	0.41%	0.49%	0.39%	0.40%	0.44%	0.42%
362	0.12%	0.11%	0.24%	0.24%	0.19%	0.19%
363	0.36%	0.29%	0.24%	0.30%	0.32%	0.30%
364	0.02%	0.02%	0.03%	0.04%	0.06%	0.03%
365	0.17%	0.25%	0.24%	0.24%	0.27%	0.24%
366	0.03%	0.05%	0.09%	0.11%	0.08%	0.07%
367	0.22%	0.22%	0.20%	0.19%	0.18%	0.20%

368	0.53%	0.52%	0.53%	0.50%	0.50%	0.52%
369	0.21%	0.25%	0.32%	0.37%	0.34%	0.30%
Total	100%	100%	100%	100%	100%	100%
Employment status						
Semi-routine and routine occupations	28.86%	28.41%	28.67%	28.06%	27.48%	28.29%
Lower supervisory and technical occupations	10.54%	10.55%	9.31%	9.45%	9.25%	9.80%
Small workers and own account workers	10.68%	11.22%	11.36%	11.62%	11.72%	11.33%
Intermediate occupations	14.68%	14.67%	14.44%	14.64%	14.52%	14.59%
Higher managerial, administrative and professional occupations	35.24%	35.15%	36.22%	36.23%	37.03%	35.99%
Wave						
	2	3	4	5	6	2-6
%	18.06%	19.55%	21.54%	21.65%	19.20%	100%
Household size						
Mean	2.01	2.05	2.01	1.96	1.95	1.99
Standard deviation	0.83	0.89	0.83	0.79	0.78	0.83
Maximum	10	11	7	8	9	11
Minimum	1	1	1	1	1	1
Race	%	%	%	%	%	%
White	98.68%	98.26%	98.19%	97.81%	97.37%	98.05%
Black and minority ethnic	1.32%	1.74%	1.81%	2.19%	2.63%	1.95%
Total	100%	100%	100%	100%	100%	100%

Population density	%	%	%	%	%	%
Urban	28.86%	28.62%	29.41%	29.49%	30.58%	29.40%
Rural	71.14%	71.38%	70.59%	70.51%	69.42%	70.60%
Total	100%	100%	100%	100%	100%	100%
Political affiliation	%	%	%	%	%	%
Member of a political party, trade union or environmental group	15.43%	14.26%	13.86%	13.35%	12.92%	13.93%
Not a member	84.57%	85.74%	86.14%	86.65%	87.08%	86.07%
Total	100%	100%	100%	100%	100%	100%

Appendix Table 3.5: ELSA descriptive statistics for the control measures. Unweighted.

ELSA - SWB variable descriptive statistics															
	wave 2					wave 3					wave 4				
	mean	sd	min	max	N	mean	sd	min	max	N	mean	sd	min	max	N
Life satisfaction (1)															
raw	4.56	1.29	0.00	6.00	5825	4.22	1.45	0.00	6.00	6304	4.34	1.38	0.00	6.00	6947
standardised	0.13	0.93	-3.14	1.17	5825	-0.11	1.04	-3.14	1.17	6304	-0.02	0.99	-3.14	1.17	6947
Life satisfaction (2)															
raw	3.43	0.74	1.00	4.00	5825	3.33	0.75	1.00	4.00	6304	3.34	0.76	1.00	4.00	6947
standardised	0.09	0.98	-3.16	0.85	5825	-0.05	1.01	-3.16	0.85	6304	-0.03	1.01	-3.16	0.85	6947
Life meaning															
raw	3.57	0.71	1.00	4.00	5825	3.52	0.70	1.00	4.00	6304	3.51	0.71	1.00	4.00	6947
standardised	0.07	1.00	-3.55	0.67	5825	0.00	0.98	-3.55	0.67	6304	-0.02	1.00	-3.55	0.67	6947
Happy last week															
raw	0.90	0.30	0.00	1.00	5825	0.90	0.29	0.00	1.00	6304	0.91	0.29	0.00	1.00	6947
Lonely last week															
raw	0.11	0.32	0.00	1.00	5825	0.12	0.32	0.00	1.00	6304	0.11	0.31	0.00	1.00	6947
Sad last week															
raw	0.20	0.40	0.00	1.00	5825	0.18	0.38	0.00	1.00	6304	0.19	0.39	0.00	1.00	6947
Depressed last week															
raw	0.14	0.35	0.00	1.00	5825	0.13	0.34	0.00	1.00	6304	0.13	0.33	0.00	1.00	6947
Experienced affect last week*															
raw	0.75	0.49	-1.00	1.00	5825	0.76	0.49	-1.00	1.00	6304	0.77	0.48	-1.00	1.00	6947
standardised	-0.03	1.01	-3.64	0.48	5825	0.00	1.02	-3.64	0.48	6304	0.00	0.99	-3.64	0.48	6947
	wave 5					wave 6					all waves				
	mean	sd	min	max	N	mean	sd	min	max	N	mean	sd	min	max	N
Life satisfaction (1)															
raw	4.41	1.39	0.00	6.00	6981	4.35	1.41	0.00	6.00	6193	4.37	1.39	0.00	6.00	32250
standardised	0.03	1.00	-3.14	1.17	6981	-0.02	1.01	-3.14	1.17	6193	0.00	1.00	-3.14	1.17	32250
Life satisfaction (2)															
raw	3.35	0.74	1.00	4.00	6981	3.38	0.74	1.00	4.00	6193	3.36	0.75	1.00	4.00	32250
standardised	-0.02	1.00	-3.16	0.85	6981	0.02	1.00	-3.16	0.85	6193	0.00	1.00	-3.16	0.85	32250
Life meaning															
raw	3.51	0.71	1.00	4.00	6981	3.50	0.71	1.00	4.00	6193	3.52	0.71	1.00	4.00	32250
standardised	-0.02	1.00	-3.55	0.67	6981	-0.03	1.00	-3.55	0.67	6193	0.00	1.00	-3.55	0.67	32250

Happy last week															
raw	0.91	0.29	0.00	1.00	6981	0.91	0.29	0.00	1.00	6193	0.91	0.29	0.00	1.00	32250
Lonely last week															
raw	0.12	0.32	0.00	1.00	6981	0.10	0.30	0.00	1.00	6193	0.11	0.32	0.00	1.00	32250
Sad last week															
raw	0.19	0.40	0.00	1.00	6981	0.17	0.37	0.00	1.00	6193	0.19	0.39	0.00	1.00	32250
Depressed last week															
raw	0.13	0.33	0.00	1.00	6981	0.11	0.31	0.00	1.00	6193	0.13	0.33	0.00	1.00	32250
Experienced affect last week*															
raw	0.76	0.49	-1.00	1.00	6981	0.78	0.47	-1.00	1.00	6193	0.77	0.49	-1.00	1.00	32250
standardised	-0.01	1.01	-3.64	0.48	6981	0.04	0.97	-3.64	0.48	6193	0.00	1.00	-3.64	0.48	32250

Appendix Table 3.6: ELSA descriptive statistics for the subjective wellbeing measures. Unweighted. *Average of happy, lonely, sad and depressed last week.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfaction (1)											
High income	.24	.023	1.407e-24	.1	.025	4.780e-05	-.0042	.023	8.559e-01	-.014	.024	5.557e-01
Constant	-.011	.0057	6.269e-02	-4.6	.31	5.625e-48	.00019	.001	8.562e-01	-6.7	.92	1.807e-13
r2	.0024			.12			1.1e-06			.015		
N	32250			32250			32250			32250		
	Life satisfaction (2)											
High income	.28	.022	5.464e-37	.089	.024	1.907e-04	.016	.022	4.690e-01	.014	.023	5.459e-01
Constant	-.013	.0057	2.846e-02	-2.3	.3	1.832e-14	-.00072	.00099	4.688e-01	-1.2	.84	1.632e-01
r2	.0033			.12			.000016			.008		
N	32250			32250			32250			32250		
	Life meaning											
High income	.21	.022	8.662e-21	.039	.024	1.005e-01	.017	.023	4.593e-01	.012	.024	6.276e-01
Constant	-.0095	.0057	9.902e-02	-4.2	.32	3.379e-39	-.00077	.001	4.596e-01	-3.2	1	2.054e-03
r2	.0019			.081			.000016			.013		
N	32250			32250			32250			32250		
	Experienced affect last week											
High income	.13	.023	3.698e-09	-.052	.025	3.382e-02	-.036	.026	1.572e-01	-.048	.027	7.181e-02
Constant	-.006	.0057	2.928e-01	-2.5	.31	8.047e-16	.0016	.0012	1.572e-01	-1.7	.98	8.216e-02
r2	.00077			.094			.000061			.011		
N	32250			32250			32250			32250		

Appendix Table 3.7: Results of regressions explaining variance in SWB from 'high income' in ELSA. High income is defined as £46K+ (see p. 103). Results are not substantively different using a £100K cutoff.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfaction (1)											
High earnings	.21	.023	1.513e-20	.13	.025	1.587e-07	.019	.027	4.858e-01	.019	.028	5.062e-01
Constant	-.0086	.0057	1.312e-01	-4.7	.31	5.399e-51	-.00077	.0011	4.856e-01	-6.8	.92	1.809e-13
r2	.0018			.12			.000018			.015		
N	32250			32250			32250			32250		
	Life satisfaction (2)											
High earnings	.27	.021	8.511e-36	.088	.024	1.848e-04	.0048	.025	8.498e-01	.0015	.026	9.535e-01
Constant	-.011	.0057	5.872e-02	-2.5	.31	9.842e-16	-.00019	.001	8.495e-01	-1.2	.84	1.616e-01
r2	.0028			.12			1.1e-06			.008		
N	32250			32250			32250			32250		
	Life meaning											
High earnings	.23	.022	7.553e-27	.069	.024	3.386e-03	.013	.024	5.764e-01	-.0048	.025	8.504e-01
Constant	-.0095	.0057	9.895e-02	-4.3	.32	2.723e-40	-.00054	.00097	5.768e-01	-3.2	1	2.086e-03
r2	.0021			.081			7.6e-06			.013		
N	32250			32250			32250			32250		
	Experienced affect last week											
High earnings	.21	.022	1.603e-21	.029	.024	2.211e-01	-.014	.03	6.462e-01	.0036	.031	9.089e-01
Constant	-.0083	.0057	1.481e-01	-2.5	.31	7.870e-16	.00056	.0012	6.462e-01	-1.7	.98	8.468e-02
r2	.0016			.094			6.9e-06			.011		
N	32250			32250			32250			32250		

Appendix Table 3.8: Results of regressions explaining variance in SWB from 'high earnings' in ELSA. High earnings are defined as £46+ (see p. 103). Results are not substantively different using a £100K cutoff.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfaction (1)											
High wealth	.3	.011	2.92e-149	.12	.013	3.152e-22	.0048	.017	7.768e-01	-.017	.017	3.174e-01
Constant	-.076	.0067	6.592e-30	-4.4	.31	1.099e-43	-.0012	.0043	7.767e-01	-6.8	.92	1.745e-13
r2	0.017			0.12			3.20E-06			0.015		
N	32250			32250			32250			32250		
	Life satisfaction (2)											
High wealth	.36	.011	7.18e-224	.15	.013	6.557e-33	.036	.017	3.876e-02	.019	.017	2.653e-01
Constant	-.092	.0067	4.101e-43	-2.1	.3	1.064e-11	-.0091	.0044	3.876e-02	-1.2	.84	1.676e-01
r2	0.025			0.013			0.00017			0.0081		
N	32250			32250			32250			32250		
	Life meaning											
High wealth	.24	.012	5.727e-98	.052	.013	6.370e-05	.062	.019	1.009e-03	.037	.019	4.553e-02
Constant	-.062	.0067	1.160e-20	-4.1	.32	2.835e-37	-.016	.0048	1.009e-03	-3.1	1	2.244e-03
r2	0.003			0.081			0.000045			0.013		
N	0.011			32250			0.00045			32250		
	Experienced affect last week											
High wealth	.22	.011	1.504e-85	.015	.012	2.341e-01	.02	.019	2.838e-01	.013	.019	5.089e-01
Constant	-.056	.0068	1.873e-16	-2.5	.31	3.129e-15	-.0052	.0048	2.838e-01	-1.7	.98	8.721e-02
r2	0.0091			0.094			0.000041			0.011		
N	32250			32250			32250			32250		

Appendix Table 3.9: Results of regressions explaining variance in SWB from 'high wealth' in ELSA. High wealth is defined as £450K+ (see p. 104).

	Cantril ladder (no controls)			Cantril ladder (controls)			Happy (no controls)			Happy (controls)		
	b	se	p	b	se	p	b	se	p	b	se	p
Log earnings	.072	.012	9.134e-10	.058	.015	1.013e-04	-.055	.015	3.292e-04	-.016	.019	3.944e-01
Constant	-.78	.13	4.312e-09	-1.4	.24	1.164e-09	.57	.17	9.296e-04	-1.2	.29	4.838e-05
N	38561			38561			38561			38561		
	Negative affect (no controls)			Negative affect (controls			Experienced meaning (no controls)			Experienced meaning (controls)		
	b	se	p	b	se	p	b	se	p	b	se	p
Log earnings	-.0095	.014	4.819e-01	-.0035	.015	8.211e-01	.017	.014	2.463e-01	.016	.018	3.978e-01
Constant	.15	.15	3.306e-01	1.2	.24	6.993e-07	-.13	.16	4.122e-01	-1.5	.29	1.257e-07
N	38561			38561			38561			38561		

Appendix Table 3.2_MI: Results of multiple imputation of Table 3.2. There are no substantive differences to the main analyses.

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Log real income	0.10	0.01	1.75E-44	0.05	0.01	1.62E-11	0.01	0.01	0.16	0.008	0.01	0.33
Constant	-1.00	0.07	7.07E-43	-4.5	0.31	7.55E-49	-0.12	0.08	0.13	-6.2	1.1	7.85E-09
N	42984			42984			42984			42984		
	Life satisfation (2)											
Log real income	0.13	0.01	1.08E-59	0.04	0.01	5.22E-11	0.003	0.01	0.69	1E-04	0.01	0.99
Constant	-1.3	0.08	1.32E-60	-2.2	0.3	4.19E-14	-0.07	0.08	0.34	-2.1	1.0	0.04
N	42984			42984			42984			42984		
	Life meaning											
Log real income	0.11	0.01	6.96E-48	0.03	0.01	3.34E-05	0.01	0.01	0.48	0.005	0.01	0.59
Constant	-1.1	0.07	6.79E-52	-4.6	0.31	2.07E-49	-0.13	0.09	0.14	-4.4	1.10	1.44E-04
N	42984			42984			42984			42984		
	Experienced affect last week											
Log real income	0.12	0.01	4.07E-54	0.02	0.01	4.54E-04	**0.01**	**0.01**	**1.27E-01**	0.009	0.01	3.16E-01
Constant	-1.3	0.08	1.73E-58	-3.3	0.29	1.05E-29	-0.19	0.08	1.91E-02	-3.1	1	2.52E-03
N	42984			42984			42984			42984		

Appendix Table 3.6_MI: Results of multiple imputation of Table 3.6. Results that differed in statistical significance to the original analyses shown in **bold**.

In the imputation analyses for experienced affect last week, the association of log real income was with experienced affect last week in the fixed effects models with controls was not significant ($p>0.05$) but it was significant in the main analyses ($b=0.02$, $se=0.009$, $p>0.05$).

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Log real earnings	.0039	.00075	1.797e-07	.0047	.00098	1.758e-06	.0023	.0014	9.956e-02	.001	.0015	5.031e-01
Constant	-.0097	.0069	1.597e-01	-4.5	.3	1.294e-52	-.0093	.0049	5.630e-02	-6.2	1.1	1.426e-08
N	42984			42984			42984			42984		
	Life satisfation (2)											
Log real earnings	.008	.00074	2.745e-27	.0036	.00097	2.148e-04	.0022	.0015	1.255e-01	.00039	.0016	8.044e-01
Constant	-.045	.0072	4.373e-10	-2.3	.28	1.220e-15	-.043	.0052	6.421e-17	-2.1	.98	3.153e-02
N	42984			42984			42984			42984		
	Life meaning											
Log real earnings	.012	.00079	4.811e-52	.0049	.001	1.018e-06	**.0031**	**.0015**	**3.963e-02**	-.0002	.0016	9.032e-01
Constant	-.07	.0068	6.886e-25	-4.6	.29	6.015e-55	-.068	.0046	2.571e-48	-4.3	1.1	7.180e-05
N	42984			42984			42984			42984		
	Experienced affect last week											
Log real earnings	.014	.00072	4.833e-84	.008	.00097	1.771e-16	.00015	.0015	9.194e-01	.00083	.0017	6.141e-01
Constant	-.069	.0052	2.211e-40	-3.2	.28	3.028e-30	-.066	.0011	0.000e+00	-3.2	1	2.020e-03
N	42984			42984			42984			42984		

Appendix Table 3.7_MI: Results of multiple imputation of Table 3.7. Results that differed in statistical significance to the original analyses shown in **bold**.

In the imputation analyses, the association of earnings with life meaning was significant in the fixed effects model without controls (b=0.003, se=0.002, p<0.05) but it was not significant in the main analyses (b=0.002, se=0.001, p>0.05).

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Log real wealth	.039	.0018	6.19e-105	.019	.0017	2.999e-28	**.0066**	**.0036**	**6.212e-02**	.007	.0035	4.690e-02
Constant	-.45	.025	4.361e-74	-4.5	.31	7.546e-49	-.083	.041	4.318e-02	-6.2	1.1	7.846e-09
N	42984			42984			42984			42984		
	Life satisfation (2)											
Log real wealth	.052	.0017	1.12e-208	.026	.0016	9.036e-57	.01	.0032	1.351e-03	.0097	.0032	1.979e-03
Constant	-.63	.023	3.65e-169	-2.2	.3	4.194e-14	-.16	.037	1.960e-05	-2.1	1	3.910e-02
N	42984			42984			42984			42984		
	Life meaning											
Log real wealth	.036	.0015	8.93e-120	.011	.0016	1.456e-11	**.0063**	**.0033**	**5.505e-02**	**.0042**	**.0033**	**2.059e-01**
Constant	-.47	.019	5.73e-127	-4.6	.31	2.068e-49	-.14	.037	2.094e-04	-4.4	1.1	1.443e-04
N	42984			42984			42984			42984		
	Experienced affect last week											
Log real wealth	.048	.0017	1.49e-179	.019	.0017	2.141e-28	**.0091**	**.0035**	**9.277e-03**	**.0071**	**.0035**	**4.004e-02**
Constant	-.6	.02	4.38e-189	-3.3	.29	1.045e-29	-.17	.039	1.867e-05	-3.1	1	2.518e-03
N	42984			42984			42984			42984		

Appendix Table 3.8_MI: Results of multiple imputation of Table 3.8. Results that differed in statistical significance to the original analyses shown in **bold**.

In the main analyses, the relationship of log real wealth with life satisfaction (1) was significant in the fixed effects model (b=0.01, se=0.003, p<0.01) but it was not significant in the imputation analyses (b=0.007, se=0.004, p>0.05). In the main analyses, the association of log real wealth with life meaning was significant in the fixed effects model (b=0.007, se=0.003, p<0.05) but it was (marginally) not significant in the imputation model (b=0.006, se=0.003, p>0.05). Again for life meaning, in the main fixed effects + controls analyses, the association of log real wealth was significant (b=0.007, se=0.003, p<0.05) but it was not significant in the imputation analyses (b=0.004, se=0.003, p>0.05). For experienced affect last week in the main analyses, the association with log real with was not significant in the fixed effects models (p>0.05) but it was significant in the imputation - without controls (b=0.009, se=0.004, p<0.01) and with controls (b=0.007, se=0.004, p<0.05).

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	se	p	b	se	p	b	se	p	b	se	p
	Life satisfation (1)											
NVQ1/CSE	.014	.026	5.892e-01	**-.056**	**.025**	**2.604e-02**	.0064	.075	9.316e-01	.025	.074	7.320e-01
NVQ2/GCE O Lev	-.028	.015	6.427e-02	-.069	.015	5.838e-06	-.058	.045	1.918e-01	-.041	.044	3.446e-01
NVQ3/GCE A Lev	-.04	.021	5.629e-02	-.09	.02	9.579e-06	-.065	.056	2.402e-01	-.047	.056	4.044e-01
Higher ed (below deg)	.056	.017	8.002e-04	-.046	.016	5.147e-03	-.066	.05	1.865e-01	-.047	.05	3.477e-01
NVQ4/NVQ5/Degree+	.11	.015	3.632e-13	-.0089	.017	5.996e-01	-.067	.049	1.761e-01	-.042	.049	3.902e-01
Constant	-.028	.012	1.541e-02	-4.5	.31	1.237e-47	.027	.022	2.073e-01	-6.2	1.1	8.091e-09
N	42984			42984			42984			42984		
	Life satisfation (2)											
NVQ1/CSE	.062	.027	2.051e-02	-.013	.026	6.256e-01	-.05	.067	4.533e-01	-.037	.066	5.744e-01
NVQ2/GCE O Lev	.067	.015	6.808e-06	-.021	.015	1.545e-01	-.085	.048	7.569e-02	-.079	.048	9.660e-02
NVQ3/GCE A Lev	.073	.021	4.064e-04	-.03	.02	1.399e-01	-.11	.059	5.962e-02	-.1	.059	7.414e-02
Higher ed (below deg)	.17	.016	3.583e-26	.0099	.016	5.433e-01	-.074	.051	1.481e-01	-.07	.051	1.762e-01
NVQ4/NVQ5/Degree+	.23	.015	7.467e-52	**.043**	**.017**	**1.407e-02**	-.097	.048	4.452e-02	-.086	.048	7.349e-02
Constant	-.13	.011	7.105e-32	-2.2	.3	1.056e-13	.011	.022	6.363e-01	-2.1	1	4.065e-02
N	42984			42984			42984			42984		
	Life meaning											
NVQ1/CSE	.069	.028	1.301e-02	.045	.027	1.035e-01	.031	.093	7.362e-01	.056	.093	5.445e-01
NVQ2/GCE O Lev	.16	.015	3.863e-27	.053	.016	7.016e-04	-.046	.05	3.563e-01	-.035	.05	4.884e-01
NVQ3/GCE A Lev	.16	.021	9.158e-15	**.045**	**.021**	**3.302e-02**	.0094	.066	8.867e-01	.024	.064	7.116e-01
Higher ed (below deg)	.25	.016	2.424e-57	.11	.017	7.859e-10	.011	.056	8.473e-01	.027	.056	6.282e-01
NVQ4/NVQ5/Degree+	.33	.015	4.20e-110	.15	.018	1.542e-17	-.033	.052	5.236e-01	-.0059	.052	9.095e-01
Constant	-.2	.0097	9.341e-97	-4.6	.31	2.949e-49	-.054	.024	2.580e-02	-4.4	1.1	1.480e-04
N	42984			42984			42984			42984		
	Experienced affect last week											
NVQ1/CSE	.19	.026	2.961e-13	.054	.024	2.713e-02	-.0056	.077	9.414e-01	.0016	.077	9.838e-01
NVQ2/GCE O Lev	.16	.015	1.595e-27	.045	.015	2.551e-03	.0064	.05	8.988e-01	.025	.05	6.134e-01
NVQ3/GCE A Lev	.18	.02	5.310e-19	.032	.02	1.175e-01	.014	.057	8.008e-01	.028	.056	6.225e-01
Higher ed (below deg)	.24	.015	7.293e-55	.038	.016	1.750e-02	-.054	.054	3.153e-01	-.04	.054	4.564e-01
NVQ4/NVQ5/Degree+	.25	.014	4.896e-65	.011	.017	4.975e-01	-.04	.057	4.851e-01	-.013	.058	8.212e-01
Constant	-.19	.0091	9.18e-101	-3.3	.29	4.534e-30	-.053	.024	2.585e-02	-3.1	1	2.410e-03
N	42984			42984			42984			42984		

Appendix Table 3.9_MI: Results of multiple imputation of Table 3.9. Results that differed in statistical significance to the original analyses shown in **bold**.

In the main analyses, those with NVQ1/CSE-level qualifications did not have significantly different life satisfaction (1) scores to those with no/foreign/other qualifications in the pooled + control model (b=-0.06, se=0.03, p>0.05) but this relationship was significant in the imputation analyses (b=-0.056, se=0.03, p<0.05). In the main analyses, those with NVQ4/NVQ5/Degree+ qualifications did not have significantly different life satisfaction (2) scores to those with no/foreign/other qualifications in the pooled + controls model (b=0.02, se=0.02, p>0.05) but they did in the imputation analyses (b=0.04, se=0.02, p<0.05). Those with NVQ3/GCE A level qualifications did not have significantly different scores on life meaning to those with no/foreign/other qualifications

in the main analyses in the pooled + control model (b=0.03, se=0.02, p>0.05) but they had higher scores in the imputation analyses (b=0.05, se=0.02, p<0.05). Those with higher education (below degree) did not have significantly different scores to those with no/foreign/other qualifications in the main analyses in the pooled + control models for experienced affect last week (b=0.02, se=0.02, p>0.05) but they had higher scores in the imputation analyse (b=0.04, se=0.02, p<0.05).

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	se	p	b	se	p	b	se	p	b	se	p
	Life satisfation (1)											
Lower supervisory and technical occupations	**.047**	**.019**	**1.598e-02**	-.0054	.019	7.716e-01	.053	.061	3.834e-01	**.062**	**.06**	**3.011e-01**
Small workers and own account workers	.12	.018	3.372e-10	.013	.018	4.766e-01	**.06**	**.058**	**3.017e-01**	**.074**	**.058**	**2.014e-01**
Intermediate occupations	.061	.017	3.908e-04	-.024	.017	1.536e-01	.0031	.062	9.600e-01	.014	.061	8.147e-01
Higher managerial, administrative and professional occupations	.15	.013	5.848e-31	.041	.015	5.583e-03	**.046**	**.049**	**3.508e-01**	**.059**	**.049**	**2.243e-01**
Constant	-.086	.013	7.927e-12	-4.5	.31	1.292e-48	-.038	.03	2.147e-01	-6.2	1.1	7.027e-09
N	42984			42984			42984			42984		
	Life satisfation (2)											
Lower supervisory and technical occupations	**.048**	**.019**	**1.316e-02**	-.0031	.019	8.692e-01	-.063	.059	2.895e-01	-.057	.059	3.358e-01
Small workers and own account workers	.16	.018	6.969e-18	.026	.018	1.418e-01	.022	.058	7.053e-01	.033	.058	5.691e-01
Intermediate occupations	.15	.017	7.650e-18	.018	.017	2.802e-01	.012	.057	8.323e-01	.019	.056	7.327e-01
Higher managerial, administrative and professional occupations	.23	.013	7.326e-68	.071	.015	2.440e-06	.012	.05	8.130e-01	.026	.049	5.961e-01
Constant	-.17	.012	2.902e-47	-2.2	.3	6.625e-14	-.045	.03	1.314e-01	-2.1	1	4.232e-02
N	42984			42984			42984			42984		
	Life meaning											
Lower supervisory and technical occupations	.031	.02	1.191e-01	.025	.02	2.077e-01	-.047	.069	4.980e-01	-.038	.069	5.800e-01
Small workers and own account workers	.16	.019	6.713e-16	.057	.02	3.520e-03	-.027	.064	6.721e-01	-.01	.063	8.698e-01
Intermediate occupations	.14	.017	6.627e-15	.018	.017	2.954e-01	-.0099	.061	8.707e-01	.0049	.061	9.353e-01
Higher managerial, administrative and professional occupations	.23	.013	2.071e-75	.079	.015	9.308e-08	-.028	.055	6.058e-01	-.0061	.054	9.104e-01
Constant	-.19	.011	5.260e-69	-4.6	.31	2.369e-49	-.046	.033	1.662e-01	-4.4	1.1	1.546e-04
N	42984			42984			42984			42984		
	Experienced affect last week											
Lower supervisory and technical occupations	.11	.02	9.175e-09	**.021**	**.019**	**2.758e-01**	-.032	.063	6.051e-01	-.013	.062	8.383e-01
Small workers and own account workers	.2	.018	1.278e-29	.047	.018	9.878e-03	.0095	.065	8.833e-01	.015	.064	8.186e-01
Intermediate occupations	.15	.017	5.141e-18	.051	.017	2.907e-03	.0073	.062	9.058e-01	.026	.061	6.668e-01
Higher managerial, administrative and professional occupations	.22	.013	4.283e-64	.037	.015	1.066e-02	-.04	.055	4.737e-01	-.011	.055	8.370e-01
Constant	-.2	.01	1.832e-81	-3.3	.29	7.888e-30	-.051	.033	1.279e-01	-3.1	1	2.488e-03
N	42984			42984			42984			42984		

Appendix Table 3.10_MI: Results of multiple imputation of Table 3.10. Results that differed in statistical significance to the original analyses shown in **bold**.

In the imputation analyses for life satisfaction (1), those in lower supervisory and technical occupations had significantly higher scores than those in semi-routine and routine occupations (b=0.05, se=0.02, p<0.05) but they did not in the main analyses (b=0.04, se=0.02, p>0.05). In the fixed effects model, small account workers and own account workers were no different in life satisfaction (1) scores than those in semi-routine and routine occupations (b=0.06, se=0.06, p>0.05), nor were those in administrative and professional occupations (b=0.05, se=0.05, p>0.05), but they had higher scores in the main analyses (b=0.12, se=0.05, p>0.05 and b=0.14, se=0.04, p>0.05, respectively).

In the fixed effects models with controls, again for life satisfaction (1) those in lower supervisory and technical occupations, small workers and own account workers, and those in higher managerial/administrative/professional occupations did not have significantly different scores to those in semi-routine and routine occupations (e.g. lower supervisory and technical occupations, b=0.06, se=0.06, p>0.05) but they all had higher scores in the main analyses (e.g. lower supervisory and technical occupations, b=0.11, se=0.05, p<0.05).

In the imputation analyses for life satisfaction (2), and for the pooled model, those in lower supervisory and technical occupations had higher scores than those in semi-routine and routine occupations (b=0.05, se=0.02, p>0.05), however, there was not a significant difference between these groups in the main analyses (b=0.04, se=0.02, p>0.05). In the imputation analyses for experienced affect last week, and for the pooled plus controls model, there was no difference between those in semi-routine and routine occupations and those in lower supervisory and technical occupations (b=0.02, se=0.02, p>0.05), however, in the main analyses those in lower supervisory and technical occupations had higher scores (b=0.05, se=0.02, p>0.05).

Again in the imputation analyses for life satisfaction (2), in the fixed effects model with controls, there were no significant differences relative to those in lower supervisory and technical occupations (model with change in reference category not shown, e.g. higher managerial, professional and technical occupations, (b=0.09, se=0.05, p>0.05). However, there were differences in the main analyses - those in lower supervisory and technical occupations had lower SWB scores than small workers and own account workers (b=-0.12, se=0.06, p<0.05), those in intermediate occupations (b=-0.12, se=0.06, p=0.05), and those in higher managerial, administrative and professional occupations (b=-0.10, se=0.05, p<0.05).

	Pooled			Pooled+ controls			Fixed effects			Fixed effects + controls		
	b	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**	**b**	**se**	**p**
	Life satisfation (1)											
Unemployed	-.59	.065	1.840e-19	-.3	.061	8.053e-07	-.2	.063	1.474e-03	-.2	.062	1.098e-03
Constant	-.0034	.0069	6.192e-01	-4.5	.3	1.294e-52	-.0068	.0049	1.632e-01	-6.2	1.1	1.426e-08
N	42984			42984			42984			42984		
	Life satisfation (2)											
Unemployed	-.48	.066	7.632e-13	-.17	.062	4.975e-03	-.13	.066	5.326e-02	-.13	.066	4.302e-02
Constant	-.038	.0071	6.621e-08	-2.3	.28	1.220e-15	-.041	.0051	5.275e-16	-2.1	.98	3.153e-02
N	42984			42984			42984			42984		
	Life meaning											
Unemployed	-.32	.06	1.095e-07	-.15	.057	7.762e-03	-.099	.065	1.292e-01	-.11	.064	9.463e-02
Constant	-.064	.0068	3.713e-21	-4.6	.29	6.015e-55	-.066	.0046	1.773e-45	-4.3	1.1	7.180e-05
N	42984			42984			42984			42984		
	Experienced affect last week											
Unemployed	-.33	.067	1.254e-06	-.12	.064	6.196e-02	-.14	.075	5.895e-02	-.13	.075	8.363e-02
Constant	-.063	.0052	2.408e-33	-3.2	.28	3.028e-30	-.064	.0013	0.000e+00	-3.2	1	2.020e-03
N	42984			42984			42984			42984		

Appendix Table 3.11_MI: Results of multiple imputation of Table 3.11. There are no substantive differences to the main analyses.

Appendix C – Supplement to Chapter Four

Descriptive statistics for relative variables in ATUS 2012/2013					
Average household income (old) in….	mean	sd	min	max	n (activities)
State	74131.74	9463.76	53394.14	100488.1	63402
Age group in state	72777.02	16384.45	31232.43	136683.1	63402
Gender group in state	74419.16	10043.15	50532.04	105392.5	63402
Marital group in state	76572.32	21285.68	31436.93	164968.8	63402
Race group in state	74567.47	11951.37	26833.96	124891.4	63402
Parent group in state	74139.61	10702.07	48481.48	110908.1	63402
Occupation group in state	86683.44	25391.67	50048.19	156828.2	38561
Education group in state	79785.79	28523.43	32021.85	176301.7	63402
Unemployment group in state	73740.27	11077.11	28752.14	103066.1	63402
% household income (old) $100K+ in…	mean	sd	min	max	n (activities)
State	0.20	0.06	0.08	0.35	63402
Age group in state	0.19	0.08	0.01	0.51	63402
Gender group in state	0.20	0.06	0.08	0.37	63402
Marital group in state	0.21	0.09	0.02	0.58	63402
Race group in state	0.20	0.06	0.01	0.52	63402
Parent group in state	0.20	0.06	0.07	0.38	63402
Occupation group in state	0.25	0.13	0.05	0.61	38561
Education group in state	0.23	0.15	0.03	0.66	63402
Unemployment group in state	0.20	0.06	0.01	0.36	63402
Average income earnings (current) in….	mean	sd	min	max	n (activities)
State	44400.53	4907.48	33480.13	66679.29	34184
Age group in state	47967.57	11798.79	12973.28	135199.40	34184
Gender group in state	44381.42	10201.68	26629.83	74699.59	34184
Marital group in state	44433.13	13314.64	16274.45	95793.46	34184
Race group in state	44504.18	5924.64	21869.37	81495.02	34184
Parent group in state	43487.59	5683.46	31518.13	68206.05	34184
Occupation group in state	46909.72	18105.39	24084.09	88806.02	34184
Income group in state	44571.88	19741.17	15610.95	106478.10	34184

Education group in state	45573.62	21563.20	10469.95	116656.00	34184
% income earnings (current) $100K+ in…	mean	sd	min	max	n (activities)
State	0.05	0.02	0.02	0.13	63402
Age group in state	0.06	0.04	0.00	0.24	63402
Gender group in state	0.05	0.03	0.01	0.17	63402
Marital group in state	0.05	0.04	0.00	0.23	63402
Race group in state	0.05	0.02	0.00	0.21	63402
Parent group in state	0.05	0.02	0.01	0.14	63402
Occupation group in state	0.08	0.07	0.00	0.28	38561
Income group in state	0.06	0.08	0.00	0.34	63402
Education group in state	0.06	0.08	0.00	0.34	63402
Median education (old) in…..	mean	sd	min	max	n (activities)
State	1.83	0.40	1	4	63402
Age group in state	1.90	0.57	1	4	63402
Gender group in state	1.83	0.39	1	4	63402
Marital group in state	1.80	0.59	1	4	63402
Race group in state	1.75	0.44	1	4	63402
Parent group in state	1.54	0.51	1	4	63402
Occupation group in state	2.54	1.26	1	5	38561
Income group in state	2.14	1.11	1	5	63402
Unemployment group in state	1.80	0.41	1	4	63402
% degree+ (old) in…	mean	sd	min	max	n (activities)
State	0.36	0.04	0.26	0.58	63402
Age group in state	0.38	0.10	0.06	0.76	63402
Gender group in state	0.36	0.05	0.23	0.58	63402
Marital group in state	0.37	0.11	0.14	0.71	63402
Race group in state	0.36	0.06	0.18	0.84	63402
Parent group in state	0.33	0.08	0.16	0.64	63402
Occupation group in state	0.45	0.25	0.08	0.91	38561
Income group in state	0.39	0.16	0.09	0.86	63402
Unemployment group in state	0.36	0.05	0.09	0.60	63402
% Unemployed (old) in…..	mean	sd	min	max	n (activities)
State	0.05	0.01	0.02	0.09	63402
Age group in state	0.05	0.03	0.00	0.16	63402
Gender group in state	0.05	0.01	0.02	0.11	63402
Marital group in state	0.05	0.02	0.01	0.13	63402
Race group in state	0.05	0.02	0.02	0.14	63402
Parent group in state	0.06	0.02	0.02	0.13	63402

Income group in state	0.05	0.03	0.00	0.16	63402
Education group in state	0.06	0.02	0.00	0.15	63402
% Unemployed (current) in….	mean	sd	min	max	n (activities)
State	0.05	0.01	0.02	0.08	63402
Age group in state	0.05	0.03	0.00	0.14	63402
Gender group in state	0.05	0.01	0.02	0.10	63402
Marital group in state	0.05	0.02	0.01	0.13	63402
Race group in state	0.05	0.02	0.02	0.13	63402
Parent group in state	0.05	0.01	0.02	0.13	63402
Income group in state	0.05	0.03	0.00	0.14	63402
Education group in state	0.06	0.02	0.00	0.15	63402
*Top 1% income shares in…**	mean	sd	min	max	n (activities)
State	21.04	4.85	12.51	33.01	33181.00
Rank earnings in…	mean	sd	min	max	n (activities)
State	0.33	0.17	0.00	0.84	34184
Age group in state	0.37	0.21	0.00	0.92	34184
Gender group in state	0.33	0.17	0.00	0.85	34184
Marital group in state	0.34	0.18	0.00	0.87	34184
Race group in state	0.33	0.17	0.00	0.84	34184
Parent group in state	0.34	0.17	0.00	0.85	34184
Occupation group in state	0.47	0.24	0.00	0.96	34184
Income group in state	0.34	0.19	0.00	0.89	34184
Education group in state	0.34	0.19	0.00	0.90	34184
Distance from average earnings in…	mean	sd	min	max	n (activities)
State	298.51	33842.24	-58359.29	116519.60	34184
Age group in state	-3247.76	31719.32	-120878.60	125123.50	34184
Gender group in state	328.96	33227.25	-66899.59	123369.90	34184
Marital group in state	285.43	32499.58	-66668.14	127799.40	34184
Race group in state	197.55	33768.03	-72662.84	121571.70	34184
Parent group in state	1202.65	33942.81	-61656.98	117783.00	34184
Occupation group in state	-2189.90	30884.34	-80516.93	125915.60	34184
Income group in state	171.88	30574.19	-84541.04	131607.10	34184
Education group in state	-848.19	30458.68	-106256.00	139529.80	34184
Rank education in in…	mean	sd	min	max	n (activities)
State	0.58	0.27	0.06	0.97	63402
Age	0.55	0.28	0.01	0.99	63402
Gender	0.57	0.27	0.05	1.00	63402

Marital	0.57	0.27	0.02	1.00	63402
Race	0.57	0.27	0.03	0.99	63402
Parent	0.59	0.27	0.04	0.98	63402
Occupation	0.50	0.28	0.00	1.00	38561
Income	0.55	0.27	0.02	1.00	63402
Unemployment	0.57	0.27	0.05	1.00	63402
Distance from median education in in…	mean	sd	min	max	n (activities)
State	0.68	1.63	-4	4	63402
Age	0.45	1.60	-4	4	63402
Gender	0.68	1.62	-4	4	63402
Marital	0.70	1.62	-3	4	63402
Race	0.76	1.63	-3	4	63402
Parent	0.96	1.64	-4	4	63402
Occupation	-0.04	1.40	-4	4	38561
Income	0.36	1.57	-4	4	63402
Unemployment	0.66	1.62	-4	4	63402

Appendix Table 4.1: Weighted means and standard deviations, minimums and maximums, and activity counts (n) for the relative variables in ATUS. *Not weighted, 2012 only

	% household income (old) $100K+ in…	Age group in state	***% Unemployed (old) in….***	Age group in state	***Rank earnings in….***	Income group in state
% household income (old) $100K+ in…						
Age group in state		1				
% Unemployed (old) in….						
Age group in state		0.4		1		
Rank earnings in….						
Income group in state		0.23		-0.11		1

Appendix Table 4.2: Unweighted pairwise correlations between the relative variables significantly associated with SWB in ATUS. Full 107 X 107 table available upon request.

	Happy			
	b	se	p	n
Rank earnings in income group in state	-0.539161	0.1441763	1.85E-04	38561

Appendix Table 4.4_MI: Results of multiple imputation explaining variance in happiness in ATUS from rank earnings in income group in state. With controls and clustered standard errors. There are no substantive differences to the main analyses.

Relative variable	Cantril ladder				
	b	se	p	r2	n (activities)
% share income of 1% by state	0.000975749	0.002703347	7.18E-01	2.26217E-05	33181
% top earnings in age group in state	-1.405917868	0.223852792	3.44E-10	0.003055547	63402
% top earnings in education group in state	0.742856645	0.10850432	7.78E-12	0.002692854	63402
% top earnings in gender group in state	-1.334440903	0.284567016	2.76E-06	0.001816035	63402
% top earnings in income group in state	1.421205006	0.117999236	2.66E-33	0.010213829	63402
% top earnings in marital group in state	3.381379286	0.257711436	3.54E-39	0.013549006	63402
% top earnings in occupation group in state	0.626021845	0.139883254	7.69E-06	0.00245349	38561
% top earnings in parent group in state	-1.279402814	0.51717501	1.34E-02	0.000489939	63402
% top earnings in race group in state	0.243692245	0.469981564	6.04E-01	2.17984E-05	63402
% top earnings in state	-0.231021536	0.544417859	6.71E-01	1.41266E-05	63402
% top education in age group in state	-0.827878432	0.090543356	6.57E-20	0.006478796	63402
% top education in gender group in state	0.176272173	0.192105618	3.59E-01	6.48193E-05	63402
% top education in income group in state	0.71883908	0.05344586	4.52E-41	0.014282896	63402
% top education in marital group in state	1.139092841	0.085261134	1.50E-40	0.014701126	63402
% top education in occupation group in state	0.226535087	0.042001447	7.03E-08	0.003811947	38561
% top education in parent group in state	-0.449460718	0.117255423	1.27E-04	0.001190128	63402
% top education in race group in state	-0.001432345	0.159809336	9.93E-01	6.29428E-09	63402
% top education in state	-0.092040178	0.199405944	6.44E-01	1.62394E-05	63402
% top education in unemployment group in state	0.932309866	0.170586671	4.67E-08	0.002453056	63402
% top income in age group in state	-0.677027408	0.106796104	2.35E-10	0.003127137	63402
% top income in education group in state	0.311350326	0.057960145	7.88E-08	0.001940635	63402
% top income in gender group in state	-0.280211682	0.158028488	7.62E-02	0.000255201	63402
% top income in marital group in state	1.115094589	0.094817454	7.81E-32	0.009847294	63402

% top income in occupation group in state	0.337701403	0.077300282	1.26E-05	0.002440394	38561
% top income in parent group in state	-0.317775298	0.152308858	3.70E-02	0.000360631	63402
% top income in race group in state	-0.018085519	0.141250979	8.98E-01	1.34251E-06	63402
% top income in state	-0.153627971	0.160485987	3.38E-01	7.37788E-05	63402
% top income in unemployed group in state	0.507295867	0.144895875	4.64E-04	0.000987115	63402
% unemployed (new) in age group in state	-2.617901237	0.34551004	3.68E-14	0.005095544	63402
% unemployed (new) in education group in state	-2.105857922	0.407755477	2.43E-07	0.001971965	63402
% unemployed (new) in gender group in state	-3.053585376	0.681056978	7.38E-06	0.001627095	63402
% unemployed (new) in income group in state	-4.377952601	0.34903062	5.78E-36	0.013398241	63402
% unemployed (new) in marital group in state	-4.724281394	0.415053392	6.23E-30	0.011809076	63402
% unemployed (new) in parent group in state	0.593353197	0.579681477	3.06E-01	7.8286E-05	63402
% unemployed (new) in race group in state	-1.715322904	0.590282876	3.67E-03	0.000684242	63402
% unemployed (new) in state	-1.431391358	0.927615212	1.23E-01	0.000182467	63402
% unemployed (old) in age group in state	-2.513834039	0.333236691	4.75E-14	0.005034865	63402
% unemployed (old) in education group in state	-2.248022552	0.405682184	3.04E-08	0.002248208	63402
% unemployed (old) in gender group in state	-2.856366458	0.632916399	6.42E-06	0.001646143	63402
% unemployed (old) in income group in state	-4.157202035	0.342387954	8.18E-34	0.012690552	63402
% unemployed (old) in marital group in state	-4.486072075	0.409375589	7.18E-28	0.011071457	63402
% unemployed (old) in parent group in state	0.619954229	0.55508941	2.64E-01	9.17732E-05	63402
% unemployed (old) in race group in state	-1.574920976	0.568619978	5.62E-03	0.000620393	63402
% unemployed (old) in state	-1.064671436	0.862463247	2.17E-01	0.000115247	63402
Average earnings in age group in state	-2.53903E-06	6.67449E-07	1.43E-04	0.001187018	63402
Average earnings in education group in state	2.15657E-06	3.78442E-07	1.22E-08	0.002015148	63402
Average earnings in gender group in state	-4.26267E-06	9.02651E-07	2.35E-06	0.001873413	63402
Average earnings in income group in state	5.89916E-06	4.4575E-07	7.96E-40	0.013333353	63402

Average earnings in marital group in state	8.91607E-06	7.16037E-07	1.81E-35	0.01343706	63402
Average earnings in occupation group in state	2.5976E-06	5.70138E-07	5.26E-06	0.00262946	38561
Average earnings in parent group in state	-4.39755E-06	1.60114E-06	6.03E-03	0.000612001	63402
Average earnings in race group in state	8.95343E-07	1.55508E-06	5.65E-01	2.79215E-05	63402
Average earnings in state	-6.3831E-07	1.87219E-06	7.33E-01	9.59733E-06	63402
Average income in age group in state	-3.47868E-06	5.37491E-07	9.87E-11	0.003248577	63402
Average income in education group in state	1.60763E-06	2.97754E-07	6.77E-08	0.001926785	63402
Average income in gender group in state	-2.31072E-06	8.79582E-07	8.62E-03	0.000539198	63402
Average income in marital group in state	5.49754E-06	3.91598E-07	1.42E-44	0.014113737	63402
Average income in occupation group in state	1.84102E-06	4.08036E-07	6.48E-06	0.002601357	38561
Average income in parent group in state	-1.36799E-06	8.23595E-07	9.67E-02	0.000208475	63402
Average income in race group in state	3.81366E-07	7.55362E-07	6.14E-01	2.11762E-05	63402
Average income in state	-9.03096E-07	9.35911E-07	3.35E-01	7.24561E-05	63402
Average income in unemployed group in state	3.58221E-06	8.14926E-07	1.11E-05	0.001574542	63402
Distance from average earnings in age group in state	2.92581E-06	3.1563E-07	2.20E-20	0.010403718	34184
Distance from average earnings in education group in state	2.211E-06	3.37414E-07	5.89E-11	0.005478331	34184
Distance from average earnings in gender group in state	3.00333E-06	3.11495E-07	6.44E-22	0.012029454	34184
Distance from average earnings in income group in state	1.02503E-06	3.57884E-07	4.19E-03	0.001186413	34184
Distance from average earnings in marital group in state	1.41362E-06	3.10367E-07	5.30E-06	0.002549589	34184
Distance from average earnings in occupation group in state	2.35463E-06	3.31321E-07	1.26E-12	0.00638811	34184
Distance from average earnings in parent group in state	2.83859E-06	2.96097E-07	1.10E-21	0.011213729	34184
Distance from average earnings in race group in state	2.66974E-06	2.98378E-07	4.19E-19	0.009817434	34184
Distance from average earnings in state	2.72727E-06	2.97118E-07	5.08E-20	0.010290241	34184
Distance from median education in age group in state	0.039910589	0.005351308	9.11E-14	0.004126817	63402
Distance from median education in gender group in state	0.020198533	0.005146244	8.70E-05	0.001119964	63402

Distance from median education in income group in state	-0.024726055	0.005424739	5.19E-06	0.001577173	63402
Distance from median education in marital group in state	-0.000340298	0.005369456	9.49E-01	3.04413E-07	63402
Distance from median education in occupation group in state	-0.003270404	0.007677832	6.70E-01	2.50611E-05	38561
Distance from median education in parent group in state	0.026133291	0.005150546	3.93E-07	0.001866936	63402
Distance from median education in race group in state	0.021783389	0.005199441	2.81E-05	0.001300656	63402
Distance from median education in state	0.019538967	0.005165008	1.55E-04	0.001051678	63402
Distance from median education in unemployment group in state	0.014273962	0.005232989	6.38E-03	0.000551973	63402
Median education in age group in state	-0.145600021	0.014963656	2.49E-22	0.006832107	63402
Median education in gender group in state	0.006840092	0.023511902	7.71E-01	7.04497E-06	63402
Median education in income group in state	0.102178558	0.008009093	3.84E-37	0.012288362	63402
Median education in marital group in state	0.164288607	0.014886841	3.05E-28	0.009425616	63402
Median education in occupation group in state	0.047134961	0.008340967	1.63E-08	0.004229709	38561
Median education in parent group in state	-0.058514371	0.017539366	8.51E-04	0.000875448	63402
Median education in race group in state	-0.016343184	0.020368324	4.22E-01	5.28024E-05	63402
Median education in state	0.016898713	0.022784964	4.58E-01	4.48345E-05	63402
Median education in unemployment group in state	0.105728153	0.022771435	3.45E-06	0.001882789	63402
Rank earnings in age group in state	0.282017678	0.050566437	2.50E-08	0.004317155	34184
Rank earnings in education group in state	0.38517025	0.056514243	9.86E-12	0.006465255	34184
Rank earnings in gender group in state	0.503215224	0.062411414	8.18E-16	0.009356259	34184
Rank earnings in income group in state	0.276196831	0.056296859	9.42E-07	0.003344201	34184
Rank earnings in marital group in state	0.287217645	0.060765419	2.31E-06	0.003099812	34184
Rank earnings in occupation group in state	0.259635122	0.046342346	2.16E-08	0.004832638	34184
Rank earnings in parent group in state	0.506678677	0.063278839	1.29E-15	0.00921596	34184
Rank earnings in race group in state	0.482827916	0.062777031	1.58E-14	0.008457555	34184
Rank earnings in state	0.484324674	0.062837321	1.39E-14	0.008441971	34184

Rank education in age group in state	0.161253345	0.032564608	7.41E-07	0.001979092	63402
Rank education in gender group in state	0.090010352	0.030833522	3.51E-03	0.000656776	63402
Rank education in income group in state	-0.065841271	0.031437028	3.62E-02	0.000344809	63402
Rank education in marital group in state	-0.016717406	0.031388652	5.94E-01	2.24574E-05	63402
Rank education in occupation group in state	0.054940506	0.038779492	1.57E-01	0.000280201	38561
Rank education in parent group in state	0.110805954	0.03136315	4.12E-04	0.000978379	63402
Rank education in race group in state	0.093503367	0.030834039	2.43E-03	0.000709205	63402
Rank education in state	0.091430614	0.03090632	3.10E-03	0.000678179	63402
Rank education in unemployment group in state	0.073437795	0.030977093	1.78E-02	0.000436137	63402

Appendix Table 4.3: Results of regressions explaining variance in the Cantril ladder from the relative variables in ATUS without controls. Weighted and with clustered standard errors.

Relative variable	**Happy**				
	b	se	p	r2	n (activities)
% share income of 1% by state	0.001144747	0.00278215	6.81E-01	3.12861E-05	33181
% top earnings in age group in state	-1.258862095	0.268887399	2.86E-06	0.002373481	63402
% top earnings in education group in state	-0.697127564	0.138297745	4.67E-07	0.00231324	63402
% top earnings in gender group in state	-1.75834353	0.383562186	4.58E-06	0.003078329	63402
% top earnings in income group in state	-0.337384134	0.147067574	2.18E-02	0.000550314	63402
% top earnings in marital group in state	1.026358408	0.312651288	1.03E-03	0.001183031	63402
% top earnings in occupation group in state	-0.899460651	0.211718896	2.17E-05	0.004418274	38561
% top earnings in parent group in state	-2.780034906	0.654473827	2.17E-05	0.002232811	63402
% top earnings in race group in state	-2.176654294	0.600564076	2.90E-04	0.0017011	63402
% top earnings in state	-1.87502033	0.692497558	6.78E-03	0.000901538	63402

% top education in age group in state	-0.43687579	0.110092125	7.26E-05	0.001724784	63402
% top education in gender group in state	-0.522260286	0.252469764	3.86E-02	0.000557162	63402
% top education in income group in state	-0.055935533	0.067566469	4.08E-01	8.4261E-05	63402
% top education in marital group in state	0.330858569	0.101877172	1.17E-03	0.001187836	63402
% top education in occupation group in state	-0.205910732	0.05728518	3.26E-04	0.002778305	38561
% top education in parent group in state	-0.63819651	0.147844764	1.59E-05	0.00230743	63402
% top education in race group in state	-0.806612785	0.203608227	7.47E-05	0.001974681	63402
% top education in state	-0.761954648	0.259764237	3.36E-03	0.001094018	63402
% top education in unemployment group in state	-0.613995154	0.21117078	3.65E-03	0.001063645	63402
% top income in age group in state	-0.731911516	0.147678429	7.25E-07	0.003549077	63402
% top income in education group in state	-0.374389407	0.0708806	1.29E-07	0.002723198	63402
% top income in gender group in state	-0.718485024	0.235770017	2.31E-03	0.001650894	63402
% top income in marital group in state	0.177712336	0.113937255	1.19E-01	0.000239505	63402
% top income in occupation group in state	-0.477694386	0.126037703	1.51E-04	0.004310996	38561
% top income in parent group in state	-0.787547552	0.213168507	2.21E-04	0.002167609	63402
% top income in race group in state	-0.735656198	0.205793339	3.51E-04	0.002195904	63402
% top income in state	-0.622052783	0.234253438	7.93E-03	0.001185971	63402
% top income in unemployed group in state	-0.582065309	0.20720766	4.97E-03	0.001269384	63402
% unemployed (new) in age group in state	-1.087128597	0.407684841	7.67E-03	0.000848723	63402
% unemployed (new) in education group in state	1.511683268	0.539541579	5.09E-03	0.001001961	63402
% unemployed (new) in gender group in state	-3.433166457	0.852231918	5.63E-05	0.001959203	63402
% unemployed (new) in income group in state	-0.960552318	0.432575427	2.64E-02	0.000632555	63402
% unemployed (new) in marital group in state	-2.224884891	0.531188585	2.82E-05	0.002570376	63402
% unemployed (new) in parent group in state	-0.247411448	0.680450592	7.16E-01	1.31819E-05	63402
% unemployed (new) in race group in state	0.393458374	0.67947177	5.63E-01	3.47169E-05	63402

% unemployed (new) in state	-2.774363629	1.091554807	1.10E-02	0.000648512	63402
% unemployed (old) in age group in state	-1.114680559	0.395743749	4.86E-03	0.000944033	63402
% unemployed (old) in education group in state	1.568710681	0.539649664	3.65E-03	0.001071419	63402
% unemployed (old) in gender group in state	-3.401655619	0.779983818	1.30E-05	0.002206176	63402
% unemployed (old) in income group in state	-0.781056983	0.417102432	6.11E-02	0.000435193	63402
% unemployed (old) in marital group in state	-2.205002931	0.520872874	2.31E-05	0.002590707	63402
% unemployed (old) in parent group in state	-0.437821204	0.65396563	5.03E-01	4.37937E-05	63402
% unemployed (old) in race group in state	0.212254919	0.660241989	7.48E-01	1.07765E-05	63402
% unemployed (old) in state	-2.644771433	1.012569974	9.01E-03	0.000669798	63402
Average earnings in age group in state	-1.70671E-06	7.66178E-07	2.59E-02	0.000508745	63402
Average earnings in education group in state	-2.26584E-06	4.94886E-07	4.71E-06	0.002176946	63402
Average earnings in gender group in state	-5.19261E-06	1.18494E-06	1.18E-05	0.002722845	63402
Average earnings in income group in state	-7.64522E-07	5.63046E-07	1.75E-01	0.000216281	63402
Average earnings in marital group in state	3.18937E-06	8.75599E-07	2.71E-04	0.001643517	63402
Average earnings in occupation group in state	-3.28301E-06	8.23137E-07	6.69E-05	0.003690199	38561
Average earnings in parent group in state	-7.57217E-06	2.05377E-06	2.28E-04	0.001767681	63402
Average earnings in race group in state	-5.6783E-06	2.04672E-06	5.54E-03	0.001102841	63402
Average earnings in state	-5.29869E-06	2.43251E-06	2.94E-02	0.000643486	63402
Average income in age group in state	-3.3377E-06	6.94388E-07	1.54E-06	0.002904317	63402
Average income in education group in state	-1.91911E-06	3.7579E-07	3.30E-07	0.002674303	63402
Average income in gender group in state	-4.90724E-06	1.30666E-06	1.73E-04	0.002391209	63402
Average income in marital group in state	1.22582E-06	4.72507E-07	9.49E-03	0.000678511	63402
Average income in occupation group in state	-2.54062E-06	6.23878E-07	4.68E-05	0.004383524	38561
Average income in parent group in state	-4.21162E-06	1.1095E-06	1.47E-04	0.001925687	63402
Average income in race group in state	-4.01243E-06	1.06178E-06	1.58E-04	0.002298798	63402

Average income in state	-3.83481E-06	1.36656E-06	5.02E-03	0.001283278	63402
Average income in unemployed group in state	-3.38025E-06	1.11604E-06	2.46E-03	0.001373463	63402
Distance from average earnings in age group in state	-1.56988E-06	3.8634E-07	4.87E-05	0.002606894	34184
Distance from average earnings in education group in state	-3.72592E-07	4.23467E-07	3.79E-01	0.000133686	34184
Distance from average earnings in gender group in state	-1.20388E-06	4.11676E-07	3.46E-03	0.001679984	34184
Distance from average earnings in income group in state	-1.6205E-06	4.3698E-07	2.10E-04	0.002494693	34184
Distance from average earnings in marital group in state	-2.4716E-06	3.85518E-07	1.50E-10	0.006764196	34184
Distance from average earnings in occupation group in state	-1.00112E-06	4.3085E-07	2.02E-02	0.000992341	34184
Distance from average earnings in parent group in state	-1.38072E-06	3.73889E-07	2.23E-04	0.002306461	34184
Distance from average earnings in race group in state	-1.50387E-06	3.77788E-07	6.91E-05	0.002699597	34184
Distance from average earnings in state	-1.51474E-06	3.77837E-07	6.14E-05	0.00275481	34184
Distance from median education in age group in state	-0.017338188	0.007026695	1.36E-02	0.000760104	63402
Distance from median education in gender group in state	-0.026355497	0.00643636	4.24E-05	0.001850119	63402
Distance from median education in income group in state	-0.019517951	0.00646103	2.52E-03	0.000954326	63402
Distance from median education in marital group in state	-0.033699348	0.00674259	5.84E-07	0.002904775	63402
Distance from median education in occupation group in state	-0.021351161	0.011407898	6.13E-02	0.000965948	38561
Distance from median education in parent group in state	-0.020702294	0.006677709	1.94E-03	0.001149326	63402
Distance from median education in race group in state	-0.021297985	0.00660343	1.26E-03	0.001214242	63402
Distance from median education in state	-0.026250432	0.006527396	5.80E-05	0.001842985	63402
Distance from median education in unemployment group in state	-0.026076337	0.006616632	8.14E-05	0.001791141	63402
Median education in age group in state	-0.083982713	0.019688294	2.00E-05	0.002199854	63402
Median education in gender group in state	0.001115173	0.029349711	9.70E-01	1.83554E-07	63402
Median education in income group in state	-0.018621496	0.009799325	5.74E-02	0.000393645	63402
Median education in marital group in state	0.048791533	0.017947494	6.56E-03	0.000788606	63402
Median education in occupation group in state	-0.039641771	0.01103086	3.27E-04	0.002647952	38561

Median education in parent group in state	-0.058806374	0.021223226	5.60E-03	0.000853703	63402
Median education in race group in state	-0.068747946	0.02410603	4.35E-03	0.000895234	63402
Median education in state	0.0011224	0.0277265	9.68E-01	1.95029E-07	63402
Median education in unemployment group in state	-0.008334688	0.026326058	7.52E-01	1.12156E-05	63402
Rank earnings in age group in state	-0.331926367	0.064425066	2.62E-07	0.005213688	34184
Rank earnings in education group in state	-0.253216754	0.072825138	5.09E-04	0.00239924	34184
Rank earnings in gender group in state	-0.272037538	0.079836039	6.58E-04	0.002354583	34184
Rank earnings in income group in state	-0.351856702	0.071582196	8.98E-07	0.004680116	34184
Rank earnings in marital group in state	-0.428152351	0.081222582	1.38E-07	0.005954786	34184
Rank earnings in occupation group in state	-0.168027211	0.058794332	4.27E-03	0.001755316	34184
Rank earnings in parent group in state	-0.29292562	0.079872011	2.46E-04	0.002656936	34184
Rank earnings in race group in state	-0.310213199	0.078451449	7.72E-05	0.003008251	34184
Rank earnings in state	-0.306065151	0.079561778	1.20E-04	0.002900689	34184
Rank education in age group in state	-0.128345636	0.042235125	2.38E-03	0.001224767	63402
Rank education in gender group in state	-0.139661335	0.039044879	3.48E-04	0.001542321	63402
Rank education in income group in state	-0.149066527	0.039008746	1.33E-04	0.001726826	63402
Rank education in marital group in state	-0.176343587	0.039666512	8.81E-06	0.00244335	63402
Rank education in occupation group in state	-0.168761632	0.053670134	1.67E-03	0.002365478	38561
Rank education in parent group in state	-0.113119457	0.040436653	5.16E-03	0.000996351	63402
Rank education in race group in state	-0.12499744	0.039162832	1.42E-03	0.001236892	63402
Rank education in state	-0.13409073	0.039278913	6.42E-04	0.001422624	63402
Rank education in unemployment group in state	-0.132533248	0.039303679	7.47E-04	0.001385284	63402

Appendix Table 4.4: Results of regressions explaining variance in happiness from the relative variables in ATUS without controls. Weighted and with clustered standard errors.

Relative variable	Negative affect				
	b	se	p	r2	n (activities)
% share income of 1% by state	-0.001864722	0.003024717	0.537580438	8.10844E-05	33181
% top earnings in age group in state	1.981284059	0.254373574	7.06447E-15	0.005988226	63402
% top earnings in education group in state	-0.327939408	0.127958565	0.010388219	0.000521385	63402
% top earnings in gender group in state	-1.648589674	0.322399047	3.18934E-07	0.002756182	63402
% top earnings in income group in state	-0.781888969	0.136524753	1.03528E-08	0.003010419	63402
% top earnings in marital group in state	-0.806808668	0.305590565	0.008292594	0.000744585	63402
% top earnings in occupation group in state	-0.13937278	0.162427211	0.390873431	0.000116984	38561
% top earnings in parent group in state	0.797763579	0.587085296	0.174206851	0.000187273	63402
% top earnings in race group in state	0.714001451	0.548373758	0.192918546	0.000186434	63402
% top earnings in state	0.117256554	0.62434688	0.851029914	3.59105E-06	63402
% top education in age group in state	0.499190744	0.100943496	7.66173E-07	0.002293649	63402
% top education in gender group in state	0.368894	0.2255912	0.102014953	0.00028313	63402
% top education in income group in state	-0.543853533	0.063965923	1.97872E-17	0.008113166	63402
% top education in marital group in state	-0.246819921	0.096748881	0.010743959	0.000673298	63402
% top education in occupation group in state	-0.054230546	0.047147735	0.250071909	0.000212516	38561
% top education in parent group in state	0.089433284	0.122429739	0.465100725	4.61523E-05	63402
% top education in race group in state	0.183218823	0.179755189	0.308086881	0.000103772	63402
% top education in state	0.061050258	0.227969993	0.788856186	7.15346E-06	63402
% top education in unemployment group in state	0.00472185	0.197050245	0.980882606	6.40717E-08	63402
% top income in age group in state	0.829806096	0.114664717	4.74751E-13	0.004646508	63402
% top income in education group in state	-0.17568699	0.066450098	0.008201765	0.000610782	63402
% top income in gender group in state	-0.135982001	0.174780494	0.436568173	6.02312E-05	63402
% top income in marital group in state	-0.373138758	0.108895673	0.000612392	0.001075463	63402
% top income in occupation group in state	-0.020470837	0.087849412	0.815748055	8.73031E-06	38561
% top income in parent group in state	0.142655838	0.164066016	0.384581917	7.24405E-05	63402
% top income in race group in state	0.207966429	0.159442372	0.192132944	0.000178741	63402
% top income in state	0.068670488	0.177379244	0.698656852	1.47209E-05	63402
% top income in unemployed group in state	0.052088058	0.158355361	0.742210694	1.03538E-05	63402

% unemployed (new) in age group in state	-0.025516081	0.384991247	0.947157874	4.7622E-07	63402
% unemployed (new) in education group in state	0.617179551	0.468655853	0.187881362	0.000170109	63402
% unemployed (new) in gender group in state	-2.773402165	0.806742312	0.000587611	0.001302239	63402
% unemployed (new) in income group in state	3.473122554	0.403792969	8.41459E-18	0.008423089	63402
% unemployed (new) in marital group in state	0.494015008	0.505563767	0.328502544	0.000129073	63402
% unemployed (new) in parent group in state	0.689356392	0.685773805	0.314800194	0.000104232	63402
% unemployed (new) in race group in state	-0.198061681	0.70755927	0.779539732	8.96023E-06	63402
% unemployed (new) in state	0.858854323	1.049685946	0.413251328	6.33002E-05	63402
% unemployed (old) in age group in state	-0.016473941	0.372655042	0.964739854	2.10018E-07	63402
% unemployed (old) in education group in state	0.369254926	0.456510393	0.418602161	6.04646E-05	63402
% unemployed (old) in gender group in state	-2.710905449	0.743643191	0.000267563	0.001427129	63402
% unemployed (old) in income group in state	3.436417686	0.40012207	9.40505E-18	0.008580321	63402
% unemployed (old) in marital group in state	0.40795083	0.470477362	0.385896963	9.03214E-05	63402
% unemployed (old) in parent group in state	0.449308616	0.645138455	0.486152676	4.69767E-05	63402
% unemployed (old) in race group in state	-0.291050876	0.696117874	0.67587397	2.06383E-05	63402
% unemployed (old) in state	0.436259145	0.973058366	0.653913702	1.85623E-05	63402
Average earnings in age group in state	4.93641E-06	7.5321E-07	5.73445E-11	0.004334866	63402
Average earnings in education group in state	-1.35564E-06	4.54207E-07	0.002842477	0.000793688	63402
Average earnings in gender group in state	-5.35615E-06	1.00468E-06	9.85486E-08	0.002950748	63402
Average earnings in income group in state	-3.84575E-06	5.24804E-07	2.4189E-13	0.00557411	63402
Average earnings in marital group in state	-1.53119E-06	8.25034E-07	0.063479696	0.000385831	63402
Average earnings in occupation group in state	-5.88082E-07	6.59331E-07	0.372443201	0.000130575	38561
Average earnings in parent group in state	2.32632E-06	1.80678E-06	0.19791602	0.000169933	63402
Average earnings in race group in state	1.97836E-06	1.76869E-06	0.263347801	0.000136352	63402
Average earnings in state	6.92009E-07	2.05702E-06	0.736562407	1.11789E-05	63402

Average income in age group in state	4.59149E-06	5.87616E-07	5.80336E-15	0.005597974	63402
Average income in education group in state	-1.01993E-06	3.55542E-07	0.004126124	0.000769359	63402
Average income in gender group in state	-2.11188E-06	1.01745E-06	0.037937314	0.000451085	63402
Average income in marital group in state	-2.0402E-06	4.54441E-07	7.17692E-06	0.001914373	63402
Average income in occupation group in state	-1.20171E-07	4.68901E-07	0.797737019	1.08149E-05	38561
Average income in parent group in state	3.26097E-07	9.50075E-07	0.731426381	1.17586E-05	63402
Average income in race group in state	8.19972E-07	8.82252E-07	0.352688062	9.77822E-05	63402
Average income in state	-7.99224E-08	1.08404E-06	0.9412286	5.67733E-07	63402
Average income in unemployed group in state	-5.83952E-08	9.15083E-07	0.949118847	4.17492E-07	63402
Distance from average earnings in age group in state	-1.22236E-06	3.61665E-07	0.000727747	0.001754269	34184
Distance from average earnings in education group in state	-7.48164E-07	3.47074E-07	0.031133102	0.000598301	34184
Distance from average earnings in gender group in state	-2.10993E-07	3.40734E-07	0.535777123	5.72768E-05	34184
Distance from average earnings in income group in state	1.58281E-07	3.72408E-07	0.670829719	2.64168E-05	34184
Distance from average earnings in marital group in state	-3.72617E-07	3.37333E-07	0.269356998	0.000170644	34184
Distance from average earnings in occupation group in state	-4.88423E-07	3.50291E-07	0.163244116	0.000262174	34184
Distance from average earnings in parent group in state	-7.35969E-07	3.29922E-07	0.025717895	0.000727378	34184
Distance from average earnings in race group in state	-7.39865E-07	3.29176E-07	0.024618749	0.000725251	34184
Distance from average earnings in state	-7.01446E-07	3.28975E-07	0.033009991	0.000655708	34184
Distance from median education in age group in state	-0.029064542	0.006461884	6.90039E-06	0.002175544	63402
Distance from median education in gender group in state	-0.02219204	0.006179671	0.00032997	0.001336063	63402
Distance from median education in income group in state	0.009042161	0.006151826	0.141621402	0.000208616	63402
Distance from median education in marital group in state	-0.015960167	0.00642967	0.013062433	0.00066362	63402
Distance from median education in occupation group in state	0.006249382	0.00812817	0.441993502	9.12569E-05	38561
Distance from median education in parent group in state	-0.02099109	0.006313683	0.000886617	0.001203514	63402
Distance from median education in race group in state	-0.020324433	0.006263934	0.001177635	0.001126264	63402

Distance from median education in state	-0.01980787	0.006202925	0.001408532	0.001068807	63402
Distance from median education in unemployment group in state	-0.020856023	0.006262287	0.000868615	0.00116701	63402
Median education in age group in state	0.058313553	0.017710009	0.000993936	0.00108026	63402
Median education in gender group in state	0.025792501	0.02672899	0.334573889	0.00010001	63402
Median education in income group in state	-0.068669311	0.009286993	1.47517E-13	0.005452249	63402
Median education in marital group in state	-0.043708712	0.017556468	0.012795895	0.000644588	63402
Median education in occupation group in state	-0.0102433	0.009467684	0.279306936	0.000194969	38561
Median education in parent group in state	0.004006524	0.019951223	0.840844357	4.03617E-06	63402
Median education in race group in state	-0.004731624	0.023503933	0.840456517	4.31929E-06	63402
Median education in state	-0.015020261	0.026572352	0.57190348	3.55742E-05	63402
Median education in unemployment group in state	-0.002259613	0.02558255	0.929618138	8.39631E-07	63402
Rank earnings in age group in state	-0.120215767	0.059043191	0.041766564	0.000759086	34184
Rank earnings in education group in state	-0.110202966	0.063265908	0.081552289	0.000504408	34184
Rank earnings in gender group in state	-0.102568824	0.069895162	0.142276314	0.000371529	34184
Rank earnings in income group in state	-0.023883532	0.062773814	0.703603788	2.39347E-05	34184
Rank earnings in marital group in state	-0.0806417	0.069286911	0.244496347	0.000234474	34184
Rank earnings in occupation group in state	-0.032923109	0.052253225	0.528662234	7.48004E-05	34184
Rank earnings in parent group in state	-0.125265066	0.071155341	0.078358791	0.000539302	34184
Rank earnings in race group in state	-0.133952323	0.070456122	0.057298511	0.000622587	34184
Rank earnings in state	-0.126594677	0.070992677	0.074578725	0.000550821	34184
Rank education in age group in state	-0.207291118	0.039501907	1.5553E-07	0.003254078	63402
Rank education in gender group in state	-0.13338052	0.036968291	0.000309298	0.001432789	63402
Rank education in income group in state	-0.003250229	0.036422915	0.928895327	8.36164E-07	63402
Rank education in marital group in state	-0.108930035	0.03761836	0.003787398	0.000949592	63402
Rank education in occupation group in state	0.016858549	0.041725864	0.686196437	2.60311E-05	38561

Rank education in parent group in state	-0.132983252	0.038029317	0.000471712	0.001402512	63402
Rank education in race group in state	-0.132298535	0.036957698	0.000344705	0.001411286	63402
Rank education in state	-0.131106246	0.037159721	0.000419294	0.001385206	63402
Rank education in unemployment group in state	-0.132319691	0.037072291	0.000358803	0.001406414	63402

Appendix Table 4.5: Results of regressions explaining variance in negative affect from the relative variables in ATUS without controls. Weighted and with clustered standard errors.

Relative variable	**Meaning**				
	b	se	p	r2	n (activities)
% share income of 1% by state	0.000134568	0.002519042	0.957398126	4.85961E-07	33181
% top earnings in age group in state	1.026467672	0.237977561	1.61552E-05	0.001754499	63402
% top earnings in education group in state	-0.117244886	0.117646449	0.318976338	7.27473E-05	63402
% top earnings in gender group in state	-1.673410723	0.327921632	3.37E-07	0.003099886	63402
% top earnings in income group in state	-0.424508993	0.131011048	0.001196043	0.000968653	63402
% top earnings in marital group in state	2.168766392	0.271984311	1.61378E-15	0.005872955	63402
% top earnings in occupation group in state	-0.11986615	0.162441805	0.460587206	8.5022E-05	38561
% top earnings in parent group in state	-1.50874673	0.565885591	0.007677821	0.000731168	63402
% top earnings in race group in state	-1.022563	0.5455334	0.06088497	0.000417411	63402
% top earnings in state	-0.650040911	0.605618374	0.283125788	0.000120472	63402
% top education in age group in state	0.308514539	0.10081072	0.002213611	0.000956319	63402
% top education in gender group in state	-0.123746337	0.217801475	0.569931455	3.4778E-05	63402
% top education in income group in state	-0.149605752	0.060941464	0.014099854	0.000670164	63402
% top education in marital group in state	0.76822781	0.090534313	2.28455E-17	0.007120077	63402
% top education in occupation group in state	-0.022526645	0.047608358	0.63610284	3.603E-05	38561

% top education in parent group in state	-0.420287915	0.128900751	0.001113669	0.001112619	63402
% top education in race group in state	-0.452731756	0.188944238	0.016578435	0.000691643	63402
% top education in state	-0.399750346	0.22961434	0.0817041	0.000334793	63402
% top education in unemployment group in state	-0.176784585	0.215594875	0.412233654	9.80367E-05	63402
% top income in age group in state	0.083878019	0.116149285	0.470205782	5.18236E-05	63402
% top income in education group in state	-0.101972031	0.061766242	0.098766462	0.000224609	63402
% top income in gender group in state	-0.274812757	0.189882399	0.147833394	0.000268529	63402
% top income in marital group in state	0.498523553	0.101492287	9.08412E-07	0.002095483	63402
% top income in occupation group in state	-0.030500945	0.092072174	0.740444258	1.90438E-05	38561
% top income in parent group in state	-0.318613511	0.172929565	0.065423535	0.000394447	63402
% top income in race group in state	-0.295889361	0.172167068	0.085698353	0.000394962	63402
% top income in state	-0.104255422	0.188077234	0.57936397	3.70382E-05	63402
% top income in unemployed group in state	-0.08583629	0.17249876	0.618767367	3.0692E-05	63402
% unemployed (new) in age group in state	-2.843030962	0.374041148	3.06168E-14	0.006453576	63402
% unemployed (new) in education group in state	0.218201203	0.445586334	0.624355029	2.32101E-05	63402
% unemployed (new) in gender group in state	-2.456091554	0.722095363	0.00067178	0.001114838	63402
% unemployed (new) in income group in state	0.533564695	0.379872124	0.160157534	0.000217002	63402
% unemployed (new) in marital group in state	-3.841698855	0.438303251	2.00427E-18	0.008520424	63402
% unemployed (new) in parent group in state	0.521107528	0.614676108	0.396572243	6.50168E-05	63402
% unemployed (new) in race group in state	1.78318909	0.632714092	0.004831997	0.000792813	63402
% unemployed (new) in state	0.419214319	0.946399017	0.657801085	1.64625E-05	63402
% unemployed (old) in age group in state	-2.770236496	0.356826473	8.62523E-15	0.00648266	63402
% unemployed (old) in education group in state	0.260460986	0.447824329	0.560832652	3.28392E-05	63402
% unemployed (old) in gender group in state	-2.370960234	0.666993537	0.000379223	0.001191629	63402
% unemployed (old) in income group in state	0.647102438	0.361670505	0.073595926	0.00033212	63402

% unemployed (old) in marital group in state	-3.721238258	0.428001614	3.72949E-18	0.008203665	63402
% unemployed (old) in parent group in state	0.587794037	0.595631724	0.323731461	8.7761E-05	63402
% unemployed (old) in race group in state	1.789374264	0.615101688	0.003628747	0.000851524	63402
% unemployed (old) in state	0.640244668	0.897495683	0.475625803	4.36408E-05	63402
Average earnings in age group in state	5.31494E-06	7.2807E-07	2.97652E-13	0.005485386	63402
Average earnings in education group in state	-1.02908E-07	4.12279E-07	0.802892883	4.99254E-06	63402
Average earnings in gender group in state	-5.3001E-06	1.04028E-06	3.51918E-07	0.003153935	63402
Average earnings in income group in state	-1.41445E-06	4.97079E-07	0.004438153	0.000823083	63402
Average earnings in marital group in state	6.8226E-06	7.54831E-07	1.71765E-19	0.008361737	63402
Average earnings in occupation group in state	-2.29156E-07	6.55291E-07	0.726568063	1.94814E-05	38561
Average earnings in parent group in state	-4.27546E-06	1.79791E-06	0.017414871	0.000626558	63402
Average earnings in race group in state	-3.03382E-06	1.86559E-06	0.103921651	0.000350017	63402
Average earnings in state	-1.93054E-06	2.08351E-06	0.354154259	9.49715E-05	63402
Average income in age group in state	8.66114E-07	5.77208E-07	0.13349345	0.000217436	63402
Average income in education group in state	-3.64813E-07	3.2977E-07	0.268623164	0.000107445	63402
Average income in gender group in state	-2.6394E-06	1.06549E-06	0.013250758	0.000769104	63402
Average income in marital group in state	2.37009E-06	4.21125E-07	1.84579E-08	0.002820127	63402
Average income in occupation group in state	-2.13688E-07	4.7455E-07	0.652504975	3.3601E-05	38561
Average income in parent group in state	-1.72756E-06	9.28344E-07	0.062770627	0.000360237	63402
Average income in race group in state	-2.16548E-06	8.93514E-07	0.015377378	0.00074444	63402
Average income in state	-9.71629E-07	1.09016E-06	0.372792826	9.15937E-05	63402
Average income in unemployed group in state	-5.89929E-07	9.74649E-07	0.545003358	4.65106E-05	63402
Distance from average earnings in age group in state	-9.08944E-07	3.29147E-07	0.005762433	0.000947468	34184
Distance from average earnings in education group in state	5.81052E-07	3.55588E-07	0.102273561	0.000352491	34184
Distance from average earnings in gender group in state	2.42143E-07	3.5369E-07	0.493598235	7.36853E-05	34184

Distance from average earnings in income group in state	3.56972E-07	3.93658E-07	0.364528153	0.000131245	34184
Distance from average earnings in marital group in state	-1.14345E-06	3.33945E-07	0.000619043	0.001569619	34184
Distance from average earnings in occupation group in state	-1.92986E-07	3.54236E-07	0.585905004	3.99798E-05	34184
Distance from average earnings in parent group in state	3.03745E-08	3.30234E-07	0.926716478	1.21019E-06	34184
Distance from average earnings in race group in state	-4.70093E-08	3.32572E-07	0.887595456	2.85985E-06	34184
Distance from average earnings in state	-9.62686E-08	3.34661E-07	0.773612095	1.20638E-05	34184
Distance from median education in age group in state	0.002386885	0.005816515	0.681543458	1.60163E-05	63402
Distance from median education in gender group in state	-0.001076142	0.005567237	0.84672659	3.42949E-06	63402
Distance from median education in income group in state	0.012846713	0.005852266	0.028162071	0.000459669	63402
Distance from median education in marital group in state	-0.013905205	0.005764022	0.015855568	0.000549867	63402
Distance from median education in occupation group in state	-0.023168914	0.008500873	0.006429469	0.001232457	38561
Distance from median education in parent group in state	0.004767595	0.005666858	0.400182544	6.77701E-05	63402
Distance from median education in race group in state	0.00238073	0.005618801	0.67178311	1.68687E-05	63402
Distance from median education in state	-0.000465932	0.005592496	0.933602834	6.45545E-07	63402
Distance from median education in unemployment group in state	-0.000702559	0.005648741	0.901019976	1.44556E-06	63402
Median education in age group in state	-0.020686747	0.017346862	0.233064479	0.000148399	63402
Median education in gender group in state	0.01659534	0.02606076	0.524265687	4.51944E-05	63402
Median education in income group in state	-0.028716721	0.009009825	0.001438286	0.001040825	63402
Median education in marital group in state	0.106109694	0.016135155	4.93318E-11	0.004146812	63402
Median education in occupation group in state	-0.008006738	0.009399901	0.394346523	0.000117048	38561
Median education in parent group in state	-0.053478957	0.018969885	0.00481948	0.000784977	63402
Median education in race group in state	-0.035846039	0.022898979	0.117504035	0.000270603	63402
Median education in state	0.00535651	0.026266263	0.838409202	4.93857E-06	63402
Median education in unemployment group in state	0.008880177	0.025981157	0.732510012	1.41554E-05	63402
Rank earnings in age group in state	-0.207488402	0.056266294	0.000227402	0.002208756	34184

Rank earnings in education group in state	0.01980155	0.064119559	0.757462254	1.59069E-05	34184
Rank earnings in gender group in state	0.042493219	0.072257301	0.556488725	6.22866E-05	34184
Rank earnings in income group in state	-0.002625038	0.065051533	0.967812235	2.8242E-07	34184
Rank earnings in marital group in state	-0.166877873	0.07027997	0.017590245	0.000980768	34184
Rank earnings in occupation group in state	0.02890125	0.052310783	0.580622498	5.63026E-05	34184
Rank earnings in parent group in state	0.044339527	0.07333156	0.545427066	6.60005E-05	34184
Rank earnings in race group in state	0.027421935	0.071530695	0.701460646	2.54852E-05	34184
Rank earnings in state	0.02528461	0.072558108	0.727490617	2.14627E-05	34184
Rank education in age group in state	-0.072610635	0.035565452	0.041202775	0.000435838	63402
Rank education in gender group in state	0.013546614	0.034085146	0.691050981	1.61331E-05	63402
Rank education in income group in state	0.033449808	0.034144423	0.327266646	9.66738E-05	63402
Rank education in marital group in state	-0.053886991	0.03429776	0.116162021	0.000253669	63402
Rank education in occupation group in state	-0.143761146	0.043858273	0.001048718	0.001859963	38561
Rank education in parent group in state	0.034355486	0.034726356	0.322517586	0.000102179	63402
Rank education in race group in state	0.021361578	0.034032644	0.530220837	4.01633E-05	63402
Rank education in state	0.014643237	0.034185012	0.668398747	1.88625E-05	63402
Rank education in unemployment group in state	0.014641157	0.034042264	0.667136187	1.87963E-05	63402

Appendix Table 4.6: Results of regressions explaining variance in meaning from the relative variables in ATUS without controls. Weighted and with clustered standard errors.

Relative variable	Cantril ladder				
	b	se	p	r2	n (activities)
% unemployed (old) in age group in state	-2.5270415	0.74	6.64E-04	0.20	63402
% unemployed (new) in age group in state	-2.3348438	0.76	2.20E-03	0.20	63402
Rank earnings in education group in state	0.3308350	0.11	3.56E-03	0.16	34184
Distance from average earnings in occupation group in state	0.0000017	0.00	5.36E-03	0.16	34184
Rank earnings in age group in state	0.3261412	0.12	5.37E-03	0.16	34184
Rank earnings in gender group in state	0.4589330	0.17	5.88E-03	0.16	34184
Distance from average earnings in income group in state	0.0000016	0.00	6.90E-03	0.16	34184
Median education in age group in state	-0.0559877	0.02	7.00E-03	0.20	63402
Rank earnings in parent group in state	0.4644994	0.17	7.49E-03	0.16	34184
Rank earnings in race group in state	0.4551182	0.17	8.67E-03	0.16	34184
Distance from average earnings in education group in state	0.0000015	0.00	9.42E-03	0.16	34184
Average income in race group in state	-0.0000054	0.00	9.93E-03	0.20	63402
% top income in age group in state	-0.5528861	0.22	1.18E-02	0.20	63402
Rank earnings in state	0.4368595	0.18	1.30E-02	0.16	34184
Distance from average earnings in age group in state	0.0000014	0.00	1.37E-02	0.16	34184
Distance from average earnings in parent group in state	0.0000015	0.00	1.44E-02	0.16	34184
% top education in race group in state	-0.7309672	0.30	1.59E-02	0.20	63402
Distance from average earnings in marital group in state	0.0000014	0.00	1.78E-02	0.16	34184
Distance from average earnings in state	0.0000014	0.00	1.83E-02	0.16	34184
Distance from average earnings in race group in state	0.0000014	0.00	1.97E-02	0.16	34184
% top education in age group in state	-0.3559124	0.16	2.41E-02	0.20	63402
Distance from average earnings in gender group in state	0.0000013	0.00	2.84E-02	0.16	34184
Median education in gender group in state	-0.0725482	0.04	4.91E-02	0.20	63402
Rank earnings in occupation group in state	0.1921312	0.11	6.78E-02	0.16	34184

Average income in age group in state	-0.0000018	0.00	7.66E-02	0.20	63402
% unemployed (new) in race group in state	1.9634450	1.14	8.61E-02	0.20	63402
Rank earnings in marital group in state	0.2266865	0.15	1.29E-01	0.16	34184
% top income in parent group in state	-0.4232086	0.28	1.31E-01	0.20	63402
% top education in parent group in state	-0.4183456	0.29	1.47E-01	0.20	63402
Median education in parent group in state	-0.0462343	0.04	1.98E-01	0.20	63402
% unemployed (old) in race group in state	1.2682597	1.07	2.36E-01	0.20	63402
Average income in parent group in state	-0.0000018	0.00	2.56E-01	0.20	63402
Median education in race group in state	-0.0335413	0.03	2.90E-01	0.20	63402
% unemployed (old) in education group in state	-0.7291802	0.81	3.65E-01	0.20	63402
% unemployed (new) in parent group in state	0.9281531	1.14	4.17E-01	0.20	63402
% unemployed (old) in income group in state	0.6936315	0.86	4.19E-01	0.20	63402
% top earnings in parent group in state	-0.9565489	1.31	4.66E-01	0.16	34184
Median education in marital group in state	0.0195595	0.03	4.73E-01	0.20	63402
Average earnings in parent group in state	-0.0000022	0.00	5.98E-01	0.16	34184
% unemployed (new) in marital group in state	-0.5722444	1.12	6.08E-01	0.20	63402
Average earnings in age group in state	-0.0000010	0.00	6.17E-01	0.16	34184
% unemployed (old) in gender group in state	-0.5725289	1.32	6.64E-01	0.20	63402
% unemployed (new) in gender group in state	0.5789810	1.51	7.02E-01	0.20	63402
% unemployed (new) in state	0.8059204	2.46	7.43E-01	0.20	63402
% unemployed (old) in parent group in state	0.3100646	1.06	7.70E-01	0.20	63402
% top earnings in race group in state	-0.3136812	1.55	8.40E-01	0.16	34184
% top earnings in age group in state	0.1157748	0.64	8.56E-01	0.16	34184
Median education in unemployment group in state	-0.0091487	0.05	8.57E-01	0.20	63402
% unemployed (old) in state	0.2516503	1.95	8.97E-01	0.20	63402
Rank earnings in income group in state	-0.0134768	0.12	9.08E-01	0.16	34184
% unemployed (old) in marital group in state	-0.0943080	1.06	9.29E-01	0.20	63402
% unemployed (new) in education group in state	0.0455186	0.82	9.56E-01	0.20	63402

% unemployed (new) in income group in state	0.0432893	0.89	9.61E-01	0.20	63402
Average earnings in race group in state	0.0000002	0.00	9.62E-01	0.16	34184

Appendix Table 4.7: Results of regressions explaining variance in the Cantril ladder from the relative variables in ATUS with VIF < 10 - with controls. Weighted and with clustered standard errors.

Relative variable	Happy				
	b	se	p	r2	n (activities)
Rank earnings in income group in state	-0.547738881	0.149603932	2.52E-04	0.133168195	34184
% top education in parent group in state	-0.754207869	0.311268885	1.54E-02	0.125753881	63402
% top income in age group in state	-0.653093887	0.293127114	2.59E-02	0.125899691	63402
Average income in race group in state	-4.72362E-06	2.21348E-06	3.29E-02	0.125687609	63402
% top education in race group in state	-0.601289141	0.309090115	5.17E-02	0.125615424	63402
Rank earnings in race group in state	-0.382650952	0.212513584	7.18E-02	0.131792971	34184
% top income in parent group in state	-0.538296852	0.305851405	7.84E-02	0.125556289	63402
Median education in marital group in state	0.055160276	0.032009555	8.49E-02	0.125602326	63402
Rank earnings in parent group in state	-0.374602635	0.217646349	8.52E-02	0.131738079	34184
% unemployed (new) in race group in state	2.08151147	1.225329811	8.94E-02	0.125547364	63402
% unemployed (new) in education group in state	1.626290426	0.9663175	9.24E-02	0.125570877	63402
% top education in age group in state	0.314939599	0.188251762	9.43E-02	0.125600931	63402
Average income in parent group in state	-2.72707E-06	1.7004E-06	1.09E-01	0.125507542	63402
Rank earnings in education group in state	-0.24050742	0.150698288	1.11E-01	0.13169413	34184
Distance from average earnings in marital group in state	-1.19543E-06	7.59696E-07	1.16E-01	0.131694617	34184
% top earnings in race group in state	-2.692650289	1.733106573	1.20E-01	0.131690527	34184
Rank earnings in occupation group in state	-0.219476917	0.141353413	1.21E-01	0.131693575	34184

% unemployed (old) in education group in state	1.464119013	0.976819993	1.34E-01	0.125531161	63402
% unemployed (new) in income group in state	-1.605421261	1.133470667	1.57E-01	0.125536933	63402
Rank earnings in state	-0.30709508	0.222068259	1.67E-01	0.131611758	34184
Median education in parent group in state	-0.053712223	0.03903817	1.69E-01	0.125461506	63402
Distance from average earnings in state	-1.05232E-06	7.79157E-07	1.77E-01	0.131611085	34184
Average earnings in parent group in state	-5.85276E-06	4.39477E-06	1.83E-01	0.131611142	34184
Distance from average earnings in race group in state	-1.02787E-06	7.7322E-07	1.84E-01	0.131602233	34184
Distance from average earnings in gender group in state	-1.01807E-06	7.78288E-07	1.91E-01	0.131596699	34184
Distance from average earnings in age group in state	-9.43436E-07	7.28039E-07	1.95E-01	0.131581529	34184
% top earnings in parent group in state	-1.716600818	1.519908266	2.59E-01	0.131543593	34184
% unemployed (old) in parent group in state	-1.290115041	1.151740514	2.63E-01	0.125407788	63402
Average income in age group in state	-1.50478E-06	1.37308E-06	2.73E-01	0.125456007	63402
% unemployed (old) in state	-2.193465063	2.061875357	2.87E-01	0.125404191	63402
Distance from average earnings in income group in state	-8.02163E-07	7.69524E-07	2.97E-01	0.131507459	34184
Distance from average earnings in parent group in state	-7.75508E-07	7.57782E-07	3.06E-01	0.131494877	34184
% unemployed (new) in age group in state	0.829852315	0.846416693	3.27E-01	0.125405707	63402
Rank earnings in marital group in state	-0.1685149	0.195963574	3.90E-01	0.131455618	34184
Distance from average earnings in occupation group in state	-6.49854E-07	7.88996E-07	4.10E-01	0.13144999	34184
% unemployed (new) in marital group in state	1.056270029	1.299037304	4.16E-01	0.125388817	63402
% unemployed (old) in race group in state	0.940447917	1.165470952	4.20E-01	0.125376826	63402
% top earnings in age group in state	-0.579258555	0.733118274	4.29E-01	0.131439279	34184
Median education in race group in state	-0.02780245	0.039643573	4.83E-01	0.125372075	63402
Distance from average earnings in education group in state	-4.9126E-07	7.75884E-07	5.27E-01	0.13140878	34184
Rank earnings in age group in state	-0.083316251	0.136256832	5.41E-01	0.131390962	34183
% unemployed (old) in gender group in state	-0.879562548	1.455059132	5.46E-01	0.125353075	63402

Rank earnings in gender group in state	-0.127059536	0.214410854	5.53E-01	0.131399855	34184
% unemployed (new) in gender group in state	0.855802962	1.741080374	6.23E-01	0.12534443	63402
Median education in age group in state	0.01320203	0.028067284	6.38E-01	0.125347677	63402
Average earnings in race group in state	2.52869E-06	6.06229E-06	6.77E-01	0.131380094	34184
% unemployed (new) in state	-1.090154486	2.663744409	6.82E-01	0.125336662	63402
Median education in unemployment group in state	-0.023455799	0.057885985	6.85E-01	0.125342435	63402
% unemployed (old) in income group in state	-0.428086946	1.081932465	6.92E-01	0.125341242	63402
% unemployed (old) in marital group in state	0.410749559	1.183501449	7.29E-01	0.125335147	63402
% unemployed (old) in age group in state	0.268136964	0.800963472	7.38E-01	0.125333724	63402
% unemployed (new) in parent group in state	-0.356036395	1.26858223	7.79E-01	0.12533	63402
Average earnings in age group in state	5.20245E-07	2.38028E-06	8.27E-01	0.131354454	34184
Median education in gender group in state	0.001039537	0.046853361	9.82E-01	0.125324483	63402

Appendix Table 4.8: Results of regressions explaining variance in happiness from the relative variables in ATUS with VIF < 10 - with controls. Weighted and with clustered standard errors.

Relative variable	Negative affect				
	b	se	p	r2	n (activities)
% top income in age group in state	1.0287043	0.221141	3.31E-06	0.30	63402
Average income in age group in state	0.0000037	0.000001	6.82E-04	0.30	63402
% unemployed (old) in education group in state	-2.1275538	0.809534	8.59E-03	0.30	63402
% top earnings in race group in state	2.9152577	1.534750	5.75E-02	0.26	34184
% unemployed (new) in parent group in state	2.2395548	1.185349	5.89E-02	0.30	63402
% unemployed (new) in education group in state	-1.4937656	0.796859	6.09E-02	0.30	63402
Average earnings in race group in state	0.0000080	0.000005	1.09E-01	0.26	34184
Rank earnings in education group in state	-0.1684675	0.118219	1.54E-01	0.26	34184
Median education in race group in state	0.0457678	0.034856	1.89E-01	0.30	63402
% top education in race group in state	0.3809164	0.294592	1.96E-01	0.30	63402
% unemployed (new) in gender group in state	2.0133281	1.601592	2.09E-01	0.30	63402
% unemployed (new) in state	3.0315012	2.450428	2.16E-01	0.30	63402
% unemployed (old) in parent group in state	1.2180458	1.065743	2.53E-01	0.30	63402
Rank earnings in income group in state	0.1348366	0.121311	2.66E-01	0.26	34184
Average earnings in parent group in state	0.0000041	0.000004	2.74E-01	0.26	34184
% top earnings in parent group in state	1.2712150	1.284847	3.22E-01	0.26	34184
Rank earnings in race group in state	-0.1568721	0.166406	3.46E-01	0.26	34184
Rank earnings in gender group in state	-0.1484410	0.158204	3.48E-01	0.26	34184
Distance from average earnings in income group in state	-0.0000005	0.000001	3.54E-01	0.26	34184
Distance from average earnings in gender group in state	-0.0000005	0.000001	3.82E-01	0.26	34184
Distance from average earnings in race group in state	-0.0000005	0.000001	3.85E-01	0.26	34184
Median education in unemployment group in state	0.0392866	0.048586	4.19E-01	0.30	63402
Distance from average earnings in parent group in state	-0.0000005	0.000001	4.27E-01	0.26	34184
% top education in age group in state	-0.1296610	0.163401	4.27E-01	0.30	63402

Rank earnings in state	-0.1238025	0.166690	4.58E-01	0.26	34184
Average income in race group in state	0.0000015	0.000002	4.65E-01	0.30	63402
Distance from average earnings in age group in state	-0.0000004	0.000001	4.65E-01	0.26	34184
Distance from average earnings in state	-0.0000004	0.000001	5.20E-01	0.26	34184
Rank earnings in parent group in state	-0.0989166	0.164452	5.48E-01	0.26	34184
Average income in parent group in state	0.0000009	0.000001	5.48E-01	0.30	63402
Distance from average earnings in education group in state	-0.0000003	0.000001	5.62E-01	0.26	34184
Rank earnings in age group in state	-0.0701317	0.120902	5.62E-01	0.26	34184
Distance from average earnings in marital group in state	-0.0000003	0.000001	5.70E-01	0.26	34184
Median education in marital group in state	-0.0148911	0.026840	5.79E-01	0.30	63402
% top earnings in age group in state	0.3483555	0.647904	5.91E-01	0.26	34184
Distance from average earnings in occupation group in state	-0.0000003	0.000001	6.03E-01	0.26	34184
Average earnings in age group in state	0.0000011	0.000002	6.07E-01	0.26	34184
% top education in parent group in state	0.1340918	0.274676	6.25E-01	0.30	63402
% top income in parent group in state	0.1321384	0.271663	6.27E-01	0.30	63402
Median education in age group in state	-0.0090695	0.022752	6.90E-01	0.30	63402
% unemployed (old) in gender group in state	0.4948279	1.293816	7.02E-01	0.30	63402
% unemployed (old) in age group in state	0.2596976	0.694697	7.09E-01	0.30	63402
Rank earnings in marital group in state	0.0533892	0.152219	7.26E-01	0.26	34184
% unemployed (new) in race group in state	0.3079367	1.096711	7.79E-01	0.30	63402
% unemployed (old) in state	0.5062022	1.814262	7.80E-01	0.30	63402
% unemployed (old) in income group in state	0.1996415	0.917784	8.28E-01	0.30	63402
Median education in gender group in state	-0.0072797	0.039291	8.53E-01	0.30	63402
% unemployed (new) in marital group in state	0.1845884	1.219515	8.80E-01	0.30	63402
% unemployed (old) in marital group in state	-0.1264935	1.015437	9.01E-01	0.30	63402
Median education in parent group in state	-0.0046835	0.037992	9.02E-01	0.30	63402
% unemployed (new) in income group in state	-0.1075073	0.941250	9.09E-01	0.30	63402
% unemployed (new) in age group in state	-0.0651445	0.740588	9.30E-01	0.30	63402
Rank earnings in occupation group in state	-0.0024320	0.109751	9.82E-01	0.26	34184

% unemployed (old) in race group in state	0.0143266	1.048577	9.89E-01	0.30	63402

Appendix Table 4.9: Results of regressions explaining variance in negative affect from the relative variables in ATUS with VIF < 10. With controls, weighted and with clustered standard errors.

	Meaning				
Relative variable	b	se	p	r2	n (activities)
Rank earnings in income group in state	-0.424796	0.14	3.10E-03	0.08	34184
% top education in parent group in state	-0.825688	0.30	5.45E-03	0.07	63402
% top education in age group in state	0.474948	0.18	8.64E-03	0.07	63402
% top earnings in parent group in state	-2.830962	1.41	4.41E-02	0.08	34184
Average earnings in parent group in state	-0.000009	0.00	4.50E-02	0.08	34184
Median education in parent group in state	-0.074301	0.04	5.31E-02	0.07	63402
Rank earnings in race group in state	-0.383816	0.20	5.72E-02	0.08	34184
Distance from average earnings in race group in state	-0.000001	0.00	6.79E-02	0.07	34184
Rank earnings in education group in state	-0.257588	0.14	7.12E-02	0.07	34184
Distance from average earnings in state	-0.000001	0.00	7.54E-02	0.07	34184
Average income in parent group in state	-0.000003	0.00	7.97E-02	0.07	63402
Distance from average earnings in income group in state	-0.000001	0.00	8.11E-02	0.07	34184
Rank earnings in state	-0.367986	0.21	8.20E-02	0.07	34184
% top income in parent group in state	-0.491035	0.29	8.56E-02	0.07	63402
Distance from average earnings in marital group in state	-0.000001	0.00	9.67E-02	0.07	34184
Distance from average earnings in gender group in state	-0.000001	0.00	1.03E-01	0.07	34184
Rank earnings in parent group in state	-0.338971	0.21	1.04E-01	0.07	34184
% unemployed (new) in education group in state	1.480715	0.94	1.16E-01	0.07	63402
Average income in age group in state	-0.000002	0.00	1.34E-01	0.07	63402
Rank earnings in gender group in state	-0.295232	0.20	1.38E-01	0.07	34184
Median education in marital group in state	0.043861	0.03	1.38E-01	0.07	63402

Median education in race group in state	0.053457	0.04	1.46E-01	0.07	63402
Distance from average earnings in age group in state	-0.000001	0.00	1.56E-01	0.07	34184
% unemployed (old) in income group in state	1.398078	1.00	1.61E-01	0.07	63402
% unemployed (old) in state	2.749565	1.98	1.65E-01	0.07	63402
Distance from average earnings in parent group in state	-0.000001	0.00	1.65E-01	0.07	34184
% top earnings in age group in state	-0.978675	0.74	1.87E-01	0.07	34184
% unemployed (old) in race group in state	1.434651	1.10	1.91E-01	0.07	63402
Distance from average earnings in occupation group in state	-0.000001	0.00	1.97E-01	0.07	34184
Median education in age group in state	0.032882	0.03	2.03E-01	0.07	63402
Distance from average earnings in education group in state	-0.000001	0.00	2.39E-01	0.07	34184
% unemployed (old) in education group in state	1.084050	0.95	2.52E-01	0.07	63402
Rank earnings in marital group in state	-0.198309	0.18	2.76E-01	0.07	34184
Average earnings in age group in state	-0.000002	0.00	3.22E-01	0.07	34184
% unemployed (new) in race group in state	1.089571	1.16	3.48E-01	0.07	63402
% top income in age group in state	-0.210459	0.26	4.11E-01	0.07	63402
% unemployed (old) in parent group in state	0.766250	1.11	4.89E-01	0.07	63402
Median education in unemployment group in state	0.040283	0.06	4.90E-01	0.07	63402
% unemployed (old) in marital group in state	0.811563	1.18	4.92E-01	0.07	63402
Average income in race group in state	-0.000001	0.00	5.04E-01	0.07	63402
Rank earnings in age group in state	-0.082928	0.13	5.35E-01	0.07	34184
% top earnings in race group in state	-0.946018	1.58	5.50E-01	0.07	34184
% top education in race group in state	0.135860	0.30	6.48E-01	0.07	63402
% unemployed (new) in gender group in state	0.657171	1.59	6.80E-01	0.07	63402
% unemployed (new) in income group in state	0.425751	1.06	6.87E-01	0.07	63402
% unemployed (new) in marital group in state	0.482677	1.26	7.01E-01	0.07	63402
% unemployed (new) in state	0.790786	2.55	7.57E-01	0.07	63402
% unemployed (old) in gender group in state	0.375319	1.34	7.80E-01	0.07	63402
Median education in gender group in state	0.009736	0.04	8.24E-01	0.07	63402

Rank earnings in occupation group in state	0.018573	0.14	8.91E-01	0.07	34184
% unemployed (new) in age group in state	0.074741	0.87	9.32E-01	0.07	63402
Average earnings in race group in state	0.000000	0.00	9.65E-01	0.07	34184
% unemployed (new) in parent group in state	-0.031835	1.19	9.79E-01	0.07	63402
% unemployed (old) in age group in state	-0.004610	0.80	9.95E-01	0.07	63402

Appendix Table 4.10: Results of regressions explaining variance in meaning from the relative variables in ATUS with VIF < 10 - with controls. Weighted and with clustered standard errors.

Relative variable	Life satisfaction (1)			
	b	se	p	n (activities)
% top income in gender in GOR	-2.5	0.58	3.67E-05	42984
% top income in race in GOR	**-1.8**	**0.58**	**2.22E-03**	**42984**
% top income in religion in GOR	**-1.4**	**0.38**	**3.06E-04**	**42984**
% top education in age in GOR	-1.9	0.28	1.53E-11	42984
% top education in parent in GOR	-1.6	0.33	1.92E-06	42984
% top education in religion in GOR	-1.7	0.29	1.15E-08	42984
% top education in unemployment in GOR	-2	0.3	1.89E-11	42984
% top earnings in age in GOR	-3.5	0.44	2.08E-14	42984
% top earnings in education in GOR	-1.2	0.27	1.03E-05	42984
% top earnings in gender in GOR	-4.4	0.48	8.60E-18	42984
% top earnings in marital in GOR	-3.7	0.38	2.72E-20	42984
% top earnings in occupation in GOR	-1.5	0.27	5.25E-08	42984
% top earnings in parent in GOR	-2.3	0.41	6.17E-08	42984
% top earnings in political in GOR	-2	0.39	1.51E-06	42984
% top earnings in race in GOR	-3.6	0.54	8.02E-10	42984
% top earnings in religion in GOR	-2.9	0.38	2.46E-14	42984
Average income in parent in GOR	**-4.00E-06**	**3.20E-06**	**2.22E-01**	**42984**
Average income in race in GOR	**-7.00E-06**	**3.80E-06**	**6.64E-02**	**42984**
Average income in religion in GOR	**-8.70E-06**	**3.20E-06**	**7.63E-03**	**42984**
Average earnings in education in GOR	-1.30E-05	2.50E-06	5.21E-07	42984
Average earnings in occupation in GOR	-1.80E-05	2.50E-06	1.45E-11	42984
Average earnings in parent in GOR	-2.20E-05	3.60E-06	4.12E-09	42984

Average earnings in political in GOR	-1.70E-05	3.30E-06	7.75E-07	42984
Average earnings in race in GOR	-3.00E-05	3.90E-06	2.25E-13	42984
Average earnings in religion in GOR	-1.80E-05	2.80E-06	8.25E-10	42984
Average wealth in age in GOR	**-4.90E-07**	**1.30E-07**	**1.35E-04**	**42984**
Average wealth in religion in GOR	**-4.70E-07**	**1.20E-07**	**1.38E-04**	**42984**
MacArthur ladder	9.70E-03	4.80E-04	2.07E-63	42984
Median education in age in GOR	-0.06	8.90E-03	1.45E-10	42984
Median education in gender in GOR	-0.07	9.30E-03	1.43E-11	42984
Median education in marital in GOR	-0.05	0.011	4.55E-06	42984
Median education in parent in GOR	-0.06	0.01	1.07E-12	42984
Median education in political in GOR	-0.07	0.01	5.95E-17	42984
Median education in race in GOR	-0.07	0.01	2.30E-19	42984
Median education in religion in GOR	-0.09	0.01	7.13E-16	42984
Median education in unemployment in GOR	-0.08	0.01	4.55E-21	42984
Well off nearby	0.1	0.01	3.36E-19	42984

Appendix Table 4.9_MI: Results of multiple imputation of Table 4.10. Effects that different in statistical significance to Table 4.10 shown in **bold**.

Relative variable	**Life satisfaction (2)**			
	b	se	p	n (activities)
% top education in age in GOR	-1.4	0.29	3.41E-06	42984
% top education in parent in GOR	**-1.3**	**0.32**	**1.18E-04**	42984
% top education in religion in GOR	-1.3	0.28	1.50E-06	42984

% top education in unemployment in GOR	-1.4	0.32	1.44E-05	42984
% top earnings in age in GOR	-1.9	0.43	1.07E-05	42984
% top earnings in gender in GOR	-2.2	0.45	1.54E-06	42984
% top earnings in marital in GOR	-1.5	0.37	5.14E-05	42984
% top earnings in occupation in GOR	**-1.1**	**0.27**	**9.15E-05**	42984
% top earnings in religion in GOR	**-1.5**	**0.41**	**4.57E-04**	42984
Average earnings in occupation in GOR	-1.20E-05	2.60E-06	3.44E-06	42984
MacArthur ladder	0.01	5.40E-04	4.26E-30	42984
Median education in age in GOR	-0.04	0.01	3.78E-05	42984
Median education in gender in GOR	-0.04	0.01	3.59E-05	42984
Median education in parent in GOR	-0.04	0.01	2.54E-05	42984
Median education in political in GOR	-0.05	0.01	1.14E-08	42984
Median education in race in GOR	-0.05	0.01	1.12E-08	42984
Median education in religion in GOR	-0.06	0.01	9.88E-08	42984
Median education in unemployment in GOR	-0.05	0.01	7.83E-09	42984

Appendix Table 4.10_MI: Results of multiple imputation of Table 4.11. Effects that different in statistical significance to Table 4.11 shown in **bold**.

Absolute model	AIC	BIC	N
Negative affect (with earnings)	81916.17	82675.73	34184
Cantril ladder (with earnings)	84820	85579.55	34184
Meaning (with earnings)	90246.07	91005.62	34184
Happy (with earnings)	90843.78	91603.33	34184
Negative affect (without earnings)	158469.2	159293.4	63402
Cantril ladder (without earnings)	165777	166601.2	63402
Meaning (without earnings)	170748.1	171572.3	63402
Happy (without earnings)	173540.2	174364.4	63402

Appendix Table 4.11: AIC and BIC tests of model fit for the absolute models in ATUS. Weighted and with controls, standard errors clustered at the individual level.

The AIC and BICs of the absolute models for each of the SWB measures are shown in Tables 4.11. This table only is ordered from the smallest to the largest AICs and BICs for the purposes of illustrating differences in their magnitude for this first AIC and BIC table. We can see that the models with earnings fit better than the models without earnings because they have lower AICs and BICs (e.g. the negative affect model with earnings has a BIC of 82,675, which is lower than the BIC of negative affect without earnings of 159,293, and lower BIC lower scores reflect better fit). The negative affect models fit best, followed by the Cantril ladder, meaning and happiness models.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Cantril ladder	Income	Average income in age group in state	-257.54	-230.38	63402
Cantril ladder	Income	Average income in parent group in state	-258.07	-230.91	63402
Cantril ladder	Income	Average income in race group in state	-232.03	-204.87	63402
Cantril ladder	Income	% top income in parent group in state	-253.76	-226.60	63402
Cantril ladder	Income	% top income in age group in state	-241.74	-214.57	63402
Happy	Income	Average income in age group in state	-34.23	-7.07	63402
Happy	Income	Average income in parent group in state	-31.91	-4.75	63402
Happy	Income	Average income in race group in state	-18.17	8.99	63402
Happy	Income	% top income in parent group in state	-28.48	-1.32	63402
Happy	Income	% top income in age group in state	-1.39	25.77	63402
Negative affect	Income	Average income in age group in state	-88.95	-61.79	63402
Negative affect	Income	Average income in parent group in state	-145.80	-118.64	63402
Negative affect	Income	Average income in race group in state	-145.07	-117.91	63402
Negative affect	Income	% top income in parent group in state	-146.44	-119.27	63402
Negative affect	Income	% top income in age group in state	-30.86	-3.69	63402
Meaning	Income	Average income in age group in state	-85.02	-57.86	63402
Meaning	Income	Average income in parent group in state	-91.19	-64.03	63402
Meaning	Income	Average income in race group in state	-102.48	-75.32	63402
Meaning	Income	% top income in parent group in state	-90.01	-62.85	63402
Meaning	Income	% top income in age group in state	-98.42	-71.25	63402

Appendix Table 4.12: The AICs and BICs for the income models in ATUS. Weighted, with controls and clustered standard errors.

The AIC and BIC differences for income are shown in Table 4.12. In all instances, these are the absolute models minus the relative models. The coefficients and p-values are not reported in order to avoid making too many unnecessary comparisons, however, coefficients and p-values of other models with most of these variables are already shown elsewhere in this Appendix C. The coefficients for relative variables that were collinear in Table 4.2 are never reported in models with controls, however, because a 'relative' effect should not be interpreted in the absence of controlling for an absolute effect, as discussed earlier (see pp. 217, 237).

To illustrate, from Table 4.12, it is evident that each relative income model fit worse than the absolute models. This is because the differences between the relative and absolute models were less than zero – with two exceptions. For happiness and average income in race group in state, the fit was moderately better according to the ΔBIC but not the ΔAIC (ΔAIC = -18.17, ΔBIC = 8.99). For happiness and proportions with top incomes in age group in state, the relative model fit strongly better according to the ΔBIC but not the ΔAIC (ΔAIC = -1.39, ΔBIC = 25.77). The absolute models were usually strongly better because the ΔAIC and ΔBIC were greater than ten, except for the other happiness models, where the absolute fits were slightly to moderately better on the BIC but not the AIC (e.g. % top income in parent group in state, ΔAIC = -28.48, ΔBIC = -1.32). Also, for negative affect, the ΔBIC was only 3.69 for % top income in age group in state.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Cantril ladder	Earnings	% top earnings in age group in state	-63.16	-63.17	34184
Cantril ladder	Earnings	% top earnings in parent group in state	-61.04	-61.04	34184
Cantril ladder	Earnings	% top earnings in race group in state	-63.08	-63.09	34184
Cantril ladder	Earnings	Average earnings in age group in state	-63.40	-63.40	34184
Cantril ladder	Earnings	Average earnings in parent group in state	-62.35	-62.36	34184
Cantril ladder	Earnings	Average earnings in race group in state	-63.58	-63.58	34184
Cantril ladder	Earnings	Distance from average earnings in age group in state	23.66	23.65	34184
Cantril ladder	Earnings	Distance from average earnings in education group in state	28.76	28.75	34184
Cantril ladder	Earnings	Distance from average earnings in gender group in state	19.24	19.23	34184
Cantril ladder	Earnings	Distance from average earnings in income group in state	31.95	31.94	34184
Cantril ladder	Earnings	Distance from average earnings in marital group in state	23.17	23.17	34184
Cantril ladder	Earnings	Distance from average earnings in occupation group in state	33.73	33.72	34184
Cantril ladder	Earnings	Distance from average earnings in parent group in state	25.10	25.09	34184
Cantril ladder	Earnings	Distance from average earnings in race group in state	22.90	22.89	34184
Cantril ladder	Earnings	Distance from average earnings in state	23.51	23.50	34184
Cantril ladder	Earnings	Rank earnings in age group in state	37.68	37.68	34184
Cantril ladder	Earnings	Rank earnings in education group in state	33.07	33.07	34184
Cantril ladder	Earnings	Rank earnings in gender group in state	33.38	33.37	34184
Cantril ladder	Earnings	Rank earnings in income group in state	-20.41	-20.42	34184
Cantril ladder	Earnings	Rank earnings in marital group in state	9.00	9.00	34184
Cantril ladder	Earnings	Rank earnings in occupation group in state	14.34	14.33	34184
Cantril ladder	Earnings	Rank earnings in parent group in state	29.86	29.86	34184
Cantril ladder	Earnings	Rank earnings in race group in state	31.07	31.06	34184
Cantril ladder	Earnings	Rank earnings in state	26.98	26.98	34184

Happy	Earnings	% top earnings in age group in state	-1.96	-1.97	34184
Happy	Earnings	% top earnings in parent group in state	1.97	1.97	34184
Happy	Earnings	% top earnings in race group in state	7.14	7.14	34184
Happy	Earnings	Average earnings in age group in state	-5.66	-5.67	34184
Happy	Earnings	Average earnings in parent group in state	4.72	4.71	34184
Happy	Earnings	Average earnings in race group in state	-4.39	-4.39	34184
Happy	Earnings	Distance from average earnings in age group in state	8.53	8.52	34184
Happy	Earnings	Distance from average earnings in education group in state	2.33	2.32	34184
Happy	Earnings	Distance from average earnings in gender group in state	8.78	8.77	34184
Happy	Earnings	Distance from average earnings in income group in state	6.05	6.04	34184
Happy	Earnings	Distance from average earnings in marital group in state	11.57	11.56	34184
Happy	Earnings	Distance from average earnings in occupation group in state	4.02	4.01	34184
Happy	Earnings	Distance from average earnings in parent group in state	5.62	5.61	34184
Happy	Earnings	Distance from average earnings in race group in state	8.93	8.92	34184
Happy	Earnings	Distance from average earnings in state	9.17	9.16	34184
Happy	Earnings	Rank earnings in age group in state	4.38	4.37	34184
Happy	Earnings	Rank earnings in education group in state	9.94	9.94	34184
Happy	Earnings	Rank earnings in gender group in state	2.01	2.01	34184
Happy	Earnings	Rank earnings in income group in state	36.03	36.02	34184
Happy	Earnings	Rank earnings in marital group in state	3.73	3.73	34184
Happy	Earnings	Rank earnings in occupation group in state	8.37	8.36	34184
Happy	Earnings	Rank earnings in parent group in state	9.02	9.01	34184
Happy	Earnings	Rank earnings in race group in state	-132.74	10.19	34184
Happy	Earnings	Rank earnings in state	-129.38	6.83	34184
Negative affect	Earnings	% top earnings in age group in state	-16.00	26.20	34184
Negative affect	Earnings	% top earnings in parent group in state	-12.63	29.57	34184
Negative affect	Earnings	% top earnings in race group in state	2.69	44.89	34184

Negative affect	Earnings	Average earnings in age group in state	-16.67	25.53	34184
Negative affect	Earnings	Average earnings in parent group in state	-11.01	31.19	34184
Negative affect	Earnings	Average earnings in race group in state	-1.61	40.60	34184
Negative affect	Earnings	Distance from average earnings in age group in state	-18.38	23.82	34184
Negative affect	Earnings	Distance from average earnings in education group in state	-16.14	26.06	34184
Negative affect	Earnings	Distance from average earnings in gender group in state	-18.43	23.77	34184
Negative affect	Earnings	Distance from average earnings in income group in state	-18.47	23.73	34184
Negative affect	Earnings	Distance from average earnings in marital group in state	-18.17	24.03	34184
Negative affect	Earnings	Distance from average earnings in occupation group in state	-18.08	24.12	34184
Negative affect	Earnings	Distance from average earnings in parent group in state	-18.40	23.80	34184
Negative affect	Earnings	Distance from average earnings in race group in state	-18.43	23.77	34184
Negative affect	Earnings	Distance from average earnings in state	-18.24	23.96	34184
Negative affect	Earnings	Rank earnings in age group in state	-15.83	26.38	34184
Negative affect	Earnings	Rank earnings in education group in state	-16.17	26.03	34184
Negative affect	Earnings	Rank earnings in gender group in state	-18.36	23.84	34184
Negative affect	Earnings	Rank earnings in income group in state	-12.68	29.52	34184
Negative affect	Earnings	Rank earnings in marital group in state	-16.27	25.93	34184
Negative affect	Earnings	Rank earnings in occupation group in state	-17.21	25.00	34184
Negative affect	Earnings	Rank earnings in parent group in state	-18.00	24.20	34184
Negative affect	Earnings	Rank earnings in race group in state	-18.35	23.85	34184
Negative affect	Earnings	Rank earnings in state	-18.14	24.06	34184
Meaning	Earnings	% top earnings in age group in state	4.50	4.49	34184
Meaning	Earnings	% top earnings in parent group in state	15.66	15.65	34184
Meaning	Earnings	% top earnings in race group in state	-3.71	-3.72	34184
Meaning	Earnings	Average earnings in age group in state	-1.15	-1.15	34184
Meaning	Earnings	Average earnings in parent group in state	19.16	19.15	34184

Meaning	Earnings	Average earnings in race group in state	-5.60	-5.61	34184
Meaning	Earnings	Distance from average earnings in age group in state	-5.60	-5.60	34184
Meaning	Earnings	Distance from average earnings in education group in state	-5.51	-5.52	34184
Meaning	Earnings	Distance from average earnings in gender group in state	-5.54	-5.54	34184
Meaning	Earnings	Distance from average earnings in income group in state	-5.40	-5.41	34184
Meaning	Earnings	Distance from average earnings in marital group in state	-5.53	-5.53	34184
Meaning	Earnings	Distance from average earnings in occupation group in state	-5.57	-5.58	34184
Meaning	Earnings	Distance from average earnings in parent group in state	-5.60	-5.61	34184
Meaning	Earnings	Distance from average earnings in race group in state	-5.36	-5.36	34184
Meaning	Earnings	Distance from average earnings in state	-5.43	-5.44	34184
Meaning	Earnings	Rank earnings in age group in state	-1.36	-1.37	34184
Meaning	Earnings	Rank earnings in education group in state	-5.60	-5.61	34184
Meaning	Earnings	Rank earnings in gender group in state	-5.21	-5.22	34184
Meaning	Earnings	Rank earnings in income group in state	-3.56	-3.56	34184
Meaning	Earnings	Rank earnings in marital group in state	-4.65	-4.66	34184
Meaning	Earnings	Rank earnings in occupation group in state	-0.44	-0.45	34184
Meaning	Earnings	Rank earnings in parent group in state	-5.22	-5.23	34184
Meaning	Earnings	Rank earnings in race group in state	-5.53	-5.53	34184
Meaning	Earnings	Rank earnings in state	-5.37	-5.38	34184

Appendix Table 4.13: The AICs and BICs for the earnings models in ATUS. Weighted, with controls and clustered standard errors.

The AIC and BIC differences for earnings are in Table 4.13. Note that because proportion with top earnings and average earnings was drawn from the March CPS (see section 2.2), there were full observations (63,402) for these models but not for the other earnings models because earnings was missing for some respondents. The sample for top and average earnings was restricted to the earnings sample size of 39,184 to ensure a fair comparison between models without and with relative and absolute socio-economic status on the same sample.

Absolute model	**AIC**	**BIC**	**N**
Cantril (without earnings, restricted to employed)	95852.13	96613.97	38561
Happy (without earnings, restricted to employed)	102384.9	103146.8	38561
Negative affect (without earnings, restricted to employed)	92397.1	93158.94	38561
Meaning (without earnings, restricted to employed)	101778.7	102540.5	38561

Appendix Table 4.14: AIC and BIC tests of model fit for the absolute models in ATUS that are restricted to the employed. Weighted and with controls, standard errors clustered at the individual level.

The AIC and BIC differences for education are considered next. Because the scope occupation is included in these models, earnings is not excluded, and occupation was not defined for those not in work, the absolute and relative models need to be restricted to those not missing occupation information for occupation scopes (see section 2.4). The new AIC and BIC information for the absolute occupation models only are in Table 4.14. The AIC and BIC differences for education are shown in Table 4.15. For unemployment, the ΔAICs and ΔBICs are shown in Table 4.16.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Cantril ladder	Education	% top education in age group in state	-192.70	-156.48	63402
Cantril ladder	Education	% top education in parent group in state	-290.77	-254.55	63402
Cantril ladder	Education	% top education in race group in state	-267.15	-230.93	63402
Cantril ladder	Education	Distance from median education in age group in state	-225.54	-189.32	63402
Cantril ladder	Education	Distance from median education in gender group in state	-192.29	-156.07	63402
Cantril ladder	Education	Distance from median education in income group in state	-183.37	-147.15	63402
Cantril ladder	Education	Distance from median education in marital group in state	-171.40	-135.18	63402
Cantril ladder	Education	Distance from median education in occupation group in state	-97.63	-63.39	38561
Cantril ladder	Education	Distance from median education in parent group in state	-187.44	-151.22	63402
Cantril ladder	Education	Distance from median education in race group in state	-187.91	-151.70	63402
Cantril ladder	Education	Distance from median education in state	-176.49	-140.27	63402
Cantril ladder	Education	Distance from median education in unemployment group in state	-175.28	-139.06	63402
Cantril ladder	Education	Median education in age group in state	-229.69	-193.47	63402
Cantril ladder	Education	Median education in gender group in state	-285.31	-249.09	63402
Cantril ladder	Education	Median education in marital group in state	-307.64	-271.42	63402
Cantril ladder	Education	Median education in parent group in state	-297.15	-260.93	63402
Cantril ladder	Education	Median education in race group in state	-299.96	-263.74	63402
Cantril ladder	Education	Median education in unemployment group in state	-308.65	-272.43	63402
Cantril ladder	Education	Rank education in age group in state	-165.12	-128.90	63402
Cantril ladder	Education	Rank education in gender group in state	-129.26	-93.04	63402
Cantril ladder	Education	Rank education in income group in state	-143.70	-107.48	63402
Cantril ladder	Education	Rank education in marital group in state	-119.18	-82.96	63402

Cantril ladder	Education	Rank education in occupation group in state	-104.65	-70.41	38561
Cantril ladder	Education	Rank education in parent group in state	-123.77	-87.55	63402
Cantril ladder	Education	Rank education in race group in state	-144.10	-107.88	63402
Cantril ladder	Education	Rank education in state	-126.58	-90.36	63402
Cantril ladder	Education	Rank education in unemployment group in state	-124.30	-88.08	63402
Happy	Education	% top education in age group in state	-122.25	-86.03	63402
Happy	Education	% top education in parent group in state	-90.40	-54.18	63402
Happy	Education	% top education in race group in state	-104.19	-67.97	63402
Happy	Education	Distance from median education in age group in state	-41.03	-4.81	63402
Happy	Education	Distance from median education in gender group in state	-43.09	-6.87	63402
Happy	Education	Distance from median education in income group in state	-64.43	-28.21	63402
Happy	Education	Distance from median education in marital group in state	-25.53	10.69	63402
Happy	Education	Distance from median education in occupation group in state	-64.73	-30.43	38561
Happy	Education	Distance from median education in parent group in state	-52.67	-16.46	63402
Happy	Education	Distance from median education in race group in state	-50.35	-14.13	63402
Happy	Education	Distance from median education in state	-39.10	-2.88	63402
Happy	Education	Distance from median education in unemployment group in state	-45.55	-9.33	63402
Happy	Education	Median education in age group in state	-126.57	-90.35	63402
Happy	Education	Median education in gender group in state	-126.55	-90.33	63402
Happy	Education	Median education in marital group in state	-109.48	-73.26	63402
Happy	Education	Median education in parent group in state	-115.95	-79.73	63402
Happy	Education	Median education in race group in state	-122.29	-86.07	63402
Happy	Education	Median education in unemployment group in state	-125.23	-89.01	63402
Happy	Education	Rank education in age group in state	-39.19	-2.97	63402

Happy	Education	Rank education in gender group in state	-50.14	-13.92	63402
Happy	Education	Rank education in income group in state	-54.10	-17.88	63402
Happy	Education	Rank education in marital group in state	-56.99	-20.77	63402
Happy	Education	Rank education in occupation group in state	-53.19	-18.89	38561
Happy	Education	Rank education in parent group in state	-56.86	-20.64	63402
Happy	Education	Rank education in race group in state	-60.53	-24.32	63402
Happy	Education	Rank education in state	-52.91	-16.69	63402
Happy	Education	Rank education in unemployment group in state	-53.98	-17.76	63402
Negative affect	Education	% top education in age group in state	-99.24	-63.02	63402
Negative affect	Education	% top education in parent group in state	-113.34	-77.12	63402
Negative affect	Education	% top education in race group in state	-105.26	-69.04	63402
Negative affect	Education	Distance from median education in age group in state	-108.50	-72.28	63402
Negative affect	Education	Distance from median education in gender group in state	-110.53	-74.31	63402
Negative affect	Education	Distance from median education in income group in state	-110.27	-74.06	63402
Negative affect	Education	Distance from median education in marital group in state	-109.70	-73.48	63402
Negative affect	Education	Distance from median education in occupation group in state	-13.28	20.96	38561
Negative affect	Education	Distance from median education in parent group in state	-110.73	-74.51	63402
Negative affect	Education	Distance from median education in race group in state	-112.87	-76.65	63402
Negative affect	Education	Distance from median education in state	-111.47	-75.25	63402
Negative affect	Education	Distance from median education in unemployment group in state	-112.05	-75.84	63402
Negative affect	Education	Median education in age group in state	-110.66	-74.44	63402
Negative affect	Education	Median education in gender group in state	-113.90	-77.69	63402
Negative affect	Education	Median education in marital group in state	-112.34	-76.12	63402
Negative affect	Education	Median education in parent group in state	-114.21	-77.99	63402

Negative affect	Education	Median education in race group in state	-103.99	-67.77	63402
Negative affect	Education	Median education in unemployment group in state	-108.93	-72.71	63402
Negative affect	Education	Rank education in age group in state	-111.25	-75.03	63402
Negative affect	Education	Rank education in gender group in state	-113.83	-77.61	63402
Negative affect	Education	Rank education in income group in state	-112.02	-75.80	63402
Negative affect	Education	Rank education in marital group in state	-114.03	-77.81	63402
Negative affect	Education	Rank education in occupation group in state	-8.84	25.40	38561
Negative affect	Education	Rank education in parent group in state	-114.12	-77.90	63402
Negative affect	Education	Rank education in race group in state	-114.24	-78.02	63402
Negative affect	Education	Rank education in state	-114.19	-77.97	63402
Negative affect	Education	Rank education in unemployment group in state	-114.25	-78.04	63402
Meaning	Education	% top education in age group in state	-35.76	0.46	63402
Meaning	Education	% top education in parent group in state	-34.74	1.48	63402
Meaning	Education	% top education in race group in state	-74.85	-38.63	63402
Meaning	Education	Distance from median education in age group in state	-56.07	-19.86	63402
Meaning	Education	Distance from median education in gender group in state	-62.85	-26.63	63402
Meaning	Education	Distance from median education in income group in state	-67.86	-31.64	63402
Meaning	Education	Distance from median education in marital group in state	-57.28	-21.06	63402
Meaning	Education	Distance from median education in occupation group in state	-93.76	-59.56	38561
Meaning	Education	Distance from median education in parent group in state	-68.39	-32.17	63402
Meaning	Education	Distance from median education in race group in state	-58.18	-21.96	63402
Meaning	Education	Distance from median education in state	-61.35	-25.14	63402
Meaning	Education	Distance from median education in unemployment group in state	-61.55	-25.33	63402
Meaning	Education	Median education in age group in state	-66.96	-30.74	63402

Meaning	Education	Median education in gender group in state	-75.98	-39.76	63402
Meaning	Education	Median education in marital group in state	-63.86	-27.65	63402
Meaning	Education	Median education in parent group in state	-56.40	-20.18	63402
Meaning	Education	Median education in race group in state	-62.89	-26.67	63402
Meaning	Education	Median education in unemployment group in state	-72.59	-36.37	63402
Meaning	Education	Rank education in age group in state	-63.23	-27.01	63402
Meaning	Education	Rank education in gender group in state	-68.93	-32.71	63402
Meaning	Education	Rank education in income group in state	-67.03	-30.81	63402
Meaning	Education	Rank education in marital group in state	-70.20	-33.98	63402
Meaning	Education	Rank education in occupation group in state	-84.65	-50.45	38561
Meaning	Education	Rank education in parent group in state	-70.85	-34.63	63402
Meaning	Education	Rank education in race group in state	-67.88	-31.66	63402
Meaning	Education	Rank education in state	-68.29	-32.07	63402
Meaning	Education	Rank education in unemployment group in state	-67.33	-31.11	63402

Appendix Table 4.15: The AIC and BIC differences for the education models in ATUS. Weighted, with controls and clustered standard errors.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Cantril ladder	Unemployment	% unemployed (new) in age group in state	-285.72	-258.56	63402
Cantril ladder	Unemployment	% unemployed (new) in education group in state	-348.19	-321.03	63402
Cantril ladder	Unemployment	% unemployed (new) in gender group in state	-347.41	-320.25	63402
Cantril ladder	Unemployment	% unemployed (new) in income group in state	-348.20	-321.04	63402
Cantril ladder	Unemployment	% unemployed (new) in marital group in state	-346.63	-319.47	63402
Cantril ladder	Unemployment	% unemployed (new) in parent group in state	-345.76	-318.59	63402
Cantril ladder	Unemployment	% unemployed (new) in race group in state	-337.51	-310.35	63402
Cantril ladder	Unemployment	% unemployed (new) in state	-347.54	-320.37	63402
Cantril ladder	Unemployment	% unemployed (old) in age group in state	-268.57	-241.41	63402
Cantril ladder	Unemployment	% unemployed (old) in education group in state	-342.86	-315.69	63402
Cantril ladder	Unemployment	% unemployed (old) in income group in state	-345.20	-318.04	63402
Cantril ladder	Unemployment	% unemployed (old) in marital group in state	-348.11	-320.94	63402
Cantril ladder	Unemployment	% unemployed (old) in parent group in state	-348.01	-320.85	63402
Cantril ladder	Unemployment	% unemployed (old) in race group in state	-343.82	-316.66	63402
Cantril ladder	Unemployment	% unemployed (old) in state	-348.08	-320.92	63402
Cantril ladder	Unemployment	% unemployed (old) in gender group in state	-347.01	-319.85	63402
Happy	Unemployment	% unemployed (new) in age group in state	-22.64	4.53	63402
Happy	Unemployment	% unemployed (new) in education group in state	-10.62	16.54	63402
Happy	Unemployment	% unemployed (new) in gender group in state	-27.69	-0.53	63402
Happy	Unemployment	% unemployed (new) in income group in state	-13.28	13.88	63402
Happy	Unemployment	% unemployed (new) in marital group in state	-24.12	3.04	63402
Happy	Unemployment	% unemployed (new) in parent group in state	-28.45	-1.29	63402
Happy	Unemployment	% unemployed (new) in race group in state	-11.42	15.75	63402

Happy	Unemployment	% unemployed (new) in state	-27.89	-0.73	63402
Happy	Unemployment	% unemployed (old) in age group in state	-28.12	-0.96	63402
Happy	Unemployment	% unemployed (old) in education group in state	-13.42	13.74	63402
Happy	Unemployment	% unemployed (old) in income group in state	-27.69	-0.53	63402
Happy	Unemployment	% unemployed (old) in marital group in state	-28.14	-0.98	63402
Happy	Unemployment	% unemployed (old) in parent group in state	-22.81	4.35	63402
Happy	Unemployment	% unemployed (old) in race group in state	-24.51	2.65	63402
Happy	Unemployment	% unemployed (old) in state	-22.86	4.30	63402
Happy	Unemployment	% unemployed (old) in gender group in state	-26.61	0.55	63402
Negative affect	Unemployment	% unemployed (new) in age group in state	-13.52	13.64	63402
Negative affect	Unemployment	% unemployed (new) in education group in state	5.58	32.74	63402
Negative affect	Unemployment	% unemployed (new) in gender group in state	-4.24	22.92	63402
Negative affect	Unemployment	% unemployed (new) in income group in state	-13.48	13.68	63402
Negative affect	Unemployment	% unemployed (new) in marital group in state	-13.35	13.82	63402
Negative affect	Unemployment	% unemployed (new) in parent group in state	6.58	33.74	63402
Negative affect	Unemployment	% unemployed (new) in race group in state	-13.14	14.02	63402
Negative affect	Unemployment	% unemployed (new) in state	-5.15	22.02	63402
Negative affect	Unemployment	% unemployed (old) in age group in state	-12.87	14.29	63402
Negative affect	Unemployment	% unemployed (old) in education group in state	26.20	53.36	63402
Negative affect	Unemployment	% unemployed (old) in income group in state	-13.23	13.93	63402
Negative affect	Unemployment	% unemployed (old) in marital group in state	-13.48	13.68	63402
Negative affect	Unemployment	% unemployed (old) in parent group in state	-6.96	20.20	63402
Negative affect	Unemployment	% unemployed (old) in race group in state	-13.57	13.59	63402
Negative affect	Unemployment	% unemployed (old) in state	-13.26	13.90	63402
Negative affect	Unemployment	% unemployed (old) in gender group in state	-12.98	14.19	63402

Meaning	Unemployment	% unemployed (new) in age group in state	-48.65	-21.49	63402
Meaning	Unemployment	% unemployed (new) in education group in state	-33.78	-6.62	63402
Meaning	Unemployment	% unemployed (new) in gender group in state	-48.05	-20.89	63402
Meaning	Unemployment	% unemployed (new) in income group in state	-47.66	-20.50	63402
Meaning	Unemployment	% unemployed (new) in marital group in state	-47.49	-20.33	63402
Meaning	Unemployment	% unemployed (new) in parent group in state	-48.91	-21.75	63402
Meaning	Unemployment	% unemployed (new) in race group in state	-43.32	-16.16	63402
Meaning	Unemployment	% unemployed (new) in state	-48.50	-21.33	63402
Meaning	Unemployment	% unemployed (old) in age group in state	-48.87	-21.71	63402
Meaning	Unemployment	% unemployed (old) in education group in state	-40.26	-13.10	63402
Meaning	Unemployment	% unemployed (old) in income group in state	-35.10	-7.94	63402
Meaning	Unemployment	% unemployed (old) in marital group in state	-45.11	-17.95	63402
Meaning	Unemployment	% unemployed (old) in parent group in state	-46.70	-19.54	63402
Meaning	Unemployment	% unemployed (old) in race group in state	-38.63	-11.47	63402
Meaning	Unemployment	% unemployed (old) in state	-39.88	-12.72	63402
Meaning	Unemployment	% unemployed (old) in gender group in state	-48.61	-21.45	63402

Appendix Table 4.16: The AIC and BIC differences for the unemployment models in ATUS**.** Weighted, with controls and clustered standard errors.

Descriptive statistics for the relative variables in ELSA (waves 2-6)					
Average income in…	mean	sd	min	max	N
Local authority	19449.55	5830.33	7546.64	111542.59	32250
Age in GOR	19388.61	3727.68	8928.28	30278.94	32250
Gender in GOR	19246.56	2314.13	14212.68	26025.95	32250
Marital in GOR	19419.21	3558.23	10437.59	26493.16	32250
Race in GOR	19345.25	2045.93	3827.65	25007.89	32250
Parent in GOR	19656.3	2021.35	14302.32	26686.82	32250
Occupation in GOR	19915.86	4970.36	11563.51	30308.4	32250
Wealth in GOR	20202.29	8528.96	10049.97	190782.27	32250
Education in GOR	20042.71	5807.94	12397.45	34212.41	32250
Religion in GOR	19853.09	2031.46	15303.86	27378.4	32250
Political in GOR	19833.38	2807.89	15094.44	30521.87	32250
% income £46K+ in…	mean	sd	min	max	N
Local authority	0.04	0.05	0	0.5	32250
Age in GOR	0.04	0.01	0	0.06	32250
Gender in GOR	0.04	0.01	0.01	0.07	32250
Marital in GOR	0.04	0.02	0	0.09	32250
Race in GOR	0.04	0.01	0	0.12	32250
Parent in GOR	0.04	0.01	0	0.09	32250
Occupation in GOR	0.04	0.03	0	0.11	32250
Wealth in GOR	0.04	0.05	0	0.5	32250
Education in GOR	0.04	0.04	0	0.15	32250
Religion in GOR	0.04	0.01	0	0.09	32250
Political in GOR	0.04	0.02	0.01	0.11	32250
Average earnings in…	mean	sd	min	max	N
Local authority	9236.43	5063.23	0	49457	32250
Age in GOR	8510.11	7825.83	0	31618.94	32250
Gender in GOR	9244.41	2158.12	4900.85	14801.2	32250
Marital in GOR	9450.03	4299.03	247.47	15554.4	32250
Race in GOR	9264.21	1565.8	0	30458.72	32250
Parent in GOR	9466.57	1618.79	3795.98	12657.04	32250
Occupation in GOR	9437.54	4245.15	887.52	19598.57	32250
Wealth in GOR	9732.97	4340.53	0	125492.94	32250
Education in GOR	9979.33	5256.74	1789.58	24916.04	32250
Religion in GOR	9617.8	2138.07	2379.61	17533.7	32250
Political in GOR	9658.72	3594.75	5313.94	24880.01	32250
% earnings £46K+ in…	mean	sd	min	max	N
Local authority	0.04	0.05	0	0.5	32250
Age in GOR	0.04	0.01	0	0.07	32250

Gender in GOR	0.04	0.01	0.01	0.09	32250
Marital in GOR	0.04	0.02	0	0.09	32250
Race in GOR	0.04	0.01	0	0.14	32250
Parent in GOR	0.04	0.01	0	0.08	32250
Occupation in GOR	0.04	0.04	0	0.13	32250
Wealth in GOR	0.04	0.04	0	0.5	32250
Education in GOR	0.04	0.04	0	0.19	32250
Religion in GOR	0.04	0.02	0	0.07	32250
Political in GOR	0.04	0.02	0.01	0.16	32250
Average wealth in…	mean	sd	min	max	N
Local authority	351750.99	220412.32	3668.1	3389215.25	32250
Age in GOR	352985.77	113881.55	51384.38	656222.19	32250
Gender in GOR	343489.08	96387.23	164282.48	538212.81	32250
Marital in GOR	348460.32	135766.69	57819.87	599741.81	32250
Race in GOR	345761.51	97802.45	59004.68	882216.94	32250
Parent in GOR	355673.36	96864.21	174178.52	548757.38	32250
Occupation in GOR	361365.67	168991.67	85383.01	745448.69	32250
Income in GOR	344859.27	132536.49	50844.13	1616645.25	32250
Education in GOR	365474.89	178150.56	97769.73	905430.38	32250
Unemployment in GOR	344823.84	94656.44	33585.97	509179.75	32250
Religion in GOR	364051.84	103935.33	178390.94	754916.88	32250
Political in GOR	363041.49	100331.79	168889.97	723022.81	32250
% wealth 450K+ in...	mean	sd	min	max	N
Local authority	0.15	0.08	0	1	32250
Age in GOR	0.16	0.05	0	0.23	32250
Gender in GOR	0.16	0.05	0.05	0.24	32250
Marital in GOR	0.16	0.06	0	0.25	32250
Race in GOR	0.16	0.05	0	0.32	32250
Parent in GOR	0.17	0.05	0.05	0.24	32250
Occupation in GOR	0.16	0.08	0	0.25	32250
Income in GOR	0.16	0.06	0	0.33	32250
Education in GOR	0.15	0.07	0	0.26	32250
Unemployment in GOR	0.16	0.05	0	0.33	32250
Religion in GOR	0.17	0.05	0.05	0.25	32250
Political in GOR	0.17	0.05	0.05	0.25	32250
Median education in…	mean	sd	min	max	N
Local authority	1.63	1.12	0	5	32250
Age in GOR	1.69	0.65	0	2	32250
Gender in GOR	1.54	0.95	0	3	32250
Marital in GOR	1.59	0.8	0	3	32250
Race in GOR	1.7	0.68	0	5	32250

Parent in GOR	1.8	0.6	0	3	32250
Occupation in GOR	1.97	1.68	0	4	32250
Income in GOR	1.39	1.24	0	5	32250
Wealth in GOR	1.84	1.38	0	5	32250
Unemployment in GOR	1.7	0.66	0	5	32250
Religion in GOR	1.89	0.58	0	3	32250
Political in GOR	1.99	0.83	0	4	32250
%NVQ4/NVQ5/Degree+	mean	sd	min	max	N
Local authority	0.13	0.07	0	1	32250
Age in GOR	0.13	0.03	0	0.2	32250
Gender in GOR	0.13	0.04	0.03	0.22	32250
Marital in GOR	0.13	0.04	0.01	0.23	32250
Race in GOR	0.13	0.03	0.05	0.46	32250
Parent in GOR	0.13	0.03	0.05	0.24	32250
Occupation in GOR	0.12	0.09	0	0.25	32250
Income in GOR	0.12	0.05	0	0.3	32250
Wealth in GOR	0.13	0.07	0	0.5	32250
Unemployment in GOR	0.13	0.03	0	0.5	32250
Religion in GOR	0.14	0.03	0.05	0.23	32250
Political in GOR	0.14	0.04	0.05	0.25	32250
% unemployed in…	mean	sd	min	max	N
Local authority	0.01	0.02	0	0.31	32250
Age in GOR	0.01	0.01	0	0.03	32250
Gender in GOR	0.01	0.01	0	0.04	32250
Marital in GOR	0.01	0.01	0	0.12	32250
Race in GOR	0.01	0.01	0	0.16	32250
Parent in GOR	0.01	0.01	0	0.06	32250
Occupation in GOR	0.01	0.01	0	0.05	32250
Income in GOR	0.01	0.01	0	0.15	32250
Wealth in GOR	0.01	0.01	0	0.2	32250
Education in GOR	0.01	0.01	0	0.19	32250
Religion in GOR	0.01	0.01	0	0.03	32250
Political in GOR	0.01	0.01	0	0.04	32250
Rank income in…	mean	sd	min	max	N
Local authority	0.52	0.29	0	1	32250
Age in GOR	0.61	0.32	0	1	32250
Gender in GOR	0.52	0.28	0	0.99	32250
Marital in GOR	0.52	0.28	0	1	32250
Race in GOR	0.52	0.28	0	1	32250
Parent in GOR	0.51	0.28	0	1	32250
Occupation in GOR	0.51	0.28	0	1	32250

Wealth in GOR	0.51	0.29	0	1	32250
Education in GOR	0.5	0.28	0	1	32250
Religion in GOR	0.51	0.28	0	1	32250
Political in GOR	0.51	0.28	0	1	32250
Distance from average income in…	mean	sd	min	max	N
Local authority	937.17	17325.1	-107586.91	534702.44	32250
Age in GOR	998.11	17584.86	-27711.12	550704.13	32250
Gender in GOR	1140.16	17889.12	-25249.08	554006.5	32250
Marital in GOR	967.51	17689.88	-26493.16	549367.31	32250
Race in GOR	1041.47	17919.35	-23866.69	552506.38	32250
Parent in GOR	730.42	17909.9	-26439.75	551945.5	32250
Occupation in GOR	470.86	17338.81	-29506.55	544036.63	32250
Wealth in GOR	184.43	15718.99	-147553.94	536741.25	32250
Education in GOR	344.01	17144.94	-33284.6	555626.63	32250
Religion in GOR	533.63	17910.41	-25220.35	553002.38	32250
Political in GOR	553.34	17793.3	-28586.07	553300.31	32250
Rank earnings in…	mean	sd	min	max	N
Local authority	0.48	0.25	0	1	32250
Age in GOR	0.59	0.28	0.05	1	32250
Gender in GOR	0.48	0.24	0.23	1	32250
Marital in GOR	0.48	0.24	0.21	1	32250
Race in GOR	0.48	0.24	0	1	32250
Parent in GOR	0.48	0.25	0.23	1	32250
Occupation in GOR	0.48	0.24	0.21	1	32250
Wealth in GOR	0.49	0.25	0	1	32250
Education in GOR	0.47	0.24	0.15	1	32250
Religion in GOR	0.48	0.24	0.26	1	32250
Political in GOR	0.48	0.24	0.12	1	32250
Distance from average earnings in….	mean	sd	min	max	N
Local authority	-498.96	16838.4	-49457	461857.47	32250
Age in GOR	227.36	14902.11	-31618.94	472487.13	32250
Gender in GOR	-506.94	17311.69	-14801.2	477453.84	32250
Marital in GOR	-712.56	16969.77	-15554.4	471068.72	32250
Race in GOR	-526.73	17340.82	-18993.23	475464.09	32250
Parent in GOR	-729.09	17309.07	-12657.04	475481	32250
Occupation in GOR	-700.06	16968.48	-19598.57	468973.31	32250
Wealth in GOR	-995.5	17053.86	-81974.54	451608.69	32250
Education in GOR	-1241.85	16851.43	-24916.04	471405.56	32250
Religion in GOR	-880.33	17270.01	-17533.7	469089.44	32250
Political in GOR	-921.25	17065.97	-24880.01	477807.47	32250
Rank wealth in…	mean	sd	min	max	N

Local authority	0.53	0.29	0	1	32250
Age in GOR	0.62	0.31	0	1	32250
Gender in GOR	0.54	0.28	0.01	1	32250
Marital in GOR	0.54	0.28	0	1	32250
Race in GOR	0.54	0.28	0	1	32250
Parent in GOR	0.52	0.28	0	1	32250
Occupation in GOR	0.52	0.28	0	1	32250
Income in GOR	0.55	0.28	0	1	32250
Education in GOR	0.52	0.28	0	1	32250
Unemployment in GOR	0.54	0.28	0	1	32250
Religion in GOR	0.52	0.28	0	1	32250
Political in GOR	0.52	0.28	0	1	32250
Distance from average wealth in...	mean	sd	min	max	N
Local authority	36018.3	584857.34	-3031624.75	23508966	32250
Age in GOR	34783.51	610182.22	-656222.19	25030858	32250
Gender in GOR	44280.2	613431.57	-538212.81	25136966	32250
Marital in GOR	39308.96	606374.61	-599741.81	25033288	32250
Race in GOR	42007.77	613744.59	-882216.94	25123956	32250
Parent in GOR	32095.93	613749.25	-548757.38	25082144	32250
Occupation in GOR	26403.62	597790.94	-745448.69	24826732	32250
Income in GOR	42910.01	608048.4	-1367037.75	25127872	32250
Education in GOR	22294.4	597777.65	-905430.38	25067304	32250
Unemployment in GOR	42945.45	613878.07	-509179.75	25124300	32250
Religion in GOR	23717.45	612734.68	-754916.88	25088848	32250
Political in GOR	24727.8	613135.35	-723022.81	25082198	32250
Rank education in…	mean	sd	min	max	N
Local authority	0.54	0.28	0	1	32250
Age in GOR	0.63	0.31	0.06	1	32250
Gender in GOR	0.54	0.27	0.11	0.99	32250
Marital in GOR	0.54	0.27	0.08	1	32250
Race in GOR	0.54	0.28	0	1	32250
Parent in GOR	0.53	0.28	0.12	0.97	32250
Occupation in GOR	0.52	0.27	0.04	1	32250
Income in GOR	0.54	0.28	0	1	32250
Wealth in GOR	0.52	0.27	0	1	32250
Unemployment in GOR	0.54	0.28	0	1	32250
Religion in GOR	0.52	0.28	0.1	0.97	32250
Political in GOR	0.52	0.28	0.02	0.97	32250
Distance from median education in…	mean	sd	min	max	N
Local authority	0.59	1.99	-5	5	32250
Age in GOR	0.53	1.97	-2	5	32250

Gender in GOR	0.68	1.99	-3	5	32250
Marital in GOR	0.63	1.95	-3	5	32250
Race in GOR	0.52	1.99	-5	5	32250
Parent in GOR	0.42	1.97	-3	5	32250
Occupation in GOR	0.25	1.8	-4	5	32250
Income in GOR	0.83	2.02	-5	5	32250
Wealth in GOR	0.38	1.9	-5	5	32250
Unemployment in GOR	0.52	1.99	-4	5	32250
Religion in GOR	0.33	1.95	-3	5	32250
Political in GOR	0.23	1.95	-4	5	32250
Perceived standpoint measures	mean	sd	min	max	N
MacArthur ladder	59.08	16.58	5	100	31255
Well off friends	2.98	0.82	1	6	18701
Well off work	3.58	1.22	1	6	6924
Well off nearby	3.09	0.83	1	5	18289

Appendix Table 4.17: Unweighted means and standard deviations, minimums and maximums, and observation counts for the relative variables in ELSA.

	Average earnings in….	Race in GOR	Parent in GOR	Occupation in GOR	Education in GOR	Unemployed in GOR	Religion in GOR	Political in GOR	***% earnings £46K+ in…***	Age in GOR	Gender in GOR	Marital in GOR	Race in GOR	Parent in GOR	Occupation in GOR	Education in GOR	Unemployment in GOR	Religion in GOR	Political in GOR	***% income £46K+ in…***	Gender in GOR	***Median education in…***	Age in GOR	Gender in GOR	Marital in GOR	Race in GOR	Parent in GOR	Unemployment in GOR	Religion in GOR	Political in GOR	***%NVQ4/NVQ5/Degree+***	Age in GOR	Parent in GOR	Unemployment in GOR	Religion in GOR	***MacArthur ladder***	***Well off nearby***
Average earnings in….																																					
Race in GOR		1																																			
Parent in GOR		.7	1																																		
Occupation in GOR		.3	.2	1																																	
Education in GOR		.2	.2	.5	1																																
Unemployed in GOR		.9	.8	.3	.3	1																															
Religion in GOR		.6	.5	.2	.1	.6	1																														
Political in GOR		.3	.3	.2	.3	.3	.2	1																													
% earnings £46K+ in…																																					
Age in GOR		.7	.6	.2	.2	.7	.5	.3		1																											
Gender in GOR		.7	.6	.3	.3	.7	.5	.3		.6	1																										
Marital in GOR		.4	.4	.2	.2	.4	.3	.2		.5	.5	1																									
Race in GOR		.9	.7	.3	.2	.8	.5	.3		.8	.7	.4	1																								
Parent in GOR		.6	.8	.2	.2	.7	.5	.3		.7	.6	.4	.7	1																							
Occupation in GOR		.2	.2	.9	.5	.2	.1	.2		.2	.3	.2	.3	.2	1																						
Education in GOR		.2	.2	.5	.9	.2	.1	.2		.3	.3	.2	.3	.2	.5	1																					
Unemployment in GOR		.8	.7	.3	.2	.9	.5	.3		.8	.7	.4	.9	.8	.3	.3	1																				
Religion in GOR		.6	.6	.2	.2	.6	.8	.3		.6	.6	.4	.7	.7	.2	.2	.7	1																			
Political in GOR		.4	.4	.2	.3	.4	.3	.9		.4	.4	.3	.5	.4	.2	.3	.5	.4	1																		
% income £46K+ in…																																					

Gender in GOR		.5	.4	.2	.2	.5	.4	.2		.5	.7	.3	.5	.4	.2	.2	.5	.4	.3		1																				
Median education in…																																									
Age in GOR		.3	.2	.1	.1	.3	.2	.1		.5	.2	.2	.3	.2	.1	.1	.3	.2	.1		.4		1																		
Gender in GOR		.4	.3	.1	.2	.4	.2	.2		.4	.6	.3	.4	.3	.2	.2	.4	.3	.2		.7		.3	1																	
Marital in GOR		.1	.1	.1	.2	.1	.1	.1		.2	.2	.6	.1	.1	.1	.1	.1	.1	.1		.3		.4	.3	1																
Race in GOR		.4	.3	.1	.1	.4	.2	.1		.3	.3	.2	.4	.3	.1	.1	.3	.2	.2		.4		.7	.4	.3	1															
Parent in GOR		.3	.3	.1	.1	.4	.2	.1		.3	.3	.1	.3	.3	.1	.1	.3	.2	.2		.4		.7	.4	.4	.8	1														
Unemployment in GOR		.4	.3	.1	.1	.4	.2	.1		.3	.3	.2	.3	.3	.1	.1	.3	.2	.2		.4		.8	.4	.3	.9	.8	1													
Religion in GOR		.3	.3	.1	.1	.4	.0	.1		.3	.3	.2	.3	.3	.1	.1	.3	.1	.2		.4		.6	.3	.3	.7	.7	.7	1												
Political in GOR		.3	.2	.2	.2	.3	.1	.7		.2	.3	.2	.3	.2	.2	.2	.3	.2	.6		.3		.5	.3	.3	.6	.6	.6	.5	1											
%NVQ4/NVQ5 /Degree+																																									
Age in GOR		.4	.3	.1	.1	.4	.3	.2		.6	.3	.3	.3	.3	.1	.1	.4	.3	.2		.5		.7	.5	.4	.5	.5	.5	.5	.4		1									
Parent in GOR		.3	.2	.2	.1	.4	.2	.1		.3	.3	.1	.3	.2	.1	.1	.3	.3	.2		.5		.4	.5	.3	.5	.6	.5	.5	.4		.7	1								
Unemployment in GOR		.4	.4	.1	.1	.5	.3	.2		.3	.3	.2	.4	.3	.1	.1	.4	.3	.2		.6		.5	.5	.3	.6	.5	.6	.5	.4		.8	.8	1							
Religion in GOR		.3	.3	.1	.1	.3	-.1	.1		.2	.2	.1	.3	.3	.1	.1	.3	.1	.2		.4		.4	.4	.2	.5	.4	.5	.7	.3		.6	.7	.7	1						
MacArthur ladder		.0	.0	.2	.3	.0	.0	.1		.0	.1	.1	.0	.0	.3	.3	.0	.0	.1		.1		.0	.1	.1	.0	.0	.0	.0	.1		.0	.0	.0	.1	1					
Well off nearby		.0	.0	.1	.1	.0	.0	.1		.0	.0	.1	.0	.0	.1	.1	.0	.0	.0		.0		.0	.0	.0	.0	.0	.0	.0	.0		.0	.0	.0	.0	.3	1				

Appendix Table 4.18: Unweighted pairwise correlations between the relative variables in ELSA significantly associated with SWB. Full 200 X 200 table available upon request.

Relative variable	Life satisfaction (1)				
	b	se	p	r2	n
% top income in age in GOR	-0.08671971	0.410702156	8.33E-01	0.000001	32250
% top income in education in GOR	1.06575776	0.13681507	6.91E-15	0.001777	32250
% top income in gender in GOR	0.21137402	0.413339097	6.09E-01	0.000008	32250
% top income in LA	0.51891331	0.114344126	5.69E-06	0.000601	32250
% top income in marital in GOR	4.94070471	0.299756281	8.71E-61	0.0088	32250
% top income in occupation in GOR	1.66116836	0.168953197	8.81E-23	0.002943	32250
% top income in parent in GOR	-1.0039335	0.417123405	1.61E-02	0.000187	32250
% top income in political in GOR	-0.18433767	0.328795045	5.75E-01	0.00001	32250
% top income in race in GOR	-0.88755906	0.458279025	5.28E-02	0.000117	32250
% top income in religion in GOR	-0.50585992	0.38439264	1.88E-01	0.000051	32250
% top income in wealth in GOR	2.44978682	0.092188315	6.24E-154	0.016605	32250
% top education in age in GOR	-0.77518825	0.19346628	6.17E-05	0.00049	32250
% top education in gender in GOR	0.12990443	0.146563856	3.75E-01	0.000024	32250
% top education in income in GOR	0.46088307	0.109736994	2.68E-05	0.000478	32250
% top education in LA	0.18356102	0.081624991	2.45E-02	0.000149	32250
% top education in marital in GOR	1.47823118	0.144364953	1.44E-24	0.003541	32250
% top education in occupation in GOR	0.64321327	0.061252239	9.40E-26	0.003336	32250
% top education in parent in GOR	-1.47705844	0.200770359	1.93E-13	0.001694	32250
% top education in political in GOR	-0.19676016	0.142418856	1.67E-01	0.000058	32250
% top education in race in GOR	-1.23722991	0.216985744	1.20E-08	0.000993	32250
% top education in religion in GOR	0.31846772	0.174099897	6.74E-02	0.000098	32250
% top education in unemployment in GOR	-1.24410004	0.220991388	1.82E-08	0.001043	32250

% top education in wealth in GOR	2.10198095	0.076187867	1.26E-165	0.022834	32250
% top earnings in age in GOR	-1.39431789	0.388327233	3.30E-04	0.000413	32250
% top earnings in education in GOR	0.78901321	0.129818321	1.23E-09	0.001103	32250
% top earnings in gender in GOR	-0.84803382	0.369000183	2.16E-02	0.00016	32250
% top earnings in LA	0.31626482	0.111883804	4.71E-03	0.000235	32250
% top earnings in marital in GOR	4.72397479	0.2287537	3.90E-94	0.013926	32250
% top earnings in occupation in GOR	0.98054336	0.142447794	5.95E-12	0.00144	32250
% top earnings in parent in GOR	-1.4036522	0.402966947	4.96E-04	0.000381	32250
% top earnings in political in GOR	-0.40497072	0.23974901	9.12E-02	0.000086	32250
% top earnings in race in GOR	-2.67300608	0.437863096	1.04E-09	0.00115	32250
% top earnings in religion in GOR	-3.78154726	0.361186067	1.31E-25	0.003265	32250
% top earnings in wealth in GOR	3.23053327	0.132363658	2.23E-130	0.016131	32250
% top wealth in age in GOR	0.14904773	0.110009925	1.75E-01	0.000057	32250
% top wealth in education in GOR	0.52699229	0.075861044	3.81E-12	0.001491	32250
% top wealth in gender in GOR	0.19604731	0.111819493	7.96E-02	0.000095	32250
% top wealth in income in GOR	0.50190083	0.09525712	1.38E-07	0.000846	32250
% top wealth in LA	0.60590684	0.067180741	2.00E-19	0.002581	32250
% top wealth in marital in GOR	2.09286799	0.091555476	9.73E-115	0.017214	32250
% top wealth in occupation in GOR	0.72484943	0.072991519	3.31E-23	0.003129	32250
% top wealth in parent in GOR	0.02015655	0.112969217	8.58E-01	0.000001	32250
% top wealth in political in GOR	0.10991059	0.113719884	3.34E-01	0.000029	32250
% top wealth in race in GOR	0.13030593	0.111402079	2.42E-01	0.000043	32250
% top wealth in religion in GOR	0.36080594	0.111946544	1.27E-03	0.000321	32250
% top wealth in unemployment	0.22016392	0.113687817	5.28E-02	0.00012	32250
% unemployed in age in GOR	-3.15471709	1.075634921	3.36E-03	0.000282	32250
% unemployed in education in GOR	-1.84984856	0.556191058	8.82E-04	0.000361	32250

% unemployed in gender in GOR	0.43128996	0.760765776	5.71E-01	0.00001	32250
% unemployed in income in GOR	-2.02363849	0.465040607	1.36E-05	0.000541	32250
% unemployed in LA	-1.07262034	0.249351954	1.70E-05	0.000612	32250
% unemployed in marital in GOR	-7.20978895	0.53470114	2.52E-41	0.007703	32250
% unemployed in occupation in GOR	-4.44332061	0.685739515	9.33E-11	0.001335	32250
% unemployed in parent in GOR	-4.0987257	0.688347847	2.64E-09	0.001251	32250
% unemployed in political in GOR	-3.48209537	0.857713753	4.92E-05	0.000502	32250
% unemployed in race in GOR	-5.08922977	0.973005119	1.70E-07	0.000951	32250
% unemployed in religion in GOR	-6.37842153	0.847008378	5.19E-14	0.001766	32250
% unemployed in wealth in GOR	-7.10539175	0.485536828	2.43E-48	0.008819	32250
Average income in age in GOR	-0.00001035	0.000001492	4.03E-12	0.001489	32250
Average income in education in GOR	0.00000742	0.000000938	2.69E-15	0.001856	32250
Average income in gender in GOR	0.0000047	0.00000237	4.72E-02	0.000118	32250
Average income in LA	0.00000527	0.000000963	4.53E-08	0.000944	32250
Average income in marital in GOR	0.00003567	0.000001605	1.41E-108	0.01611	32250
Average income in occupation in GOR	0.0000113	0.000001117	5.41E-24	0.003153	32250
Average income in parent in GOR	-0.0000036	0.000002756	1.91E-01	0.000053	32250
Average income in political in GOR	0.00000138	0.000001955	4.80E-01	0.000015	32250
Average income in race in GOR	-0.00000352	0.000002717	1.95E-01	0.000052	32250
Average income in religion in GOR	-0.00000077	0.000002676	7.72E-01	0.000002	32250
Average income in wealth in GOR	0.00001621	0.000000745	3.83E-104	0.019105	32250
Average earnings in age in GOR	-0.00000955	0.000000731	6.76E-39	0.005583	32250
Average earnings in education in GOR	0.00000507	0.000001052	1.41E-06	0.000711	32250
Average earnings in gender in GOR	-0.00000122	0.000002554	6.32E-01	0.000007	32250
Average earnings in LA	0.00000083	0.000001083	4.41E-01	0.000018	32250
Average earnings in marital in GOR	0.0000267	0.000001333	1.05E-88	0.013174	32250

Average earnings in occupation in GOR	0.00000753	0.000001304	7.79E-09	0.001022	32250
Average earnings in parent in GOR	-0.00001261	0.000003457	2.66E-04	0.000416	32250
Average earnings in political in GOR	-0.00000033	0.000001518	8.30E-01	0.000001	32250
Average earnings in race in GOR	-0.00002423	0.000003579	1.30E-11	0.00144	32250
Average earnings in religion in GOR	-0.00003195	0.000002515	7.04E-37	0.004666	32250
Average earnings in wealth in GOR	0.00002532	0.000001636	8.24E-54	0.012077	32250
Average wealth in age in GOR	-0.00000004	0.000000049	3.94E-01	0.000023	32250
Average wealth in education in GOR	0.00000022	0.000000031	3.14E-13	0.001586	32250
Average wealth in gender in GOR	0.00000011	0.000000057	6.66E-02	0.000103	32250
Average wealth in income in GOR	0.00000024	0.00000004	3.17E-09	0.000979	32250
Average wealth in LA	0.0000002	0.000000025	6.96E-15	0.00186	32250
Average wealth in marital in GOR	0.00000096	0.000000042	1.93E-115	0.017002	32250
Average wealth in occupation in GOR	0.0000003	0.000000033	8.94E-20	0.00259	32250
Average wealth in parent in GOR	0.00000002	0.000000057	7.88E-01	0.000002	32250
Average wealth in political in GOR	0.00000001	0.000000056	8.90E-01	0.000001	32250
Average wealth in race in GOR	0.00000002	0.000000057	7.90E-01	0.000002	32250
Average wealth in religion in GOR	0.00000015	0.000000053	4.80E-03	0.000238	32250
Average wealth in unemployment	0.00000009	0.00000006	1.44E-01	0.000068	32250
Distance from average income in age in GOR	0.00000645	0.000000453	7.33E-46	0.012854	32250
Distance from average income in education in GOR	0.00000544	0.000000405	4.34E-41	0.008705	32250
Distance from average income in gender in GOR	0.0000057	0.000000395	4.60E-47	0.010404	32250
Distance from average income in LA	0.00000557	0.000000381	2.92E-48	0.009299	32250
Distance from average income in marital in GOR	0.00000447	0.00000033	9.56E-42	0.006247	32250
Distance from average income in occupation in GOR	0.00000522	0.00000038	8.32E-43	0.008207	32250
Distance from average income in parent in GOR	0.00000581	0.0000004	1.30E-47	0.010839	32250
Distance from average income in political in GOR	0.00000581	0.000000405	1.35E-46	0.010681	32250

Distance from average income in race in GOR	0.00000581	0.0000004	1.53E-47	0.010827	32250
Distance from average income in religion in GOR	0.00000578	0.000000399	2.23E-47	0.010704	32250
Distance from average income in wealth in GOR	0.00000272	0.000000285	1.83E-21	0.001822	32250
Distance from average earnings in age in GOR	0.00000607	0.000000417	6.31E-48	0.008191	32250
Distance from average earnings in education in GOR	0.0000022	0.000000281	6.05E-15	0.00137	32250
Distance from average earnings in gender in GOR	0.00000257	0.000000277	1.77E-20	0.001977	32250
Distance from average earnings in LA	0.00000262	0.000000289	1.17E-19	0.001945	32250
Distance from average earnings in marital in GOR	0.00000094	0.000000277	6.87E-04	0.000254	32250
Distance from average earnings in occupation in GOR	0.00000218	0.000000282	1.04E-14	0.001371	32250
Distance from average earnings in parent in GOR	0.00000266	0.000000277	7.47E-22	0.00212	32250
Distance from average earnings in political in GOR	0.00000264	0.000000281	6.11E-21	0.002026	32250
Distance from average earnings in race in GOR	0.00000274	0.000000277	5.79E-23	0.002255	32250
Distance from average earnings in religion in GOR	0.00000305	0.000000281	2.19E-27	0.002777	32250
Distance from average earnings in wealth in GOR	0.00000099	0.000000275	3.32E-04	0.000283	32250
Distance from average wealth in age in GOR	0.00000017	0.000000021	3.21E-16	0.010736	32250
Distance from average wealth in education in GOR	0.00000016	0.00000002	4.40E-15	0.008647	32250
Distance from average wealth in gender in GOR	0.00000016	0.00000002	3.47E-16	0.010118	32250
Distance from average wealth in income in GOR	0.00000016	0.00000002	1.32E-15	0.009268	32250
Distance from average wealth in LA	0.00000016	0.000000019	7.77E-16	0.008267	32250
Distance from average wealth in marital in GOR	0.00000012	0.000000016	6.59E-14	0.005502	32250
Distance from average wealth in occupation in GOR	0.00000015	0.000000019	8.49E-15	0.008185	32250
Distance from average wealth in parent in GOR	0.00000017	0.00000002	2.48E-16	0.010382	32250
Distance from average wealth in political in GOR	0.00000017	0.00000002	2.90E-16	0.010426	32250
Distance from average wealth in race in GOR	0.00000017	0.00000002	2.82E-16	0.010382	32250
Distance from average wealth in religion in GOR	0.00000016	0.00000002	2.46E-16	0.009936	32250
Distance from average wealth in unemployment	0.00000016	0.00000002	3.14E-16	0.010168	32250

	0.02442996	0.002809188	3.58E-18	0.002319	32250
Distance from median education in age in GOR					
Distance from median education in gender in GOR	0.01928914	0.002806883	6.44E-12	0.001481	32250
Distance from median education in income in GOR	0.01223871	0.002726944	7.21E-06	0.00061	32250
Distance from median education in LA	0.01275861	0.002801636	5.28E-06	0.000643	32250
Distance from median education in marital in GOR	0.00932795	0.002845749	1.05E-03	0.000332	32250
Distance from median education in occupation in GOR	-0.0070773	0.003177879	2.60E-02	0.000163	32250
Distance from median education in parent in GOR	0.02653585	0.002793453	2.25E-21	0.002734	32250
Distance from median education in political in GOR	0.02562758	0.002811221	8.22E-20	0.002499	32250
Distance from median education in race in GOR	0.02762676	0.002760732	1.54E-23	0.003024	32250
Distance from median education in religion in GOR	0.02355702	0.002825535	7.91E-17	0.002117	32250
Distance from median education in unemployment in GOR	0.02796726	0.002763902	4.95E-24	0.003093	32250
Distance from median education in wealth in GOR	-0.03867764	0.002934977	1.48E-39	0.005388	32250
MacArthur ladder	0.01931526	0.000357056	0.00E+00	0.103586	31255
Median education in age in GOR	-0.03390215	0.008530611	7.08E-05	0.000481	32250
Median education in gender in GOR	0.004471	0.005850245	4.45E-01	0.000018	32250
Median education in income in GOR	0.02009402	0.004270192	2.54E-06	0.000621	32250
Median education in LA	0.02430928	0.004910525	7.44E-07	0.000738	32250
Median education in marital in GOR	0.07067336	0.007276952	2.88E-22	0.003196	32250
Median education in occupation in GOR	0.03675904	0.003298494	8.63E-29	0.003815	32250
Median education in parent in GOR	-0.06171749	0.009044428	9.02E-12	0.001373	32250
Median education in political in GOR	-0.02444041	0.006612207	2.19E-04	0.00041	32250
Median education in race in GOR	-0.06275229	0.008009595	4.85E-15	0.001801	32250
Median education in religion in GOR	-0.02705743	0.009166441	3.16E-03	0.000246	32250
Median education in unemployment in GOR	-0.06910146	0.008254073	5.90E-17	0.002062	32250
Median education in wealth in GOR	0.11533452	0.004008116	8.25E-180	0.02538	32250
Rank income in age in GOR	0.26315075	0.018268473	6.77E-47	0.006974	32250

Rank income in education in GOR	0.4539688	0.019807181	2.49E-115	0.016248	32250
Rank income in gender in GOR	0.48213715	0.019828716	1.99E-129	0.018194	32250
Rank income in LA	0.43359047	0.018996441	2.10E-114	0.016207	32250
Rank income in marital in GOR	0.33429699	0.01969627	2.49E-64	0.008831	32250
Rank income in occupation in GOR	0.4364048	0.019724635	1.15E-107	0.015133	32250
Rank income in parent in GOR	0.48956799	0.019549635	4.34E-137	0.019135	32250
Rank income in political in GOR	0.4876463	0.019561375	7.00E-136	0.018955	32250
Rank income in race in GOR	0.49710774	0.019766104	3.09E-138	0.019398	32250
Rank income in religion in GOR	0.49001455	0.019525844	1.16E-137	0.019133	32250
Rank income in wealth in GOR	0.20292255	0.019532901	3.06E-25	0.003387	32250
Rank education in age in GOR	0.06233906	0.01852187	7.64E-04	0.000363	32250
Rank education in gender in GOR	0.13149813	0.020309274	9.63E-11	0.001298	32250
Rank education in income in GOR	0.10622338	0.019914204	9.67E-08	0.000862	32250
Rank education in LA	0.11451689	0.019538511	4.64E-09	0.001055	32250
Rank education in marital in GOR	0.08720727	0.020144007	1.50E-05	0.000574	32250
Rank education in occupation in GOR	0.03869171	0.020857848	6.36E-02	0.000109	32250
Rank education in parent in GOR	0.15882117	0.0199139	1.57E-15	0.00194	32250
Rank education in political in GOR	0.14906823	0.019886303	6.75E-14	0.00171	32250
Rank education in race in GOR	0.15260127	0.020039855	2.71E-14	0.001773	32250
Rank education in religion in GOR	0.13396555	0.019876121	1.61E-11	0.001388	32250
Rank education in unemployment in GOR	0.15575633	0.020101602	9.57E-15	0.001841	32250
Rank education in wealth in GOR	-0.11722606	0.020307416	7.88E-09	0.001029	32250
Rank earnings in age in GOR	0.11541129	0.020975407	3.78E-08	0.001019	32250
Rank earnings in education in GOR	0.10150389	0.021586803	2.59E-06	0.000608	32250
Rank earnings in gender in GOR	0.11217756	0.02165475	2.23E-07	0.000755	32250
Rank earnings in LA	0.12171978	0.021159774	8.88E-09	0.000936	32250

	-0.01478942	0.022229505	5.06E-01	0.000013	32250
Rank earnings in marital in GOR					
Rank earnings in occupation in GOR	0.0986038	0.021873152	6.57E-06	0.000579	32250
Rank earnings in parent in GOR	0.11758867	0.02151639	4.66E-08	0.000834	32250
Rank earnings in political in GOR	0.118707	0.021695074	4.49E-08	0.000838	32250
Rank earnings in race in GOR	0.1264298	0.021668074	5.44E-09	0.000957	32250
Rank earnings in religion in GOR	0.15799047	0.021618745	2.77E-13	0.001495	32250
Rank earnings in wealth in GOR	0.0349457	0.02127492	1.00E-01	0.000076	32250
Rank wealth in age in GOR	0.38150331	0.019368686	7.34E-86	0.014143	32250
Rank wealth in education in GOR	0.67547187	0.020482824	1.36E-234	0.035724	32250
Rank wealth in gender in GOR	0.71439068	0.020846532	7.90E-253	0.038956	32250
Rank wealth in income in GOR	0.65770538	0.020179014	2.69E-229	0.03503	32250
Rank wealth in LA	0.6268508	0.019723114	2.66E-218	0.033234	32250
Rank wealth in marital in GOR	0.49255435	0.020675569	2.30E-124	0.018759	32250
Rank wealth in occupation in GOR	0.65303218	0.020382229	9.37E-222	0.033716	32250
Rank wealth in parent in GOR	0.71288198	0.020409528	2.14E-262	0.03991	32250
Rank wealth in political in GOR	0.70572968	0.020306491	7.64E-260	0.039297	32250
Rank wealth in race in GOR	0.72273426	0.020791017	5.85E-260	0.039928	32250
Rank wealth in religion in GOR	0.69098456	0.020298428	1.45E-249	0.037739	32250
Rank wealth in unemployment	0.71532966	0.020807051	2.05E-254	0.039143	32250
Well off friends	0.20586791	0.011138173	1.33E-75	0.029064	18701
Well off nearby	0.23624071	0.009840007	1.98E-125	0.039415	18289
Well off work	0.11445745	0.01024737	1.01E-28	0.021605	6924

Appendix Table 4.19: Results of OLS regressions explaining variance in life satisfaction (1) in ELSA without controls from the relative variables. Robust standard errors.

Relative variable	Life satisfaction (2)				
	b	se	p	r2	n
% top income in age in GOR	0.01486222	0.410601097	9.71E-01	0	32250
% top income in education in GOR	1.73364485	0.133973692	3.32E-38	0.004702	32250
% top income in gender in GOR	0.41971388	0.414903088	3.12E-01	0.0000311	32250
% top income in LA	0.73356609	0.112763768	7.87E-11	0.0012006	32250
% top income in marital in GOR	6.50131901	0.301237037	1.41E-102	0.0152378	32250
% top income in occupation in GOR	2.4698749	0.167920863	8.18E-49	0.006506	32250
% top income in parent in GOR	-0.83615789	0.417537192	4.52E-02	0.0001296	32250
% top income in political in GOR	0.84351553	0.324284301	9.30E-03	0.0002015	32250
% top income in race in GOR	0.27315432	0.459235064	5.52E-01	0.0000111	32250
% top income in religion in GOR	0.09588433	0.391057769	8.06E-01	0.0000018	32250
% top income in wealth in GOR	2.96264865	0.092410876	4.99E-222	0.024285	32250
% top education in age in GOR	-0.57760706	0.198242468	3.57E-03	0.0002723	32250
% top education in gender in GOR	-0.00077995	0.147930058	9.96E-01	0	32250
% top education in income in GOR	0.88866333	0.107924282	1.88E-16	0.0017771	32250
% top education in LA	0.40733994	0.083188872	9.80E-07	0.0007331	32250
% top education in marital in GOR	1.99745107	0.14510373	5.43E-43	0.0064658	32250
% top education in occupation in GOR	0.96716995	0.060932998	1.60E-56	0.007542	32250
% top education in parent in GOR	-1.40878424	0.204176947	5.30E-12	0.0015411	32250
% top education in political in GOR	0.28427434	0.139683154	4.18E-02	0.0001219	32250
% top education in race in GOR	-0.93370711	0.228100515	4.26E-05	0.0005655	32250
% top education in religion in GOR	0.51713614	0.178195269	3.71E-03	0.0002595	32250
% top education in unemployment in GOR	-0.74904751	0.223248281	7.94E-04	0.0003781	32250

% top education in wealth in GOR	2.63362905	0.075424635	3.15E-262	0.0358459	32250
% top earnings in age in GOR	-0.74843671	0.386158518	5.26E-02	0.0001189	32250
% top earnings in education in GOR	1.50828904	0.127304825	2.58E-32	0.0040293	32250
% top earnings in gender in GOR	-0.28615118	0.36931107	4.38E-01	0.0000183	32250
% top earnings in LA	0.46892874	0.11135776	2.55E-05	0.0005159	32250
% top earnings in marital in GOR	6.30721727	0.225392375	2.83E-170	0.0248248	32250
% top earnings in occupation in GOR	1.70939045	0.140780443	7.48E-34	0.0043759	32250
% top earnings in parent in GOR	0.08101173	0.403579282	8.41E-01	0.0000013	32250
% top earnings in political in GOR	0.55405892	0.231684345	1.68E-02	0.0001618	32250
% top earnings in race in GOR	-1.24751224	0.440677305	4.64E-03	0.0002504	32250
% top earnings in religion in GOR	-2.69394054	0.362715389	1.14E-13	0.0016568	32250
% top earnings in wealth in GOR	3.97447105	0.13252903	6.45E-195	0.0244165	32250
% top wealth in age in GOR	0.30405523	0.11012306	5.76E-03	0.0002367	32250
% top wealth in education in GOR	0.99220803	0.075927406	6.31E-39	0.0052836	32250
% top wealth in gender in GOR	0.35624329	0.111792572	1.44E-03	0.0003146	32250
% top wealth in income in GOR	0.70294716	0.09489066	1.31E-13	0.0016599	32250
% top wealth in LA	0.83927343	0.06694245	5.67E-36	0.0049522	32250
% top wealth in marital in GOR	2.61795884	0.089786128	1.66E-184	0.0269359	32250
% top wealth in occupation in GOR	1.13876528	0.0731115	1.68E-54	0.0077225	32250
% top wealth in parent in GOR	0.2519298	0.11307177	2.59E-02	0.0001552	32250
% top wealth in political in GOR	0.40260435	0.113579056	3.94E-04	0.0003925	32250
% top wealth in race in GOR	0.41843869	0.111177282	1.68E-04	0.0004419	32250
% top wealth in religion in GOR	0.56107766	0.112515605	6.17E-07	0.0007766	32250
% top wealth in unemployment	0.4373081	0.112975527	1.09E-04	0.0004743	32250
% unemployed in age in GOR	-4.40824311	1.077647182	4.31E-05	0.0005506	32250
% unemployed in education in GOR	-2.08179298	0.551421638	1.60E-04	0.0004567	32250

% unemployed in gender in GOR	-0.93278102	0.753289729	2.16E-01	0.0000478	32250
% unemployed in income in GOR	-2.32299951	0.467937763	6.93E-07	0.0007127	32250
% unemployed in LA	-1.16874795	0.248253584	2.51E-06	0.0007266	32250
% unemployed in marital in GOR	-8.2322386	0.521749963	7.12E-56	0.0100421	32250
% unemployed in occupation in GOR	-6.36038761	0.696663825	7.25E-20	0.0027359	32250
% unemployed in parent in GOR	-4.87200968	0.661499057	1.81E-13	0.001767	32250
% unemployed in political in GOR	-4.35863749	0.862454642	4.36E-07	0.0007872	32250
% unemployed in race in GOR	-5.98656823	1.023490922	4.99E-09	0.0013158	32250
% unemployed in religion in GOR	-6.91567301	0.84048533	1.97E-16	0.0020759	32250
% unemployed in wealth in GOR	-8.74376403	0.510196877	1.51E-65	0.0133546	32250
Average income in age in GOR	-0.00000188	0.000001503	2.10E-01	0.0000492	32250
Average income in education in GOR	0.00001309	0.000000929	6.11E-45	0.0057791	32250
Average income in gender in GOR	0.00000654	0.000002383	6.09E-03	0.0002289	32250
Average income in LA	0.00000705	0.000000964	2.63E-13	0.0016908	32250
Average income in marital in GOR	0.00004602	0.000001593	2.61E-181	0.0268192	32250
Average income in occupation in GOR	0.00001724	0.000001111	4.43E-54	0.0073407	32250
Average income in parent in GOR	0.00000325	0.000002771	2.41E-01	0.0000432	32250
Average income in political in GOR	0.00000851	0.000001926	1.01E-05	0.0005706	32250
Average income in race in GOR	0.00000616	0.000002755	2.54E-02	0.0001588	32250
Average income in religion in GOR	0.00000581	0.000002724	3.28E-02	0.0001395	32250
Average income in wealth in GOR	0.0000199	0.000000812	2.05E-131	0.0287982	32250
Average earnings in age in GOR	-0.00000412	0.000000718	9.26E-09	0.001041	32250
Average earnings in education in GOR	0.00001263	0.000001043	1.10E-33	0.0044047	32250
Average earnings in gender in GOR	0.00000155	0.000002562	5.44E-01	0.0000113	32250
Average earnings in LA	0.00000363	0.000001092	8.89E-04	0.0003375	32250
Average earnings in marital in GOR	0.00003524	0.000001322	6.23E-155	0.0229523	32250

Average earnings in occupation in GOR	0.00001431	0.00000129	1.47E-28	0.0036921	32250
Average earnings in parent in GOR	0.0000047	0.000003444	1.72E-01	0.0000579	32250
Average earnings in political in GOR	0.00000653	0.000001475	9.44E-06	0.0005515	32250
Average earnings in race in GOR	-0.00000947	0.000003571	7.99E-03	0.0002199	32250
Average earnings in religion in GOR	-0.00002325	0.000002516	2.56E-20	0.0024712	32250
Average earnings in wealth in GOR	0.00003304	0.000001633	1.56E-90	0.020572	32250
Average wealth in age in GOR	0.00000013	0.000000049	5.98E-03	0.000232	32250
Average wealth in education in GOR	0.0000004	0.00000003	6.16E-39	0.0050336	32250
Average wealth in gender in GOR	0.00000018	0.000000058	1.65E-03	0.000305	32250
Average wealth in income in GOR	0.00000035	0.000000038	2.72E-20	0.0021865	32250
Average wealth in LA	0.00000027	0.000000024	7.26E-29	0.0035569	32250
Average wealth in marital in GOR	0.00000122	0.000000041	2.73E-189	0.0273567	32250
Average wealth in occupation in GOR	0.00000048	0.000000033	1.72E-48	0.0066545	32250
Average wealth in parent in GOR	0.00000017	0.000000058	3.16E-03	0.0002726	32250
Average wealth in political in GOR	0.00000019	0.000000056	7.16E-04	0.0003557	32250
Average wealth in race in GOR	0.00000019	0.000000057	8.56E-04	0.0003469	32250
Average wealth in religion in GOR	0.00000028	0.000000053	2.09E-07	0.0008264	32250
Average wealth in unemployment	0.00000022	0.000000059	1.81E-04	0.0004413	32250
Distance from average income in age in GOR	0.00000676	0.000000463	4.77E-48	0.01412	32250
Distance from average income in education in GOR	0.00000552	0.000000399	2.33E-43	0.0089488	32250
Distance from average income in gender in GOR	0.00000634	0.000000425	3.75E-50	0.0128567	32250
Distance from average income in LA	0.00000608	0.000000394	1.43E-53	0.01108	32250
Distance from average income in marital in GOR	0.00000473	0.000000333	1.21E-45	0.0070061	32250
Distance from average income in occupation in GOR	0.00000545	0.000000386	3.65E-45	0.0089198	32250
Distance from average income in parent in GOR	0.00000639	0.000000427	1.69E-50	0.0131031	32250
Distance from average income in political in GOR	0.00000631	0.000000425	1.05E-49	0.0125879	32250

Distance from average income in race in GOR	0.00000635	0.000000424	1.93E-50	0.0129302	32250
Distance from average income in religion in GOR	0.00000636	0.000000425	2.33E-50	0.0129658	32250
Distance from average income in wealth in GOR	0.00000249	0.000000278	2.88E-19	0.0015359	32250
Distance from average earnings in age in GOR	0.00000616	0.000000386	3.42E-57	0.0084269	32250
Distance from average earnings in education in GOR	0.0000027	0.00000027	1.66E-23	0.0020696	32250
Distance from average earnings in gender in GOR	0.0000037	0.00000027	1.79E-42	0.0040983	32250
Distance from average earnings in LA	0.00000361	0.00000028	9.51E-38	0.0036873	32250
Distance from average earnings in marital in GOR	0.00000161	0.000000266	1.36E-09	0.0007482	32250
Distance from average earnings in occupation in GOR	0.00000298	0.000000272	9.05E-28	0.0025541	32250
Distance from average earnings in parent in GOR	0.00000368	0.00000027	2.40E-42	0.0040621	32250
Distance from average earnings in political in GOR	0.00000354	0.000000272	1.50E-38	0.0036502	32250
Distance from average earnings in race in GOR	0.00000379	0.000000271	2.48E-44	0.0043121	32250
Distance from average earnings in religion in GOR	0.0000041	0.000000275	6.71E-50	0.005005	32250
Distance from average earnings in wealth in GOR	0.00000169	0.000000265	1.69E-10	0.0008355	32250
Distance from average wealth in age in GOR	0.0000002	0.000000021	1.74E-21	0.015558	32250
Distance from average wealth in education in GOR	0.00000018	0.00000002	1.83E-20	0.0118979	32250
Distance from average wealth in gender in GOR	0.0000002	0.000000021	1.24E-21	0.0154143	32250
Distance from average wealth in income in GOR	0.00000019	0.000000021	4.20E-21	0.0138838	32250
Distance from average wealth in LA	0.00000019	0.00000002	4.34E-22	0.0122372	32250
Distance from average wealth in marital in GOR	0.00000015	0.000000016	1.38E-20	0.0083435	32250
Distance from average wealth in occupation in GOR	0.00000018	0.000000019	3.01E-20	0.0114828	32250
Distance from average wealth in parent in GOR	0.0000002	0.000000021	9.62E-22	0.0154323	32250
Distance from average wealth in political in GOR	0.0000002	0.000000021	1.22E-21	0.0153446	32250
Distance from average wealth in race in GOR	0.0000002	0.000000021	1.14E-21	0.0153427	32250
Distance from average wealth in religion in GOR	0.0000002	0.000000021	7.03E-22	0.0149247	32250
Distance from average wealth in unemployment	0.0000002	0.000000021	1.13E-21	0.0152687	32250

Distance from median education in age in GOR	0.04080168	0.002782764	1.61E-48	0.00647	32250
Distance from median education in gender in GOR	0.03526192	0.002773329	6.01E-37	0.0049484	32250
Distance from median education in income in GOR	0.02105097	0.002707701	7.80E-15	0.0018057	32250
Distance from median education in LA	0.02686984	0.002772429	3.50E-22	0.0028523	32250
Distance from median education in marital in GOR	0.02344254	0.002830127	1.24E-16	0.0020942	32250
Distance from median education in occupation in GOR	-0.00144648	0.003163431	6.47E-01	0.0000068	32250
Distance from median education in parent in GOR	0.04208814	0.002783176	1.73E-51	0.0068771	32250
Distance from median education in political in GOR	0.0381815	0.00279553	2.37E-42	0.0055479	32250
Distance from median education in race in GOR	0.04185659	0.002751905	4.60E-52	0.0069418	32250
Distance from median education in religion in GOR	0.03936221	0.002807276	1.56E-44	0.0059098	32250
Distance from median education in unemployment in GOR	0.04189993	0.002753689	4.21E-52	0.0069431	32250
Distance from median education in wealth in GOR	-0.03500493	0.002911876	3.23E-33	0.0044129	32250
MacArthur ladder	0.01955938	0.000351813	0.00E+00	0.1061781	31255
Median education in age in GOR	-0.02074392	0.008701912	1.71E-02	0.00018	32250
Median education in gender in GOR	0.01068904	0.005866661	6.85E-02	0.0001022	32250
Median education in income in GOR	0.0417015	0.004206733	3.94E-23	0.0026737	32250
Median education in LA	0.03502399	0.004984065	2.15E-12	0.0015321	32250
Median education in marital in GOR	0.09465468	0.007292158	1.97E-38	0.0057327	32250
Median education in occupation in GOR	0.05475296	0.003284739	4.02E-62	0.0084649	32250
Median education in parent in GOR	-0.03744635	0.009341985	6.13E-05	0.0005056	32250
Median education in political in GOR	0.00669544	0.006591733	3.10E-01	0.0000307	32250
Median education in race in GOR	-0.03488033	0.008405819	3.34E-05	0.0005564	32250
Median education in religion in GOR	-0.00072706	0.009504908	9.39E-01	0.0000002	32250
Median education in unemployment in GOR	-0.0366131	0.008564429	1.92E-05	0.0005789	32250
Median education in wealth in GOR	0.14463401	0.003958553	2.02E-286	0.0399134	32250
Rank income in age in GOR	0.30428909	0.018182934	1.34E-62	0.0093246	32250

Rank income in education in GOR	0.48576387	0.019563026	7.74E-135	0.0186034	32250
Rank income in gender in GOR	0.566705	0.019520002	5.90E-183	0.0251363	32250
Rank income in LA	0.48859369	0.018802473	2.38E-147	0.0205803	32250
Rank income in marital in GOR	0.37193651	0.019419333	2.59E-81	0.0109314	32250
Rank income in occupation in GOR	0.48274715	0.019524806	1.02E-133	0.0185174	32250
Rank income in parent in GOR	0.56567099	0.019253858	2.95E-187	0.0255467	32250
Rank income in political in GOR	0.55557531	0.019270619	1.76E-180	0.0246039	32250
Rank income in race in GOR	0.56948283	0.019467822	1.12E-185	0.0254569	32250
Rank income in religion in GOR	0.56592133	0.01923809	1.02E-187	0.0255204	32250
Rank income in wealth in GOR	0.20619808	0.019308806	1.41E-26	0.0034971	32250
Rank education in age in GOR	0.12964299	0.018632114	3.52E-12	0.0015715	32250
Rank education in gender in GOR	0.27413256	0.020188711	7.00E-42	0.0056392	32250
Rank education in income in GOR	0.21092604	0.019866547	2.74E-26	0.0034008	32250
Rank education in LA	0.22953266	0.019404715	3.23E-32	0.0042389	32250
Rank education in marital in GOR	0.20430457	0.020093655	3.01E-24	0.0031506	32250
Rank education in occupation in GOR	0.13502379	0.020738756	7.59E-11	0.0013295	32250
Rank education in parent in GOR	0.28798533	0.019825615	1.17E-47	0.0063801	32250
Rank education in political in GOR	0.26546414	0.019780375	5.90E-41	0.005422	32250
Rank education in race in GOR	0.27997354	0.019958064	1.42E-44	0.0059685	32250
Rank education in religion in GOR	0.2595435	0.01977052	2.88E-39	0.0052099	32250
Rank education in unemployment in GOR	0.28062316	0.020013706	1.56E-44	0.0059767	32250
Rank education in wealth in GOR	-0.04391015	0.020276769	3.04E-02	0.0001444	32250
Rank earnings in age in GOR	0.11105477	0.020788174	9.24E-08	0.0009436	32250
Rank earnings in education in GOR	0.14607769	0.021408567	9.05E-12	0.0012594	32250
Rank earnings in gender in GOR	0.20649544	0.021321007	3.74E-22	0.002558	32250
Rank earnings in LA	0.19646523	0.020939475	6.85E-21	0.0024384	32250

Rank earnings in marital in GOR	0.04769698	0.021988053	3.01E-02	0.000131	32250
Rank earnings in occupation in GOR	0.17764966	0.021594525	2.00E-16	0.001879	32250
Rank earnings in parent in GOR	0.20245998	0.02118883	1.32E-21	0.0024717	32250
Rank earnings in political in GOR	0.19230754	0.021377973	2.47E-19	0.0022001	32250
Rank earnings in race in GOR	0.21362615	0.02133223	1.43E-23	0.0027322	32250
Rank earnings in religion in GOR	0.24412093	0.021266532	1.93E-30	0.0035685	32250
Rank earnings in wealth in GOR	0.10177069	0.020907063	1.13E-06	0.0006407	32250
Rank wealth in age in GOR	0.4722034	0.019150267	5.19E-133	0.0216668	32250
Rank wealth in education in GOR	0.77197543	0.020090621	0.00E+00	0.0466609	32250
Rank wealth in gender in GOR	0.86077583	0.020360713	0.00E+00	0.0565561	32250
Rank wealth in income in GOR	0.77655418	0.019710084	0.00E+00	0.0488332	32250
Rank wealth in LA	0.72280184	0.019408757	2.99E-297	0.044187	32250
Rank wealth in marital in GOR	0.58585016	0.020337115	3.38E-180	0.0265379	32250
Rank wealth in occupation in GOR	0.75544127	0.020061057	9.68E-304	0.04512	32250
Rank wealth in parent in GOR	0.84930699	0.019953456	0.00E+00	0.056647	32250
Rank wealth in political in GOR	0.83947156	0.019852616	0.00E+00	0.0556028	32250
Rank wealth in race in GOR	0.85814143	0.02032912	0.00E+00	0.0562908	32250
Rank wealth in religion in GOR	0.82957576	0.019862635	0.00E+00	0.0543959	32250
Rank wealth in unemployment	0.8553918	0.020350733	0.00E+00	0.0559721	32250
Well off friends	0.19985239	0.010555167	3.29E-79	0.0269869	18701
Well off nearby	0.21934881	0.009563631	8.49E-115	0.0332061	18289
Well off work	0.11659694	0.009619763	1.79E-33	0.0242332	6924

Appendix Table 4.20: Results of OLS regressions explaining variance in life satisfaction (2) in ELSA without controls from the relative variables. Robust standard errors.

Relative variable	Life meaning				
	b	se	p	r2	n
% top income in age in GOR	2.983342983	0.430886371	4.48E-12	0.001668	32250
% top income in education in GOR	2.231156211	0.130846168	6.54E-65	0.007788	32250
% top income in gender in GOR	-0.484157699	0.418347363	2.47E-01	0.000041	32250
% top income in LA	0.513104681	0.11544237	8.83E-06	0.000587	32250
% top income in marital in GOR	4.687791701	0.30582155	7.58E-53	0.007922	32250
% top income in occupation in GOR	2.527197406	0.168139747	6.91E-51	0.006811	32250
% top income in parent in GOR	-0.508300863	0.422249541	2.29E-01	0.000048	32250
% top income in political in GOR	1.084384566	0.323098352	7.91E-04	0.000333	32250
% top income in race in GOR	-0.056543563	0.457918289	9.02E-01	0	32250
% top income in religion in GOR	0.759918617	0.380303174	4.57E-02	0.000116	32250
% top income in wealth in GOR	1.890293544	0.094437831	1.37E-88	0.009886	32250
% top education in age in GOR	1.118652922	0.202328677	3.25E-08	0.001021	32250
% top education in gender in GOR	-0.435772221	0.147374696	3.11E-03	0.000266	32250
% top education in income in GOR	1.093631965	0.107122478	1.97E-24	0.002691	32250
% top education in LA	0.426481623	0.081991397	1.99E-07	0.000804	32250
% top education in marital in GOR	1.786672584	0.147229367	8.14E-34	0.005173	32250
% top education in occupation in GOR	1.007013215	0.060650919	1.19E-61	0.008176	32250
% top education in parent in GOR	-1.002908194	0.205730468	1.09E-06	0.000781	32250
% top education in political in GOR	0.7034166	0.138251274	3.64E-07	0.000746	32250
% top education in race in GOR	-0.076159563	0.21696684	7.26E-01	0.000004	32250
% top education in religion in GOR	1.89258339	0.17351265	1.19E-27	0.003475	32250
% top education in unemployment in GOR	-0.120301404	0.216058201	5.78E-01	0.00001	32250
% top education in wealth in GOR	1.816655598	0.076206992	1.60E-124	0.017056	32250
% top earnings in age in GOR	2.337088591	0.406035885	8.70E-09	0.001159	32250

% top earnings in education in GOR	2.071376921	0.124734259	1.13E-61	0.007599	32250
% top earnings in gender in GOR	-1.297601486	0.370253254	4.58E-04	0.000375	32250
% top earnings in LA	0.34074045	0.113182856	2.61E-03	0.000272	32250
% top earnings in marital in GOR	4.227691483	0.229706799	2.93E-75	0.011154	32250
% top earnings in occupation in GOR	1.894638291	0.139286117	5.06E-42	0.005376	32250
% top earnings in parent in GOR	0.689991089	0.409546898	9.20E-02	0.000092	32250
% top earnings in political in GOR	0.994176269	0.229187285	1.44E-05	0.000521	32250
% top earnings in race in GOR	-0.790938723	0.440763817	7.27E-02	0.000101	32250
% top earnings in religion in GOR	-2.856721983	0.358174527	1.56E-15	0.001863	32250
% top earnings in wealth in GOR	2.521709142	0.136704586	1.37E-75	0.009829	32250
% top wealth in age in GOR	0.794520058	0.110879023	7.91E-13	0.001616	32250
% top wealth in education in GOR	1.32320091	0.075380161	1.16E-68	0.009397	32250
% top wealth in gender in GOR	0.378971949	0.1113685	6.68E-04	0.000356	32250
% top wealth in income in GOR	0.642482056	0.095124098	1.46E-11	0.001387	32250
% top wealth in LA	0.666773022	0.066808493	2.01E-23	0.003126	32250
% top wealth in marital in GOR	1.769469222	0.090406247	8.26E-85	0.012305	32250
% top wealth in occupation in GOR	1.159092176	0.073405805	5.89E-56	0.008001	32250
% top wealth in parent in GOR	0.409597263	0.112105404	2.59E-04	0.00041	32250
% top wealth in political in GOR	0.598619584	0.113043477	1.19E-07	0.000868	32250
% top wealth in race in GOR	0.432317855	0.110428904	9.06E-05	0.000472	32250
% top wealth in religion in GOR	0.928686577	0.110962654	6.02E-17	0.002127	32250
% top wealth in unemployment	0.53935416	0.112323424	1.58E-06	0.000721	32250
% unemployed in age in GOR	3.696917263	1.09288237	7.19E-04	0.000387	32250
% unemployed in education in GOR	-0.658540729	0.527390716	2.12E-01	0.000046	32250
% unemployed in gender in GOR	-2.861443467	0.760925344	1.70E-04	0.00045	32250
% unemployed in income in GOR	-2.010758856	0.46690321	1.66E-05	0.000534	32250

% unemployed in LA	-1.051250475	0.253356264	3.34E-05	0.000588	32250
% unemployed in marital in GOR	-3.40486544	0.511131519	2.76E-11	0.001718	32250
% unemployed in occupation in GOR	-5.21818329	0.688752861	3.65E-14	0.001841	32250
% unemployed in parent in GOR	-4.399699771	0.684688258	1.33E-10	0.001441	32250
% unemployed in political in GOR	-2.00534202	0.853688098	1.88E-02	0.000167	32250
% unemployed in race in GOR	-2.0928289	0.939448463	2.59E-02	0.000161	32250
% unemployed in religion in GOR	-7.79658571	0.820529534	2.20E-21	0.002638	32250
% unemployed in wealth in GOR	-4.656208715	0.461997872	7.47E-24	0.003787	32250
Average income in age in GOR	0.000011729	0.000001528	1.69E-14	0.001912	32250
Average income in education in GOR	0.000016639	0.000000917	3.18E-73	0.009338	32250
Average income in gender in GOR	-0.000005325	0.000002409	2.71E-02	0.000152	32250
Average income in LA	0.000004711	0.000000978	1.45E-06	0.000754	32250
Average income in marital in GOR	0.000030582	0.000001636	1.33E-77	0.011842	32250
Average income in occupation in GOR	0.000016818	0.00000111	1.00E-51	0.006988	32250
Average income in parent in GOR	0.000000525	0.000002806	8.52E-01	0.000001	32250
Average income in political in GOR	0.000008311	0.00000193	1.66E-05	0.000545	32250
Average income in race in GOR	-0.000002032	0.000002731	4.57E-01	0.000017	32250
Average income in religion in GOR	0.000007802	0.000002668	3.46E-03	0.000251	32250
Average income in wealth in GOR	0.000012717	0.000000682	3.93E-77	0.011764	32250
Average earnings in age in GOR	0.00000254	0.00000072	4.19E-04	0.000395	32250
Average earnings in education in GOR	0.000017979	0.000001028	3.81E-68	0.008932	32250
Average earnings in gender in GOR	-0.000010511	0.000002559	4.01E-05	0.000515	32250
Average earnings in LA	0.000001839	0.000001101	9.48E-02	0.000087	32250
Average earnings in marital in GOR	0.000025942	0.000001367	6.62E-80	0.012438	32250
Average earnings in occupation in GOR	0.000016218	0.000001273	4.30E-37	0.00474	32250
Average earnings in parent in GOR	0.000008772	0.000003499	1.22E-02	0.000202	32250

Average earnings in political in GOR	0.000008582	0.000001455	3.67E-09	0.000952	32250
Average earnings in race in GOR	-0.000006534	0.000003531	6.43E-02	0.000105	32250
Average earnings in religion in GOR	-0.000035584	0.000002464	3.93E-47	0.005788	32250
Average earnings in wealth in GOR	0.000021003	0.00000156	3.40E-41	0.008311	32250
Average wealth in age in GOR	0.000000467	0.000000048	2.09E-22	0.002832	32250
Average wealth in education in GOR	0.000000527	0.00000003	3.88E-69	0.008812	32250
Average wealth in gender in GOR	0.000000174	0.000000057	2.51E-03	0.00028	32250
Average wealth in income in GOR	0.000000322	0.000000038	2.20E-17	0.001822	32250
Average wealth in LA	0.00000021	0.000000025	1.48E-16	0.002134	32250
Average wealth in marital in GOR	0.000000813	0.000000041	1.37E-85	0.012195	32250
Average wealth in occupation in GOR	0.000000491	0.000000033	3.84E-50	0.006876	32250
Average wealth in parent in GOR	0.000000281	0.000000057	7.08E-07	0.000743	32250
Average wealth in political in GOR	0.000000288	0.000000055	1.77E-07	0.000833	32250
Average wealth in race in GOR	0.00000021	0.000000056	1.93E-04	0.000423	32250
Average wealth in religion in GOR	0.000000484	0.000000052	2.01E-20	0.002532	32250
Average wealth in unemployment	0.000000276	0.000000059	2.89E-06	0.000681	32250
Distance from average income in age in GOR	0.000004526	0.000000365	2.80E-35	0.006334	32250
Distance from average income in education in GOR	0.000003406	0.000000317	6.49E-27	0.003411	32250
Distance from average income in gender in GOR	0.000004972	0.000000381	8.04E-39	0.00791	32250
Distance from average income in LA	0.000004672	0.000000362	4.33E-38	0.006552	32250
Distance from average income in marital in GOR	0.000003756	0.00000032	1.07E-31	0.004414	32250
Distance from average income in occupation in GOR	0.000003815	0.000000332	1.47E-30	0.004376	32250
Distance from average income in parent in GOR	0.000004865	0.000000374	1.44E-38	0.00759	32250
Distance from average income in political in GOR	0.000004728	0.000000369	1.70E-37	0.007078	32250
Distance from average income in race in GOR	0.000004893	0.000000375	9.93E-39	0.007686	32250
Distance from average income in religion in GOR	0.000004771	0.000000369	3.95E-38	0.007301	32250

Distance from average income in wealth in GOR	0.00000258	0.000000304	2.38E-17	0.001644	32250
Distance from average earnings in age in GOR	0.000004264	0.00000034	5.79E-36	0.004038	32250
Distance from average earnings in education in GOR	0.000002133	0.000000274	6.80E-15	0.001292	32250
Distance from average earnings in gender in GOR	0.000003842	0.00000028	1.13E-42	0.004424	32250
Distance from average earnings in LA	0.000003722	0.000000289	5.72E-38	0.003929	32250
Distance from average earnings in marital in GOR	0.000002164	0.000000268	7.56E-16	0.001348	32250
Distance from average earnings in occupation in GOR	0.000002814	0.000000277	3.05E-24	0.00228	32250
Distance from average earnings in parent in GOR	0.000003603	0.000000276	8.51E-39	0.00389	32250
Distance from average earnings in political in GOR	0.000003405	0.000000278	2.23E-34	0.003377	32250
Distance from average earnings in race in GOR	0.00000372	0.000000278	8.46E-41	0.004161	32250
Distance from average earnings in religion in GOR	0.000004242	0.000000286	1.40E-49	0.005367	32250
Distance from average earnings in wealth in GOR	0.00000243	0.000000269	1.89E-19	0.001718	32250
Distance from average wealth in age in GOR	0.000000125	0.000000012	2.44E-24	0.005835	32250
Distance from average wealth in education in GOR	0.000000101	0.00000001	2.37E-22	0.003616	32250
Distance from average wealth in gender in GOR	0.000000136	0.000000013	1.22E-24	0.006927	32250
Distance from average wealth in income in GOR	0.000000127	0.000000013	5.17E-24	0.005978	32250
Distance from average wealth in LA	0.000000124	0.000000012	6.81E-25	0.005278	32250
Distance from average wealth in marital in GOR	0.000000102	0.00000001	5.80E-23	0.003861	32250
Distance from average wealth in occupation in GOR	0.000000108	0.000000011	9.60E-23	0.004182	32250
Distance from average wealth in parent in GOR	0.000000133	0.000000013	1.03E-24	0.006644	32250
Distance from average wealth in political in GOR	0.000000132	0.000000013	1.19E-24	0.00659	32250
Distance from average wealth in race in GOR	0.000000134	0.000000013	1.09E-24	0.006813	32250
Distance from average wealth in religion in GOR	0.000000126	0.000000012	1.14E-24	0.005994	32250
Distance from average wealth in unemployment	0.000000133	0.000000013	1.15E-24	0.006687	32250
Distance from median education in age in GOR	0.046953825	0.002793214	3.83E-63	0.008568	32250
Distance from median education in gender in GOR	0.053575652	0.002733559	4.91E-85	0.011423	32250

Distance from median education in income in GOR	0.033025423	0.002699729	2.47E-34	0.004444	32250
Distance from median education in LA	0.040170076	0.002736965	1.30E-48	0.006375	32250
Distance from median education in marital in GOR	0.036786979	0.00284519	3.82E-38	0.005157	32250
Distance from median education in occupation in GOR	0.015250197	0.003149267	1.29E-06	0.000757	32250
Distance from median education in parent in GOR	0.054703597	0.002780694	1.18E-85	0.011618	32250
Distance from median education in political in GOR	0.050418417	0.002811357	1.43E-71	0.009674	32250
Distance from median education in race in GOR	0.053534673	0.002739885	1.58E-84	0.011356	32250
Distance from median education in religion in GOR	0.048568528	0.002808601	1.07E-66	0.008998	32250
Distance from median education in unemployment in GOR	0.05415213	0.002749161	7.23E-86	0.011597	32250
Distance from median education in wealth in GOR	0.005651887	0.002867413	4.87E-02	0.000115	32250
MacArthur ladder	0.015276572	0.000354206	0.00E+00	0.064828	31255
Median education in age in GOR	0.043792186	0.009268471	2.31E-06	0.000802	32250
Median education in gender in GOR	-0.013883221	0.005828941	1.72E-02	0.000172	32250
Median education in income in GOR	0.043071679	0.004184455	8.26E-25	0.002852	32250
Median education in LA	0.033708308	0.004973811	1.25E-11	0.001419	32250
Median education in marital in GOR	0.094732367	0.007497236	1.64E-36	0.005742	32250
Median education in occupation in GOR	0.053538937	0.003280468	1.22E-59	0.008094	32250
Median education in parent in GOR	-0.032110502	0.009390594	6.28E-04	0.000372	32250
Median education in political in GOR	0.013011551	0.00656132	4.74E-02	0.000116	32250
Median education in race in GOR	-0.024759633	0.008369767	3.10E-03	0.00028	32250
Median education in religion in GOR	0.046267019	0.009667459	1.71E-06	0.000719	32250
Median education in unemployment in GOR	-0.030949291	0.008545163	2.93E-04	0.000414	32250
Median education in wealth in GOR	0.094571317	0.003969693	2.28E-124	0.017065	32250
Rank income in age in GOR	0.212108553	0.01804444	7.75E-32	0.004531	32250
Rank income in education in GOR	0.299401492	0.019803156	1.83E-51	0.007067	32250
Rank income in gender in GOR	0.449158152	0.019571998	1.27E-115	0.01579	32250

Rank income in LA	0.375158693	0.018859407	1.59E-87	0.012133	32250
Rank income in marital in GOR	0.302585658	0.019543868	7.13E-54	0.007235	32250
Rank income in occupation in GOR	0.341478138	0.019577348	8.04E-68	0.009265	32250
Rank income in parent in GOR	0.432269856	0.019345906	9.37E-110	0.014918	32250
Rank income in political in GOR	0.420853784	0.019406893	1.54E-103	0.014118	32250
Rank income in race in GOR	0.440812799	0.019571875	1.80E-111	0.015253	32250
Rank income in religion in GOR	0.431022163	0.019327044	2.40E-109	0.014804	32250
Rank income in wealth in GOR	0.206736224	0.019179611	4.81E-27	0.003515	32250
Rank education in age in GOR	0.19009817	0.018699493	3.06E-24	0.003379	32250
Rank education in gender in GOR	0.396652609	0.020058131	1.59E-86	0.011806	32250
Rank education in income in GOR	0.307961192	0.019890898	7.12E-54	0.007249	32250
Rank education in LA	0.325621685	0.019418095	7.60E-63	0.008531	32250
Rank education in marital in GOR	0.309682283	0.020099497	2.26E-53	0.007239	32250
Rank education in occupation in GOR	0.242508213	0.020625355	7.48E-32	0.004289	32250
Rank education in parent in GOR	0.384862893	0.019782666	8.07E-84	0.011395	32250
Rank education in political in GOR	0.361883103	0.01978059	2.17E-74	0.010076	32250
Rank education in race in GOR	0.374608021	0.019911464	1.54E-78	0.010685	32250
Rank education in religion in GOR	0.340761538	0.019758536	2.37E-66	0.008981	32250
Rank education in unemployment in GOR	0.378155771	0.019953761	1.16E-79	0.010853	32250
Rank education in wealth in GOR	0.173326561	0.020124917	7.47E-18	0.00225	32250
Rank earnings in age in GOR	0.095238475	0.020262028	2.61E-06	0.000694	32250
Rank earnings in education in GOR	0.155627762	0.021764159	8.82E-13	0.001429	32250
Rank earnings in gender in GOR	0.275979408	0.021381667	5.09E-38	0.004569	32250
Rank earnings in LA	0.242328892	0.021024052	1.12E-30	0.00371	32250
Rank earnings in marital in GOR	0.137066475	0.02185905	3.65E-10	0.001082	32250
Rank earnings in occupation in GOR	0.217874903	0.021747274	1.37E-23	0.002826	32250

Rank earnings in parent in GOR	0.253060787	0.021321106	2.00E-32	0.003862	32250
Rank earnings in political in GOR	0.235531399	0.021522546	7.99E-28	0.0033	32250
Rank earnings in race in GOR	0.265313005	0.02144714	4.53E-35	0.004214	32250
Rank earnings in religion in GOR	0.315598441	0.021394189	4.34E-49	0.005964	32250
Rank earnings in wealth in GOR	0.191513601	0.02110866	1.22E-19	0.002269	32250
Rank wealth in age in GOR	0.291504338	0.018789695	4.37E-54	0.008257	32250
Rank wealth in education in GOR	0.419381404	0.020032414	1.13E-96	0.013771	32250
Rank wealth in gender in GOR	0.564847011	0.020364255	2.30E-167	0.024353	32250
Rank wealth in income in GOR	0.498715009	0.019798016	1.13E-138	0.020141	32250
Rank wealth in LA	0.472585844	0.019208885	1.98E-132	0.018889	32250
Rank wealth in marital in GOR	0.3914804	0.020304556	2.28E-82	0.01185	32250
Rank wealth in occupation in GOR	0.446083826	0.019947495	6.21E-110	0.015733	32250
Rank wealth in parent in GOR	0.550901784	0.01997858	1.87E-165	0.023834	32250
Rank wealth in political in GOR	0.537068049	0.019907118	1.52E-158	0.022758	32250
Rank wealth in race in GOR	0.560494368	0.020337647	2.82E-165	0.024014	32250
Rank wealth in religion in GOR	0.516643442	0.019886585	2.78E-147	0.021098	32250
Rank wealth in unemployment	0.5551047	0.020352255	5.83E-162	0.023572	32250
Well off friends	0.091672695	0.010172359	2.22E-19	0.005746	18701
Well off nearby	0.146544403	0.009364534	7.67E-55	0.015005	18289
Well off work	0.08168485	0.009512699	1.09E-17	0.011669	6924

Appendix Table 4.21: Results of OLS regressions explaining variance in life meaning in ELSA without controls from the relative variables. Robust standard errors.

Relative variable	Experienced affect last week				
	b	se	p	r2	n
% top income in age in GOR	2.5661503	0.40582333	2.59E-10	0.0012	32250
% top income in education in GOR	1.4474055	0.1335392	2.51E-27	0.0033	32250
% top income in gender in GOR	4.4623254	0.40184119	1.34E-28	0.0035	32250
% top income in LA	0.4651116	0.11299126	3.86E-05	0.0005	32250
% top income in marital in GOR	7.1605232	0.30809139	1.64E-118	0.0185	32250
% top income in occupation in GOR	2.1947111	0.16775981	5.21E-39	0.0051	32250
% top income in parent in GOR	0.97771	0.40989817	1.71E-02	0.0002	32250
% top income in political in GOR	1.5154861	0.32456906	3.04E-06	0.0007	32250
% top income in race in GOR	1.7441192	0.47025594	2.09E-04	0.0005	32250
% top income in religion in GOR	0.9744189	0.39150687	1.28E-02	0.0002	32250
% top income in wealth in GOR	1.7226272	0.09255605	6.54E-77	0.0082	32250
% top education in age in GOR	0.5928073	0.19992625	3.03E-03	0.0003	32250
% top education in gender in GOR	1.9472235	0.14819224	2.46E-39	0.0053	32250
% top education in income in GOR	1.1729397	0.10642435	3.39E-28	0.0031	32250
% top education in LA	0.3308356	0.08054772	4.01E-05	0.0005	32250
% top education in marital in GOR	3.0065792	0.15490653	1.94E-83	0.0146	32250
% top education in occupation in GOR	0.8158272	0.0615408	5.25E-40	0.0054	32250
% top education in parent in GOR	-0.2921569	0.20734792	1.59E-01	0.0001	32250
% top education in political in GOR	0.4492713	0.14323208	1.71E-03	0.0003	32250
% top education in race in GOR	-0.1894293	0.22950386	4.09E-01	0	32250
% top education in religion in GOR	0.2660166	0.17819373	1.35E-01	0.0001	32250
% top education in unemployment in GOR	0.1229873	0.22549841	5.85E-01	0	32250
% top education in wealth in GOR	1.8062558	0.07737958	1.60E-119	0.0169	32250

% top earnings in age in GOR	2.1593385	0.38313116	1.75E-08	0.001	32250
% top earnings in education in GOR	1.4214191	0.12588972	1.65E-29	0.0036	32250
% top earnings in gender in GOR	4.212508	0.35435194	1.60E-32	0.004	32250
% top earnings in LA	0.4924714	0.11082251	8.87E-06	0.0006	32250
% top earnings in marital in GOR	6.4021946	0.23551037	6.51E-161	0.0256	32250
% top earnings in occupation in GOR	1.5550041	0.13808662	2.32E-29	0.0036	32250
% top earnings in parent in GOR	0.9705552	0.39477109	1.40E-02	0.0002	32250
% top earnings in political in GOR	0.9421526	0.23630008	6.70E-05	0.0005	32250
% top earnings in race in GOR	1.0669653	0.45815129	1.99E-02	0.0002	32250
% top earnings in religion in GOR	-0.0177727	0.36248711	9.61E-01	0	32250
% top earnings in wealth in GOR	2.8017668	0.13387124	1.29E-96	0.0121	32250
% top wealth in age in GOR	0.5401875	0.1099086	8.93E-07	0.0007	32250
% top wealth in education in GOR	0.9433895	0.07638571	5.82E-35	0.0048	32250
% top wealth in gender in GOR	0.7263052	0.11276059	1.20E-10	0.0013	32250
% top wealth in income in GOR	0.6194971	0.09612872	1.18E-10	0.0013	32250
% top wealth in LA	0.5969539	0.06654414	3.10E-19	0.0025	32250
% top wealth in marital in GOR	2.2469043	0.09339728	9.15E-127	0.0198	32250
% top wealth in occupation in GOR	1.0281409	0.07502795	1.28E-42	0.0063	32250
% top wealth in parent in GOR	0.3712809	0.11363689	1.09E-03	0.0003	32250
% top wealth in political in GOR	0.5007445	0.11444065	1.21E-05	0.0006	32250
% top wealth in race in GOR	0.4870841	0.11228822	1.44E-05	0.0006	32250
% top wealth in religion in GOR	0.4510977	0.11319596	6.76E-05	0.0005	32250
% top wealth in unemployment	0.4359579	0.11300124	1.15E-04	0.0005	32250
% unemployed in age in GOR	0.5574629	1.08893761	6.09E-01	0	32250
% unemployed in education in GOR	-1.0561332	0.53800074	4.96E-02	0.0001	32250
% unemployed in gender in GOR	6.7428729	0.7586146	6.51E-19	0.0025	32250

% unemployed in income in GOR	-1.5322254	0.48218753	1.49E-03	0.0003	32250
% unemployed in LA	-0.5147219	0.25315487	4.20E-02	0.0001	32250
% unemployed in marital in GOR	-3.7032992	0.55430562	2.41E-11	0.002	32250
% unemployed in occupation in GOR	-5.0051893	0.69042475	4.28E-13	0.0017	32250
% unemployed in parent in GOR	-2.6942616	0.67567299	6.69E-05	0.0005	32250
% unemployed in political in GOR	-2.0457063	0.87522445	1.94E-02	0.0002	32250
% unemployed in race in GOR	-3.6574448	1.09561166	8.44E-04	0.0005	32250
% unemployed in religion in GOR	-2.0685711	0.84770164	1.47E-02	0.0002	32250
% unemployed in wealth in GOR	-6.6501275	0.52049215	2.73E-37	0.0077	32250
Average income in age in GOR	0.0000071	0.00000149	1.56E-06	0.0007	32250
Average income in education in GOR	0.0000124	0.00000093	5.44E-40	0.0052	32250
Average income in gender in GOR	0.0000329	0.00000235	2.48E-44	0.0058	32250
Average income in LA	0.0000069	0.00000104	4.13E-11	0.0016	32250
Average income in marital in GOR	0.000048	0.00000168	1.42E-176	0.0292	32250
Average income in occupation in GOR	0.0000159	0.00000113	3.58E-45	0.0063	32250
Average income in parent in GOR	0.0000121	0.00000272	7.80E-06	0.0006	32250
Average income in political in GOR	0.000012	0.00000194	5.60E-10	0.0011	32250
Average income in race in GOR	0.0000175	0.00000276	2.38E-10	0.0013	32250
Average income in religion in GOR	0.0000121	0.00000269	7.33E-06	0.0006	32250
Average income in wealth in GOR	0.0000131	0.0000007	5.35E-78	0.0125	32250
Average earnings in age in GOR	-0.0000006	0.00000072	3.71E-01	0	32250
Average earnings in education in GOR	0.000013	0.00000103	2.63E-36	0.0047	32250
Average earnings in gender in GOR	0.0000379	0.00000252	6.85E-51	0.0067	32250
Average earnings in LA	0.0000057	0.00000108	1.77E-07	0.0008	32250
Average earnings in marital in GOR	0.0000398	0.00000143	2.27E-168	0.0293	32250
Average earnings in occupation in GOR	0.0000133	0.00000127	7.56E-26	0.0032	32250

Average earnings in parent in GOR	0.0000093	0.00000338	5.91E-03	0.0002	32250
Average earnings in political in GOR	0.0000075	0.00000149	5.03E-07	0.0007	32250
Average earnings in race in GOR	0.0000071	0.00000365	5.19E-02	0.0001	32250
Average earnings in religion in GOR	-0.0000016	0.00000245	5.10E-01	0	32250
Average earnings in wealth in GOR	0.0000257	0.00000145	3.79E-70	0.0124	32250
Average wealth in age in GOR	0.0000003	0.00000005	8.63E-08	0.0009	32250
Average wealth in education in GOR	0.0000003	0.00000003	1.47E-28	0.0038	32250
Average wealth in gender in GOR	0.0000004	0.00000006	1.00E-13	0.0017	32250
Average wealth in income in GOR	0.0000003	0.00000004	3.92E-14	0.0015	32250
Average wealth in LA	0.0000002	0.00000003	9.59E-13	0.0016	32250
Average wealth in marital in GOR	0.000001	0.00000004	1.14E-132	0.02	32250
Average wealth in occupation in GOR	0.0000004	0.00000003	5.72E-36	0.0051	32250
Average wealth in parent in GOR	0.0000002	0.00000006	6.89E-04	0.0004	32250
Average wealth in political in GOR	0.0000002	0.00000006	1.64E-04	0.0005	32250
Average wealth in race in GOR	0.0000002	0.00000006	6.49E-05	0.0005	32250
Average wealth in religion in GOR	0.0000002	0.00000005	2.47E-04	0.0004	32250
Average wealth in unemployment	0.0000002	0.00000006	3.72E-05	0.0005	32250
Distance from average income in age in GOR	0.0000042	0.00000041	6.91E-25	0.0054	32250
Distance from average income in education in GOR	0.0000033	0.00000037	2.79E-19	0.0032	32250
Distance from average income in gender in GOR	0.0000038	0.00000037	3.10E-24	0.0046	32250
Distance from average income in LA	0.0000039	0.00000037	2.66E-25	0.0045	32250
Distance from average income in marital in GOR	0.0000025	0.00000032	2.53E-15	0.002	32250
Distance from average income in occupation in GOR	0.0000033	0.00000036	6.85E-20	0.0033	32250
Distance from average income in parent in GOR	0.0000042	0.00000039	1.64E-26	0.0056	32250
Distance from average income in political in GOR	0.0000041	0.00000039	1.89E-25	0.0053	32250
Distance from average income in race in GOR	0.0000041	0.00000039	5.57E-26	0.0054	32250

Distance from average income in religion in GOR	0.0000042	0.00000039	2.08E-26	0.0056	32250
Distance from average income in wealth in GOR	0.0000018	0.00000034	1.27E-07	0.0008	32250
Distance from average earnings in age in GOR	0.0000052	0.0000004	2.76E-38	0.006	32250
Distance from average earnings in education in GOR	0.0000026	0.00000028	1.07E-20	0.002	32250
Distance from average earnings in gender in GOR	0.0000031	0.00000028	1.94E-28	0.0029	32250
Distance from average earnings in LA	0.0000034	0.00000029	4.29E-31	0.0033	32250
Distance from average earnings in marital in GOR	0.0000013	0.00000027	9.25E-07	0.0005	32250
Distance from average earnings in occupation in GOR	0.000003	0.00000029	8.39E-26	0.0026	32250
Distance from average earnings in parent in GOR	0.0000036	0.00000029	6.55E-36	0.0039	32250
Distance from average earnings in political in GOR	0.0000035	0.00000029	6.89E-33	0.0035	32250
Distance from average earnings in race in GOR	0.0000036	0.00000029	3.36E-36	0.004	32250
Distance from average earnings in religion in GOR	0.0000037	0.00000029	1.32E-37	0.0042	32250
Distance from average earnings in wealth in GOR	0.0000022	0.00000027	2.85E-15	0.0013	32250
Distance from average wealth in age in GOR	0.0000001	0.00000001	6.97E-21	0.0058	32250
Distance from average wealth in education in GOR	0.0000001	0.00000001	1.07E-19	0.0042	32250
Distance from average wealth in gender in GOR	0.0000001	0.00000001	5.60E-21	0.0056	32250
Distance from average wealth in income in GOR	0.0000001	0.00000001	1.70E-20	0.0054	32250
Distance from average wealth in LA	0.0000001	0.00000001	5.59E-21	0.0049	32250
Distance from average wealth in marital in GOR	0.0000001	0.00000001	2.66E-18	0.0026	32250
Distance from average wealth in occupation in GOR	0.0000001	0.00000001	1.79E-19	0.004	32250
Distance from average wealth in parent in GOR	0.0000001	0.00000001	3.28E-21	0.0061	32250
Distance from average wealth in political in GOR	0.0000001	0.00000001	4.19E-21	0.0061	32250
Distance from average wealth in race in GOR	0.0000001	0.00000001	4.00E-21	0.006	32250
Distance from average wealth in religion in GOR	0.0000001	0.00000001	3.01E-21	0.0061	32250
Distance from average wealth in unemployment	0.0000001	0.00000001	3.87E-21	0.006	32250
Distance from median education in age in GOR	0.0323797	0.00280342	8.48E-31	0.0041	32250

Distance from median education in gender in GOR	0.0170225	0.00278638	1.01E-09	0.0012	32250
Distance from median education in income in GOR	0.0146576	0.0027239	7.45E-08	0.0009	32250
Distance from median education in LA	0.0237214	0.00278298	1.61E-17	0.0022	32250
Distance from median education in marital in GOR	0.0117108	0.00286443	4.36E-05	0.0005	32250
Distance from median education in occupation in GOR	0.0033691	0.00310262	2.78E-01	0	32250
Distance from median education in parent in GOR	0.0353556	0.00281697	4.77E-36	0.0049	32250
Distance from median education in political in GOR	0.0322466	0.00283154	5.45E-30	0.004	32250
Distance from median education in race in GOR	0.0330779	0.00278169	1.54E-32	0.0043	32250
Distance from median education in religion in GOR	0.0352459	0.00283616	2.24E-35	0.0047	32250
Distance from median education in unemployment in GOR	0.033868	0.00278976	7.67E-34	0.0045	32250
Distance from median education in wealth in GOR	-0.0158675	0.00293737	6.64E-08	0.0009	32250
MacArthur ladder	0.0122956	0.00038743	1.40E-217	0.0418	31255
Median education in age in GOR	0.0448504	0.00885082	4.06E-07	0.0008	32250
Median education in gender in GOR	0.085906	0.00609833	6.22E-45	0.0066	32250
Median education in income in GOR	0.0552005	0.00425174	1.91E-38	0.0047	32250
Median education in LA	0.0407417	0.00508023	1.10E-15	0.0021	32250
Median education in marital in GOR	0.1562455	0.00791116	2.60E-86	0.0156	32250
Median education in occupation in GOR	0.0473276	0.00334359	2.39E-45	0.0063	32250
Median education in parent in GOR	0.0203505	0.0096712	3.54E-02	0.0001	32250
Median education in political in GOR	0.0319025	0.006776	2.51E-06	0.0007	32250
Median education in race in GOR	0.029592	0.00869752	6.69E-04	0.0004	32250
Median education in religion in GOR	0.0302455	0.00967903	1.78E-03	0.0003	32250
Median education in unemployment in GOR	0.0246791	0.00874924	4.79E-03	0.0003	32250
Median education in wealth in GOR	0.1057355	0.00407129	3.45E-147	0.0213	32250
Rank income in age in GOR	0.198368	0.018936	1.23E-25	0.004	32250
Rank income in education in GOR	0.3732332	0.02028321	3.13E-75	0.011	32250

Rank income in gender in GOR	0.4248718	0.0202219	2.37E-97	0.0141	32250
Rank income in LA	0.3909732	0.01938037	6.00E-90	0.0132	32250
Rank income in marital in GOR	0.2645305	0.01997554	6.32E-40	0.0055	32250
Rank income in occupation in GOR	0.3895551	0.02010143	3.42E-83	0.0121	32250
Rank income in parent in GOR	0.4596453	0.01996173	2.21E-116	0.0169	32250
Rank income in political in GOR	0.4531773	0.01994795	2.31E-113	0.0164	32250
Rank income in race in GOR	0.4561939	0.0201893	3.55E-112	0.0163	32250
Rank income in religion in GOR	0.4582194	0.01988803	1.62E-116	0.0167	32250
Rank income in wealth in GOR	0.2152868	0.01976664	1.41E-27	0.0038	32250
Rank education in age in GOR	0.0949747	0.01894383	5.37E-07	0.0008	32250
Rank education in gender in GOR	0.2054425	0.02035714	6.51E-24	0.0032	32250
Rank education in income in GOR	0.1972175	0.01996468	5.57E-23	0.003	32250
Rank education in LA	0.2230369	0.01950184	3.13E-30	0.004	32250
Rank education in marital in GOR	0.1610636	0.02020987	1.64E-15	0.002	32250
Rank education in occupation in GOR	0.1440615	0.02060248	2.75E-12	0.0015	32250
Rank education in parent in GOR	0.2710965	0.0199791	7.97E-42	0.0057	32250
Rank education in political in GOR	0.2584007	0.01994847	2.80E-38	0.0051	32250
Rank education in race in GOR	0.2669158	0.02011119	4.29E-40	0.0054	32250
Rank education in religion in GOR	0.2634816	0.01991742	7.61E-40	0.0054	32250
Rank education in unemployment in GOR	0.2682578	0.02019459	3.67E-40	0.0055	32250
Rank education in wealth in GOR	0.0577485	0.02030581	4.46E-03	0.0002	32250
Rank earnings in age in GOR	0.1134734	0.02120159	8.75E-08	0.001	32250
Rank earnings in education in GOR	0.230235	0.02115507	1.55E-27	0.0031	32250
Rank earnings in gender in GOR	0.2581038	0.02114301	3.37E-34	0.004	32250
Rank earnings in LA	0.265755	0.02069862	1.22E-37	0.0045	32250
Rank earnings in marital in GOR	0.0985282	0.02142416	4.26E-06	0.0006	32250

Rank earnings in occupation in GOR	0.2756425	0.02136843	5.62E-38	0.0045	32250
Rank earnings in parent in GOR	0.294843	0.02103269	1.63E-44	0.0052	32250
Rank earnings in political in GOR	0.2883203	0.02106159	1.55E-42	0.0049	32250
Rank earnings in race in GOR	0.2992544	0.0211455	2.48E-45	0.0054	32250
Rank earnings in religion in GOR	0.3087557	0.02111276	2.81E-48	0.0057	32250
Rank earnings in wealth in GOR	0.207108	0.02059718	9.45E-24	0.0027	32250
Rank wealth in age in GOR	0.2735824	0.0199006	6.97E-43	0.0073	32250
Rank wealth in education in GOR	0.5083836	0.02103684	6.92E-128	0.0202	32250
Rank wealth in gender in GOR	0.5746175	0.02138705	2.85E-157	0.0252	32250
Rank wealth in income in GOR	0.5385687	0.02062026	7.98E-149	0.0235	32250
Rank wealth in LA	0.5006168	0.02014094	4.21E-135	0.0212	32250
Rank wealth in marital in GOR	0.3791001	0.02108403	6.23E-72	0.0111	32250
Rank wealth in occupation in GOR	0.5049188	0.02079005	3.94E-129	0.0202	32250
Rank wealth in parent in GOR	0.5883214	0.02097349	4.46E-171	0.0272	32250
Rank wealth in political in GOR	0.5779138	0.02085584	4.83E-167	0.0264	32250
Rank wealth in race in GOR	0.5915826	0.02136875	9.62E-167	0.0268	32250
Rank wealth in religion in GOR	0.5823549	0.02084237	9.00E-170	0.0268	32250
Rank wealth in unemployment	0.5930069	0.02138412	2.71E-167	0.0269	32250
Well off friends	0.1323757	0.01128593	1.16E-31	0.0119	18701
Well off nearby	0.1650974	0.01025248	6.07E-58	0.019	18289
Well off work	0.0627656	0.01015918	6.85E-10	0.0073	6924

Appendix Table 4.22: Results of OLS regressions explaining variance in experienced affect last week in ELSA without controls from the relative variables. Robust standard errors.

Relative variable	Life satisfaction (1)				
	b	se	p	r2	n
% top income in age in GOR	0.1701190970	0.7096207120	8.11E-01	0.126778702	32250
% top income in education in GOR	0.0511375750	0.3669560580	8.89E-01	0.126777533	32250
% top income in gender in GOR	-0.0797143000	0.7892545600	9.20E-01	0.126777284	32250
% top income in LA	0.2085216390	0.1120796610	6.28E-02	0.126867005	32250
% top income in marital in GOR	0.2886082860	0.5294419890	5.86E-01	0.126786064	32250
% top income in occupation in GOR	0.0831600150	0.4206606980	8.43E-01	0.126778091	32250
% top income in parent in GOR	0.5645050200	0.5963375890	3.44E-01	0.126803645	32250
% top income in political in GOR	0.0258451410	0.5592802390	9.63E-01	0.126777061	32250
% top income in race in GOR	1.0854204660	0.8079697270	1.79E-01	0.126826738	32250
% top income in religion in GOR	-0.1065642200	0.5292836010	8.40E-01	0.126778063	32250
% top income in wealth in GOR	1.0581852000	0.1057110300	1.49E-23	0.129065619	32250
% top education in age in GOR	-0.4537717000	0.4699276530	3.34E-01	0.126805507	32250
% top education in income in GOR	0.6398675940	0.1456439540	1.12E-05	0.127253126	32250
% top education in LA	0.0372646660	0.0877756740	6.71E-01	0.126781799	32250
% top education in parent in GOR	1.0803773220	0.4923763250	2.82E-02	0.126924142	32250
% top education in religion in GOR	0.3973032990	0.3742493290	2.88E-01	0.126805138	32250
% top education in unemployment in GOR	0.3316617650	0.5959692140	5.78E-01	0.126786798	32250
% top education in wealth in GOR	0.8481411150	0.1013673890	6.15E-17	0.128671456	32250
% top earnings in age in GOR	0.2085664200	0.6738322560	7.57E-01	0.126779781	32250
% top earnings in education in GOR	-0.2895518500	0.3278080580	3.77E-01	0.126798194	32250
% top earnings in gender in GOR	-0.0449284080	0.7124750300	9.50E-01	0.126777111	32250
% top earnings in LA	0.1994735360	0.1103293390	7.06E-02	0.126863472	32250
% top earnings in marital in GOR	-0.5038035780	0.5281150860	3.40E-01	0.126803546	32250
% top earnings in occupation in GOR	-0.4441898080	0.3515691800	2.06E-01	0.126819472	32250

% top earnings in parent in GOR	0.1903405820	0.6230143600	7.60E-01	0.126779622	32250
% top earnings in political in GOR	-0.3074778170	0.4514175260	4.96E-01	0.126789148	32250
% top earnings in race in GOR	1.1728473830	0.7368252120	1.11E-01	0.126843883	32250
% top earnings in religion in GOR	-0.6021069010	0.5128498630	2.40E-01	0.126811542	32250
% top earnings in wealth in GOR	1.2854090440	0.1532892010	5.25E-17	0.128473449	32250
% top wealth in income in GOR	0.8764836130	0.1545216500	1.42E-08	0.127558575	32250
% top wealth in LA	0.2495923320	0.0805908180	1.96E-03	0.12704659	32250
% unemployed in age in GOR	-2.0871955140	1.6149547380	1.96E-01	0.126825099	32250
% unemployed in education in GOR	-0.1053638700	0.5561483790	8.50E-01	0.126777994	32250
% unemployed in gender in GOR	-1.0119039870	1.1338142890	3.72E-01	0.126798494	32250
% unemployed in income in GOR	-0.5700946620	0.4680027830	2.23E-01	0.126814233	32250
% unemployed in LA	-0.2004555900	0.2322196890	3.88E-01	0.126797407	32250
% unemployed in marital in GOR	-0.0140788140	0.6619124180	9.83E-01	0.12677702	32250
% unemployed in occupation in GOR	-0.0336899890	0.7210390900	9.63E-01	0.126777064	32250
% unemployed in parent in GOR	-0.1452290150	0.8767094080	8.68E-01	0.12677782	32250
% unemployed in political in GOR	-0.8406534330	1.0141877850	4.07E-01	0.126794765	32250
% unemployed in race in GOR	-2.3597723320	1.1244409390	3.59E-02	0.126903175	32250
% unemployed in religion in GOR	-0.1371844750	1.0750596780	8.98E-01	0.126777442	32250
% unemployed in wealth in GOR	-0.4258158060	0.4732839000	3.68E-01	0.126802628	32250
Average income in age in GOR	0.0000076500	0.0000040000	5.60E-02	0.126875382	32250
Average income in LA	0.0000016800	0.0000009660	8.21E-02	0.126857976	32250
Average income in parent in GOR	0.0000131000	0.0000062300	3.59E-02	0.126911631	32250
Average income in race in GOR	0.0000172000	0.0000073200	1.85E-02	0.126932759	32250
Average income in religion in GOR	0.0000068200	0.0000056100	2.24E-01	0.126814868	32250
Average income in wealth in GOR	0.0000058200	0.0000007030	1.38E-16	0.128404478	32250
Average earnings in education in GOR	-0.0000012500	0.0000030800	6.84E-01	0.126781406	32250

Average earnings in LA	0.0000016100	0.0000011000	1.44E-01	0.126835564	32250
Average earnings in occupation in GOR	-0.0000017600	0.0000036200	6.27E-01	0.126783361	32250
Average earnings in parent in GOR	0.0000015300	0.0000069200	8.25E-01	0.126778344	32250
Average earnings in political in GOR	0.0000004210	0.0000040100	9.16E-01	0.126777286	32250
Average earnings in race in GOR	0.0000140000	0.0000065700	3.33E-02	0.126890293	32250
Average earnings in religion in GOR	0.0000007790	0.0000039700	8.45E-01	0.126777903	32250
Average earnings in wealth in GOR	0.0000063900	0.0000017200	1.99E-04	0.127248775	32250
Average wealth in age in GOR	0.0000000112	0.0000001230	9.27E-01	0.126777239	32250
Average wealth in income in GOR	0.0000001980	0.0000000509	9.83E-05	0.127118647	32250
Average wealth in LA	0.0000000581	0.0000000270	3.14E-02	0.126896987	32250
Average wealth in religion in GOR	-0.0000000343	0.0000001470	8.16E-01	0.126778392	32250
Distance from average income in age in GOR	0.0000028900	0.0000003550	4.03E-16	0.128437432	32250
Distance from average income in education in GOR	0.0000029000	0.0000003550	3.04E-16	0.128447797	32250
Distance from average income in gender in GOR	0.0000029400	0.0000003580	2.26E-16	0.128487913	32250
Distance from average income in LA	0.0000027400	0.0000003510	6.58E-15	0.128251307	32250
Distance from average income in marital in GOR	0.0000029200	0.0000003570	2.80E-16	0.128465567	32250
Distance from average income in occupation in GOR	0.0000029500	0.0000003590	1.94E-16	0.128506212	32250
Distance from average income in parent in GOR	0.0000029100	0.0000003560	3.22E-16	0.128452843	32250
Distance from average income in political in GOR	0.0000029200	0.0000003570	3.11E-16	0.128466217	32250
Distance from average income in race in GOR	0.0000029100	0.0000003560	3.27E-16	0.128458583	32250
Distance from average income in religion in GOR	0.0000029300	0.0000003570	2.52E-16	0.128479279	32250
Distance from average income in wealth in GOR	0.0000017700	0.0000003360	1.39E-07	0.127320323	32250
Distance from average earnings in age in GOR	0.0000022800	0.0000004250	8.45E-08	0.127460976	32250
Distance from average earnings in education in GOR	0.0000023000	0.0000004250	5.93E-08	0.127473898	32250
Distance from average earnings in gender in GOR	0.0000022700	0.0000004240	8.63E-08	0.127452759	32250
Distance from average earnings in LA	0.0000019100	0.0000004110	3.35E-06	0.127279084	32250

Distance from average earnings in marital in GOR	0.0000022500	0.0000004230	1.07E-07	0.127441258	32250
Distance from average earnings in occupation in GOR	0.0000023100	0.0000004250	5.65E-08	0.127475077	32250
Distance from average earnings in parent in GOR	0.0000022800	0.0000004250	8.42E-08	0.127455763	32250
Distance from average earnings in political in GOR	0.0000022700	0.0000004230	7.91E-08	0.127455317	32250
Distance from average earnings in race in GOR	0.0000022200	0.0000004220	1.49E-07	0.127422177	32250
Distance from average earnings in religion in GOR	0.0000022700	0.0000004230	7.64E-08	0.127453753	32250
Distance from average earnings in wealth in GOR	0.0000016700	0.0000003980	2.84E-05	0.127152529	32250
Distance from average wealth in age in GOR	0.0000000456	0.0000000122	1.97E-04	0.127423456	32250
Distance from average wealth in education in GOR	0.0000000440	0.0000000121	2.77E-04	0.127377503	32250
Distance from average wealth in gender in GOR	0.0000000450	0.0000000122	2.19E-04	0.127408844	32250
Distance from average wealth in income in GOR	0.0000000400	0.0000000118	6.79E-04	0.127275815	32250
Distance from average wealth in LA	0.0000000413	0.0000000121	6.21E-04	0.127277742	32250
Distance from average wealth in marital in GOR	0.0000000461	0.0000000123	1.72E-04	0.127438967	32250
Distance from average wealth in occupation in GOR	0.0000000465	0.0000000123	1.61E-04	0.127447332	32250
Distance from average wealth in parent in GOR	0.0000000456	0.0000000122	1.89E-04	0.127425139	32250
Distance from average wealth in political in GOR	0.0000000457	0.0000000122	1.89E-04	0.127426585	32250
Distance from average wealth in race in GOR	0.0000000450	0.0000000122	2.18E-04	0.127409302	32250
Distance from average wealth in religion in GOR	0.0000000457	0.0000000122	1.75E-04	0.127427856	32250
Distance from average wealth in unemployment	0.0000000453	0.0000000122	2.05E-04	0.127416612	32250
Distance from median education in income in GOR	-0.0250495220	0.0064183660	9.53E-05	0.127160649	32250
Distance from median education in LA	-0.0117035300	0.0054642240	3.22E-02	0.126899816	32250
Distance from median education in wealth in GOR	-0.0436777910	0.0053684370	4.23E-16	0.128626349	32250
MacArthur ladder	0.0165144840	0.0003856350	0.00E+00	0.185194705	31255
Median education in age in GOR	-0.0131589590	0.0128111090	3.04E-01	0.126805991	32250
Median education in gender in GOR	-0.0067004900	0.0117808510	5.70E-01	0.126785877	32250
Median education in income in GOR	0.0250495220	0.0064183660	9.53E-05	0.127160649	32250

Median education in LA	0.0117035300	0.0054642240	3.22E-02	0.126899816	32250
Median education in marital in GOR	0.0087284380	0.0141439080	5.37E-01	0.126787741	32250
Median education in parent in GOR	0.0014511400	0.0125388460	9.08E-01	0.126777348	32250
Median education in political in GOR	-0.0060745730	0.0132429000	6.46E-01	0.126782095	32250
Median education in race in GOR	-0.0066002430	0.0134982150	6.25E-01	0.126783023	32250
Median education in religion in GOR	-0.0118467110	0.0148475090	4.25E-01	0.126792724	32250
Median education in unemployment in GOR	-0.0136729010	0.0152265550	3.69E-01	0.126797803	32250
Median education in wealth in GOR	0.0436777910	0.0053684370	4.23E-16	0.128626349	32250
Rank income in age in GOR	0.1671580520	0.0287038810	5.82E-09	0.127782311	32250
Rank income in education in GOR	0.2565675600	0.0291409910	1.38E-18	0.129129791	32250
Rank income in gender in GOR	0.2884844170	0.0325750850	8.71E-19	0.129188635	32250
Rank income in LA	0.2200386070	0.0275321980	1.37E-15	0.128719934	32250
Rank income in marital in GOR	0.2739881820	0.0308061830	6.20E-19	0.1291764	32250
Rank income in occupation in GOR	0.2733586230	0.0301242140	1.21E-19	0.12929399	32250
Rank income in parent in GOR	0.2883519170	0.0322817780	4.39E-19	0.1292193	32250
Rank income in political in GOR	0.2832555780	0.0316315750	3.58E-19	0.129220343	32250
Rank income in race in GOR	0.2972513330	0.0327413640	1.16E-19	0.12930947	32250
Rank income in religion in GOR	0.2971808330	0.0321619550	2.61E-20	0.129372365	32250
Rank income in wealth in GOR	0.1413527950	0.0272408300	2.13E-07	0.127609121	32250
Rank education in age in GOR	-0.0685333810	0.0461979610	1.38E-01	0.126838178	32250
Rank education in wealth in GOR	-0.4938513710	0.0553587850	4.86E-19	0.128957596	32250
Rank earnings in age in GOR	0.1511986450	0.0461444610	1.05E-03	0.127066401	32250
Rank earnings in LA	0.1366773800	0.0536710910	1.09E-02	0.126945365	32250
Rank wealth in age in GOR	0.1928585620	0.0286867050	1.81E-11	0.128106131	32250
Rank wealth in education in GOR	0.2351130490	0.0277946350	2.81E-17	0.128865336	32250
Rank wealth in gender in GOR	0.2814264190	0.0309771440	1.09E-19	0.129217504	32250

Rank wealth in income in GOR	0.2114280380	0.0279159310	3.72E-14	0.128419744	32250
Rank wealth in LA	0.2182709060	0.0250074710	2.71E-18	0.128951495	32250
Rank wealth in marital in GOR	0.2544384230	0.0287730230	9.79E-19	0.128990226	32250
Rank wealth in occupation in GOR	0.2469867480	0.0278284620	7.33E-19	0.129059948	32250
Rank wealth in parent in GOR	0.2887453220	0.0299118900	5.10E-22	0.129507911	32250
Rank wealth in political in GOR	0.2780887700	0.0295927640	5.96E-21	0.129363843	32250
Rank wealth in race in GOR	0.2873779010	0.0308443000	1.27E-20	0.129328072	32250
Rank wealth in religion in GOR	0.2842994050	0.0295144090	6.24E-22	0.129486771	32250
Rank wealth in unemployment	0.2888360710	0.0309632700	1.14E-20	0.129350354	32250
Well off friends	0.1630210120	0.0103013170	4.82E-56	0.146046131	18701
Well off nearby	0.1916812930	0.0093645600	4.42E-92	0.150855765	18289
Well off work	0.0829494670	0.0102824480	8.43E-16	0.114000711	6924

Appendix Table 4.23: Results of OLS regressions explaining variance in life satisfaction (1) in ELSA with controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	**Life satisfaction (2)**				
	b	se	p	r2	n
% top income in age in GOR	-0.7351685100	0.7083068320	2.99E-01	0.131387481	32250
% top income in education in GOR	-0.0343183540	0.3564314290	9.23E-01	0.131356	32250
% top income in gender in GOR	-0.6027140100	0.7949212050	4.48E-01	0.131371749	32250
% top income in LA	0.2622203260	0.1098524990	1.70E-02	0.131498085	32250
% top income in marital in GOR	0.5089183490	0.5307351740	3.38E-01	0.131383934	32250
% top income in occupation in GOR	-0.1849521240	0.4139630800	6.55E-01	0.131361139	32250
% top income in parent in GOR	-0.5945978550	0.5818221490	3.07E-01	0.131385319	32250
% top income in political in GOR	-0.1624531720	0.5443229460	7.65E-01	0.131358026	32250

% top income in race in GOR	0.4220585580	0.8013248570	5.98E-01	0.131363282	32250
% top income in religion in GOR	-0.2998765470	0.5319136480	5.73E-01	0.13136415	32250
% top income in wealth in GOR	1.2180508030	0.1044820580	2.42E-31	0.134388117	32250
% top education in age in GOR	-0.4608915910	0.4751505820	3.32E-01	0.131385166	32250
% top education in income in GOR	0.4507862820	0.1417274810	1.47E-03	0.13159207	32250
% top education in LA	0.0899192250	0.0882341320	3.08E-01	0.131383681	32250
% top education in parent in GOR	0.3789164600	0.4840928070	4.34E-01	0.131373861	32250
% top education in religion in GOR	0.2240571060	0.3772647860	5.53E-01	0.13136471	32250
% top education in unemployment in GOR	0.4106497790	0.5842192600	4.82E-01	0.131370777	32250
% top education in wealth in GOR	1.1221749680	0.1008043030	9.87E-29	0.134672174	32250
% top earnings in age in GOR	-0.4420789680	0.6718012750	5.11E-01	0.131368236	32250
% top earnings in education in GOR	-0.6730078940	0.3159154300	3.32E-02	0.131470241	32250
% top earnings in gender in GOR	-0.2870494770	0.7134878590	6.87E-01	0.131360126	32250
% top earnings in LA	0.1377132460	0.1091828370	2.07E-01	0.131396975	32250
% top earnings in marital in GOR	-0.2333865760	0.5264927990	6.58E-01	0.131361458	32250
% top earnings in occupation in GOR	-0.3200140480	0.3460641960	3.55E-01	0.131377805	32250
% top earnings in parent in GOR	0.4551939600	0.6119110680	4.57E-01	0.131370736	32250
% top earnings in political in GOR	-0.3674072930	0.4405593450	4.04E-01	0.131373102	32250
% top earnings in race in GOR	0.5274130950	0.7590166040	4.87E-01	0.131369286	32250
% top earnings in religion in GOR	-0.6211257300	0.5208636140	2.33E-01	0.131392516	32250
% top earnings in wealth in GOR	1.3896911060	0.1505424350	2.83E-20	0.133338629	32250
% top wealth in income in GOR	0.7212406750	0.1501870800	1.58E-06	0.131884988	32250
% top wealth in LA	0.3675318060	0.0791878370	3.48E-06	0.131940317	32250
% unemployed in age in GOR	-1.7481336170	1.6317753230	2.84E-01	0.1313895	32250
% unemployed in education in GOR	-0.5534071590	0.5602210330	3.23E-01	0.131383074	32250
% unemployed in gender in GOR	-0.3036013330	1.1402029220	7.90E-01	0.131357696	32250

% unemployed in income in GOR	-0.6450414520	0.4691834520	1.69E-01	0.131403423	32250
% unemployed in LA	-0.3045177790	0.2307525860	1.87E-01	0.131402848	32250
% unemployed in marital in GOR	0.3007096650	0.6481414800	6.43E-01	0.131363024	32250
% unemployed in occupation in GOR	-0.7650673810	0.7354958730	2.98E-01	0.131386505	32250
% unemployed in parent in GOR	0.4089829420	0.8505624570	6.31E-01	0.131362237	32250
% unemployed in political in GOR	-0.7174386220	1.0123255850	4.79E-01	0.131368698	32250
% unemployed in race in GOR	-1.5767416780	1.1615601250	1.75E-01	0.131412092	32250
% unemployed in religion in GOR	-0.2401016570	1.0644431160	8.22E-01	0.131357102	32250
% unemployed in wealth in GOR	-1.1116111600	0.4831330970	2.14E-02	0.131530385	32250
Average income in age in GOR	0.0000081000	0.0000040400	4.53E-02	0.131465821	32250
Average income in LA	0.0000013600	0.0000009500	1.51E-01	0.131409249	32250
Average income in parent in GOR	0.0000056600	0.0000061300	3.55E-01	0.13138102	32250
Average income in race in GOR	0.0000101000	0.0000074600	1.74E-01	0.131409696	32250
Average income in religion in GOR	0.0000036300	0.0000055900	5.16E-01	0.13136645	32250
Average income in wealth in GOR	0.0000071500	0.0000007050	3.88E-24	0.13381514	32250
Average earnings in education in GOR	-0.0000019900	0.0000029800	5.05E-01	0.131366817	32250
Average earnings in LA	0.0000015800	0.0000011000	1.50E-01	0.131412565	32250
Average earnings in occupation in GOR	-0.0000017700	0.0000035600	6.18E-01	0.131362228	32250
Average earnings in parent in GOR	0.0000028400	0.0000068300	6.77E-01	0.131360408	32250
Average earnings in political in GOR	0.0000002910	0.0000039200	9.41E-01	0.131355897	32250
Average earnings in race in GOR	0.0000065500	0.0000066900	3.28E-01	0.131380591	32250
Average earnings in religion in GOR	0.0000016000	0.0000041500	7.00E-01	0.131359544	32250
Average earnings in wealth in GOR	0.0000075800	0.0000015200	6.27E-07	0.132020158	32250
Average wealth in age in GOR	0.0000002270	0.0000001200	5.87E-02	0.131451576	32250
Average wealth in income in GOR	0.0000001690	0.0000000475	3.77E-04	0.131603682	32250
Average wealth in LA	0.0000000770	0.0000000254	2.44E-03	0.131566395	32250

Average wealth in religion in GOR	0.0000000877	0.0000001460	5.49E-01	0.131364822	32250
Distance from average income in age in GOR	0.0000023600	0.0000003200	1.65E-13	0.132464016	32250
Distance from average income in education in GOR	0.0000024000	0.0000003210	7.99E-14	0.132499353	32250
Distance from average income in gender in GOR	0.0000024200	0.0000003230	6.23E-14	0.132521574	32250
Distance from average income in LA	0.0000022500	0.0000003200	1.91E-12	0.132354596	32250
Distance from average income in marital in GOR	0.0000023700	0.0000003210	1.43E-13	0.132472056	32250
Distance from average income in occupation in GOR	0.0000024700	0.0000003250	3.14E-14	0.132561393	32250
Distance from average income in parent in GOR	0.0000024100	0.0000003230	8.07E-14	0.132508027	32250
Distance from average income in political in GOR	0.0000024300	0.0000003230	5.41E-14	0.132529379	32250
Distance from average income in race in GOR	0.0000024000	0.0000003220	8.71E-14	0.132502805	32250
Distance from average income in religion in GOR	0.0000024200	0.0000003230	6.84E-14	0.132514455	32250
Distance from average income in wealth in GOR	0.0000007990	0.0000003230	1.34E-02	0.131466351	32250
Distance from average earnings in age in GOR	0.0000015900	0.0000003760	2.22E-05	0.13169051	32250
Distance from average earnings in education in GOR	0.0000016600	0.0000003780	1.18E-05	0.131716008	32250
Distance from average earnings in gender in GOR	0.0000016400	0.0000003770	1.38E-05	0.13170758	32250
Distance from average earnings in LA	0.0000012800	0.0000003770	6.70E-04	0.131581458	32250
Distance from average earnings in marital in GOR	0.0000015800	0.0000003750	2.58E-05	0.131683846	32250
Distance from average earnings in occupation in GOR	0.0000016400	0.0000003770	1.32E-05	0.131710036	32250
Distance from average earnings in parent in GOR	0.0000016100	0.0000003760	1.97E-05	0.131693521	32250
Distance from average earnings in political in GOR	0.0000016100	0.0000003760	1.82E-05	0.131696592	32250
Distance from average earnings in race in GOR	0.0000015900	0.0000003760	2.42E-05	0.131686064	32250
Distance from average earnings in religion in GOR	0.0000016000	0.0000003760	2.16E-05	0.131690798	32250
Distance from average earnings in wealth in GOR	0.0000009210	0.0000003680	1.23E-02	0.13147021	32250
Distance from average wealth in age in GOR	0.0000000583	0.0000000106	3.61E-08	0.1324111	32250
Distance from average wealth in education in GOR	0.0000000585	0.0000000106	3.28E-08	0.13241854	32250
Distance from average wealth in gender in GOR	0.0000000597	0.0000000107	2.38E-08	0.132466187	32250

Distance from average wealth in income in GOR	0.0000000547	0.0000000103	9.60E-08	0.132289563	32250
Distance from average wealth in LA	0.0000000538	0.0000000102	1.58E-07	0.132205023	32250
Distance from average wealth in marital in GOR	0.0000000601	0.0000000107	2.18E-08	0.132478988	32250
Distance from average wealth in occupation in GOR	0.0000000594	0.0000000107	2.49E-08	0.132453442	32250
Distance from average wealth in parent in GOR	0.0000000595	0.0000000107	2.43E-08	0.132460703	32250
Distance from average wealth in political in GOR	0.0000000591	0.0000000106	2.81E-08	0.132442773	32250
Distance from average wealth in race in GOR	0.0000000586	0.0000000106	3.11E-08	0.132428852	32250
Distance from average wealth in religion in GOR	0.0000000592	0.0000000106	2.43E-08	0.132446661	32250
Distance from average wealth in unemployment	0.0000000590	0.0000000106	2.88E-08	0.132441287	32250
Distance from median education in income in GOR	-0.0209898250	0.0063456570	9.42E-04	0.131625131	32250
Distance from median education in LA	-0.0054709780	0.0054830910	3.18E-01	0.131382599	32250
Distance from median education in wealth in GOR	-0.0580529140	0.0053071230	8.43E-28	0.134622729	32250
MacArthur ladder	0.0153008910	0.0003856800	0.00E+00	0.182512715	31255
Median education in age in GOR	-0.0179425850	0.0130256220	1.68E-01	0.131409654	32250
Median education in gender in GOR	0.0028661390	0.0117386800	8.07E-01	0.131357385	32250
Median education in income in GOR	0.0209898250	0.0063456570	9.42E-04	0.131625131	32250
Median education in LA	0.0054709780	0.0054830910	3.18E-01	0.131382599	32250
Median education in marital in GOR	-0.0066744540	0.0143270760	6.41E-01	0.13136204	32250
Median education in parent in GOR	-0.0063194600	0.0128318100	6.22E-01	0.13136229	32250
Median education in political in GOR	-0.0082575450	0.0137590480	5.48E-01	0.131365168	32250
Median education in race in GOR	-0.0132524070	0.0143417620	3.55E-01	0.131380026	32250
Median education in religion in GOR	-0.0125950390	0.0153323660	4.11E-01	0.131373531	32250
Median education in unemployment in GOR	-0.0129941090	0.0156669370	4.07E-01	0.131374547	32250
Median education in wealth in GOR	0.0580529140	0.0053071230	8.43E-28	0.134622729	32250
Rank income in age in GOR	0.1854773060	0.0287405700	1.11E-10	0.132593492	32250
Rank income in education in GOR	0.2468035130	0.0293545090	4.35E-17	0.133532879	32250

Rank income in gender in GOR	0.2745632180	0.0326671530	4.46E-17	0.133540256	32250
Rank income in LA	0.1910975280	0.0274249480	3.28E-12	0.132821207	32250
Rank income in marital in GOR	0.2446706620	0.0310078840	3.10E-15	0.133269145	32250
Rank income in occupation in GOR	0.2641461320	0.0304569370	4.41E-18	0.133705956	32250
Rank income in parent in GOR	0.2727119700	0.0324282840	4.28E-17	0.133540307	32250
Rank income in political in GOR	0.2698030370	0.0317408600	1.97E-17	0.133572531	32250
Rank income in race in GOR	0.2798901270	0.0329600210	2.12E-17	0.133601045	32250
Rank income in religion in GOR	0.2781809020	0.0323463690	8.32E-18	0.133629869	32250
Rank income in wealth in GOR	0.0677705970	0.0274432690	1.35E-02	0.131547037	32250
Rank education in age in GOR	-0.0265216490	0.0458293240	5.63E-01	0.131364923	32250
Rank education in wealth in GOR	-0.6298086700	0.0547727100	1.54E-30	0.134902256	32250
Rank earnings in age in GOR	0.0995375310	0.0444531470	2.52E-02	0.131481183	32250
Rank earnings in LA	0.0734446220	0.0536394430	1.71E-01	0.131404377	32250
Rank wealth in age in GOR	0.2799322940	0.0281870460	3.29E-23	0.134155999	32250
Rank wealth in education in GOR	0.3204840050	0.0271481340	4.28E-32	0.135236004	32250
Rank wealth in gender in GOR	0.3804205210	0.0305580800	1.71E-35	0.135815167	32250
Rank wealth in income in GOR	0.2875409490	0.0273135740	7.12E-26	0.134394149	32250
Rank wealth in LA	0.2410730050	0.0248087150	2.73E-22	0.134008309	32250
Rank wealth in marital in GOR	0.3348624550	0.0284496980	6.45E-32	0.135189237	32250
Rank wealth in occupation in GOR	0.3331093520	0.0273351960	4.38E-34	0.135508377	32250
Rank wealth in parent in GOR	0.3751435140	0.0294974960	5.78E-37	0.135965455	32250
Rank wealth in political in GOR	0.3673357730	0.0291095780	2.02E-36	0.135869423	32250
Rank wealth in race in GOR	0.3758373850	0.0304462570	6.27E-35	0.135719064	32250
Rank wealth in religion in GOR	0.3707125500	0.0290783910	3.90E-37	0.135963149	32250
Rank wealth in unemployment	0.3768729430	0.0305336280	6.38E-35	0.135736891	32250
Well off friends	0.1483479110	0.0096540300	5.80E-53	0.144385832	18701

Well off nearby	0.1662999640	0.0091293870	1.73E-73	0.146311805	18289
Well off work	0.0894021710	0.0096786060	3.31E-20	0.118054725	6924

Appendix Table 4.24: Results of OLS regressions explaining variance in life satisfaction (2) in ELSA with controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	**Life meaning**				
	b	se	p	r2	n
% top income in age in GOR	1.705261120	0.768489226	2.65E-02	0.083380924	32250
% top income in education in GOR	0.311852668	0.360492437	3.87E-01	0.083229918	32250
% top income in gender in GOR	0.342244685	0.813385179	6.74E-01	0.083215417	32250
% top income in LA	0.121362207	0.115436351	2.93E-01	0.083240749	32250
% top income in marital in GOR	0.400521657	0.542623613	4.60E-01	0.083227712	32250
% top income in occupation in GOR	0.037816416	0.423075621	9.29E-01	0.083210487	32250
% top income in parent in GOR	-0.293253880	0.614112327	6.33E-01	0.083217452	32250
% top income in political in GOR	-0.565377706	0.556074129	3.09E-01	0.083237689	32250
% top income in race in GOR	-0.144109689	0.825034329	8.61E-01	0.083211139	32250
% top income in religion in GOR	-0.274879528	0.527938418	6.03E-01	0.08321731	32250
% top income in wealth in GOR	0.395128194	0.107426148	2.35E-04	0.083529361	32250
% top education in age in GOR	0.729568879	0.522303732	1.62E-01	0.083283941	32250
% top education in income in GOR	0.461324702	0.145244265	1.49E-03	0.083457748	32250
% top education in LA	-0.087286022	0.090494582	3.35E-01	0.08323657	32250
% top education in parent in GOR	-0.739358359	0.506230541	1.44E-01	0.083279173	32250
% top education in religion in GOR	0.527888957	0.374349029	1.59E-01	0.08325993	32250
% top education in unemployment in GOR	-0.008723517	0.562487593	9.88E-01	0.083210269	32250
% top education in wealth in GOR	0.413780219	0.102231606	5.19E-05	0.083661169	32250

% top earnings in age in GOR	1.401783326	0.735655922	5.67E-02	0.083335687	32250
% top earnings in education in GOR	-0.171687214	0.319246326	5.91E-01	0.083217712	32250
% top earnings in gender in GOR	-0.564477008	0.740242548	4.46E-01	0.083227141	32250
% top earnings in LA	-0.015086185	0.113697926	8.94E-01	0.083210757	32250
% top earnings in marital in GOR	-0.543917583	0.537468409	3.12E-01	0.083241199	32250
% top earnings in occupation in GOR	-0.001825154	0.347630557	9.96E-01	0.083210263	32250
% top earnings in parent in GOR	0.143359942	0.645059235	8.24E-01	0.083211747	32250
% top earnings in political in GOR	0.020486974	0.451918655	9.64E-01	0.083210316	32250
% top earnings in race in GOR	-0.307260872	0.784964414	6.95E-01	0.083214852	32250
% top earnings in religion in GOR	-0.337606469	0.508306244	5.07E-01	0.083221121	32250
% top earnings in wealth in GOR	0.358384218	0.159545397	2.47E-02	0.083342135	32250
% top wealth in income in GOR	0.401196918	0.152802216	8.65E-03	0.083374018	32250
% top wealth in LA	0.134918018	0.082001453	9.99E-02	0.083289035	32250
% unemployed in age in GOR	2.284158843	1.706057518	1.81E-01	0.083267863	32250
% unemployed in education in GOR	0.125445325	0.547328221	8.19E-01	0.083211666	32250
% unemployed in gender in GOR	-0.058144968	1.176856186	9.61E-01	0.083210333	32250
% unemployed in income in GOR	-0.813204333	0.477861494	8.88E-02	0.083286013	32250
% unemployed in LA	-0.521293863	0.246496646	3.45E-02	0.083348246	32250
% unemployed in marital in GOR	0.601624572	0.651396112	3.56E-01	0.083239333	32250
% unemployed in occupation in GOR	-0.898356673	0.747824880	2.30E-01	0.08325265	32250
% unemployed in parent in GOR	0.517177601	0.904449771	5.67E-01	0.083220616	32250
% unemployed in political in GOR	1.335781873	1.029100104	1.94E-01	0.083255106	32250
% unemployed in race in GOR	-0.500121175	1.119155988	6.55E-01	0.083215929	32250
% unemployed in religion in GOR	0.132314479	1.062049079	9.01E-01	0.083210669	32250
% unemployed in wealth in GOR	0.857574885	0.474800466	7.09E-02	0.083314192	32250
Average income in age in GOR	0.000006038	0.000004163	1.47E-01	0.083271491	32250

Average income in LA	-0.000000006	0.000001012	9.96E-01	0.083210263	32250
Average income in parent in GOR	0.000001999	0.000006463	7.57E-01	0.083213407	32250
Average income in race in GOR	-0.000005466	0.000007447	4.63E-01	0.08322591	32250
Average income in religion in GOR	-0.000001551	0.000005490	7.77E-01	0.083212219	32250
Average income in wealth in GOR	0.000002178	0.000000698	1.80E-03	0.083438374	32250
Average earnings in education in GOR	0.000003703	0.000002980	2.14E-01	0.083248659	32250
Average earnings in LA	-0.000000856	0.000001132	4.50E-01	0.083226882	32250
Average earnings in occupation in GOR	0.000002242	0.000003554	5.28E-01	0.083220594	32250
Average earnings in parent in GOR	-0.000003736	0.000007185	6.03E-01	0.083218287	32250
Average earnings in political in GOR	0.000003125	0.000004005	4.35E-01	0.083225789	32250
Average earnings in race in GOR	-0.000001726	0.000006832	8.01E-01	0.083211988	32250
Average earnings in religion in GOR	-0.000007304	0.000004157	7.89E-02	0.083289299	32250
Average earnings in wealth in GOR	0.000000974	0.000001676	5.61E-01	0.083221219	32250
Average wealth in age in GOR	0.000000169	0.000000123	1.70E-01	0.083263497	32250
Average wealth in income in GOR	0.000000112	0.000000047	1.74E-02	0.08331904	32250
Average wealth in LA	0.000000016	0.000000028	5.76E-01	0.083218912	32250
Average wealth in religion in GOR	0.000000110	0.000000148	4.55E-01	0.083224604	32250
Distance from average income in age in GOR	0.000001211	0.000000302	6.11E-05	0.083501193	32250
Distance from average income in education in GOR	0.000001195	0.000000302	7.47E-05	0.083493651	32250
Distance from average income in gender in GOR	0.000001267	0.000000303	2.88E-05	0.083528384	32250
Distance from average income in LA	0.000001274	0.000000319	6.59E-05	0.083529342	32250
Distance from average income in marital in GOR	0.000001249	0.000000302	3.62E-05	0.083519719	32250
Distance from average income in occupation in GOR	0.000001294	0.000000303	1.95E-05	0.083542585	32250
Distance from average income in parent in GOR	0.000001255	0.000000303	3.50E-05	0.083522423	32250
Distance from average income in political in GOR	0.000001293	0.000000303	1.98E-05	0.083541547	32250
Distance from average income in race in GOR	0.000001276	0.000000303	2.59E-05	0.083533347	32250

Distance from average income in religion in GOR	0.000001268	0.000000303	2.79E-05	0.083529338	32250
Distance from average income in wealth in GOR	0.000000840	0.000000325	9.84E-03	0.083332536	32250
Distance from average earnings in age in GOR	0.000000932	0.000000376	1.33E-02	0.083324768	32250
Distance from average earnings in education in GOR	0.000000924	0.000000377	1.42E-02	0.083322421	32250
Distance from average earnings in gender in GOR	0.000001033	0.000000378	6.36E-03	0.08335004	32250
Distance from average earnings in LA	0.000001101	0.000000387	4.39E-03	0.083376707	32250
Distance from average earnings in marital in GOR	0.000000998	0.000000378	8.28E-03	0.083341143	32250
Distance from average earnings in occupation in GOR	0.000000969	0.000000377	1.02E-02	0.083333449	32250
Distance from average earnings in parent in GOR	0.000001023	0.000000379	6.95E-03	0.083347145	32250
Distance from average earnings in political in GOR	0.000000966	0.000000377	1.03E-02	0.083332728	32250
Distance from average earnings in race in GOR	0.000001012	0.000000378	7.43E-03	0.083344579	32250
Distance from average earnings in religion in GOR	0.000001088	0.000000380	4.23E-03	0.083365282	32250
Distance from average earnings in wealth in GOR	0.000000893	0.000000374	1.71E-02	0.083317783	32250
Distance from average wealth in age in GOR	0.000000020	0.000000007	6.68E-03	0.083331604	32250
Distance from average wealth in education in GOR	0.000000021	0.000000007	5.01E-03	0.0833412	32250
Distance from average wealth in gender in GOR	0.000000021	0.000000007	4.58E-03	0.083343332	32250
Distance from average wealth in income in GOR	0.000000018	0.000000007	1.47E-02	0.083306706	32250
Distance from average wealth in LA	0.000000020	0.000000008	8.21E-03	0.083328787	32250
Distance from average wealth in marital in GOR	0.000000022	0.000000007	2.79E-03	0.083358958	32250
Distance from average wealth in occupation in GOR	0.000000022	0.000000007	2.43E-03	0.08336316	32250
Distance from average wealth in parent in GOR	0.000000021	0.000000007	4.63E-03	0.083343187	32250
Distance from average wealth in political in GOR	0.000000020	0.000000007	4.89E-03	0.083340842	32250
Distance from average wealth in race in GOR	0.000000020	0.000000007	5.06E-03	0.083339981	32250
Distance from average wealth in religion in GOR	0.000000020	0.000000007	5.35E-03	0.083338801	32250
Distance from average wealth in unemployment	0.000000020	0.000000007	5.03E-03	0.083340404	32250
Distance from median education in income in GOR	-0.019629453	0.006384452	2.11E-03	0.083445847	32250

Distance from median education in LA	-0.002941513	0.005590380	5.99E-01	0.08321802	32250
Distance from median education in wealth in GOR	-0.017645995	0.005371858	1.02E-03	0.083512111	32250
MacArthur ladder	0.012125404	0.000394050	7.37E-205	0.114320733	31255
Median education in age in GOR	0.028479366	0.014091612	4.33E-02	0.083346037	32250
Median education in gender in GOR	-0.010492406	0.011946446	3.80E-01	0.08323202	32250
Median education in income in GOR	0.019629453	0.006384452	2.11E-03	0.083445847	32250
Median education in LA	0.002941513	0.005590380	5.99E-01	0.08321802	32250
Median education in marital in GOR	0.024406158	0.014889753	1.01E-01	0.083294206	32250
Median education in parent in GOR	-0.007074007	0.013339700	5.96E-01	0.083218443	32250
Median education in political in GOR	-0.012741567	0.014488534	3.79E-01	0.083232658	32250
Median education in race in GOR	0.010784390	0.014356130	4.53E-01	0.083226331	32250
Median education in religion in GOR	0.004901600	0.015639788	7.54E-01	0.083212953	32250
Median education in unemployment in GOR	0.006864248	0.015706826	6.62E-01	0.083215504	32250
Median education in wealth in GOR	0.017645995	0.005371858	1.02E-03	0.083512111	32250
Rank income in age in GOR	0.080858334	0.029462039	6.06E-03	0.083445493	32250
Rank income in education in GOR	0.115420338	0.029654663	9.96E-05	0.083686412	32250
Rank income in gender in GOR	0.135133750	0.033048860	4.34E-05	0.08373943	32250
Rank income in LA	0.096296141	0.027602212	4.86E-04	0.083582377	32250
Rank income in marital in GOR	0.112630831	0.031168000	3.02E-04	0.083615727	32250
Rank income in occupation in GOR	0.132090456	0.030692294	1.68E-05	0.083797965	32250
Rank income in parent in GOR	0.130999916	0.032729675	6.28E-05	0.083714337	32250
Rank income in political in GOR	0.137748549	0.032107300	1.79E-05	0.083788093	32250
Rank income in race in GOR	0.137992547	0.033185746	3.22E-05	0.083756029	32250
Rank income in religion in GOR	0.140634416	0.032628811	1.64E-05	0.083791481	32250
Rank income in wealth in GOR	0.062578214	0.026857877	1.98E-02	0.08337335	32250
Rank education in age in GOR	0.002377508	0.046400949	9.59E-01	0.083210336	32250

Rank education in wealth in GOR	-0.251320690	0.055529695	6.04E-06	0.083774989	32250
Rank earnings in age in GOR	0.048751116	0.044956646	2.78E-01	0.083240348	32250
Rank earnings in LA	0.038299092	0.055033244	4.86E-01	0.083223482	32250
Rank wealth in age in GOR	0.075566676	0.028446201	7.90E-03	0.083414318	32250
Rank wealth in education in GOR	0.102459244	0.027174552	1.63E-04	0.083606858	32250
Rank wealth in gender in GOR	0.118796434	0.030603581	1.04E-04	0.083645128	32250
Rank wealth in income in GOR	0.087443726	0.027534715	1.50E-03	0.083491259	32250
Rank wealth in LA	0.091876378	0.024749140	2.06E-04	0.08359554	32250
Rank wealth in marital in GOR	0.092186219	0.028566106	1.25E-03	0.083500793	32250
Rank wealth in occupation in GOR	0.109755939	0.027365423	6.07E-05	0.083661083	32250
Rank wealth in parent in GOR	0.124854219	0.029520348	2.35E-05	0.083720865	32250
Rank wealth in political in GOR	0.112821960	0.029104867	1.06E-04	0.083636047	32250
Rank wealth in race in GOR	0.119608565	0.030426217	8.47E-05	0.083652178	32250
Rank wealth in religion in GOR	0.119863291	0.029056475	3.71E-05	0.083691935	32250
Rank wealth in unemployment	0.118754646	0.030502871	9.91E-05	0.08364527	32250
Well off friends	0.073518257	0.009746255	4.79E-14	0.082250047	18701
Well off nearby	0.111292592	0.009303146	7.38E-33	0.086634285	18289
Well off work	0.061187167	0.009841405	5.35E-10	0.074537436	6924

Appendix Table 4.25: Results of OLS regressions explaining variance in life meaning in ELSA with controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	Experienced affect last week				
	b	se	p	r2	n
% top income in age in GOR	0.260220090	0.713136841	7.15E-01	0.096724165	32250
% top income in education in GOR	-0.265190368	0.352246438	4.52E-01	0.096734404	32250
% top income in gender in GOR	-0.113841099	0.791460265	8.86E-01	0.096720761	32250
% top income in LA	0.003374903	0.112218686	9.76E-01	0.096720214	32250
% top income in marital in GOR	0.481967310	0.555676727	3.86E-01	0.096745458	32250
% top income in occupation in GOR	0.141889845	0.418720778	7.35E-01	0.096723355	32250
% top income in parent in GOR	0.131743224	0.607583867	8.28E-01	0.096721642	32250
% top income in political in GOR	0.368755932	0.560938792	5.11E-01	0.096731858	32250
% top income in race in GOR	-0.521519915	0.920724700	5.71E-01	0.096731672	32250
% top income in religion in GOR	0.030098682	0.556988161	9.57E-01	0.096720275	32250
% top income in wealth in GOR	0.080096624	0.105657471	4.48E-01	0.096733303	32250
% top education in age in GOR	0.017409432	0.476456165	9.71E-01	0.096720233	32250
% top education in income in GOR	0.440695572	0.141994704	1.91E-03	0.096946038	32250
% top education in LA	0.063391844	0.087461577	4.69E-01	0.096734067	32250
% top education in parent in GOR	0.402826496	0.501313487	4.22E-01	0.096740646	32250
% top education in religion in GOR	0.963596268	0.389099997	1.33E-02	0.096885685	32250
% top education in unemployment in GOR	1.203980002	0.626698892	5.47E-02	0.09684926	32250
% top education in wealth in GOR	0.225483399	0.101337060	2.61E-02	0.096854089	32250
% top earnings in age in GOR	-0.333466603	0.675620680	6.22E-01	0.096727288	32250
% top earnings in education in GOR	-0.625409290	0.316545890	4.82E-02	0.09681905	32250
% top earnings in gender in GOR	-0.315150026	0.679716720	6.43E-01	0.096725452	32250

% top earnings in LA	0.071815766	0.109904807	5.13E-01	0.096731399	32250
% top earnings in marital in GOR	-0.585310036	0.550952458	2.88E-01	0.096756015	32250
% top earnings in occupation in GOR	0.084650215	0.350794401	8.09E-01	0.096721733	32250
% top earnings in parent in GOR	-0.154216230	0.633357283	8.08E-01	0.096721909	32250
% top earnings in political in GOR	-0.488749175	0.461144614	2.89E-01	0.096750875	32250
% top earnings in race in GOR	0.209736907	0.884408067	8.13E-01	0.096722329	32250
% top earnings in religion in GOR	-0.443296398	0.535161041	4.07E-01	0.096738912	32250
% top earnings in wealth in GOR	0.246260068	0.152541096	1.06E-01	0.096782456	32250
% top wealth in income in GOR	0.442464124	0.147738045	2.75E-03	0.096919367	32250
% top wealth in LA	0.151146755	0.081416064	6.34E-02	0.096819053	32250
% unemployed in age in GOR	-0.236660929	1.634732396	8.85E-01	0.096720809	32250
% unemployed in education in GOR	-0.745856211	0.545418152	1.71E-01	0.096769801	32250
% unemployed in gender in GOR	-0.735909126	1.157748788	5.25E-01	0.096731556	32250
% unemployed in income in GOR	-0.394891480	0.503215889	4.33E-01	0.096738053	32250
% unemployed in LA	-0.003462541	0.241536108	9.89E-01	0.096720197	32250
% unemployed in marital in GOR	-1.415623974	0.694262996	4.15E-02	0.096881142	32250
% unemployed in occupation in GOR	-0.720928680	0.735292019	3.27E-01	0.096747489	32250
% unemployed in parent in GOR	-1.057945792	0.861289712	2.19E-01	0.096763518	32250
% unemployed in political in GOR	-0.259878861	1.063302810	8.07E-01	0.096721888	32250
% unemployed in race in GOR	-0.037300468	1.272038099	9.77E-01	0.096720222	32250
% unemployed in religion in GOR	0.505669313	1.100031212	6.46E-01	0.096726136	32250
% unemployed in wealth in GOR	-0.762688018	0.525826058	1.47E-01	0.096802394	32250
Average income in age in GOR	0.000001219	0.000004008	7.61E-01	0.096722688	32250
Average income in LA	0.000001061	0.000001042	3.09E-01	0.0967525	32250
Average income in parent in GOR	-0.000006755	0.000006221	2.78E-01	0.096756107	32250
Average income in race in GOR	0.000000892	0.000008041	9.12E-01	0.096720608	32250

Average income in religion in GOR	0.000001499	0.000005898	7.99E-01	0.096722016	32250
Average income in wealth in GOR	0.000000903	0.000000676	1.82E-01	0.096759361	32250
Average earnings in education in GOR	-0.000003272	0.000003000	2.76E-01	0.096750172	32250
Average earnings in LA	0.000001440	0.000001111	1.95E-01	0.096767261	32250
Average earnings in occupation in GOR	0.000004020	0.000003672	2.74E-01	0.0967534	32250
Average earnings in parent in GOR	-0.000010370	0.000007015	1.39E-01	0.096782004	32250
Average earnings in political in GOR	-0.000000874	0.000004047	8.29E-01	0.096721404	32250
Average earnings in race in GOR	0.000000394	0.000007834	9.60E-01	0.096720281	32250
Average earnings in religion in GOR	-0.000000997	0.000004120	8.09E-01	0.096721662	32250
Average earnings in wealth in GOR	0.000001078	0.000001437	4.53E-01	0.09673362	32250
Average wealth in age in GOR	0.000000011	0.000000125	9.31E-01	0.096720406	32250
Average wealth in income in GOR	0.000000076	0.000000046	9.70E-02	0.096770765	32250
Average wealth in LA	0.000000020	0.000000028	4.69E-01	0.096734769	32250
Average wealth in religion in GOR	0.000000141	0.000000149	3.44E-01	0.096743519	32250
Distance from average income in age in GOR	0.000000067	0.000000360	8.52E-01	0.096721088	32250
Distance from average income in education in GOR	0.000000069	0.000000359	8.47E-01	0.096721149	32250
Distance from average income in gender in GOR	0.000000088	0.000000360	8.07E-01	0.096721721	32250
Distance from average income in LA	-0.000000077	0.000000361	8.32E-01	0.096721346	32250
Distance from average income in marital in GOR	0.000000024	0.000000359	9.46E-01	0.096720308	32250
Distance from average income in occupation in GOR	0.000000085	0.000000359	8.13E-01	0.096721618	32250
Distance from average income in parent in GOR	0.000000104	0.000000358	7.71E-01	0.096722354	32250
Distance from average income in political in GOR	0.000000075	0.000000360	8.36E-01	0.096721294	32250
Distance from average income in race in GOR	0.000000075	0.000000360	8.34E-01	0.096721313	32250
Distance from average income in religion in GOR	0.000000071	0.000000359	8.42E-01	0.096721203	32250
Distance from average income in wealth in GOR	-0.000000162	0.000000388	6.77E-01	0.096724718	32250
Distance from average earnings in age in GOR	-0.000000003	0.000000390	9.94E-01	0.096720192	32250

Distance from average earnings in education in GOR	0.000000089	0.000000392	8.21E-01	0.096721222	32250
Distance from average earnings in gender in GOR	0.000000048	0.000000391	9.03E-01	0.09672049	32250
Distance from average earnings in LA	-0.000000220	0.000000390	5.72E-01	0.096726843	32250
Distance from average earnings in marital in GOR	-0.000000009	0.000000391	9.82E-01	0.0967202	32250
Distance from average earnings in occupation in GOR	-0.000000044	0.000000392	9.10E-01	0.096720446	32250
Distance from average earnings in parent in GOR	0.000000064	0.000000392	8.69E-01	0.096720734	32250
Distance from average earnings in political in GOR	0.000000029	0.000000390	9.40E-01	0.096720304	32250
Distance from average earnings in race in GOR	0.000000017	0.000000391	9.65E-01	0.096720229	32250
Distance from average earnings in religion in GOR	0.000000030	0.000000392	9.39E-01	0.09672031	32250
Distance from average earnings in wealth in GOR	-0.000000074	0.000000389	8.49E-01	0.096720929	32250
Distance from average wealth in age in GOR	0.000000012	0.000000007	6.84E-02	0.096765425	32250
Distance from average wealth in education in GOR	0.000000012	0.000000007	5.91E-02	0.096768719	32250
Distance from average wealth in gender in GOR	0.000000012	0.000000007	7.17E-02	0.096764285	32250
Distance from average wealth in income in GOR	0.000000010	0.000000007	1.26E-01	0.096751141	32250
Distance from average wealth in LA	0.000000010	0.000000007	1.42E-01	0.096751843	32250
Distance from average wealth in marital in GOR	0.000000012	0.000000007	6.29E-02	0.096767291	32250
Distance from average wealth in occupation in GOR	0.000000012	0.000000007	6.22E-02	0.096767651	32250
Distance from average wealth in parent in GOR	0.000000012	0.000000007	6.71E-02	0.096766012	32250
Distance from average wealth in political in GOR	0.000000012	0.000000007	7.34E-02	0.096763834	32250
Distance from average wealth in race in GOR	0.000000012	0.000000007	6.59E-02	0.096766355	32250
Distance from average wealth in religion in GOR	0.000000012	0.000000007	8.01E-02	0.096761901	32250
Distance from average wealth in unemployment	0.000000012	0.000000007	7.30E-02	0.096763924	32250
Distance from median education in income in GOR	-0.013726582	0.006365431	3.11E-02	0.096835391	32250
Distance from median education in LA	-0.010146888	0.005628836	7.15E-02	0.096812506	32250
Distance from median education in wealth in GOR	-0.017910686	0.005419745	9.52E-04	0.097031162	32250
MacArthur ladder	0.008008817	0.000408089	3.08E-85	0.110737087	31255
Median education in age in GOR	-0.015021523	0.013350291	2.61E-01	0.096757964	32250

Median education in gender in GOR	0.025260930	0.012136340	3.74E-02	0.096846302	32250
Median education in income in GOR	0.013726582	0.006365431	3.11E-02	0.096835391	32250
Median education in LA	0.010146888	0.005628836	7.15E-02	0.096812506	32250
Median education in marital in GOR	-0.010593782	0.015056423	4.82E-01	0.096736006	32250
Median education in parent in GOR	-0.011716002	0.013530275	3.87E-01	0.09674263	32250
Median education in political in GOR	-0.019272874	0.014229844	1.76E-01	0.096771432	32250
Median education in race in GOR	0.010140117	0.015562130	5.15E-01	0.096734396	32250
Median education in religion in GOR	0.005375902	0.015870198	7.35E-01	0.096723428	32250
Median education in unemployment in GOR	-0.019264834	0.016136924	2.33E-01	0.096761481	32250
Median education in wealth in GOR	0.017910686	0.005419745	9.52E-04	0.097031162	32250
Rank income in age in GOR	0.049877607	0.029518411	9.11E-02	0.096809697	32250
Rank income in education in GOR	0.102587868	0.030519000	7.76E-04	0.097096349	32250
Rank income in gender in GOR	0.130329460	0.034183307	1.38E-04	0.097212402	32250
Rank income in LA	0.077188183	0.028271407	6.33E-03	0.09695928	32250
Rank income in marital in GOR	0.101688829	0.032666474	1.85E-03	0.097050701	32250
Rank income in occupation in GOR	0.126775279	0.031718697	6.43E-05	0.097261548	32250
Rank income in parent in GOR	0.132833479	0.033777069	8.42E-05	0.097238475	32250
Rank income in political in GOR	0.136168776	0.033220039	4.16E-05	0.097284844	32250
Rank income in race in GOR	0.130282493	0.034374133	1.51E-04	0.097206674	32250
Rank income in religion in GOR	0.127033166	0.033692589	1.63E-04	0.097194422	32250
Rank income in wealth in GOR	0.066011433	0.027714232	1.72E-02	0.096901664	32250
Rank education in age in GOR	-0.053921940	0.048064264	2.62E-01	0.096758061	32250
Rank education in wealth in GOR	-0.114561122	0.055290267	3.83E-02	0.096837533	32250
Rank earnings in age in GOR	0.000460274	0.046140884	9.92E-01	0.096720193	32250
Rank earnings in LA	-0.063703785	0.053341102	2.32E-01	0.096756765	32250
Rank wealth in age in GOR	0.044138050	0.029485781	1.34E-01	0.096789808	32250
Rank wealth in education in GOR	0.075913380	0.028152178	7.01E-03	0.096937903	32250

Rank wealth in gender in GOR	0.086580105	0.031453981	5.92E-03	0.096951176	32250
Rank wealth in income in GOR	0.074511594	0.028097291	8.01E-03	0.096924219	32250
Rank wealth in LA	0.052247546	0.025245875	3.85E-02	0.096844785	32250
Rank wealth in marital in GOR	0.081056159	0.028957921	5.13E-03	0.096944802	32250
Rank wealth in occupation in GOR	0.089602836	0.028108941	1.44E-03	0.097020654	32250
Rank wealth in parent in GOR	0.097232974	0.030457741	1.41E-03	0.097029864	32250
Rank wealth in political in GOR	0.090348416	0.030094272	2.68E-03	0.096993241	32250
Rank wealth in race in GOR	0.090995146	0.031435931	3.80E-03	0.096975962	32250
Rank wealth in religion in GOR	0.092247678	0.030107132	2.19E-03	0.097005484	32250
Rank wealth in unemployment	0.091308738	0.031505589	3.76E-03	0.096977361	32250
Well off friends	0.087357220	0.010627791	2.17E-16	0.104352749	18701
Well off nearby	0.118193929	0.009890382	8.57E-33	0.107727043	18289
Well off work	0.039726719	0.010417023	1.38E-04	0.063715726	6924

Appendix Table 4.26: Results of OLS regressions explaining variance in experienced affect last week in ELSA with controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	**Life satisfaction (1)**				
	b	se	p	r2	n
% top income in age in GOR	-1.720196903	0.510605102	0.000757406	0.000592122	32250
% top income in education in GOR	-0.683515185	0.254958214	0.007354565	0.000316085	32250
% top income in gender in GOR	-3.895324804	0.538388451	4.99E-13	0.002580197	32250
% top income in LA	-0.098809963	0.107082426	0.356161227	3.44E-05	32250
% top income in marital in GOR	-0.638786236	0.429335377	0.136821917	0.00012422	32250
% top income in occupation in GOR	-0.560011815	0.31743096	0.07772847	0.000152355	32250
% top income in parent in GOR	-1.742293776	0.424047986	4.01E-05	0.000795259	32250
% top income in political in GOR	-1.751146929	0.35205756	6.67E-07	0.001161297	32250

% top income in race in GOR	-4.118850332	0.527270641	6.21E-15	0.002838227	32250
% top income in religion in GOR	-2.290387927	0.392013328	5.30E-09	0.001593341	32250
% top income in wealth in GOR	-0.029977634	0.127956107	0.814771894	2.13E-06	32250
% top education in age in GOR	-1.811318172	0.242783179	9.32E-14	0.002793225	32250
% top education in income in GOR	-0.461018886	0.127003357	0.000284851	0.000584106	32250
% top education in LA	-0.368582615	0.122956061	0.002727071	0.000478679	32250
% top education in parent in GOR	-2.303225693	0.252449318	8.66E-20	0.004078537	32250
% top education in religion in GOR	-1.848446287	0.215895792	1.27E-17	0.003498249	32250
% top education in unemployment in GOR	-2.293033536	0.237906686	6.84E-22	0.004595108	32250
% top education in wealth in GOR	-0.169131032	0.118274625	0.152752026	9.21E-05	32250
% top earnings in age in GOR	-3.427698761	0.432927884	2.68E-15	0.00314826	32250
% top earnings in education in GOR	-1.209870427	0.222205622	5.31E-08	0.001308698	32250
% top earnings in gender in GOR	-5.333132941	0.435458535	3.04E-34	0.006764424	32250
% top earnings in LA	-0.12634171	0.109114182	0.246938212	6.10E-05	32250
% top earnings in marital in GOR	-1.788343932	0.376072304	2.01E-06	0.001408954	32250
% top earnings in occupation in GOR	-0.768073277	0.22747175	0.000736737	0.000497901	32250
% top earnings in parent in GOR	-3.786380285	0.399343566	3.07E-21	0.003941025	32250
% top earnings in political in GOR	-1.603792658	0.254178543	2.91E-10	0.001777704	32250
% top earnings in race in GOR	-5.003329968	0.448146117	8.96E-29	0.005655628	32250
% top earnings in religion in GOR	-3.733267498	0.382022089	1.86E-22	0.004410007	32250
% top earnings in wealth in GOR	-0.22314097	0.138384052	0.106889623	9.71E-05	32250
% top wealth in income in GOR	-0.231329307	0.14243356	0.104381229	0.000117773	32250
% top wealth in LA	-0.06470339	0.10727364	0.546414427	1.76E-05	32250
% unemployed in age in GOR	-3.418906997	1.072722804	0.001441298	0.000542256	32250
% unemployed in education in GOR	-0.647976975	0.437416596	0.138538492	9.63E-05	32250
% unemployed in gender in GOR	-2.843568276	0.81196844	0.000463657	0.000584563	32250
% unemployed in income in GOR	-1.256271206	0.413476747	0.002385156	0.000448119	32250

% unemployed in LA	-0.084836511	0.188966628	0.653477573	8.35E-06	32250
% unemployed in marital in GOR	-0.316632117	0.515360771	0.538971975	2.03E-05	32250
% unemployed in occupation in GOR	-0.705697375	0.577095179	0.221417151	6.80E-05	32250
% unemployed in parent in GOR	-1.679535381	0.594896079	0.004763372	0.000354217	32250
% unemployed in political in GOR	-2.899016498	0.721320462	5.89E-05	0.000747981	32250
% unemployed in race in GOR	-4.106724181	0.970367576	2.34E-05	0.001028807	32250
% unemployed in religion in GOR	-2.06695789	0.745442535	0.005567931	0.000381518	32250
% unemployed in wealth in GOR	-0.381751582	0.417893877	0.360994485	4.52E-05	32250
Average income in age in GOR	-1.57E-05	3.76E-06	3.14E-05	0.000779446	32250
Average income in LA	-1.88E-06	8.02E-07	0.018800658	0.00019825	32250
Average income in parent in GOR	-2.27E-05	3.22E-06	1.86E-12	0.002397905	32250
Average income in race in GOR	-2.43E-05	3.32E-06	2.52E-13	0.00264423	32250
Average income in religion in GOR	-2.37E-05	3.27E-06	5.12E-13	0.002592956	32250
Average income in wealth in GOR	-6.23E-07	8.33E-07	0.454967785	2.22E-05	32250
Average earnings in education in GOR	-1.15E-05	1.89E-06	1.32E-09	0.001610925	32250
Average earnings in LA	-3.45E-06	1.14E-06	0.002419991	0.000419381	32250
Average earnings in occupation in GOR	-1.05E-05	2.12E-06	8.07E-07	0.001095639	32250
Average earnings in parent in GOR	-3.70E-05	3.42E-06	4.74E-27	0.005110886	32250
Average earnings in political in GOR	-8.19E-06	1.73E-06	2.09E-06	0.001008553	32250
Average earnings in race in GOR	-4.08E-05	3.42E-06	1.65E-32	0.006308297	32250
Average earnings in religion in GOR	-2.27E-05	2.84E-06	1.28E-15	0.002928652	32250
Average earnings in wealth in GOR	-4.05E-06	1.43E-06	0.004518784	0.000420993	32250
Average wealth in age in GOR	-4.88E-07	1.34E-07	0.000269961	0.000681015	32250
Average wealth in income in GOR	-1.70E-07	4.97E-08	0.000613425	0.000465173	32250
Average wealth in LA	-1.99E-08	3.09E-08	0.519799998	1.78E-05	32250
Average wealth in religion in GOR	-6.32E-07	1.13E-07	2.04E-08	0.001427941	32250
Distance from average income in age in GOR	7.99E-07	2.76E-07	0.003780014	0.000279416	32250

Distance from average income in education in GOR	8.09E-07	2.75E-07	0.00327591	0.000291191	32250
Distance from average income in gender in GOR	9.36E-07	2.80E-07	0.000830748	0.00038625	32250
Distance from average income in LA	9.38E-07	2.83E-07	0.000923581	0.000379982	32250
Distance from average income in marital in GOR	7.25E-07	2.71E-07	0.007487739	0.000232414	32250
Distance from average income in occupation in GOR	8.22E-07	2.75E-07	0.002797172	0.000298357	32250
Distance from average income in parent in GOR	9.20E-07	2.80E-07	0.001012441	0.000373065	32250
Distance from average income in political in GOR	9.07E-07	2.78E-07	0.001119054	0.000364202	32250
Distance from average income in race in GOR	9.24E-07	2.79E-07	0.000935077	0.000377472	32250
Distance from average income in religion in GOR	9.29E-07	2.80E-07	0.000921282	0.000380339	32250
Distance from average income in wealth in GOR	7.96E-07	2.76E-07	0.003934569	0.000266827	32250
Distance from average earnings in age in GOR	6.07E-07	4.27E-07	0.15473129	8.99E-05	32250
Distance from average earnings in education in GOR	8.81E-07	4.07E-07	0.030254594	0.000210534	32250
Distance from average earnings in gender in GOR	9.51E-07	4.05E-07	0.018918948	0.000250625	32250
Distance from average earnings in LA	8.07E-07	4.07E-07	0.047453475	0.000177486	32250
Distance from average earnings in marital in GOR	5.17E-07	3.96E-07	0.192282203	7.44E-05	32250
Distance from average earnings in occupation in GOR	7.66E-07	4.09E-07	0.061012664	0.000155463	32250
Distance from average earnings in parent in GOR	8.65E-07	4.07E-07	0.033418828	0.000204853	32250
Distance from average earnings in political in GOR	8.02E-07	3.98E-07	0.043962214	0.000177771	32250
Distance from average earnings in race in GOR	9.15E-07	4.05E-07	0.023798442	0.000231593	32250
Distance from average earnings in religion in GOR	8.31E-07	4.07E-07	0.041238489	0.000188945	32250
Distance from average earnings in wealth in GOR	7.13E-07	3.83E-07	0.062789399	0.000144323	32250
Distance from average wealth in age in GOR	-4.44E-09	1.17E-08	0.7045831	8.38E-06	32250
Distance from average wealth in education in GOR	-5.21E-09	1.16E-08	0.652539522	1.17E-05	32250
Distance from average wealth in gender in GOR	-3.26E-09	1.17E-08	0.781134804	4.54E-06	32250
Distance from average wealth in income in GOR	-1.27E-09	1.16E-08	0.913069225	6.95E-07	32250
Distance from average wealth in LA	-5.77E-09	1.17E-08	0.622413919	1.38E-05	32250
Distance from average wealth in marital in GOR	-1.04E-08	1.15E-08	0.367432522	4.62E-05	32250

Distance from average wealth in occupation in GOR	-5.48E-09	1.16E-08	0.636871671	1.28E-05	32250
Distance from average wealth in parent in GOR	-2.93E-09	1.18E-08	0.803411221	3.65E-06	32250
Distance from average wealth in political in GOR	-2.92E-09	1.17E-08	0.803270015	3.65E-06	32250
Distance from average wealth in race in GOR	-2.98E-09	1.17E-08	0.799412019	3.80E-06	32250
Distance from average wealth in religion in GOR	-2.40E-09	1.18E-08	0.838154688	2.46E-06	32250
Distance from average wealth in unemployment	-3.89E-09	1.17E-08	0.739617256	6.47E-06	32250
Distance from median education in income in GOR	0.020269828	0.004523338	7.51E-06	0.000908075	32250
Distance from median education in LA	0.010339453	0.004915544	0.035453755	0.000205799	32250
Distance from median education in wealth in GOR	0.006765809	0.004824567	0.160836642	8.95E-05	32250
MacArthur ladder	0.007233587	0.0005395	1.22E-40	0.012198621	31255
Median education in age in GOR	-0.050778452	0.007891221	1.29E-10	0.002062506	32250
Median education in gender in GOR	-0.076858059	0.007335558	1.48E-25	0.005006848	32250
Median education in income in GOR	-0.03047783	0.005235693	6.02E-09	0.00154688	32250
Median education in LA	-0.019324155	0.005939231	0.001143085	0.000499707	32250
Median education in marital in GOR	-0.014241865	0.010579557	0.178278426	0.00011072	32250
Median education in parent in GOR	-0.069379782	0.007609081	9.11E-20	0.003933136	32250
Median education in political in GOR	-0.056748577	0.006255658	1.39E-19	0.003817228	32250
Median education in race in GOR	-0.069348701	0.006661211	2.97E-25	0.005250356	32250
Median education in religion in GOR	-0.085750709	0.007968852	7.37E-27	0.005275114	32250
Median education in unemployment in GOR	-0.073518424	0.006744974	1.64E-27	0.005780752	32250
Median education in wealth in GOR	-0.014645833	0.005915907	0.013314924	0.00028092	32250
Rank income in age in GOR	0.054132337	0.0285617	0.058084222	0.000186274	32250
Rank income in education in GOR	0.080363389	0.024166447	0.000886026	0.000556109	32250
Rank income in gender in GOR	0.106945361	0.026394051	5.12E-05	0.000842809	32250
Rank income in LA	0.092580215	0.023753362	9.78E-05	0.000783614	32250
Rank income in marital in GOR	0.065483948	0.025137575	0.009200287	0.00034354	32250
Rank income in occupation in GOR	0.087703706	0.024882645	0.000425849	0.000640303	32250

Rank income in parent in GOR	0.102953146	0.026163482	8.38E-05	0.000786023	32250
Rank income in political in GOR	0.093798416	0.025488398	0.000234407	0.000683106	32250
Rank income in race in GOR	0.106081654	0.026395925	5.89E-05	0.00082508	32250
Rank income in religion in GOR	0.103191829	0.026129679	7.89E-05	0.000787862	32250
Rank income in wealth in GOR	0.054847035	0.022052389	0.01289405	0.000309012	32250
Rank education in age in GOR	0.054037969	0.056926489	0.342511719	4.41E-05	32250
Rank education in wealth in GOR	0.034976481	0.042336733	0.408738659	3.11E-05	32250
Rank earnings in age in GOR	0.082139341	0.036928633	0.026152135	0.00023819	32250
Rank earnings in LA	0.117124611	0.031787699	0.000230269	0.000652833	32250
Rank wealth in age in GOR	0.180769589	0.048014109	0.000167543	0.00073224	32250
Rank wealth in education in GOR	0.141690904	0.037807548	0.000179466	0.000663981	32250
Rank wealth in gender in GOR	0.233283781	0.044551967	1.67E-07	0.001340338	32250
Rank wealth in income in GOR	0.173544546	0.035806725	1.27E-06	0.001091017	32250
Rank wealth in LA	0.1269273	0.032101637	7.74E-05	0.000703182	32250
Rank wealth in marital in GOR	0.112857532	0.041376184	0.006390781	0.000373412	32250
Rank wealth in occupation in GOR	0.151043095	0.038595825	9.16E-05	0.000732577	32250
Rank wealth in parent in GOR	0.2246767	0.043112026	1.91E-07	0.001304133	32250
Rank wealth in political in GOR	0.203123605	0.04150843	1.01E-06	0.001123928	32250
Rank wealth in race in GOR	0.229304984	0.044301689	2.31E-07	0.001303262	32250
Rank wealth in religion in GOR	0.208627647	0.042497435	9.29E-07	0.001162392	32250
Rank wealth in unemployment	0.210376444	0.044199474	1.97E-06	0.001116081	32250
Well off friends	0.03916813	0.013175827	0.002959286	0.001366321	18701
Well off nearby	0.079284824	0.01318417	1.88E-09	0.005377428	18289
Well off work	0.026214633	0.014808937	0.07677311	0.001371719	6924

Appendix Table 4.27: Results of fixed effects regressions explaining variance in life satisfaction (1) in ELSA without controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	Life satisfaction (2)				
	b	se	p	r2	n
% top income in age in GOR	-2.01224352800	0.49994431100	5.74E-05	0.000817856	32250
% top income in education in GOR	-0.57281426700	0.24863443600	2.13E-02	0.000224076	32250
% top income in gender in GOR	-3.10198232700	0.53985552800	9.41E-09	0.001651601	32250
% top income in LA	0.08758846100	0.10949278300	4.24E-01	2.73E-05	32250
% top income in marital in GOR	-0.46428841300	0.41534941200	2.64E-01	6.62E-05	32250
% top income in occupation in GOR	-0.46445685800	0.29988367600	1.21E-01	0.000105783	32250
% top income in parent in GOR	-1.85096506500	0.42103778800	1.11E-05	0.000905989	32250
% top income in political in GOR	-1.07582419000	0.34722770500	1.95E-03	0.000442427	32250
% top income in race in GOR	-2.93336291000	0.53846508300	5.22E-08	0.001453073	32250
% top income in religion in GOR	-1.49824282300	0.38851438100	1.16E-04	0.000688202	32250
% top income in wealth in GOR	0.34523061300	0.12776989100	6.90E-03	0.000285784	32250
% top education in age in GOR	-1.57485485500	0.24036150700	5.95E-11	0.002131367	32250
% top education in income in GOR	-0.47514056500	0.11656369900	4.61E-05	0.000626266	32250
% top education in LA	-0.21295243900	0.11963408100	7.51E-02	0.000161288	32250
% top education in parent in GOR	-2.06741846600	0.24600581400	4.90E-17	0.003317026	32250
% top education in religion in GOR	-1.36793591100	0.21478576700	1.99E-10	0.001933879	32250
% top education in unemployment in GOR	-1.67365409700	0.24706229100	1.32E-11	0.002470968	32250
% top education in wealth in GOR	-0.01256792100	0.11957688800	9.16E-01	5.13E-07	32250
% top earnings in age in GOR	-1.82693530300	0.42001790600	1.38E-05	0.00090276	32250

% top earnings in education in GOR	-0.97881760300	0.21253470400	4.17E-06	0.000864621	32250
% top earnings in gender in GOR	-2.54983802900	0.43791213900	5.97E-09	0.001560817	32250
% top earnings in LA	0.00087089400	0.10980935400	9.94E-01	2.93E-09	32250
% top earnings in marital in GOR	-0.24334060100	0.34924487300	4.86E-01	2.63E-05	32250
% top earnings in occupation in GOR	-0.58574655200	0.21567727500	6.62E-03	0.000292292	32250
% top earnings in parent in GOR	-1.33647596500	0.40358726000	9.31E-04	0.000495614	32250
% top earnings in political in GOR	-0.56524783700	0.24719366400	2.22E-02	0.000222896	32250
% top earnings in race in GOR	-2.03133904400	0.45136496400	6.86E-06	0.000940997	32250
% top earnings in religion in GOR	-1.79908857700	0.37767167800	1.93E-06	0.001033777	32250
% top earnings in wealth in GOR	0.16248421800	0.13797301900	2.39E-01	5.20E-05	32250
% top wealth in income in GOR	-0.25095048200	0.13459259300	6.23E-02	0.000139901	32250
% top wealth in LA	0.11178097400	0.10655794500	2.94E-01	5.30E-05	32250
% unemployed in age in GOR	-2.13204185400	1.01883703000	3.64E-02	0.000212854	32250
% unemployed in education in GOR	-0.73928259900	0.40496702800	6.79E-02	0.000126588	32250
% unemployed in gender in GOR	-1.49846083600	0.78524810900	5.64E-02	0.000163854	32250
% unemployed in income in GOR	-0.57469960100	0.39412226100	1.45E-01	9.47E-05	32250
% unemployed in LA	-0.26367360900	0.20107565100	1.90E-01	8.14E-05	32250
% unemployed in marital in GOR	0.59500526900	0.48222495100	2.17E-01	7.25E-05	32250
% unemployed in occupation in GOR	-1.08694505200	0.58977563200	6.54E-02	0.000162857	32250
% unemployed in parent in GOR	-0.92702523300	0.58970391500	1.16E-01	0.000108927	32250
% unemployed in political in GOR	-1.47846004800	0.71096975200	3.76E-02	0.000196367	32250
% unemployed in race in GOR	-1.67126188900	0.92908489000	7.21E-02	0.000171986	32250
% unemployed in religion in GOR	-1.31029285000	0.69580421800	5.97E-02	0.000154757	32250
% unemployed in wealth in GOR	-0.82163724600	0.43094374100	5.66E-02	0.000211225	32250

Average income in age in GOR	-0.00000384469	0.00000361127	2.87E-01	4.75E-05	32250
Average income in LA	-0.00000131538	0.00000087562	1.33E-01	9.75E-05	32250
Average income in parent in GOR	-0.00001576190	0.00000314424	5.45E-07	0.001165973	32250
Average income in race in GOR	-0.00001542780	0.00000329143	2.80E-06	0.001073513	32250
Average income in religion in GOR	-0.00001451080	0.00000316072	4.46E-06	0.000982994	32250
Average income in wealth in GOR	0.00000165130	0.00000073741	2.52E-02	0.000157278	32250
Average earnings in education in GOR	-0.00000633184	0.00000183533	5.63E-04	0.000495497	32250
Average earnings in LA	0.00000024603	0.00000112687	8.27E-01	2.15E-06	32250
Average earnings in occupation in GOR	-0.00000681508	0.00000200390	6.74E-04	0.000467438	32250
Average earnings in parent in GOR	-0.00001299220	0.00000346471	1.78E-04	0.000637742	32250
Average earnings in political in GOR	-0.00000145343	0.00000167988	3.87E-01	3.21E-05	32250
Average earnings in race in GOR	-0.00001564370	0.00000339571	4.14E-06	0.000937031	32250
Average earnings in religion in GOR	-0.00001048110	0.00000285386	2.41E-04	0.000628796	32250
Average earnings in wealth in GOR	0.00000066299	0.00000118827	5.77E-01	1.14E-05	32250
Average wealth in age in GOR	0.00000004717	0.00000012363	7.03E-01	6.42E-06	32250
Average wealth in income in GOR	-0.00000010276	0.00000004395	1.94E-02	0.000171197	32250
Average wealth in LA	0.00000004746	0.00000002740	8.32E-02	0.000102408	32250
Average wealth in religion in GOR	-0.00000018868	0.00000010569	7.43E-02	0.000128489	32250
Distance from average income in age in GOR	0.00000036687	0.00000023495	1.18E-01	5.94E-05	32250
Distance from average income in education in GOR	0.00000045996	0.00000023576	5.11E-02	9.50E-05	32250
Distance from average income in gender in GOR	0.00000050754	0.00000023571	3.13E-02	0.000114744	32250
Distance from average income in LA	0.00000051357	0.00000025075	4.06E-02	0.000114894	32250
Distance from average income in marital in GOR	0.00000034401	0.00000023238	1.39E-01	5.28E-05	32250
Distance from average income in occupation in GOR	0.00000045679	0.00000023552	5.25E-02	9.31E-05	32250

Distance from average income in parent in GOR	0.00000050291	0.00000023677	3.37E-02	0.000112422	32250
Distance from average income in political in GOR	0.00000045533	0.00000023606	5.38E-02	9.27E-05	32250
Distance from average income in race in GOR	0.00000049129	0.00000023553	3.70E-02	0.000107667	32250
Distance from average income in religion in GOR	0.00000048892	0.00000023551	3.79E-02	0.000106248	32250
Distance from average income in wealth in GOR	0.00000012772	0.00000024744	6.06E-01	6.94E-06	32250
Distance from average earnings in age in GOR	0.00000022350	0.00000037394	5.50E-01	1.23E-05	32250
Distance from average earnings in education in GOR	0.00000057165	0.00000035176	1.04E-01	8.94E-05	32250
Distance from average earnings in gender in GOR	0.00000054086	0.00000034681	1.19E-01	8.19E-05	32250
Distance from average earnings in LA	0.00000025266	0.00000036292	4.86E-01	1.76E-05	32250
Distance from average earnings in marital in GOR	0.00000013943	0.00000035010	6.90E-01	5.47E-06	32250
Distance from average earnings in occupation in GOR	0.00000054861	0.00000035614	1.23E-01	8.05E-05	32250
Distance from average earnings in parent in GOR	0.00000046071	0.00000034955	1.88E-01	5.86E-05	32250
Distance from average earnings in political in GOR	0.00000035947	0.00000035018	3.05E-01	3.60E-05	32250
Distance from average earnings in race in GOR	0.00000049433	0.00000034757	1.55E-01	6.83E-05	32250
Distance from average earnings in religion in GOR	0.00000050045	0.00000035009	1.53E-01	6.92E-05	32250
Distance from average earnings in wealth in GOR	0.00000021281	0.00000034772	5.41E-01	1.30E-05	32250
Distance from average wealth in age in GOR	0.00000000690	0.00000000848	4.16E-01	2.04E-05	32250
Distance from average wealth in education in GOR	0.00000000873	0.00000000861	3.11E-01	3.31E-05	32250
Distance from average wealth in gender in GOR	0.00000000973	0.00000000884	2.71E-01	4.07E-05	32250
Distance from average wealth in income in GOR	0.00000001086	0.00000000887	2.21E-01	5.17E-05	32250
Distance from average wealth in LA	0.00000000225	0.00000000821	7.84E-01	2.11E-06	32250
Distance from average wealth in marital in GOR	0.00000000451	0.00000000818	5.82E-01	8.76E-06	32250
Distance from average wealth in occupation in GOR	0.00000000715	0.00000000852	4.02E-01	2.20E-05	32250
Distance from average wealth in parent in GOR	0.00000000911	0.00000000875	2.98E-01	3.57E-05	32250

Distance from average wealth in political in GOR	0.00000000827	0.00000000865	3.39E-01	2.94E-05	32250
Distance from average wealth in race in GOR	0.00000000898	0.00000000873	3.04E-01	3.48E-05	32250
Distance from average wealth in religion in GOR	0.00000000878	0.00000000867	3.12E-01	3.32E-05	32250
Distance from average wealth in unemployment	0.00000000842	0.00000000866	3.31E-01	3.06E-05	32250
Distance from median education in income in GOR	0.01205903100	0.00438970400	6.02E-03	0.00032442	32250
Distance from median education in LA	0.00822434800	0.00488319700	9.22E-02	0.000131435	32250
Distance from median education in wealth in GOR	-0.00415756400	0.00484954100	3.91E-01	3.41E-05	32250
MacArthur ladder	0.00516371500	0.00050234400	1.16E-24	0.006338967	31255
Median education in age in GOR	-0.04604976800	0.00802342500	9.77E-09	0.00171219	32250
Median education in gender in GOR	-0.05053223900	0.00765525000	4.29E-11	0.002184658	32250
Median education in income in GOR	-0.02537026500	0.00501765900	4.35E-07	0.00108193	32250
Median education in LA	-0.02348637600	0.00596956900	8.40E-05	0.000745087	32250
Median education in marital in GOR	-0.01131500600	0.01010531700	2.63E-01	7.05E-05	32250
Median education in parent in GOR	-0.05206491300	0.00777493900	2.25E-11	0.002235755	32250
Median education in political in GOR	-0.03948382900	0.00635178700	5.30E-10	0.001865252	32250
Median education in race in GOR	-0.05231243100	0.00682746600	2.00E-14	0.003015662	32250
Median education in religion in GOR	-0.05881231400	0.00813944000	5.35E-13	0.002504689	32250
Median education in unemployment in GOR	-0.05433003800	0.00687470900	3.01E-15	0.003186639	32250
Median education in wealth in GOR	-0.00570315200	0.00589800600	3.34E-01	4.30E-05	32250
Rank income in age in GOR	0.03361663800	0.02651045400	2.05E-01	7.25E-05	32250
Rank income in education in GOR	0.04416527800	0.02345818200	5.98E-02	0.000169538	32250
Rank income in gender in GOR	0.04320956800	0.02533320400	8.81E-02	0.000138876	32250
Rank income in LA	0.02486626900	0.02304403200	2.81E-01	5.71E-05	32250
Rank income in marital in GOR	0.02310978800	0.02405376800	3.37E-01	4.32E-05	32250

Rank income in occupation in GOR	0.03246630000	0.02372506900	1.71E-01	8.86E-05	32250
Rank income in parent in GOR	0.04110589900	0.02511593400	1.02E-01	0.000126481	32250
Rank income in political in GOR	0.03386926900	0.02472197000	1.71E-01	8.99E-05	32250
Rank income in race in GOR	0.04247558200	0.02541927800	9.48E-02	0.000133523	32250
Rank income in religion in GOR	0.04025956600	0.02510656300	1.09E-01	0.000121048	32250
Rank income in wealth in GOR	-0.00281336700	0.02146645900	8.96E-01	8.21E-07	32250
Rank education in age in GOR	0.00111787100	0.05455016300	9.84E-01	1.91E-08	32250
Rank education in wealth in GOR	-0.05833445700	0.04279420500	1.73E-01	8.73E-05	32250
Rank earnings in age in GOR	0.02944653500	0.03455680200	3.94E-01	3.09E-05	32250
Rank earnings in LA	0.02372546800	0.03036635800	4.35E-01	2.70E-05	32250
Rank wealth in age in GOR	0.23666808400	0.04724287300	5.55E-07	0.001266902	32250
Rank wealth in education in GOR	0.18984986200	0.03789442600	5.54E-07	0.001203243	32250
Rank wealth in gender in GOR	0.25435279100	0.04453066600	1.15E-08	0.001608344	32250
Rank wealth in income in GOR	0.19023180300	0.03518030000	6.54E-08	0.001323234	32250
Rank wealth in LA	0.10266471000	0.03275494000	1.73E-03	0.000464366	32250
Rank wealth in marital in GOR	0.15640342000	0.04128842200	1.53E-04	0.000723903	32250
Rank wealth in occupation in GOR	0.18364427400	0.03895208800	2.45E-06	0.001093118	32250
Rank wealth in parent in GOR	0.23354743300	0.04331936400	7.15E-08	0.001422383	32250
Rank wealth in political in GOR	0.21901751500	0.04173902100	1.57E-07	0.001318974	32250
Rank wealth in race in GOR	0.23919213500	0.04432524800	6.96E-08	0.001431394	32250
Rank wealth in religion in GOR	0.22432242200	0.04223608200	1.11E-07	0.001356486	32250
Rank wealth in unemployment	0.22235981500	0.04404086900	4.52E-07	0.001258563	32250
Well off friends	0.01866280700	0.01197495200	1.19E-01	0.000296897	18701
Well off nearby	0.05151660700	0.01262677600	4.54E-05	0.002158034	18289

Well off work	0.03489146700	0.01357307500	1.02E-02	0.002477359	6924

Appendix Table 4.28: Results of fixed effects regressions explaining variance in life satisfaction (2) in ELSA without controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	Life meaning				
	b	se	p	r2	n
% top income in age in GOR	-0.923052784000	0.553771876000	0.095575905	0.000147585	32250
% top income in education in GOR	-0.079365317000	0.265251307000	0.764787488	3.69E-06	32250
% top income in gender in GOR	-3.476307160000	0.588374246000	3.57E-09	0.001778839	32250
% top income in LA	-0.135610182000	0.117290841000	0.247631889	5.60E-05	32250
% top income in marital in GOR	-0.419326639000	0.445087208000	0.346152495	4.63E-05	32250
% top income in occupation in GOR	-0.078470445000	0.328572391000	0.81124815	2.59E-06	32250
% top income in parent in GOR	-2.145786431000	0.469990952000	5.04E-06	0.001044175	32250
% top income in political in GOR	-1.739224292000	0.363210859000	1.70E-06	0.000991617	32250
% top income in race in GOR	-3.857528940000	0.593460810000	8.41E-11	0.002155004	32250
% top income in religion in GOR	-2.141185751000	0.409554856000	1.75E-07	0.001205408	32250
% top income in wealth in GOR	0.209529845000	0.138647928000	0.130759419	9.03E-05	32250
% top education in age in GOR	-1.368781399000	0.264704462000	2.37E-07	0.001380763	32250
% top education in income in GOR	-0.645323403000	0.130742980000	8.11E-07	0.000990703	32250
% top education in LA	-0.410522183000	0.130490538000	0.001660051	0.000514023	32250
% top education in parent in GOR	-2.417478198000	0.276915276000	2.95E-18	0.003889476	32250
% top education in religion in GOR	-1.673471260000	0.235711749000	1.33E-12	0.002482037	32250
% top education in unemployment in GOR	-2.137651585000	0.266518302000	1.17E-15	0.003456873	32250
% top education in wealth in GOR	-0.021288734000	0.129871647000	0.869796349	1.26E-06	32250

% top earnings in age in GOR	0.176185019000	0.456326494000	0.699435025	7.20E-06	32250
% top earnings in education in GOR	-0.001486431000	0.221545666000	0.994646873	1.71E-09	32250
% top earnings in gender in GOR	-1.890132818000	0.474158039000	6.76E-05	0.000735504	32250
% top earnings in LA	-0.112174095000	0.118517933000	0.343929718	4.16E-05	32250
% top earnings in marital in GOR	0.563128781000	0.366713065000	0.124665022	0.000120933	32250
% top earnings in occupation in GOR	0.566921932000	0.223913799000	0.011360443	0.000234811	32250
% top earnings in parent in GOR	-0.953940387000	0.440522765000	0.030374767	0.00021654	32250
% top earnings in political in GOR	-0.401193537000	0.257924473000	0.119865724	9.63E-05	32250
% top earnings in race in GOR	-1.822791649000	0.492693777000	0.000217048	0.000649787	32250
% top earnings in religion in GOR	-1.120552896000	0.391210263000	0.004187618	0.000343922	32250
% top earnings in wealth in GOR	0.132092033000	0.154004875000	0.391071131	2.95E-05	32250
% top wealth in income in GOR	-0.217722990000	0.144439351000	0.131748096	9.03E-05	32250
% top wealth in LA	0.076855706000	0.114534967000	0.502220615	2.15E-05	32250
% unemployed in age in GOR	-3.537020802000	1.070234476000	0.000953403	0.000502389	32250
% unemployed in education in GOR	-0.875742770000	0.474498168000	0.064976809	0.000152335	32250
% unemployed in gender in GOR	-3.695119040000	0.859860617000	1.74E-05	0.000854468	32250
% unemployed in income in GOR	-1.616588874000	0.409958228000	8.09E-05	0.000642333	32250
% unemployed in LA	-0.548441018000	0.224508885000	0.014588895	0.000301967	32250
% unemployed in marital in GOR	0.249858456000	0.525012722000	0.634149262	1.10E-05	32250
% unemployed in occupation in GOR	-1.940355657000	0.620256864000	0.001763147	0.000445068	32250
% unemployed in parent in GOR	-2.308748019000	0.653920314000	0.000416424	0.0005794	32250
% unemployed in political in GOR	-3.655105982000	0.748048268000	1.04E-06	0.001029257	32250
% unemployed in race in GOR	-4.414010346000	0.979093950000	6.61E-06	0.001028832	32250
% unemployed in religion in GOR	-4.315891352000	0.749523672000	8.75E-09	0.001439884	32250

% unemployed in wealth in GOR	0.108165371000	0.415189742000	0.794467741	3.14E-06	32250
Average income in age in GOR	-0.000013992100	0.000004144850	0.000738869	0.000539286	32250
Average income in LA	-0.000003063550	0.000000975731	0.001695777	0.000453713	32250
Average income in parent in GOR	-0.000027284700	0.000003525910	1.10E-14	0.002996302	32250
Average income in race in GOR	-0.000031648000	0.000003553530	6.20E-19	0.00387403	32250
Average income in religion in GOR	-0.000028412300	0.000003333910	1.79E-17	0.003231872	32250
Average income in wealth in GOR	0.000000007041	0.000000781369	0.992810579	2.45E-09	32250
Average earnings in education in GOR	0.000003012780	0.000001951380	0.122639286	9.62E-05	32250
Average earnings in LA	-0.000003648770	0.000001273710	0.004182814	0.000404994	32250
Average earnings in occupation in GOR	0.000005875340	0.000002061090	0.004372489	0.000297935	32250
Average earnings in parent in GOR	-0.000010708200	0.000003741990	0.004223469	0.000371519	32250
Average earnings in political in GOR	-0.000002010180	0.000001742460	0.248671892	5.26E-05	32250
Average earnings in race in GOR	-0.000014949700	0.000003706500	5.54E-05	0.000733858	32250
Average earnings in religion in GOR	-0.000009420580	0.000002963260	0.00148165	0.000435636	32250
Average earnings in wealth in GOR	-0.000001176450	0.000001490090	0.429829835	3.08E-05	32250
Average wealth in age in GOR	0.000000152156	0.000000132492	0.250824077	5.73E-05	32250
Average wealth in income in GOR	-0.000000029311	0.000000047562	0.537733897	1.19E-05	32250
Average wealth in LA	0.000000008516	0.000000032246	0.791701092	2.83E-06	32250
Average wealth in religion in GOR	-0.000000017789	0.000000114819	0.876880665	9.79E-07	32250
Distance from average income in age in GOR	0.000000089188	0.000000264263	0.735750302	3.01E-06	32250
Distance from average income in education in GOR	0.000000047885	0.000000263836	0.855981315	8.83E-07	32250
Distance from average income in gender in GOR	0.000000299296	0.000000266182	0.260869254	3.42E-05	32250
Distance from average income in LA	0.000000383633	0.000000286318	0.180313091	5.50E-05	32250
Distance from average income in marital in GOR	0.000000065541	0.000000263086	0.803269836	1.64E-06	32250

Distance from average income in occupation in GOR	0.000000143527	0.000000262954	0.585198092	7.88E-06	32250
Distance from average income in parent in GOR	0.000000275532	0.000000266380	0.300994067	2.89E-05	32250
Distance from average income in political in GOR	0.000000293329	0.000000265870	0.269931664	3.30E-05	32250
Distance from average income in race in GOR	0.000000307483	0.000000265883	0.247520374	3.62E-05	32250
Distance from average income in religion in GOR	0.000000285868	0.000000266191	0.28288301	3.11E-05	32250
Distance from average income in wealth in GOR	-0.000000014075	0.000000271829	0.958704974	7.23E-08	32250
Distance from average earnings in age in GOR	-0.000000236094	0.000000374582	0.528521983	1.18E-05	32250
Distance from average earnings in education in GOR	0.000000259259	0.000000356026	0.466505611	1.58E-05	32250
Distance from average earnings in gender in GOR	0.000000604238	0.000000347526	0.082121114	8.76E-05	32250
Distance from average earnings in LA	0.000000864206	0.000000364849	0.017870907	0.000176105	32250
Distance from average earnings in marital in GOR	-0.000000005641	0.000000348942	0.98710119	7.68E-09	32250
Distance from average earnings in occupation in GOR	0.000000183359	0.000000354308	0.604809686	7.71E-06	32250
Distance from average earnings in parent in GOR	0.000000538034	0.000000348544	0.122702128	6.86E-05	32250
Distance from average earnings in political in GOR	0.000000497312	0.000000344592	0.148997728	5.92E-05	32250
Distance from average earnings in race in GOR	0.000000592187	0.000000347638	0.088512666	8.40E-05	32250
Distance from average earnings in religion in GOR	0.000000587090	0.000000350995	0.09442768	8.16E-05	32250
Distance from average earnings in wealth in GOR	0.000000483761	0.000000338343	0.15280629	5.75E-05	32250
Distance from average wealth in age in GOR	0.000000012271	0.000000007483	0.101073708	5.54E-05	32250
Distance from average wealth in education in GOR	0.000000010599	0.000000007431	0.153813414	4.18E-05	32250
Distance from average wealth in gender in GOR	0.000000014981	0.000000007661	0.050547802	8.29E-05	32250
Distance from average wealth in income in GOR	0.000000014091	0.000000007469	0.059246397	7.47E-05	32250
Distance from average wealth in LA	0.000000012733	0.000000007800	0.10260933	5.81E-05	32250
Distance from average wealth in marital in GOR	0.000000008022	0.000000007311	0.272606313	2.38E-05	32250

Distance from average wealth in occupation in GOR	0.000000013209	0.000000007547	0.080114836	6.46E-05	32250
Distance from average wealth in parent in GOR	0.000000013684	0.000000007578	0.070989656	6.91E-05	32250
Distance from average wealth in political in GOR	0.000000013863	0.000000007601	0.068215114	7.10E-05	32250
Distance from average wealth in race in GOR	0.000000014982	0.000000007665	0.050651403	8.30E-05	32250
Distance from average wealth in religion in GOR	0.000000013411	0.000000007588	0.077210586	6.63E-05	32250
Distance from average wealth in unemployment	0.000000014478	0.000000007635	0.057965502	7.75E-05	32250
Distance from median education in income in GOR	0.026943323000	0.004820910000	2.35E-08	0.001388861	32250
Distance from median education in LA	0.020789947000	0.005408917000	0.000121964	0.000720262	32250
Distance from median education in wealth in GOR	0.007820201000	0.005316932000	0.141373452	0.000103485	32250
MacArthur ladder	0.004609331000	0.000544462000	2.90E-17	0.004279359	31255
Median education in age in GOR	-0.026115936000	0.008768815000	0.002905651	0.000472261	32250
Median education in gender in GOR	-0.064389818000	0.008272245000	7.72E-15	0.003041968	32250
Median education in income in GOR	-0.032456155000	0.005464137000	2.95E-09	0.001518508	32250
Median education in LA	-0.025797948000	0.006634629000	0.000101562	0.000770938	32250
Median education in marital in GOR	0.020109956000	0.011281161000	0.074679167	0.000191095	32250
Median education in parent in GOR	-0.055604827000	0.008452487000	4.99E-11	0.002186919	32250
Median education in political in GOR	-0.041267384000	0.006666916000	6.26E-10	0.001747377	32250
Median education in race in GOR	-0.052312008000	0.007381445000	1.46E-12	0.002586125	32250
Median education in religion in GOR	-0.061074861000	0.009033896000	1.45E-11	0.002316413	32250
Median education in unemployment in GOR	-0.054311013000	0.007454485000	3.44E-13	0.002730879	32250
Median education in wealth in GOR	-0.007473066000	0.006410667000	0.243753668	6.33E-05	32250
Rank income in age in GOR	-0.021624059000	0.028907414000	0.454450167	2.57E-05	32250
Rank income in education in GOR	-0.003056893000	0.025001375000	0.902688404	6.97E-07	32250

Rank income in gender in GOR	0.024002271000	0.026891791000	0.372119398	3.67E-05	32250
Rank income in LA	0.014537603000	0.024301083000	0.549700813	1.67E-05	32250
Rank income in marital in GOR	-0.011821509000	0.026009111000	0.649468585	9.69E-06	32250
Rank income in occupation in GOR	0.008643012000	0.025273303000	0.732371626	5.38E-06	32250
Rank income in parent in GOR	0.023429349000	0.026854767000	0.382985542	3.52E-05	32250
Rank income in political in GOR	0.020303761000	0.026080340000	0.436287656	2.77E-05	32250
Rank income in race in GOR	0.025858530000	0.026976079000	0.337797043	4.24E-05	32250
Rank income in religion in GOR	0.023050797000	0.026769314000	0.389208758	3.40E-05	32250
Rank income in wealth in GOR	-0.011379243000	0.022505272000	0.613130512	1.15E-05	32250
Rank education in age in GOR	0.075552492000	0.060333764000	0.210510573	7.47E-05	32250
Rank education in wealth in GOR	0.062102227000	0.046798934000	0.184538386	8.48E-05	32250
Rank earnings in age in GOR	-0.021634114000	0.037219510000	0.561079976	1.43E-05	32250
Rank earnings in LA	0.076914133000	0.032164062000	0.016806712	0.000243698	32250
Rank wealth in age in GOR	0.183768615000	0.049047400000	0.000180134	0.000655059	32250
Rank wealth in education in GOR	0.168621222000	0.041593956000	5.07E-05	0.000814013	32250
Rank wealth in gender in GOR	0.270087134000	0.048201373000	2.16E-08	0.001555205	32250
Rank wealth in income in GOR	0.195869239000	0.037697746000	2.08E-07	0.00120303	32250
Rank wealth in LA	0.162269154000	0.034361434000	2.36E-06	0.000994865	32250
Rank wealth in marital in GOR	0.143483335000	0.045151608000	0.001488379	0.000522474	32250
Rank wealth in occupation in GOR	0.226367635000	0.041549864000	5.21E-08	0.001424343	32250
Rank wealth in parent in GOR	0.250111790000	0.046648116000	8.43E-08	0.001398971	32250
Rank wealth in political in GOR	0.238150582000	0.044991336000	1.23E-07	0.001337383	32250
Rank wealth in race in GOR	0.264995462000	0.047753626000	2.94E-08	0.001506663	32250
Rank wealth in religion in GOR	0.250530348000	0.045848535000	4.76E-08	0.00145099	32250

Rank wealth in unemployment	0.251792890000	0.047652150000	1.29E-07	0.001383959	32250
Well off friends	0.009862764000	0.013427405000	0.462647528	7.04E-05	18701
Well off nearby	0.026542641000	0.013739358000	0.053406524	0.000482764	18289
Well off work	0.026417036000	0.013365107000	0.048160435	0.001285887	6924

Appendix Table 4.29: Results of fixed effects regressions explaining variance in life meaning in ELSA without controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	Experienced affect last week				
	b	se	p	r2	n
% top income in age in GOR	2.301658941	0.582871579	7.91E-05	0.000771722	32250
% top income in education in GOR	-0.098609807	0.303832994	7.46E-01	4.79E-06	32250
% top income in gender in GOR	1.007152943	0.609635199	9.86E-02	0.000125568	32250
% top income in LA	0.022165163	0.129863604	8.64E-01	1.26E-06	32250
% top income in marital in GOR	2.674820949	0.489894891	4.87E-08	0.001585595	32250
% top income in occupation in GOR	0.615007364	0.35749895	8.54E-02	0.000133767	32250
% top income in parent in GOR	0.985855822	0.51018461	5.33E-02	0.00018536	32250
% top income in political in GOR	0.529548469	0.40079504	1.86E-01	7.73E-05	32250
% top income in race in GOR	1.121484806	0.646360673	8.28E-02	0.000153181	32250
% top income in religion in GOR	0.571620625	0.461659741	2.16E-01	7.22E-05	32250
% top income in wealth in GOR	0.168977902	0.141821342	2.33E-01	4.94E-05	32250
% top education in age in GOR	0.980044363	0.284011391	5.61E-04	0.000595294	32250
% top education in income in GOR	0.252065982	0.147373674	8.72E-02	0.000127118	32250
% top education in LA	0.208809219	0.127378608	1.01E-01	0.00011184	32250
% top education in parent in GOR	0.730232071	0.295068595	1.33E-02	0.000298454	32250
% top education in religion in GOR	0.66626123	0.260143605	1.04E-02	0.000330864	32250
% top education in unemployment in GOR	0.866241169	0.282462061	2.17E-03	0.000477394	32250
% top education in wealth in GOR	0.319627479	0.136172487	1.89E-02	0.000239366	32250
% top earnings in age in GOR	1.680451232	0.498529121	7.52E-04	0.00055086	32250
% top earnings in education in GOR	-0.23626857	0.275933013	3.92E-01	3.63E-05	32250
% top earnings in gender in GOR	0.781616002	0.498540056	1.17E-01	0.000105773	32250
% top earnings in LA	0.060556719	0.130708554	6.43E-01	1.02E-05	32250

% top earnings in marital in GOR	2.166335265	0.439449216	8.37E-07	0.001505116	32250
% top earnings in occupation in GOR	0.449880279	0.272540781	9.88E-02	0.000124353	32250
% top earnings in parent in GOR	0.537461557	0.49249472	2.75E-01	5.78E-05	32250
% top earnings in political in GOR	0.024855662	0.292732747	9.32E-01	3.11E-07	32250
% top earnings in race in GOR	1.245028444	0.547379926	2.30E-02	0.000254944	32250
% top earnings in religion in GOR	0.127768012	0.452273075	7.78E-01	3.76E-06	32250
% top earnings in wealth in GOR	0.102209976	0.162857692	5.30E-01	1.48E-05	32250
% top wealth in income in GOR	0.18169704	0.166483502	2.75E-01	5.29E-05	32250
% top wealth in LA	0.22021727	0.121751031	7.05E-02	0.000148252	32250
% unemployed in age in GOR	2.002550214	1.179360231	8.95E-02	0.000135432	32250
% unemployed in education in GOR	-0.101962543	0.490125818	8.35E-01	1.74E-06	32250
% unemployed in gender in GOR	0.936459728	0.906212808	3.01E-01	4.62E-05	32250
% unemployed in income in GOR	0.068136916	0.477509808	8.87E-01	9.60E-07	32250
% unemployed in LA	0.076625249	0.238656958	7.48E-01	4.96E-06	32250
% unemployed in marital in GOR	-0.171938231	0.657494769	7.94E-01	4.36E-06	32250
% unemployed in occupation in GOR	0.052745348	0.658975353	9.36E-01	2.77E-07	32250
% unemployed in parent in GOR	-0.372208932	0.71465832	6.03E-01	1.27E-05	32250
% unemployed in political in GOR	0.505845237	0.838705277	5.46E-01	1.66E-05	32250
% unemployed in race in GOR	0.956839717	1.042965896	3.59E-01	4.07E-05	32250
% unemployed in religion in GOR	0.583664322	0.852298577	4.93E-01	2.21E-05	32250
% unemployed in wealth in GOR	-0.302875066	0.480411671	5.28E-01	2.07E-05	32250
Average income in age in GOR	-2.29E-07	4.34E-06	9.58E-01	1.21E-07	32250
Average income in LA	1.12E-06	9.79E-07	2.55E-01	5.06E-05	32250
Average income in parent in GOR	7.26E-06	3.80E-06	5.64E-02	0.000178176	32250
Average income in race in GOR	1.04E-05	3.84E-06	6.95E-03	0.000349493	32250
Average income in religion in GOR	7.55E-06	3.78E-06	4.55E-02	0.000192114	32250

Average income in wealth in GOR	1.01E-06	9.46E-07	2.87E-01	4.22E-05	32250
Average earnings in education in GOR	2.83E-07	2.31E-06	9.02E-01	7.14E-07	32250
Average earnings in LA	1.20E-06	1.34E-06	3.71E-01	3.68E-05	32250
Average earnings in occupation in GOR	2.65E-06	2.56E-06	3.01E-01	5.09E-05	32250
Average earnings in parent in GOR	3.44E-06	4.16E-06	4.08E-01	3.22E-05	32250
Average earnings in political in GOR	1.60E-06	1.96E-06	4.14E-01	2.80E-05	32250
Average earnings in race in GOR	9.92E-06	4.17E-06	1.75E-02	0.000271576	32250
Average earnings in religion in GOR	1.81E-06	3.35E-06	5.90E-01	1.35E-05	32250
Average earnings in wealth in GOR	6.97E-07	1.43E-06	6.26E-01	9.09E-06	32250
Average wealth in age in GOR	3.20E-07	1.52E-07	3.59E-02	0.000212536	32250
Average wealth in income in GOR	5.20E-08	5.74E-08	3.65E-01	3.16E-05	32250
Average wealth in LA	4.20E-08	3.56E-08	2.38E-01	5.79E-05	32250
Average wealth in religion in GOR	2.75E-07	1.27E-07	3.06E-02	0.000197165	32250
Distance from average income in age in GOR	-3.09E-07	3.71E-07	4.05E-01	3.05E-05	32250
Distance from average income in education in GOR	-3.10E-07	3.69E-07	4.01E-01	3.10E-05	32250
Distance from average income in gender in GOR	-3.77E-07	3.68E-07	3.05E-01	4.58E-05	32250
Distance from average income in LA	-4.59E-07	3.63E-07	2.05E-01	6.63E-05	32250
Distance from average income in marital in GOR	-7.16E-07	3.68E-07	5.19E-02	0.000165061	32250
Distance from average income in occupation in GOR	-3.76E-07	3.66E-07	3.05E-01	4.55E-05	32250
Distance from average income in parent in GOR	-3.85E-07	3.66E-07	2.92E-01	4.76E-05	32250
Distance from average income in political in GOR	-3.96E-07	3.68E-07	2.82E-01	5.06E-05	32250
Distance from average income in race in GOR	-4.13E-07	3.68E-07	2.62E-01	5.48E-05	32250
Distance from average income in religion in GOR	-3.88E-07	3.68E-07	2.91E-01	4.83E-05	32250
Distance from average income in wealth in GOR	-4.59E-07	3.82E-07	2.30E-01	6.47E-05	32250
Distance from average earnings in age in GOR	-2.56E-07	4.46E-07	5.66E-01	1.17E-05	32250
Distance from average earnings in education in GOR	-7.01E-07	4.28E-07	1.01E-01	9.70E-05	32250
Distance from average earnings in gender in GOR	-7.57E-07	4.23E-07	7.37E-02	0.000115592	32250
Distance from average earnings in LA	-8.40E-07	4.38E-07	5.51E-02	0.000139875	32250
Distance from average earnings in marital in GOR	-1.45E-06	4.29E-07	7.30E-04	0.000426096	32250
Distance from average earnings in occupation in GOR	-8.04E-07	4.30E-07	6.17E-02	0.000124615	32250

Distance from average earnings in parent in GOR	-7.29E-07	4.25E-07	8.66E-02	0.000105846	32250
Distance from average earnings in political in GOR	-7.62E-07	4.21E-07	6.99E-02	0.000116938	32250
Distance from average earnings in race in GOR	-8.10E-07	4.24E-07	5.62E-02	0.000132265	32250
Distance from average earnings in religion in GOR	-7.20E-07	4.27E-07	9.21E-02	0.000103143	32250
Distance from average earnings in wealth in GOR	-7.20E-07	4.17E-07	8.40E-02	0.00010722	32250
Distance from average wealth in age in GOR	1.69E-08	8.17E-09	3.92E-02	8.79E-05	32250
Distance from average wealth in education in GOR	2.12E-08	8.57E-09	1.33E-02	0.000140798	32250
Distance from average wealth in gender in GOR	1.73E-08	8.19E-09	3.48E-02	9.28E-05	32250
Distance from average wealth in income in GOR	1.67E-08	8.10E-09	3.96E-02	8.79E-05	32250
Distance from average wealth in LA	1.50E-08	8.44E-09	7.66E-02	6.73E-05	32250
Distance from average wealth in marital in GOR	8.81E-09	7.66E-09	2.50E-01	2.42E-05	32250
Distance from average wealth in occupation in GOR	1.67E-08	8.14E-09	4.00E-02	8.69E-05	32250
Distance from average wealth in parent in GOR	1.69E-08	8.18E-09	3.84E-02	8.91E-05	32250
Distance from average wealth in political in GOR	1.62E-08	8.15E-09	4.68E-02	8.16E-05	32250
Distance from average wealth in race in GOR	1.67E-08	8.17E-09	4.04E-02	8.72E-05	32250
Distance from average wealth in religion in GOR	1.66E-08	8.19E-09	4.20E-02	8.60E-05	32250
Distance from average wealth in unemployment	1.66E-08	8.15E-09	4.14E-02	8.60E-05	32250
Distance from median education in income in GOR	-0.005172252	0.005635821	3.59E-01	4.30E-05	32250
Distance from median education in LA	-0.010388455	0.006056109	8.63E-02	0.000151243	32250
Distance from median education in wealth in GOR	-0.017975665	0.005985785	2.68E-03	0.000459835	32250
MacArthur ladder	0.00316671	0.000595236	1.06E-07	0.001676368	31255
Median education in age in GOR	0.021460353	0.009494714	2.38E-02	0.000268185	32250
Median education in gender in GOR	0.026604171	0.009240521	4.00E-03	0.000436726	32250
Median education in income in GOR	0.003512804	0.006186268	5.70E-01	1.50E-05	32250
Median education in LA	0.010773581	0.006995289	1.24E-01	0.000113073	32250
Median education in marital in GOR	0.066319754	0.012839524	2.45E-07	0.001747843	32250

Median education in parent in GOR	0.013128592	0.009521522	1.68E-01	0.000102526	32250
Median education in political in GOR	0.011470684	0.007636154	1.33E-01	0.000113538	32250
Median education in race in GOR	0.013176559	0.008279085	1.12E-01	0.000137988	32250
Median education in religion in GOR	0.019297511	0.009993204	5.35E-02	0.000194484	32250
Median education in unemployment in GOR	0.011100511	0.008321095	1.82E-01	9.59E-05	32250
Median education in wealth in GOR	0.022569184	0.006908091	1.09E-03	0.000485635	32250
Rank income in age in GOR	0.034070305	0.031519758	2.80E-01	5.37E-05	32250
Rank income in education in GOR	0.02892056	0.027781768	2.98E-01	5.24E-05	32250
Rank income in gender in GOR	0.030488614	0.030071293	3.11E-01	4.99E-05	32250
Rank income in LA	0.000433792	0.027283698	9.87E-01	1.25E-08	32250
Rank income in marital in GOR	-0.019482442	0.029400334	5.08E-01	2.21E-05	32250
Rank income in occupation in GOR	0.037058637	0.028550488	1.94E-01	8.32E-05	32250
Rank income in parent in GOR	0.022316327	0.029574679	4.51E-01	2.69E-05	32250
Rank income in political in GOR	0.023102653	0.028949123	4.25E-01	3.02E-05	32250
Rank income in race in GOR	0.020823246	0.030039439	4.88E-01	2.31E-05	32250
Rank income in religion in GOR	0.023809543	0.029502753	4.20E-01	3.05E-05	32250
Rank income in wealth in GOR	0.005495987	0.024932914	8.26E-01	2.26E-06	32250
Rank education in age in GOR	0.0189432	0.06897632	7.84E-01	3.95E-06	32250
Rank education in wealth in GOR	-0.085483904	0.053163166	1.08E-01	0.000135144	32250
Rank earnings in age in GOR	0.052536206	0.039752875	1.86E-01	7.09E-05	32250
Rank earnings in LA	-0.036779958	0.034967828	2.93E-01	4.69E-05	32250
Rank wealth in age in GOR	0.057297683	0.054001682	2.89E-01	5.36E-05	32250
Rank wealth in education in GOR	0.120570922	0.044770946	7.09E-03	0.00035001	32250
Rank wealth in gender in GOR	0.112400669	0.052080135	3.09E-02	0.00022652	32250
Rank wealth in income in GOR	0.104629837	0.041853075	1.24E-02	0.000288698	32250
Rank wealth in LA	0.016155347	0.037613701	6.68E-01	8.29E-06	32250

Rank wealth in marital in GOR	-0.016788213	0.048657525	7.30E-01	6.02E-06	32250
Rank wealth in occupation in GOR	0.087871035	0.044264017	4.72E-02	0.000180496	32250
Rank wealth in parent in GOR	0.114250019	0.050730139	2.43E-02	0.000245495	32250
Rank wealth in political in GOR	0.096383594	0.048919882	4.88E-02	0.000184225	32250
Rank wealth in race in GOR	0.101703839	0.051940912	5.02E-02	0.000186639	32250
Rank wealth in religion in GOR	0.10646129	0.050122258	3.37E-02	0.000220352	32250
Rank wealth in unemployment	0.090463911	0.05162042	7.97E-02	0.000150237	32250
Well off friends	0.035963615	0.015329773	1.90E-02	0.000799257	18701
Well off nearby	0.080309981	0.014855957	6.61E-08	0.003850341	18289
Well off work	0.005565847	0.015562693	7.21E-01	4.33E-05	6924

Appendix Table 4.30: Results of fixed effects regressions explaining variance in experienced affect last week in ELSA without controls from the relative variables with VIF <10. Robust standard errors.

Relative variable	**Life satisfaction (1)**				
	b	se	p	r2	n
MacArthur ladder	0.01	0.001	3.02E-38	0.03	31255
% top earnings in marital in GOR	-4.17	0.357	2.33E-31	0.02	32250
% top earnings in gender in GOR	-5	0.442	2.02E-29	0.02	32250
Average earnings in race in GOR	-3.75E-05	3.46E-06	3.36E-27	0.02	32250
Average earnings in parent in GOR	-3.57E-05	3.44E-06	4.19E-25	0.02	32250
% top earnings in race in GOR	-4.69	0.452	4.87E-25	0.02	32250
Median education in religion in GOR	-0.09	0.009	3.32E-22	0.02	32250
% top earnings in age in GOR	-4.17	0.432	6.13E-22	0.02	32250
Median education in unemployment in GOR	-0.08	0.008	3.20E-21	0.02	32250

% top earnings in religion in GOR	-3.47	0.388	4.23E-19	0.02	32250
% top earnings in parent in GOR	-3.59	0.401	4.87E-19	0.02	32250
Median education in race in GOR	-0.07	0.008	1.18E-18	0.02	32250
Average earnings in occupation in GOR	-2.32E-05	2.63E-06	1.49E-18	0.02	32250
Median education in political in GOR	-0.07	0.008	1.10E-17	0.02	32250
Median education in gender in GOR	-0.08	0.009	1.25E-17	0.02	32250
Average earnings in political in GOR	-2.29E-05	2.89E-06	2.52E-15	0.02	32250
% top earnings in political in GOR	-2.56	0.333	1.65E-14	0.02	32250
% top education in unemployment in GOR	-2.38	0.315	4.02E-14	0.02	32250
Average earnings in religion in GOR	-2.26E-05	2.99E-06	4.82E-14	0.02	32250
Median education in parent in GOR	-0.06	0.009	1.86E-13	0.02	32250
% top education in religion in GOR	-1.96	0.273	8.16E-13	0.02	32250
% top education in age in GOR	-2.13	0.304	2.57E-12	0.02	32250
Average earnings in education in GOR	-1.58E-05	2.26E-06	2.96E-12	0.02	32250
% top education in parent in GOR	-2.15	0.314	9.01E-12	0.02	32250
% top earnings in occupation in GOR	-1.74	0.271	1.40E-10	0.02	32250
Median education in age in GOR	-0.06	0.009	1.97E-10	0.02	32250
% top earnings in education in GOR	-1.58	0.261	1.69E-09	0.02	32250
Well off nearby	0.07	0.013	4.10E-08	0.02	18289
% top income in race in GOR	-3.23	0.588	4.13E-08	0.02	32250
Average wealth in religion in GOR	-6.25E-07	1.19E-07	1.72E-07	0.02	32250
% top income in gender in GOR	-3	0.596	4.94E-07	0.02	32250
Average income in race in GOR	-2.16E-05	4.86E-06	8.83E-06	0.02	32250
Median education in marital in GOR	-0.05	0.011	1.09E-05	0.02	32250
Average income in religion in GOR	-1.86E-05	4.27E-06	1.34E-05	0.02	32250
Average income in parent in GOR	-1.81E-05	4.18E-06	1.45E-05	0.02	32250

Average wealth in age in GOR	-5.79E-07	1.39E-07	3.04E-05	0.02	32250
% top income in religion in GOR	-1.62	0.41	7.79E-05	0.02	32250
Rank earnings in LA	0.23	0.06	1.34E-04	0.02	32250
% top income in political in GOR	-1.6	0.42	1.35E-04	0.02	32250
% top income in marital in GOR	-1.66	0.44	1.68E-04	0.02	32250
% top income in age in GOR	-2.09	0.56	1.74E-04	0.02	32250
Average earnings in wealth in GOR	-4.82E-06	1.43E-06	7.61E-04	0.02	32250
Well off friends	0.04	0.01	1.29E-03	0.02	18701
Rank income in occupation in GOR	0.1	0.03	1.74E-03	0.02	32250
Rank income in gender in GOR	0.11	0.03	2.49E-03	0.02	32250
Average earnings in LA	0	0	2.68E-03	0.02	32250
Rank income in LA	0.09	0.03	2.80E-03	0.02	32250
Distance from median education in income in GOR	0.02	0.01	2.95E-03	0.02	32250
Median education in income in GOR	-0.02	0.01	2.95E-03	0.02	32250
Rank income in race in GOR	0.1	0.03	3.18E-03	0.02	32250
Rank income in religion in GOR	0.1	0.03	3.49E-03	0.02	32250
Rank income in parent in GOR	0.1	0.03	3.61E-03	0.02	32250
Rank wealth in parent in GOR	0.13	0.05	4.54E-03	0.02	32250
% unemployed in race in GOR	-2.86	1.02	4.84E-03	0.02	32250
Rank income in marital in GoR	0.09	0.03	0.01	0.02	32250
Rank wealth in gender in GOR	0.12	0.05	0.01	0.02	32250
Rank wealth in marital in GOR	0.12	0.04	0.01	0.02	32250
% unemployed in age in GOR	-3.22	1.23	0.01	0.02	32250
% top income in occupation in GOR	-0.96	0.37	0.01	0.02	32250
Rank income in political in GOR	0.09	0.03	0.01	0.02	32250
Rank wealth in religion in GOR	0.11	0.04	0.01	0.02	32250

Rank wealth in unemployment	0.12	0.05	0.01	0.02	32250
Rank wealth in race in GOR	0.12	0.05	0.01	0.02	32250
Rank wealth in political in GOR	0.11	0.04	0.02	0.02	32250
Rank wealth in occupation in GOR	0.1	0.04	0.02	0.02	32250
Rank income in education in GOR	0.07	0.03	0.02	0.02	32250
Average wealth in income in GOR	0	0	0.02	0.02	32250
Rank wealth in income in GOR	0.08	0.04	0.02	0.02	32250
% top earnings in wealth in GOR	-0.31	0.14	0.02	0.02	32250
Rank education in age in GOR	0.25	0.11	0.02	0.02	32250
Distance from average income in LA	6.87E-07	3.06E-07	0.02	0.02	32250
% top income in parent in GOR	-0.98	0.44	0.03	0.02	32250
Distance from average income in occupation in GOR	6.72E-07	3.05E-07	0.03	0.02	32250
Rank wealth in age in GOR	0.11	0.05	0.03	0.02	32250
Well off work	0.03	0.01	0.03	0.03	6924
Median education in wealth in GOR	-0.01	0.01	0.03	0.02	32250
Distance from median education in wealth in GOR	0.01	0.01	0.03	0.02	32250
Distance from average income in marital in GOR	6.64E-07	3.04E-07	0.03	0.02	32250
Distance from average income in wealth in GOR	6.68E-07	3.07E-07	0.03	0.02	32250
Rank education in wealth in GOR	0.15	0.07	0.03	0.02	32250
Distance from average income in gender in GOR	6.58E-07	3.04E-07	0.03	0.02	32250
Average income in age in GOR	-8.27E-06	3.83E-06	0.03	0.02	32250
Distance from average income in religion in GOR	6.57E-07	3.05E-07	0.03	0.02	32250
Distance from average income in parent in GOR	6.53E-07	3.05E-07	0.03	0.02	32250
Distance from average income in race in GOR	6.41E-07	3.03E-07	0.03	0.02	32250
Distance from average income in political in GOR	6.38E-07	3.04E-07	0.04	0.02	32250
Rank income in wealth in GOR	0.06	0.03	0.04	0.02	32250

Distance from average income in age in GOR	5.94E-07	3.02E-07	0.05	0.02	32250
% top income in education in GOR	-0.62	0.31	0.05	0.02	32250
Rank earnings in age in GOR	0.11	0.06	0.06	0.02	32250
% unemployed in political in GOR	-1.43	0.77	0.06	0.02	32250
Distance from average earnings in marital in GOR	8.63E-07	4.81E-07	0.07	0.02	32250
Distance from average income in education in GOR	5.34E-07	3.00E-07	0.08	0.02	32250
Rank wealth in LA	5.65E-02	3.37E-02	0.09	0.02	32250
Distance from average earnings in occupation in GOR	7.92E-07	4.78E-07	0.1	0.02	32250
Distance from average earnings in gender in GOR	7.71E-07	4.79E-07	0.11	0.02	32250
Distance from average earnings in race in GOR	7.31E-07	4.78E-07	0.13	0.02	32250
% top education in LA	-0.19	0.13	0.14	0.02	32250
Distance from average earnings in parent in GOR	6.97E-07	4.78E-07	0.15	0.02	32250
Distance from average earnings in education in GOR	6.84E-07	4.75E-07	0.15	0.02	32250
% top education in income in GOR	-0.19	0.13	0.15	0.02	32250
Rank wealth in education in GOR	0.06	0.04	0.16	0.02	32250
Average income in LA	-1.11E-06	8.06E-07	0.17	0.02	32250
Distance from average earnings in wealth in GOR	6.05E-07	4.42E-07	0.17	0.02	32250
Distance from average wealth in LA	-1.60E-08	1.17E-08	0.17	0.02	32250
% unemployed in gender in GOR	-1.18	0.87	0.17	0.02	32250
% top education in wealth in GOR	-0.16	0.12	0.19	0.02	32250
Distance from average wealth in education in GOR	-1.53E-08	1.17E-08	0.19	0.02	32250
Distance from average earnings in LA	6.08E-07	4.66E-07	0.19	0.02	32250
Distance from average earnings in political in GOR	6.09E-07	4.70E-07	0.19	0.02	32250
Distance from average earnings in religion in GOR	6.11E-07	4.77E-07	0.2	0.02	32250
% unemployed in parent in GOR	-0.78	0.62	0.21	0.02	32250
% top earnings in LA	-0.13	0.11	0.22	0.02	32250

Distance from average wealth in marital in GOR	-1.43E-08	1.17E-08	0.22	0.02	32250
Distance from average wealth in gender in GOR	-1.41E-08	1.17E-08	0.23	0.02	32250
Distance from average wealth in race in GOR	-1.41E-08	1.17E-08	0.23	0.02	32250
Distance from average wealth in age in GOR	-1.40E-08	1.17E-08	0.23	0.02	32250
Distance from average wealth in unemployment	-1.39E-08	1.17E-08	0.24	0.02	32250
Distance from average wealth in political in GOR	-1.36E-08	1.17E-08	0.25	0.02	32250
Distance from average wealth in parent in GOR	-1.34E-08	1.17E-08	0.25	0.02	32250
Distance from average wealth in income in GOR	-1.30E-08	1.15E-08	0.26	0.02	32250
% unemployed in income in GOR	-0.47	0.42	0.26	0.02	32250
Distance from average wealth in occupation in GOR	-1.31E-08	1.17E-08	0.27	0.02	32250
Distance from average wealth in religion in GOR	-1.31E-08	1.17E-08	0.27	0.02	32250
Median education in LA	-0.01	0.01	0.27	0.02	32250
Distance from median education in LA	0.01	0.01	0.27	0.02	32250
Average income in wealth in GOR	-8.03E-07	8.54E-07	0.35	0.02	32250
% top wealth in income in GOR	-0.13	0.14	0.38	0.02	32250
Rank income in age in GOR	0.03	0.03	0.39	0.02	32250
% top income in wealth in GOR	-0.1	0.13	0.44	0.02	32250
% top wealth in LA	-0.08	0.11	0.46	0.02	32250
Average wealth in LA	-1.95E-08	3.07E-08	0.53	0.02	32250
Distance from average earnings in age in GOR	2.98E-07	4.71E-07	0.53	0.02	32250
% unemployed in wealth in GOR	0.25	0.42	0.56	0.02	32250
% top income in LA	-0.06	0.11	0.58	0.02	32250
% unemployed in religion in GOR	-0.43	0.8	0.59	0.02	32250
% unemployed in LA	0.08	0.19	0.66	0.02	32250
% unemployed in occupation in GOR	0.23	0.59	0.7	0.02	32250
% unemployed in marital in GOR	0.05	0.53	0.92	0.02	32250

% unemployed in education in GOR	0.03	0.44	0.94	0.02	32250

Appendix Table 4.31: Results of fixed effects regressions explaining variance in the first life satisfaction measure in ELSA from the relative variables with VIF <10. With controls, robust standard errors.

Relative variable	Life satisfaction (2)				
	b	se	p	r2	n
MacArthur ladder	4.92E-03	0.0005	8.45E-23	0.014	31255
% top education in parent in GOR	-1.78	0.3087	9.07E-09	0.01	32250
Average earnings in occupation in GOR	-1.43E-05	2.51E-06	1.17E-08	0.01	32250
Median education in unemployment in GOR	-0.05	0.0086	1.61E-08	0.01	32250
Median education in political in GOR	-0.05	0.0085	4.03E-08	0.01	32250
Median education in race in GOR	-0.05	0.0084	9.13E-08	0.01	32250
Median education in religion in GOR	-0.05	0.0098	1.14E-07	0.01	32250
% top education in age in GOR	-1.58	0.3045	2.31E-07	0.01	32250
% top earnings in age in GOR	-2.08	0.4265	1.06E-06	0.01	32250
% top earnings in gender in GOR	-2.11	0.4419	1.81E-06	0.01	32250
% top education in religion in GOR	-1.28	0.2762	3.92E-06	0.009	32250
Median education in age in GOR	-0.04	0.0092	3.97E-06	0.01	32250
% top earnings in occupation in GOR	-1.16	0.2638	1.02E-05	0.009	32250
Median education in parent in GOR	-0.04	0.0089	1.04E-05	0.009	32250
% top education in unemployment in GOR	-1.45	0.3361	1.61E-05	0.01	32250
Median education in gender in GOR	-0.04	0.0092	5.03E-05	0.009	32250
% top earnings in religion in GOR	-1.53	0.3837	6.40E-05	0.009	32250
% top earnings in marital in GOR	-1.45	0.3687	8.12E-05	0.009	32250
% top earnings in education in GOR	-0.95	0.245	1.01E-04	0.009	32250
Well off nearby	0.05	0.0126	1.36E-04	0.017	18289
Average earnings in parent in GOR	-1.28E-05	3.48E-06	2.45E-04	0.009	32250
% top earnings in political in GOR	-1.12	0.3179	4.09E-04	0.009	32250

% top earnings in race in GOR	-1.6	0.4536	4.13E-04	0.009	32250
Average earnings in race in GOR	-1.21E-05	3.43E-06	4.21E-04	0.009	32250
% top income in gender in GOR	-2.09	0.5968	4.62E-04	0.009	32250
% top income in age in GOR	-1.89	0.5446	5.16E-04	0.009	32250
Rank wealth in gender in GOR	0.16	0.0478	6.43E-04	0.009	32250
Rank wealth in political in GOR	0.15	0.0453	8.59E-04	0.009	32250
Rank wealth in parent in GOR	0.15	0.0462	1.03E-03	0.009	32250
Rank wealth in religion in GOR	0.15	0.0452	1.09E-03	0.009	32250
Average earnings in religion in GOR	-9.65E-06	3.01E-06	1.33E-03	0.009	32250
Rank wealth in income in GOR	0.12	0.0372	1.35E-03	0.009	32250
Rank wealth in marital in GOR	0.14	0.0449	1.60E-03	0.009	32250
Rank wealth in occupation in GOR	0.14	0.0431	1.62E-03	0.009	32250
% top income in race in GOR	-1.89	0.6022	1.67E-03	0.009	32250
Rank wealth in race in GOR	0.14	0.0477	2.37E-03	0.009	32250
Average earnings in political in GOR	-8.60E-06	2.86E-06	2.64E-03	0.009	32250
Rank wealth in unemployment	0.14	0.0475	2.72E-03	0.009	32250
Rank wealth in age in GOR	0.15	0.049	2.93E-03	0.009	32250
% top earnings in parent in GOR	-1.2	0.4063	3.25E-03	0.009	32250
Well off work	0.04	0.0136	4.12E-03	0.017	6924
Rank wealth in education in GOR	0.11	0.0419	7.84E-03	0.009	32250
% top income in parent in GOR	-1.16	0.4395	8.58E-03	0.009	32250
Average earnings in education in GOR	-5.52E-06	2.17E-06	0.01	0.009	32250
% top income in political in GOR	-1.04	0.4138	0.01	0.009	32250

Median education in marital in GOR	-0.03	0.0114	0.01	0.009	32250
% top income in wealth in GOR	0.3	0.1286	0.02	0.009	32250
Distance from median education in income in GOR	0.01	0.0057	0.02	0.009	32250
Median education in income in GOR	-0.01	0.0057	0.02	0.009	32250
Average income in wealth in GOR	1.65E-06	7.53E-07	0.03	0.009	32250
% top income in religion in GOR	-0.86	0.4068	0.04	0.009	32250
% top income in marital in GOR	-0.93	0.4499	0.04	0.009	32250
Rank education in age in GOR	0.2	0.0992	0.04	0.009	32250
% top education in income in GOR	-0.24	0.1238	0.05	0.009	32250
% unemployed in marital in GOR	0.96	0.4986	0.05	0.009	32250
Median education in LA	-0.01	0.0065	0.05	0.009	32250
Distance from median education in LA	0.01	0.0065	0.05	0.009	32250
Average wealth in religion in GOR	-2.03E-07	1.14E-07	0.07	0.009	32250
Well off friends	0.02	0.012	0.08	0.016	18701
Average income in parent in GOR	-7.03E-06	4.14E-06	0.09	0.009	32250
Average wealth in income in GOR	-7.32E-08	4.48E-08	0.1	0.009	32250
Average wealth in LA	4.26E-08	2.75E-08	0.12	0.009	32250
% top wealth in income in GOR	-0.2	0.1365	0.13	0.009	32250
% top income in occupation in GOR	-0.53	0.3564	0.13	0.009	32250
Distance from average income in occupation in GOR	4.02E-07	2.75E-07	0.14	0.009	32250
Distance from average earnings in occupation in GOR	5.92E-07	4.20E-07	0.16	0.009	32250
Distance from average income in LA	3.98E-07	2.86E-07	0.16	0.009	32250
Distance from average income in parent in GOR	3.80E-07	2.76E-07	0.17	0.009	32250
Distance from average income in political in GOR	3.74E-07	2.75E-07	0.17	0.009	32250
Distance from average income in gender in GOR	3.71E-07	2.74E-07	0.18	0.009	32250
Distance from average income in religion in GOR	3.63E-07	2.75E-07	0.19	0.009	32250
% top income in LA	0.14	0.1101	0.19	0.009	32250

Distance from average income in marital in GOR	3.58E-07	2.74E-07	0.19	0.009	32250
Distance from average income in race in GOR	3.52E-07	2.74E-07	0.2	0.009	32250
Distance from average income in age in GOR	3.14E-07	2.73E-07	0.25	0.009	32250
Rank wealth in LA	0.04	0.0345	0.26	0.009	32250
Rank income in marital in GOR	0.04	0.0337	0.26	0.009	32250
Average income in religion in GOR	-4.68E-06	4.23E-06	0.27	0.009	32250
Rank income in education in GOR	0.03	0.0322	0.29	0.009	32250
% top wealth in LA	0.11	0.1079	0.33	0.009	32250
Distance from average income in education in GOR	2.67E-07	2.74E-07	0.33	0.009	32250
Rank income in occupation in GOR	0.03	0.033	0.34	0.009	32250
Rank income in gender in GOR	0.03	0.0358	0.34	0.009	32250
Rank income in parent in GOR	0.03	0.0354	0.35	0.009	32250
Distance from average earnings in gender in GOR	3.90E-07	4.23E-07	0.36	0.009	32250
Distance from average wealth in LA	-7.06E-09	7.71E-09	0.36	0.009	32250
Rank income in political in GOR	0.03	0.0348	0.37	0.009	32250
Rank income in race in GOR	0.03	0.036	0.37	0.009	32250
Rank income in religion in GOR	0.03	0.0353	0.38	0.009	32250
Average income in race in GOR	-4.22E-06	4.89E-06	0.39	0.009	32250
Distance from average earnings in religion in GOR	3.60E-07	4.26E-07	0.4	0.009	32250
Distance from average earnings in parent in GOR	3.47E-07	4.25E-07	0.41	0.009	32250
Distance from average earnings in education in GOR	3.36E-07	4.27E-07	0.43	0.009	32250
Distance from average earnings in race in GOR	3.33E-07	4.24E-07	0.43	0.009	32250
Distance from average earnings in political in GOR	3.25E-07	4.24E-07	0.44	0.009	32250
Distance from average earnings in age in GOR	3.24E-07	4.25E-07	0.45	0.009	32250
Distance from average earnings in marital in GOR	3.24E-07	4.26E-07	0.45	0.009	32250

% unemployed in age in GOR	-0.86	1.1801	0.47	0.009	32250
% unemployed in LA	-0.13	0.2023	0.51	0.009	32250
% unemployed in wealth in GOR	-0.28	0.4295	0.51	0.009	32250
% unemployed in occupation in GOR	-0.38	0.6053	0.53	0.009	32250
% top earnings in wealth in GOR	0.09	0.1383	0.54	0.009	32250
Rank education in wealth in GOR	0.04	0.0713	0.58	0.009	32250
Rank income in age in GOR	0.02	0.0335	0.59	0.009	32250
Rank earnings in LA	-0.03	0.0596	0.59	0.009	32250
Average income in LA	-4.67E-07	8.92E-07	0.6	0.009	32250
Average income in age in GOR	1.76E-06	3.71E-06	0.63	0.009	32250
Rank earnings in age in GOR	0.03	0.0545	0.64	0.009	32250
% unemployed in religion in GOR	0.33	0.7509	0.66	0.009	32250
% unemployed in parent in GOR	0.26	0.6309	0.67	0.009	32250
Median education in wealth in GOR	-2.45E-03	0.0062	0.69	0.009	32250
Distance from median education in wealth in GOR	2.45E-03	0.0062	0.69	0.009	32250
Rank income in LA	0.01	0.0293	0.71	0.009	32250
% unemployed in education in GOR	-0.15	0.4147	0.72	0.009	32250
Average wealth in age in GOR	-4.33E-08	1.30E-07	0.74	0.009	32250
Rank income in wealth in GOR	-0.01	0.0279	0.75	0.009	32250
% top education in LA	-0.04	0.1207	0.76	0.009	32250
Distance from average wealth in education in GOR	-2.30E-09	7.78E-09	0.77	0.009	32250
Average earnings in LA	3.30E-07	1.14E-06	0.77	0.009	32250
Distance from average wealth in age in GOR	-2.06E-09	7.80E-09	0.79	0.009	32250
Distance from average income in wealth in GOR	6.97E-08	2.88E-07	0.81	0.009	32250
Distance from average earnings in wealth in GOR	1.02E-07	4.23E-07	0.81	0.009	32250

% unemployed in political in GOR	0.18	0.7727	0.81	0.009	32250
% top education in wealth in GOR	0.03	0.1259	0.82	0.009	32250
Distance from average wealth in race in GOR	-1.19E-09	7.87E-09	0.88	0.009	32250
% unemployed in gender in GOR	0.12	0.8637	0.89	0.009	32250
% top income in education in GOR	-0.04	0.302	0.89	0.009	32250
Distance from average wealth in unemployment	-1.05E-09	7.89E-09	0.89	0.009	32250
Distance from average wealth in political in GOR	-1.04E-09	7.91E-09	0.9	0.009	32250
Distance from average wealth in marital in GOR	-9.96E-10	7.89E-09	0.9	0.009	32250
% unemployed in income in GOR	0.05	0.4041	0.91	0.009	32250
Distance from average wealth in religion in GOR	-8.35E-10	7.90E-09	0.92	0.009	32250
Distance from average wealth in occupation in GOR	-8.02E-10	7.94E-09	0.92	0.009	32250
Average earnings in wealth in GOR	-1.17E-07	1.18E-06	0.92	0.009	32250
% unemployed in race in GOR	-0.08	0.9947	0.94	0.009	32250
Distance from average earnings in LA	2.83E-08	4.37E-07	0.95	0.009	32250
Distance from average wealth in parent in GOR	-4.34E-10	7.95E-09	0.96	0.009	32250
Distance from average wealth in income in GOR	4.08E-10	7.93E-09	0.96	0.009	32250
Distance from average wealth in gender in GOR	-3.99E-10	7.95E-09	0.96	0.009	32250
% top earnings in LA	1.03E-03	0.1098	0.99	0.009	32250

Appendix Table 4.32: Results of fixed effects regressions explaining variance in the second life satisfaction measure in ELSA from the relative variables with VIF <10. With controls, robust standard errors.

Relative variable	Life meaning				
	b	se	p	r2	n
MacArthur ladder	4.27E-03	0.001	2.94E-15	0.02	31255
Rank wealth in occupation in GOR	0.18	0.047	1.10E-04	0.01	32250
Rank wealth in religion in GOR	0.17	0.049	4.12E-04	0.01	32250
Rank wealth in gender in GOR	0.18	0.052	7.45E-04	0.01	32250
Rank wealth in parent in GOR	0.17	0.05	7.88E-04	0.01	32250
Rank wealth in political in GOR	0.16	0.049	8.88E-04	0.01	32250
Rank wealth in race in GOR	0.17	0.052	1.17E-03	0.01	32250
% top education in parent in GOR	-1.12	0.344	1.20E-03	0.01	32250
Rank wealth in unemployment	0.16	0.052	1.68E-03	0.01	32250
Rank wealth in income in GOR	0.12	0.04	1.89E-03	0.01	32250
Rank wealth in education in GOR	0.14	0.046	2.13E-03	0.01	32250
Rank wealth in marital in GOR	0.14	0.05	4.05E-03	0.01	32250
Average earnings in LA	-3.54E-06	1.29E-06	5.86E-03	0.01	32250
Rank wealth in LA	0.09	0.036	8.47E-03	0.01	32250
Average earnings in religion in GOR	-7.92E-06	3.11E-06	0.01	0.01	32250
% unemployed in wealth in GOR	0.98	0.419	0.02	0.01	32250
% top earnings in marital in GOR	-0.89	0.384	0.02	0.01	32250
% top education in unemployment in GOR	-0.76	0.334	0.02	0.01	32250
% top education in religion in GOR	-0.68	0.299	0.02	0.01	32250

Average earnings in parent in GOR	-8.17E-06	3.77E-06	0.03	0.01	32250
Rank wealth in age in GOR	0.11	0.053	0.03	0.01	32250
% top earnings in race in GOR	-1.05	0.496	0.03	0.01	32250
% top earnings in gender in GOR	-1	0.477	0.04	0.01	32250
Average earnings in race in GOR	-7.77E-06	3.74E-06	0.04	0.01	32250
Median education in gender in GOR	-0.02	0.01	0.04	0.01	32250
Well off work	0.03	0.013	0.04	0.02	6924
% top income in political in GOR	-0.88	0.434	0.04	0.01	32250
Median education in religion in GOR	-0.02	0.011	0.05	0.01	32250
% top income in race in GOR	-1.22	0.659	0.07	0.01	32250
% top income in religion in GOR	-0.76	0.427	0.07	0.01	32250
% unemployed in LA	-0.4	0.227	0.08	0.01	32250
Well off nearby	0.02	0.014	0.08	0.01	18289
Median education in political in GOR	-0.02	0.009	0.09	0.01	32250
% top earnings in religion in GOR	-0.67	0.394	0.09	0.01	32250
% top income in marital in GOR	-0.77	0.474	0.11	0.01	32250
% top education in wealth in GOR	0.22	0.137	0.11	0.01	32250
Median education in parent in GOR	-0.02	0.01	0.12	0.01	32250
% top income in wealth in GOR	0.21	0.14	0.13	0.01	32250
Average earnings in political in GOR	-4.48E-06	3.04E-06	0.14	0.01	32250
% unemployed in religion in GOR	-1.12	0.814	0.17	0.01	32250
% top income in parent in GOR	-0.66	0.485	0.18	0.01	32250
% top income in gender in GOR	-0.83	0.64	0.19	0.01	32250
Average income in religion in GOR	-5.63E-06	4.36E-06	0.2	0.01	32250
% top education in income in GOR	-0.18	0.139	0.2	0.01	32250

% top earnings in political in GOR	-0.43	0.338	0.2	0.01	32250
Distance from average earnings in LA	5.55E-07	4.33E-07	0.2	0.01	32250
Rank income in age in GOR	-0.05	0.037	0.2	0.01	32250
% top earnings in parent in GOR	-0.56	0.44	0.2	0.01	32250
% unemployed in marital in GOR	0.69	0.543	0.2	0.01	32250
Median education in unemployment in GOR	-0.01	0.009	0.2	0.01	32250
Average income in race in GOR	-6.68E-06	5.29E-06	0.21	0.01	32250
Average income in wealth in GOR	9.95E-07	8.14E-07	0.22	0.01	32250
Rank earnings in LA	0.08	0.065	0.22	0.01	32250
Rank education in wealth in GOR	-0.09	0.077	0.25	0.01	32250
Rank income in wealth in GOR	-0.03	0.03	0.25	0.01	32250
% top income in occupation in GOR	0.43	0.39	0.27	0.01	32250
% top wealth in income in GOR	-0.16	0.146	0.27	0.01	32250
Average income in LA	-1.07E-06	9.91E-07	0.28	0.01	32250
Median education in race in GOR	-0.01	0.009	0.29	0.01	32250
% unemployed in occupation in GOR	-0.67	0.632	0.29	0.01	32250
Average earnings in wealth in GOR	-1.56E-06	1.50E-06	0.3	0.01	32250
% top earnings in LA	-0.12	0.119	0.31	0.01	32250
Distance from median education in income in GOR	0.01	0.006	0.32	0.01	32250
Median education in income in GOR	-0.01	0.006	0.32	0.01	32250
% top income in education in GOR	0.32	0.322	0.33	0.01	32250
% unemployed in race in GOR	-0.94	0.974	0.33	0.01	32250
% top education in age in GOR	-0.3	0.331	0.37	0.01	32250
Well off friends	0.01	0.013	0.37	0.01	18701
Rank income in education in GOR	-0.03	0.035	0.37	0.01	32250

Average earnings in education in GOR	2.06E-06	2.31E-06	0.37	0.01	32250
% unemployed in income in GOR	-0.35	0.417	0.4	0.01	32250
Distance from median education in wealth in GOR	-0.01	0.007	0.4	0.01	32250
Median education in wealth in GOR	0.01	0.007	0.4	0.01	32250
Median education in marital in GOR	0.01	0.013	0.4	0.01	32250
% top earnings in education in GOR	-0.21	0.258	0.41	0.01	32250
Average wealth in religion in GOR	9.92E-08	1.24E-07	0.42	0.01	32250
Distance from average income in wealth in GOR	-2.54E-07	3.19E-07	0.43	0.01	32250
% unemployed in education in GOR	0.38	0.485	0.43	0.01	32250
% top education in LA	-0.1	0.131	0.44	0.01	32250
% unemployed in age in GOR	0.96	1.25	0.44	0.01	32250
Distance from average income in education in GOR	-2.20E-07	3.12E-07	0.48	0.01	32250
% top wealth in LA	0.08	0.116	0.49	0.01	32250
Average income in parent in GOR	-3.04E-06	4.73E-06	0.52	0.01	32250
Median education in age in GOR	0.01	0.01	0.57	0.01	32250
Rank income in LA	-0.02	0.031	0.57	0.01	32250
Rank income in gender in GOR	-0.02	0.038	0.59	0.01	32250
Distance from average wealth in occupation in GOR	3.99E-09	7.43E-09	0.59	0.01	32250
Average wealth in LA	1.68E-08	3.24E-08	0.6	0.01	32250
Rank income in occupation in GOR	-0.02	0.036	0.6	0.01	32250
Average earnings in occupation in GOR	-1.34E-06	2.64E-06	0.61	0.01	32250
Rank income in political in GOR	-0.02	0.037	0.61	0.01	32250
Rank income in race in GOR	-0.02	0.038	0.63	0.01	32250
Rank income in marital in GOR	-0.02	0.036	0.63	0.01	32250
Average wealth in income in GOR	2.17E-08	4.81E-08	0.65	0.01	32250

Rank income in religion in GOR	-0.02	0.038	0.65	0.01	32250
Distance from average wealth in gender in GOR	3.30E-09	7.38E-09	0.65	0.01	32250
Distance from average earnings in education in GOR	-1.82E-07	4.23E-07	0.67	0.01	32250
Rank income in parent in GOR	-0.02	0.038	0.67	0.01	32250
Distance from average wealth in race in GOR	3.02E-09	7.38E-09	0.68	0.01	32250
Distance from average wealth in unemployment	2.93E-09	7.38E-09	0.69	0.01	32250
% unemployed in political in GOR	-0.32	0.814	0.7	0.01	32250
Distance from average wealth in age in GOR	2.84E-09	7.39E-09	0.7	0.01	32250
Distance from average wealth in political in GOR	2.79E-09	7.40E-09	0.71	0.01	32250
Distance from average wealth in parent in GOR	2.71E-09	7.39E-09	0.71	0.01	32250
Distance from average income in occupation in GOR	-1.13E-07	3.10E-07	0.72	0.01	32250
% top earnings in wealth in GOR	0.06	0.155	0.72	0.01	32250
Average income in age in GOR	-1.47E-06	4.26E-06	0.73	0.01	32250
Distance from average wealth in marital in GOR	2.49E-09	7.42E-09	0.74	0.01	32250
Distance from average wealth in education in GOR	2.45E-09	7.45E-09	0.74	0.01	32250
Rank education in age in GOR	-0.03	0.106	0.76	0.01	32250
Distance from average earnings in religion in GOR	1.28E-07	4.23E-07	0.76	0.01	32250
Distance from average wealth in religion in GOR	2.18E-09	7.42E-09	0.77	0.01	32250
% top income in age in GOR	0.17	0.593	0.77	0.01	32250
Distance from average wealth in income in GOR	2.05E-09	7.23E-09	0.78	0.01	32250
Distance from average earnings in wealth in GOR	1.15E-07	4.09E-07	0.78	0.01	32250
Distance from average income in age in GOR	-7.68E-08	3.10E-07	0.8	0.01	32250
% top earnings in age in GOR	-0.11	0.456	0.81	0.01	32250
Distance from average earnings in age in GOR	-9.87E-08	4.22E-07	0.81	0.01	32250
Distance from average income in LA	7.61E-08	3.27E-07	0.82	0.01	32250

% top income in LA	-0.03	0.118	0.83	0.01	32250
Distance from average income in parent in GOR	-6.78E-08	3.11E-07	0.83	0.01	32250
% unemployed in parent in GOR	-0.13	0.692	0.85	0.01	32250
Distance from average income in gender in GOR	-5.85E-08	3.11E-07	0.85	0.01	32250
Distance from average earnings in parent in GOR	7.16E-08	4.21E-07	0.86	0.01	32250
Distance from average income in race in GOR	-5.24E-08	3.11E-07	0.87	0.01	32250
Distance from average income in religion in GOR	-4.88E-08	3.11E-07	0.88	0.01	32250
Distance from average income in marital in GOR	-4.76E-08	3.10E-07	0.88	0.01	32250
Distance from average earnings in race in GOR	6.39E-08	4.21E-07	0.88	0.01	32250
Distance from average wealth in LA	1.14E-09	7.68E-09	0.88	0.01	32250
Median education in LA	-8.26E-04	0.007	0.91	0.01	32250
Distance from median education in LA	8.26E-04	0.007	0.91	0.01	32250
Distance from average earnings in gender in GOR	4.70E-08	4.21E-07	0.91	0.01	32250
Distance from average earnings in occupation in GOR	-4.40E-08	4.21E-07	0.92	0.01	32250
Distance from average income in political in GOR	-2.70E-08	3.10E-07	0.93	0.01	32250
Distance from average earnings in marital in GOR	3.53E-08	4.20E-07	0.93	0.01	32250
% top earnings in occupation in GOR	-0.02	0.274	0.94	0.01	32250
Distance from average earnings in political in GOR	3.15E-08	4.17E-07	0.94	0.01	32250
Rank earnings in age in GOR	-4.20E-03	0.057	0.94	0.01	32250
Average wealth in age in GOR	9.79E-09	1.38E-07	0.94	0.01	32250
% unemployed in gender in GOR	1.38E-03	0.935	1	0.01	32250

Appendix Table 4.33: Results of fixed effects regressions explaining variance in life meaning in ELSA from the relative variables with VIF <10. With controls, robust standard errors.

Relative variable	Experienced affect last week				
	b	se	p	r2	n
Well off nearby	0.08	0.015	3.44E-08	0.02	18289
MacArthur ladder	3.06E-03	0.001	2.59E-07	0.01	31255
% top earnings in occupation in GOR	0.97	0.317	2.11E-03	0.01	32250
Median education in gender in GOR	0.03	0.011	7.37E-03	0.01	32250
% top education in unemployment in GOR	0.98	0.367	7.72E-03	0.01	32250
Well off friends	0.04	0.015	9.82E-03	0.02	18701
Average earnings in occupation in GOR	7.97E-06	3.12E-06	0.01	0.01	32250
Distance from average income in LA	-9.86E-07	4.16E-07	0.02	0.01	32250
Distance from median education in wealth in GOR	-0.02	0.007	0.02	0.01	32250
Median education in wealth in GOR	0.02	0.007	0.02	0.01	32250
Distance from average income in marital in GOR	-1.00E-06	4.36E-07	0.02	0.01	32250
% top income in age in GOR	1.45	0.631	0.02	0.01	32250
% top education in religion in GOR	0.74	0.322	0.02	0.01	32250
Distance from average income in race in GOR	-9.93E-07	4.36E-07	0.02	0.01	32250
Average earnings in race in GOR	9.64E-06	4.26E-06	0.02	0.01	32250
% top earnings in age in GOR	1.14	0.508	0.02	0.01	32250
Distance from average income in occupation in GOR	-9.72E-07	4.34E-07	0.03	0.01	32250
Distance from average income in religion in GOR	-9.71E-07	4.35E-07	0.03	0.01	32250
Distance from average income in parent in GOR	-9.63E-07	4.33E-07	0.03	0.01	32250
Distance from average income in political in GOR	-9.68E-07	4.36E-07	0.03	0.01	32250
Distance from average income in gender in GOR	-9.52E-07	4.36E-07	0.03	0.01	32250
Distance from average income in wealth in GOR	-9.74E-07	4.48E-07	0.03	0.01	32250

Distance from average income in education in GOR	-9.39E-07	4.34E-07	0.03	0.01	32250
% top education in parent in GOR	0.79	0.368	0.03	0.01	32250
% top earnings in race in GOR	1.18	0.554	0.03	0.01	32250
Distance from average income in age in GOR	-9.24E-07	4.36E-07	0.03	0.01	32250
Distance from average earnings in occupation in GOR	-1.03E-06	4.86E-07	0.03	0.01	32250
Average income in race in GOR	1.24E-05	5.94E-06	0.04	0.01	32250
Average wealth in age in GOR	3.26E-07	1.58E-07	0.04	0.01	32250
Distance from average earnings in LA	-9.69E-07	4.87E-07	0.05	0.01	32250
Rank earnings in LA	-0.13	0.067	0.05	0.01	32250
% top education in age in GOR	0.7	0.352	0.05	0.01	32250
Distance from average wealth in education in GOR	1.61E-08	8.19E-09	0.05	0.01	32250
Average wealth in religion in GOR	2.68E-07	1.36E-07	0.05	0.01	32250
Distance from average earnings in race in GOR	-9.42E-07	4.85E-07	0.05	0.01	32250
% top education in income in GOR	0.3	0.158	0.06	0.01	32250
% top income in occupation in GOR	0.77	0.412	0.06	0.01	32250
Distance from average earnings in education in GOR	-8.80E-07	4.83E-07	0.07	0.01	32250
% unemployed in marital in GOR	-1.22	0.67	0.07	0.01	32250
Distance from average earnings in marital in GOR	-8.66E-07	4.84E-07	0.07	0.01	32250
Distance from average earnings in gender in GOR	-8.61E-07	4.83E-07	0.07	0.01	32250
Distance from average earnings in religion in GOR	-8.46E-07	4.88E-07	0.08	0.01	32250
Distance from average earnings in parent in GOR	-8.25E-07	4.85E-07	0.09	0.01	32250
Distance from average earnings in political in GOR	-8.20E-07	4.82E-07	0.09	0.01	32250
Distance from average earnings in age in GOR	-8.12E-07	4.84E-07	0.09	0.01	32250

Distance from average wealth in gender in GOR	1.33E-08	8.01E-09	0.1	0.01	32250
Distance from average wealth in marital in GOR	1.31E-08	8.00E-09	0.1	0.01	32250
Distance from average wealth in unemployment	1.31E-08	8.01E-09	0.1	0.01	32250
Distance from average earnings in wealth in GOR	-7.76E-07	4.74E-07	0.1	0.01	32250
Distance from average wealth in parent in GOR	1.29E-08	8.01E-09	0.11	0.01	32250
Distance from average wealth in race in GOR	1.28E-08	8.00E-09	0.11	0.01	32250
Distance from average wealth in occupation in GOR	1.28E-08	8.01E-09	0.11	0.01	32250
Distance from average wealth in religion in GOR	1.26E-08	8.01E-09	0.12	0.01	32250
Distance from average wealth in age in GOR	1.25E-08	7.98E-09	0.12	0.01	32250
Distance from average wealth in political in GOR	1.22E-08	7.98E-09	0.13	0.01	32250
Rank wealth in education in GOR	0.07	0.05	0.13	0.01	32250
% top income in parent in GOR	0.79	0.536	0.14	0.01	32250
% top earnings in gender in GOR	0.73	0.5	0.14	0.01	32250
% top wealth in LA	0.18	0.123	0.14	0.01	32250
% top education in LA	0.19	0.13	0.15	0.01	32250
Distance from average wealth in income in GOR	1.13E-08	7.87E-09	0.15	0.01	32250
% top education in wealth in GOR	0.2	0.143	0.15	0.01	32250
Distance from average wealth in LA	1.18E-08	8.44E-09	0.16	0.01	32250
% unemployed in parent in GOR	-1.05	0.751	0.16	0.01	32250
Rank wealth in parent in GOR	0.08	0.055	0.17	0.01	32250
Average wealth in income in GOR	7.89E-08	5.81E-08	0.17	0.01	32250
Rank wealth in income in GOR	0.06	0.045	0.18	0.01	32250
% top wealth in income in GOR	0.22	0.167	0.18	0.01	32250
Rank income in LA	-0.04	0.034	0.2	0.01	32250
Rank wealth in religion in GOR	0.07	0.055	0.21	0.01	32250

Rank education in age in GOR	0.15	0.125	0.22	0.01	32250
Average income in religion in GOR	6.17E-06	5.03E-06	0.22	0.01	32250
Rank wealth in gender in GOR	0.07	0.057	0.22	0.01	32250
Rank wealth in marital in GOR	0.06	0.053	0.23	0.01	32250
Rank wealth in occupation in GOR	0.06	0.051	0.24	0.01	32250
% top income in race in GOR	0.84	0.733	0.25	0.01	32250
Average earnings in education in GOR	2.94E-06	2.65E-06	0.27	0.01	32250
% top earnings in parent in GOR	0.55	0.495	0.27	0.01	32250
Median education in religion in GOR	0.01	0.012	0.27	0.01	32250
Rank wealth in political in GOR	0.06	0.054	0.28	0.01	32250
Distance from median education in LA	-0.01	0.007	0.29	0.01	32250
Median education in LA	0.01	0.007	0.29	0.01	32250
Average earnings in LA	1.39E-06	1.35E-06	0.31	0.01	32250
% top income in gender in GOR	0.68	0.669	0.31	0.01	32250
Rank wealth in race in GOR	0.06	0.057	0.31	0.01	32250
Rank wealth in unemployment	0.06	0.057	0.32	0.01	32250
Average income in parent in GOR	5.12E-06	5.21E-06	0.33	0.01	32250
Median education in race in GOR	0.01	0.01	0.33	0.01	32250
Rank education in wealth in GOR	-0.08	0.082	0.33	0.01	32250
Average earnings in religion in GOR	3.40E-06	3.54E-06	0.34	0.01	32250
Rank income in wealth in GOR	-0.03	0.031	0.37	0.01	32250
% top income in marital in GOR	0.46	0.52	0.38	0.01	32250
% top income in political in GOR	0.41	0.474	0.38	0.01	32250
Average earnings in parent in GOR	3.64E-06	4.18E-06	0.38	0.01	32250
Median education in political in GOR	0.01	0.01	0.41	0.01	32250

Median education in income in GOR	0.01	0.007	0.42	0.01	32250
Distance from median education in income in GOR	-0.01	0.007	0.42	0.01	32250
Average earnings in political in GOR	2.72E-06	3.36E-06	0.42	0.01	32250
Average wealth in LA	2.88E-08	3.58E-08	0.42	0.01	32250
Rank income in race in GOR	-0.03	0.041	0.43	0.01	32250
% top income in religion in GOR	0.37	0.481	0.44	0.01	32250
Rank income in parent in GOR	-0.03	0.04	0.48	0.01	32250
% unemployed in education in GOR	-0.36	0.499	0.48	0.01	32250
Rank income in religion in GOR	-0.03	0.04	0.53	0.01	32250
Median education in parent in GOR	0.01	0.011	0.53	0.01	32250
Median education in age in GOR	0.01	0.011	0.54	0.01	32250
% top earnings in religion in GOR	0.26	0.462	0.58	0.01	32250
Rank income in marital in GOR	-0.02	0.039	0.58	0.01	32250
% unemployed in wealth in GOR	-0.26	0.481	0.59	0.01	32250
Median education in unemployment in GOR	0.01	0.01	0.6	0.01	32250
Rank income in political in GOR	-0.02	0.039	0.6	0.01	32250
% top earnings in LA	0.07	0.131	0.62	0.01	32250
Rank income in education in GOR	-0.02	0.036	0.62	0.01	32250
% top income in wealth in GOR	0.07	0.144	0.64	0.01	32250
Average income in LA	4.63E-07	1.01E-06	0.65	0.01	32250
Rank income in age in GOR	-0.02	0.039	0.67	0.01	32250
Well off work	0.01	0.015	0.69	0.03	6924
% unemployed in LA	0.09	0.239	0.7	0.01	32250
Average earnings in wealth in GOR	5.35E-07	1.45E-06	0.71	0.01	32250
Rank income in gender in GOR	-0.01	0.041	0.72	0.01	32250

% top earnings in wealth in GOR	0.05	0.163	0.74	0.01	32250
Rank earnings in age in GOR	0.02	0.064	0.77	0.01	32250
% unemployed in age in GOR	-0.38	1.346	0.78	0.01	32250
Rank wealth in LA	-0.01	0.04	0.78	0.01	32250
Rank wealth in age in GOR	0.02	0.058	0.78	0.01	32250
% unemployed in gender in GOR	0.26	0.99	0.8	0.01	32250
Median education in marital in GOR	-3.48E-03	0.014	0.8	0.01	32250
% top income in LA	-0.03	0.131	0.82	0.01	32250
% top earnings in political in GOR	-0.08	0.386	0.83	0.01	32250
% unemployed in occupation in GOR	-0.14	0.669	0.83	0.01	32250
% top earnings in education in GOR	-0.05	0.309	0.86	0.01	32250
Average income in wealth in GOR	1.33E-07	9.80E-07	0.89	0.01	32250
% unemployed in political in GOR	-0.11	0.889	0.9	0.01	32250
% unemployed in race in GOR	0.1	1.111	0.93	0.01	32250
% top earnings in marital in GOR	-0.03	0.432	0.95	0.01	32250
Average income in age in GOR	-1.89E-07	4.52E-06	0.97	0.01	32250
Rank income in occupation in GOR	-1.50E-03	0.038	0.97	0.01	32250
% top income in education in GOR	-0.01	0.354	0.98	0.01	32250
% unemployed in income in GOR	0.01	0.489	0.99	0.01	32250
% unemployed in religion in GOR	-0.01	0.915	0.99	0.01	32250

Appendix Table 4.34: Results of fixed effects regressions explaining variance in experienced affect last week in ELSA from the relative variables with VIF <10. With controls, robust standard errors.

AICs and BICs in ELSA

Absolute model	AIC	BIC	N
Life satisfaction (1)	51159.07	51477.56	32250
Life satisfaction (2)	51092.40	51410.89	32250
Life meaning	55872.17	56190.66	32250
Experienced affect last week	61534.76	61853.25	32250

Appendix Table 4.35: AIC and BIC tests of model fit for the absolute models in ELSA. From fixed effects models with controls and robust standard errors.

The AICs and BICs for each of the absolute models from chapter three in ELSA are shown in Table 4.35. The absolute model for the first life satisfaction measure fit better than the corresponding absolute model for the second life satisfaction measure (ΔAIC and ΔBIC=-66.67). Life meaning fit next best, and experienced affect the worst. The ΔAIC and ΔBICs from the relative income, earnings, wealth, education and unemployment models (without absolute income, earnings, education and unemployment) are shown in Tables 4.36-4.37.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	Income	% top income in age in GOR	22.08	22.08	32250
Life satisfaction (1)	Income	% top income in education in GOR	4.15	4.16	32250
Life satisfaction (1)	Income	% top income in gender in GOR	37.64	37.64	32250
Life satisfaction (1)	Income	% top income in LA	-1.04	-1.04	32250
Life satisfaction (1)	Income	% top income in marital in GOR	20.17	20.17	32250
Life satisfaction (1)	Income	% top income in occupation in GOR	8.92	8.93	32250
Life satisfaction (1)	Income	% top income in parent in GOR	5.96	5.96	32250
Life satisfaction (1)	Income	% top income in political in GOR	20.04	20.04	32250
Life satisfaction (1)	Income	% top income in race in GOR	42.5	42.5	32250
Life satisfaction (1)	Income	% top income in religion in GOR	21.77	21.77	32250
Life satisfaction (1)	Income	% top income in wealth in GOR	-0.65	-0.65	32250
Life satisfaction (1)	Income	Average income in age in GOR	5.09	5.09	32250
Life satisfaction (1)	Income	Average income in LA	0.48	0.48	32250
Life satisfaction (1)	Income	Average income in parent in GOR	24.93	24.93	32250
Life satisfaction (1)	Income	Average income in race in GOR	27.58	27.58	32250
Life satisfaction (1)	Income	Average income in religion in GOR	26.47	26.47	32250
Life satisfaction (1)	Income	Average income in wealth in GOR	-0.4	-0.4	32250
Life satisfaction (1)	Income	Distance from average income in age in GOR	3.91	3.91	32250
Life satisfaction (1)	Income	Distance from average income in education in GOR	3.13	3.13	32250
Life satisfaction (1)	Income	Distance from average income in gender in GOR	4.83	4.83	32250
Life satisfaction (1)	Income	Distance from average income in LA	5.32	5.32	32250
Life satisfaction (1)	Income	Distance from average income in marital in GOR	4.91	4.91	32250
Life satisfaction (1)	Income	Distance from average income in occupation in GOR	5.04	5.04	32250
Life satisfaction (1)	Income	Distance from average income in parent in GOR	4.75	4.75	32250

Life satisfaction (1)	Income	Distance from average income in political in GOR	4.53	4.54	32250
Life satisfaction (1)	Income	Distance from average income in race in GOR	4.59	4.59	32250
Life satisfaction (1)	Income	Distance from average income in religion in GOR	4.81	4.81	32250
Life satisfaction (1)	Income	Distance from average income in wealth in GOR	4.82	4.83	32250
Life satisfaction (1)	Income	Rank income in age in GOR	1.01	1.01	32250
Life satisfaction (1)	Income	Rank income in education in GOR	8.36	8.36	32250
Life satisfaction (1)	Income	Rank income in gender in GOR	13.04	13.04	32250
Life satisfaction (1)	Income	Rank income in LA	13.89	13.89	32250
Life satisfaction (1)	Income	Rank income in marital in GOR	10.39	10.39	32250
Life satisfaction (1)	Income	Rank income in occupation in GOR	14.19	14.19	32250
Life satisfaction (1)	Income	Rank income in parent in GOR	12.13	12.13	32250
Life satisfaction (1)	Income	Rank income in political in GOR	9.84	9.84	32250
Life satisfaction (1)	Income	Rank income in race in GOR	12.43	12.43	32250
Life satisfaction (1)	Income	Rank income in religion in GOR	12.16	12.16	32250
Life satisfaction (1)	Income	Rank income in wealth in GOR	6.61	6.61	32250
Life satisfaction (2)	Income	% top income in age in GOR	19.3	19.3	32250
Life satisfaction (2)	Income	% top income in education in GOR	0.02	0.02	32250
Life satisfaction (2)	Income	% top income in gender in GOR	19.03	19.03	32250
Life satisfaction (2)	Income	% top income in LA	2.37	2.37	32250
Life satisfaction (2)	Income	% top income in marital in GOR	6.74	6.74	32250
Life satisfaction (2)	Income	% top income in occupation in GOR	3.19	3.2	32250
Life satisfaction (2)	Income	% top income in parent in GOR	10.23	10.24	32250
Life satisfaction (2)	Income	% top income in political in GOR	8.98	8.98	32250
Life satisfaction (2)	Income	% top income in race in GOR	15.12	15.12	32250
Life satisfaction (2)	Income	% top income in religion in GOR	6.46	6.47	32250
Life satisfaction (2)	Income	% top income in wealth in GOR	6.84	6.84	32250

Life satisfaction (2)	Income	Average income in age in GOR	0.3	0.3	32250
Life satisfaction (2)	Income	Average income in LA	0.36	0.36	32250
Life satisfaction (2)	Income	Average income in parent in GOR	3.97	3.97	32250
Life satisfaction (2)	Income	Average income in race in GOR	1.1	1.1	32250
Life satisfaction (2)	Income	Average income in religion in GOR	1.76	1.76	32250
Life satisfaction (2)	Income	Average income in wealth in GOR	4.83	4.83	32250
Life satisfaction (2)	Income	Distance from average income in age in GOR	0.95	0.95	32250
Life satisfaction (2)	Income	Distance from average income in education in GOR	0.7	0.7	32250
Life satisfaction (2)	Income	Distance from average income in gender in GOR	1.31	1.31	32250
Life satisfaction (2)	Income	Distance from average income in LA	1.55	1.55	32250
Life satisfaction (2)	Income	Distance from average income in marital in GOR	1.22	1.22	32250
Life satisfaction (2)	Income	Distance from average income in occupation in GOR	1.53	1.53	32250
Life satisfaction (2)	Income	Distance from average income in parent in GOR	1.37	1.37	32250
Life satisfaction (2)	Income	Distance from average income in political in GOR	1.33	1.33	32250
Life satisfaction (2)	Income	Distance from average income in race in GOR	1.18	1.19	32250
Life satisfaction (2)	Income	Distance from average income in religion in GOR	1.26	1.26	32250
Life satisfaction (2)	Income	Distance from average income in wealth in GOR	0.05	0.05	32250
Life satisfaction (2)	Income	Rank income in age in GOR	0.4	0.41	32250
Life satisfaction (2)	Income	Rank income in education in GOR	1.4	1.4	32250
Life satisfaction (2)	Income	Rank income in gender in GOR	1.08	1.09	32250
Life satisfaction (2)	Income	Rank income in LA	0.2	0.2	32250
Life satisfaction (2)	Income	Rank income in marital in GOR	1.55	1.55	32250
Life satisfaction (2)	Income	Rank income in occupation in GOR	1.15	1.15	32250
Life satisfaction (2)	Income	Rank income in parent in GOR	1.05	1.05	32250
Life satisfaction (2)	Income	Rank income in political in GOR	0.99	0.99	32250
Life satisfaction (2)	Income	Rank income in race in GOR	0.98	0.98	32250

Life satisfaction (2)	Income	Rank income in religion in GOR	0.96	0.96	32250
Life satisfaction (2)	Income	Rank income in wealth in GOR	0.08	0.08	32250
Life meaning	Income	% top income in age in GOR	-0.12	-0.12	32250
Life meaning	Income	% top income in education in GOR	1.03	1.03	32250
Life meaning	Income	% top income in gender in GOR	2.32	2.33	32250
Life meaning	Income	% top income in LA	-0.21	-0.2	32250
Life meaning	Income	% top income in marital in GOR	3.7	3.7	32250
Life meaning	Income	% top income in occupation in GOR	1.58	1.58	32250
Life meaning	Income	% top income in parent in GOR	2.58	2.58	32250
Life meaning	Income	% top income in political in GOR	5.37	5.37	32250
Life meaning	Income	% top income in race in GOR	5.11	5.11	32250
Life meaning	Income	% top income in religion in GOR	4.15	4.15	32250
Life meaning	Income	% top income in wealth in GOR	2.72	2.72	32250
Life meaning	Income	Average income in age in GOR	-0.09	-0.09	32250
Life meaning	Income	Average income in LA	1.33	1.33	32250
Life meaning	Income	Average income in parent in GOR	0.37	0.37	32250
Life meaning	Income	Average income in race in GOR	2.13	2.13	32250
Life meaning	Income	Average income in religion in GOR	1.93	1.94	32250
Life meaning	Income	Average income in wealth in GOR	1.33	1.34	32250
Life meaning	Income	Distance from average income in age in GOR	-0.26	-0.26	32250
Life meaning	Income	Distance from average income in education in GOR	-0.11	-0.11	32250
Life meaning	Income	Distance from average income in gender in GOR	-0.25	-0.25	32250
Life meaning	Income	Distance from average income in LA	-0.07	-0.07	32250
Life meaning	Income	Distance from average income in marital in GOR	-0.25	-0.25	32250
Life meaning	Income	Distance from average income in occupation in GOR	-0.25	-0.25	32250
Life meaning	Income	Distance from average income in parent in GOR	-0.26	-0.26	32250

Life meaning	Income	Distance from average income in political in GOR	-0.23	-0.23	32250
Life meaning	Income	Distance from average income in race in GOR	-0.25	-0.25	32250
Life meaning	Income	Distance from average income in religion in GOR	-0.25	-0.25	32250
Life meaning	Income	Distance from average income in wealth in GOR	-0.03	-0.03	32250
Life meaning	Income	Rank income in age in GOR	1.12	1.12	32250
Life meaning	Income	Rank income in education in GOR	0.17	0.18	32250
Life meaning	Income	Rank income in gender in GOR	-0.19	-0.19	32250
Life meaning	Income	Rank income in LA	-0.14	-0.14	32250
Life meaning	Income	Rank income in marital in GOR	-0.22	-0.22	32250
Life meaning	Income	Rank income in occupation in GOR	-0.19	-0.19	32250
Life meaning	Income	Rank income in parent in GOR	-0.24	-0.24	32250
Life meaning	Income	Rank income in political in GOR	-0.21	-0.21	32250
Life meaning	Income	Rank income in race in GOR	-0.22	-0.22	32250
Life meaning	Income	Rank income in religion in GOR	-0.23	-0.23	32250
Life meaning	Income	Rank income in wealth in GOR	0.63	0.63	32250
Experienced affect last week	Income	% top income in age in GOR	3.39	3.39	32250
Experienced affect last week	Income	% top income in education in GOR	-4.81	-4.81	32250
Experienced affect last week	Income	% top income in gender in GOR	-3.33	-3.33	32250
Experienced affect last week	Income	% top income in LA	-4.79	-4.79	32250
Experienced affect last week	Income	% top income in marital in GOR	-3.64	-3.64	32250
Experienced affect last week	Income	% top income in occupation in GOR	0.14	0.14	32250
Experienced affect last week	Income	% top income in parent in GOR	-1.25	-1.24	32250
Experienced affect last week	Income	% top income in political in GOR	-3.77	-3.77	32250
Experienced affect last week	Income	% top income in race in GOR	-2.68	-2.68	32250
Experienced affect last week	Income	% top income in religion in GOR	-3.91	-3.91	32250
Experienced affect last week	Income	% top income in wealth in GOR	-4.49	-4.49	32250

Experienced affect last week	Income	Average income in age in GOR	-4.81	-4.81	32250
Experienced affect last week	Income	Average income in LA	-4.31	-4.3	32250
Experienced affect last week	Income	Average income in parent in GOR	-3.2	-3.2	32250
Experienced affect last week	Income	Average income in race in GOR	2.25	2.25	32250
Experienced affect last week	Income	Average income in religion in GOR	-2.46	-2.46	32250
Experienced affect last week	Income	Average income in wealth in GOR	-4.72	-4.71	32250
Experienced affect last week	Income	Distance from average income in age in GOR	-2.94	-2.94	32250
Experienced affect last week	Income	Distance from average income in education in GOR	-2.8	-2.8	32250
Experienced affect last week	Income	Distance from average income in gender in GOR	-2.75	-2.75	32250
Experienced affect last week	Income	Distance from average income in LA	-2.15	-2.14	32250
Experienced affect last week	Income	Distance from average income in marital in GOR	-2.35	-2.35	32250
Experienced affect last week	Income	Distance from average income in occupation in GOR	-2.58	-2.58	32250
Experienced affect last week	Income	Distance from average income in parent in GOR	-2.67	-2.67	32250
Experienced affect last week	Income	Distance from average income in political in GOR	-2.64	-2.64	32250
Experienced affect last week	Income	Distance from average income in race in GOR	-2.43	-2.43	32250
Experienced affect last week	Income	Distance from average income in religion in GOR	-2.61	-2.61	32250
Experienced affect last week	Income	Distance from average income in wealth in GOR	-2.53	-2.53	32250
Experienced affect last week	Income	Rank income in age in GOR	-4.41	-4.41	32250
Experienced affect last week	Income	Rank income in education in GOR	-4.23	-4.23	32250
Experienced affect last week	Income	Rank income in gender in GOR	-3.88	-3.88	32250
Experienced affect last week	Income	Rank income in LA	-4.76	-4.75	32250
Experienced affect last week	Income	Rank income in marital in GOR	-4.27	-4.27	32250
Experienced affect last week	Income	Rank income in occupation in GOR	-3.26	-3.26	32250
Experienced affect last week	Income	Rank income in parent in GOR	-4.44	-4.44	32250
Experienced affect last week	Income	Rank income in political in GOR	-4.19	-4.18	32250
Experienced affect last week	Income	Rank income in race in GOR	-4.52	-4.52	32250

Experienced affect last week	Income	Rank income in religion in GOR	-4.34	-4.34	32250
Experienced affect last week	Income	Rank income in wealth in GOR	-4.74	-4.74	32250

Appendix Table 4.36: The AIC and BIC differences for the income models in ELSA. Fixed effects, controls and robust standard errors.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	Earnings	% top earnings in age in GOR	142.02	142.02	32250
Life satisfaction (1)	Earnings	% top earnings in education in GOR	47.97	47.97	32250
Life satisfaction (1)	Earnings	% top earnings in gender in GOR	183.06	183.07	32250
Life satisfaction (1)	Earnings	% top earnings in LA	-1.25	-1.25	32250
Life satisfaction (1)	Earnings	% top earnings in marital in GOR	184.41	184.41	32250
Life satisfaction (1)	Earnings	% top earnings in occupation in GOR	54.76	54.76	32250
Life satisfaction (1)	Earnings	% top earnings in parent in GOR	109.59	109.6	32250
Life satisfaction (1)	Earnings	% top earnings in political in GOR	83.04	83.04	32250
Life satisfaction (1)	Earnings	% top earnings in race in GOR	152.92	152.92	32250
Life satisfaction (1)	Earnings	% top earnings in religion in GOR	116.41	116.41	32250
Life satisfaction (1)	Earnings	% top earnings in wealth in GOR	2.94	2.94	32250
Life satisfaction (1)	Earnings	Average earnings in education in GOR	62.28	62.28	32250
Life satisfaction (1)	Earnings	Average earnings in LA	9.06	9.06	32250
Life satisfaction (1)	Earnings	Average earnings in occupation in GOR	108.04	108.05	32250
Life satisfaction (1)	Earnings	Average earnings in parent in GOR	148.03	148.03	32250
Life satisfaction (1)	Earnings	Average earnings in political in GOR	82.38	82.38	32250
Life satisfaction (1)	Earnings	Average earnings in race in GOR	164.27	164.28	32250
Life satisfaction (1)	Earnings	Average earnings in religion in GOR	80.97	80.98	32250
Life satisfaction (1)	Earnings	Average earnings in wealth in GOR	15.56	15.56	32250
Life satisfaction (1)	Earnings	Distance from average earnings in age in GOR	-1.2	-1.2	32250
Life satisfaction (1)	Earnings	Distance from average earnings in education in GOR	2.05	2.05	32250

Life satisfaction (1)	Earnings	Distance from average earnings in gender in GOR	2.97	2.97	32250
Life satisfaction (1)	Earnings	Distance from average earnings in LA	1.3	1.31	32250
Life satisfaction (1)	Earnings	Distance from average earnings in marital in GOR	4.04	4.04	32250
Life satisfaction (1)	Earnings	Distance from average earnings in occupation in GOR	3.2	3.2	32250
Life satisfaction (1)	Earnings	Distance from average earnings in parent in GOR	2.17	2.17	32250
Life satisfaction (1)	Earnings	Distance from average earnings in political in GOR	1.33	1.33	32250
Life satisfaction (1)	Earnings	Distance from average earnings in race in GOR	2.54	2.54	32250
Life satisfaction (1)	Earnings	Distance from average earnings in religion in GOR	1.34	1.34	32250
Life satisfaction (1)	Earnings	Distance from average earnings in wealth in GOR	1.41	1.41	32250
Life satisfaction (1)	Earnings	Rank earnings in age in GOR	4.73	4.74	32250
Life satisfaction (1)	Earnings	Rank earnings in education in GOR	11.45	11.45	32250
Life satisfaction (1)	Earnings	Rank earnings in gender in GOR	16.95	16.96	32250
Life satisfaction (1)	Earnings	Rank earnings in LA	14.06	14.06	32250
Life satisfaction (1)	Earnings	Rank earnings in marital in GOR	14.43	14.44	32250
Life satisfaction (1)	Earnings	Rank earnings in occupation in GOR	13.13	13.13	32250
Life satisfaction (1)	Earnings	Rank earnings in parent in GOR	13.68	13.68	32250
Life satisfaction (1)	Earnings	Rank earnings in political in GOR	10.61	10.62	32250
Life satisfaction (1)	Earnings	Rank earnings in race in GOR	15.11	15.11	32250
Life satisfaction (1)	Earnings	Rank earnings in religion in GOR	12.68	12.68	32250
Life satisfaction (1)	Earnings	Rank earnings in wealth in GOR	7	7	32250
Life satisfaction (2)	Earnings	% top earnings in age in GOR	35.99	35.99	32250
Life satisfaction (2)	Earnings	% top earnings in education in GOR	18.58	18.58	32250
Life satisfaction (2)	Earnings	% top earnings in gender in GOR	32.89	32.89	32250
Life satisfaction (2)	Earnings	% top earnings in LA	-0.33	-0.33	32250
Life satisfaction (2)	Earnings	% top earnings in marital in GOR	22.38	22.39	32250
Life satisfaction (2)	Earnings	% top earnings in occupation in GOR	25.82	25.82	32250

Life satisfaction (2)	Earnings	% top earnings in parent in GOR	12.22	12.22	32250
Life satisfaction (2)	Earnings	% top earnings in political in GOR	16.39	16.39	32250
Life satisfaction (2)	Earnings	% top earnings in race in GOR	17.91	17.91	32250
Life satisfaction (2)	Earnings	% top earnings in religion in GOR	23.04	23.05	32250
Life satisfaction (2)	Earnings	% top earnings in wealth in GOR	0.13	0.13	32250
Life satisfaction (2)	Earnings	Average earnings in education in GOR	7.84	7.84	32250
Life satisfaction (2)	Earnings	Average earnings in LA	-0.24	-0.24	32250
Life satisfaction (2)	Earnings	Average earnings in occupation in GOR	43.01	43.01	32250
Life satisfaction (2)	Earnings	Average earnings in parent in GOR	19.2	19.2	32250
Life satisfaction (2)	Earnings	Average earnings in political in GOR	11.87	11.87	32250
Life satisfaction (2)	Earnings	Average earnings in race in GOR	17.19	17.19	32250
Life satisfaction (2)	Earnings	Average earnings in religion in GOR	15.18	15.19	32250
Life satisfaction (2)	Earnings	Average earnings in wealth in GOR	-0.32	-0.32	32250
Life satisfaction (2)	Earnings	Distance from average earnings in age in GOR	-0.12	-0.12	32250
Life satisfaction (2)	Earnings	Distance from average earnings in education in GOR	-0.1	-0.1	32250
Life satisfaction (2)	Earnings	Distance from average earnings in gender in GOR	0.02	0.02	32250
Life satisfaction (2)	Earnings	Distance from average earnings in LA	-0.3	-0.3	32250
Life satisfaction (2)	Earnings	Distance from average earnings in marital in GOR	-0.13	-0.13	32250
Life satisfaction (2)	Earnings	Distance from average earnings in occupation in GOR	0.75	0.75	32250
Life satisfaction (2)	Earnings	Distance from average earnings in parent in GOR	-0.08	-0.08	32250
Life satisfaction (2)	Earnings	Distance from average earnings in political in GOR	-0.12	-0.12	32250
Life satisfaction (2)	Earnings	Distance from average earnings in race in GOR	-0.11	-0.11	32250
Life satisfaction (2)	Earnings	Distance from average earnings in religion in GOR	-0.05	-0.05	32250
Life satisfaction (2)	Earnings	Distance from average earnings in wealth in GOR	-0.33	-0.33	32250
Life satisfaction (2)	Earnings	Rank earnings in age in GOR	-0.33	-0.32	32250
Life satisfaction (2)	Earnings	Rank earnings in education in GOR	-0.2	-0.2	32250

Life satisfaction (2)	Earnings	Rank earnings in gender in GOR	-0.32	-0.32	32250
Life satisfaction (2)	Earnings	Rank earnings in LA	0.37	0.37	32250
Life satisfaction (2)	Earnings	Rank earnings in marital in GOR	-0.17	-0.16	32250
Life satisfaction (2)	Earnings	Rank earnings in occupation in GOR	-0.18	-0.18	32250
Life satisfaction (2)	Earnings	Rank earnings in parent in GOR	-0.24	-0.24	32250
Life satisfaction (2)	Earnings	Rank earnings in political in GOR	-0.3	-0.3	32250
Life satisfaction (2)	Earnings	Rank earnings in race in GOR	-0.3	-0.3	32250
Life satisfaction (2)	Earnings	Rank earnings in religion in GOR	-0.27	-0.27	32250
Life satisfaction (2)	Earnings	Rank earnings in wealth in GOR	0.15	0.15	32250
Life meaning	Earnings	% top earnings in age in GOR	-2.22	-2.22	32250
Life meaning	Earnings	% top earnings in education in GOR	-1.46	-1.46	32250
Life meaning	Earnings	% top earnings in gender in GOR	4.05	4.06	32250
Life meaning	Earnings	% top earnings in LA	-0.62	-0.62	32250
Life meaning	Earnings	% top earnings in marital in GOR	4.97	4.97	32250
Life meaning	Earnings	% top earnings in occupation in GOR	-2.3	-2.3	32250
Life meaning	Earnings	% top earnings in parent in GOR	0.08	0.08	32250
Life meaning	Earnings	% top earnings in political in GOR	-0.16	-0.15	32250
Life meaning	Earnings	% top earnings in race in GOR	4.45	4.45	32250
Life meaning	Earnings	% top earnings in religion in GOR	1.51	1.52	32250
Life meaning	Earnings	% top earnings in wealth in GOR	-2.12	-2.12	32250
Life meaning	Earnings	Average earnings in education in GOR	-1.41	-1.41	32250
Life meaning	Earnings	Average earnings in LA	10.75	10.75	32250
Life meaning	Earnings	Average earnings in occupation in GOR	-1.94	-1.94	32250
Life meaning	Earnings	Average earnings in parent in GOR	4.69	4.7	32250
Life meaning	Earnings	Average earnings in political in GOR	0.61	0.61	32250
Life meaning	Earnings	Average earnings in race in GOR	3.97	3.97	32250

Life meaning	Earnings	Average earnings in religion in GOR	6.78	6.78	32250
Life meaning	Earnings	Average earnings in wealth in GOR	-0.56	-0.56	32250
Life meaning	Earnings	Distance from average earnings in age in GOR	-1.56	-1.56	32250
Life meaning	Earnings	Distance from average earnings in education in GOR	-1.21	-1.2	32250
Life meaning	Earnings	Distance from average earnings in gender in GOR	-1.96	-1.96	32250
Life meaning	Earnings	Distance from average earnings in LA	-2.02	-2.02	32250
Life meaning	Earnings	Distance from average earnings in marital in GOR	-1.93	-1.93	32250
Life meaning	Earnings	Distance from average earnings in occupation in GOR	-1.72	-1.71	32250
Life meaning	Earnings	Distance from average earnings in parent in GOR	-2.02	-2.02	32250
Life meaning	Earnings	Distance from average earnings in political in GOR	-1.93	-1.93	32250
Life meaning	Earnings	Distance from average earnings in race in GOR	-2	-2	32250
Life meaning	Earnings	Distance from average earnings in religion in GOR	-2.13	-2.13	32250
Life meaning	Earnings	Distance from average earnings in wealth in GOR	-2.13	-2.13	32250
Life meaning	Earnings	Rank earnings in age in GOR	-0.87	-0.87	32250
Life meaning	Earnings	Rank earnings in education in GOR	1.04	1.04	32250
Life meaning	Earnings	Rank earnings in gender in GOR	-0.6	-0.6	32250
Life meaning	Earnings	Rank earnings in LA	-2.15	-2.15	32250
Life meaning	Earnings	Rank earnings in marital in GOR	0.04	0.04	32250
Life meaning	Earnings	Rank earnings in occupation in GOR	-0.55	-0.55	32250
Life meaning	Earnings	Rank earnings in parent in GOR	-0.85	-0.85	32250
Life meaning	Earnings	Rank earnings in political in GOR	-0.16	-0.16	32250
Life meaning	Earnings	Rank earnings in race in GOR	-0.68	-0.68	32250
Life meaning	Earnings	Rank earnings in religion in GOR	-0.49	-0.48	32250
Life meaning	Earnings	Rank earnings in wealth in GOR	-0.72	-0.72	32250
Experienced affect last week	Earnings	% top earnings in age in GOR	6.43	6.43	32250
Experienced affect last week	Earnings	% top earnings in education in GOR	-1.37	-1.37	32250

Experienced affect last week	Earnings	% top earnings in gender in GOR	1.47	1.47	32250
Experienced affect last week	Earnings	% top earnings in LA	-0.98	-0.97	32250
Experienced affect last week	Earnings	% top earnings in marital in GOR	-1.4	-1.4	32250
Experienced affect last week	Earnings	% top earnings in occupation in GOR	11.91	11.91	32250
Experienced affect last week	Earnings	% top earnings in parent in GOR	0.5	0.5	32250
Experienced affect last week	Earnings	% top earnings in political in GOR	-1.34	-1.34	32250
Experienced affect last week	Earnings	% top earnings in race in GOR	5.74	5.75	32250
Experienced affect last week	Earnings	% top earnings in religion in GOR	-0.94	-0.94	32250
Experienced affect last week	Earnings	% top earnings in wealth in GOR	-1.28	-1.28	32250
Experienced affect last week	Earnings	Average earnings in education in GOR	0.33	0.33	32250
Experienced affect last week	Earnings	Average earnings in LA	0.39	0.4	32250
Experienced affect last week	Earnings	Average earnings in occupation in GOR	8.4	8.41	32250
Experienced affect last week	Earnings	Average earnings in parent in GOR	-0.22	-0.22	32250
Experienced affect last week	Earnings	Average earnings in political in GOR	-0.5	-0.5	32250
Experienced affect last week	Earnings	Average earnings in race in GOR	6.67	6.67	32250
Experienced affect last week	Earnings	Average earnings in religion in GOR	0.01	0.01	32250
Experienced affect last week	Earnings	Average earnings in wealth in GOR	-1.23	-1.23	32250
Experienced affect last week	Earnings	Distance from average earnings in age in GOR	-0.4	-0.4	32250
Experienced affect last week	Earnings	Distance from average earnings in education in GOR	-0.17	-0.17	32250
Experienced affect last week	Earnings	Distance from average earnings in gender in GOR	-0.27	-0.27	32250
Experienced affect last week	Earnings	Distance from average earnings in LA	0.49	0.49	32250
Experienced affect last week	Earnings	Distance from average earnings in marital in GOR	-0.23	-0.23	32250
Experienced affect last week	Earnings	Distance from average earnings in occupation in GOR	0.51	0.51	32250
Experienced affect last week	Earnings	Distance from average earnings in parent in GOR	-0.41	-0.41	32250
Experienced affect last week	Earnings	Distance from average earnings in political in GOR	-0.41	-0.4	32250
Experienced affect last week	Earnings	Distance from average earnings in race in GOR	0.08	0.08	32250

Experienced affect last week	Earnings	Distance from average earnings in religion in GOR	-0.33	-0.32	32250
Experienced affect last week	Earnings	Distance from average earnings in wealth in GOR	-0.45	-0.45	32250
Experienced affect last week	Earnings	Rank earnings in age in GOR	-0.17	-0.16	32250
Experienced affect last week	Earnings	Rank earnings in education in GOR	-1.41	-1.4	32250
Experienced affect last week	Earnings	Rank earnings in gender in GOR	-1.3	-1.3	32250
Experienced affect last week	Earnings	Rank earnings in LA	-1.31	-1.31	32250
Experienced affect last week	Earnings	Rank earnings in marital in GOR	-1.41	-1.41	32250
Experienced affect last week	Earnings	Rank earnings in occupation in GOR	-1.41	-1.41	32250
Experienced affect last week	Earnings	Rank earnings in parent in GOR	-1.36	-1.36	32250
Experienced affect last week	Earnings	Rank earnings in political in GOR	-1.21	-1.21	32250
Experienced affect last week	Earnings	Rank earnings in race in GOR	-1.41	-1.41	32250
Experienced affect last week	Earnings	Rank earnings in religion in GOR	-1.27	-1.27	32250
Experienced affect last week	Earnings	Rank earnings in wealth in GOR	-1.33	-1.33	32250

Appendix Table 4.37: The AIC and BIC differences for the earnings models in ELSA. Fixed effects, controls and robust standard errors.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	Wealth	% top wealth in income in GOR	-13.88	-13.88	32250
Life satisfaction (1)	Wealth	% top wealth in LA	-14.12	-14.12	32250
Life satisfaction (1)	Wealth	Average wealth in age in GOR	13.23	13.23	32250
Life satisfaction (1)	Wealth	Average wealth in income in GOR	-8.41	-8.41	32250
Life satisfaction (1)	Wealth	Average wealth in LA	-14.55	-14.55	32250
Life satisfaction (1)	Wealth	Average wealth in religion in GOR	23.71	23.71	32250
Life satisfaction (1)	Wealth	Distance from average wealth in age in GOR	-13.70	-13.70	32250
Life satisfaction (1)	Wealth	Distance from average wealth in education in GOR	-13.34	-13.33	32250
Life satisfaction (1)	Wealth	Distance from average wealth in gender in GOR	-13.67	-13.67	32250
Life satisfaction (1)	Wealth	Distance from average wealth in income in GOR	-13.89	-13.89	32250
Life satisfaction (1)	Wealth	Distance from average wealth in LA	-13.14	-13.14	32250
Life satisfaction (1)	Wealth	Distance from average wealth in marital in GOR	-13.63	-13.63	32250
Life satisfaction (1)	Wealth	Distance from average wealth in occupation in GOR	-13.93	-13.93	32250
Life satisfaction (1)	Wealth	Distance from average wealth in parent in GOR	-13.85	-13.85	32250
Life satisfaction (1)	Wealth	Distance from average wealth in political in GOR	-13.80	-13.80	32250
Life satisfaction (1)	Wealth	Distance from average wealth in race in GOR	-13.68	-13.68	32250
Life satisfaction (1)	Wealth	Distance from average wealth in religion in GOR	-13.94	-13.94	32250
Life satisfaction (1)	Wealth	Distance from average wealth in unemployment	-13.72	-13.72	32250
Life satisfaction (1)	Wealth	Rank wealth in age in GOR	-0.77	-0.77	32250
Life satisfaction (1)	Wealth	Rank wealth in education in GOR	-5.77	-5.77	32250
Life satisfaction (1)	Wealth	Rank wealth in gender in GOR	5.18	5.18	32250
Life satisfaction (1)	Wealth	Rank wealth in income in GOR	-0.10	-0.10	32250
Life satisfaction (1)	Wealth	Rank wealth in LA	-5.38	-5.38	32250
Life satisfaction (1)	Wealth	Rank wealth in marital in GOR	5.10	5.10	32250
Life satisfaction (1)	Wealth	Rank wealth in occupation in GOR	2.10	2.10	32250
Life satisfaction (1)	Wealth	Rank wealth in parent in GOR	6.61	6.61	32250
Life satisfaction (1)	Wealth	Rank wealth in political in GOR	2.27	2.27	32250
Life satisfaction (1)	Wealth	Rank wealth in race in GOR	3.90	3.90	32250
Life satisfaction (1)	Wealth	Rank wealth in religion in GOR	3.64	3.64	32250
Life satisfaction (1)	Wealth	Rank wealth in unemployment in GOR	3.96	3.97	32250
Life satisfaction (2)	Wealth	% top wealth in income in GOR	-24.20	-24.20	32250
Life satisfaction (2)	Wealth	% top wealth in LA	-25.52	-25.52	32250
Life satisfaction (2)	Wealth	Average wealth in age in GOR	-26.93	-26.93	32250
Life satisfaction (2)	Wealth	Average wealth in income in GOR	-24.49	-24.49	32250

Life satisfaction (2)	Wealth	Average wealth in LA	-23.97	-23.97	32250
Life satisfaction (2)	Wealth	Average wealth in religion in GOR	-23.05	-23.05	32250
Life satisfaction (2)	Wealth	Distance from average wealth in age in GOR	-26.89	-26.89	32250
Life satisfaction (2)	Wealth	Distance from average wealth in education in GOR	-26.92	-26.92	32250
Life satisfaction (2)	Wealth	Distance from average wealth in gender in GOR	-26.68	-26.68	32250
Life satisfaction (2)	Wealth	Distance from average wealth in income in GOR	-26.58	-26.58	32250
Life satisfaction (2)	Wealth	Distance from average wealth in LA	-27.05	-27.05	32250
Life satisfaction (2)	Wealth	Distance from average wealth in marital in GOR	-26.76	-26.76	32250
Life satisfaction (2)	Wealth	Distance from average wealth in occupation in GOR	-26.75	-26.75	32250
Life satisfaction (2)	Wealth	Distance from average wealth in parent in GOR	-26.69	-26.69	32250
Life satisfaction (2)	Wealth	Distance from average wealth in political in GOR	-26.77	-26.77	32250
Life satisfaction (2)	Wealth	Distance from average wealth in race in GOR	-26.79	-26.79	32250
Life satisfaction (2)	Wealth	Distance from average wealth in religion in GOR	-26.75	-26.74	32250
Life satisfaction (2)	Wealth	Distance from average wealth in unemployment	-26.78	-26.78	32250
Life satisfaction (2)	Wealth	Rank wealth in age in GOR	-1.21	-1.21	32250
Life satisfaction (2)	Wealth	Rank wealth in education in GOR	-2.60	-2.60	32250
Life satisfaction (2)	Wealth	Rank wealth in gender in GOR	8.14	8.14	32250
Life satisfaction (2)	Wealth	Rank wealth in income in GOR	1.65	1.66	32250
Life satisfaction (2)	Wealth	Rank wealth in LA	-18.60	-18.60	32250
Life satisfaction (2)	Wealth	Rank wealth in marital in GOR	5.10	5.10	32250
Life satisfaction (2)	Wealth	Rank wealth in occupation in GOR	4.07	4.07	32250
Life satisfaction (2)	Wealth	Rank wealth in parent in GOR	5.62	5.62	32250
Life satisfaction (2)	Wealth	Rank wealth in political in GOR	5.81	5.81	32250
Life satisfaction (2)	Wealth	Rank wealth in race in GOR	3.29	3.29	32250
Life satisfaction (2)	Wealth	Rank wealth in religion in GOR	4.82	4.82	32250
Life satisfaction (2)	Wealth	Rank wealth in unemployment	2.67	2.67	32250
Life meaning	Wealth	% top wealth in income in GOR	-6.90	-6.90	32250
Life meaning	Wealth	% top wealth in LA	-7.68	-7.68	32250
Life meaning	Wealth	Average wealth in age in GOR	-8.44	-8.44	32250
Life meaning	Wealth	Average wealth in income in GOR	-8.22	-8.22	32250
Life meaning	Wealth	Average wealth in LA	-8.00	-8.00	32250
Life meaning	Wealth	Average wealth in religion in GOR	-7.58	-7.58	32250
Life meaning	Wealth	Distance from average wealth in age in GOR	-7.99	-7.98	32250
Life meaning	Wealth	Distance from average wealth in education in GOR	-8.05	-8.05	32250
Life meaning	Wealth	Distance from average wealth in gender in GOR	-7.92	-7.92	32250

Life meaning	Wealth	Distance from average wealth in income in GOR	-8.10	-8.10	32250
Life meaning	Wealth	Distance from average wealth in LA	-8.22	-8.22	32250
Life meaning	Wealth	Distance from average wealth in marital in GOR	-8.03	-8.03	32250
Life meaning	Wealth	Distance from average wealth in occupation in GOR	-7.81	-7.81	32250
Life meaning	Wealth	Distance from average wealth in parent in GOR	-8.01	-8.00	32250
Life meaning	Wealth	Distance from average wealth in political in GOR	-7.99	-7.99	32250
Life meaning	Wealth	Distance from average wealth in race in GOR	-7.96	-7.96	32250
Life meaning	Wealth	Distance from average wealth in religion in GOR	-8.08	-8.08	32250
Life meaning	Wealth	Distance from average wealth in unemployment	-7.98	-7.97	32250
Life meaning	Wealth	Rank wealth in age in GOR	2.98	2.98	32250
Life meaning	Wealth	Rank wealth in education in GOR	13.05	13.05	32250
Life meaning	Wealth	Rank wealth in gender in GOR	16.77	16.77	32250
Life meaning	Wealth	Rank wealth in income in GOR	11.40	11.40	32250
Life meaning	Wealth	Rank wealth in LA	6.51	6.52	32250
Life meaning	Wealth	Rank wealth in marital in GOR	12.00	12.00	32250
Life meaning	Wealth	Rank wealth in occupation in GOR	22.57	22.57	32250
Life meaning	Wealth	Rank wealth in parent in GOR	16.09	16.10	32250
Life meaning	Wealth	Rank wealth in political in GOR	15.33	15.34	32250
Life meaning	Wealth	Rank wealth in race in GOR	15.06	15.06	32250
Life meaning	Wealth	Rank wealth in religion in GOR	17.80	17.81	32250
Life meaning	Wealth	Rank wealth in unemployment	14.17	14.17	32250
Experienced affect last week	Wealth	% top wealth in income in GOR	0.85	0.85	32250
Experienced affect last week	Wealth	% top wealth in LA	1.51	1.51	32250
Experienced affect last week	Wealth	Average wealth in age in GOR	4.86	4.86	32250
Experienced affect last week	Wealth	Average wealth in income in GOR	0.67	0.67	32250
Experienced affect last week	Wealth	Average wealth in LA	-0.72	-0.72	32250
Experienced affect last week	Wealth	Average wealth in religion in GOR	3.54	3.54	32250
Experienced affect last week	Wealth	Distance from average wealth in age in GOR	0.30	0.30	32250
Experienced affect last week	Wealth	Distance from average wealth in education in GOR	1.42	1.42	32250
Experienced affect last week	Wealth	Distance from average wealth in gender in GOR	0.51	0.51	32250
Experienced affect last week	Wealth	Distance from average wealth in income in GOR	0.01	0.01	32250
Experienced affect last week	Wealth	Distance from average wealth in LA	0.04	0.04	32250
Experienced affect last week	Wealth	Distance from average wealth in marital in GOR	0.47	0.47	32250
Experienced affect last week	Wealth	Distance from average wealth in occupation in GOR	0.36	0.36	32250
Experienced affect last week	Wealth	Distance from average wealth in parent in GOR	0.40	0.40	32250

Experienced affect last week	Wealth	Distance from average wealth in political in GOR	0.20	0.20	32250
Experienced affect last week	Wealth	Distance from average wealth in race in GOR	0.39	0.39	32250
Experienced affect last week	Wealth	Distance from average wealth in religion in GOR	0.32	0.32	32250
Experienced affect last week	Wealth	Distance from average wealth in unemployment	0.48	0.48	32250
Experienced affect last week	Wealth	Rank wealth in age in GOR	-1.13	-1.13	32250
Experienced affect last week	Wealth	Rank wealth in education in GOR	3.17	3.17	32250
Experienced affect last week	Wealth	Rank wealth in gender in GOR	2.06	2.06	32250
Experienced affect last week	Wealth	Rank wealth in income in GOR	2.30	2.31	32250
Experienced affect last week	Wealth	Rank wealth in LA	-1.66	-1.65	32250
Experienced affect last week	Wealth	Rank wealth in marital in GOR	1.84	1.84	32250
Experienced affect last week	Wealth	Rank wealth in occupation in GOR	1.71	1.71	32250
Experienced affect last week	Wealth	Rank wealth in parent in GOR	2.68	2.69	32250
Experienced affect last week	Wealth	Rank wealth in political in GOR	1.31	1.31	32250
Experienced affect last week	Wealth	Rank wealth in race in GOR	1.16	1.16	32250
Experienced affect last week	Wealth	Rank wealth in religion in GOR	2.12	2.13	32250
Experienced affect last week	Wealth	Rank wealth in unemployment	1.08	1.09	32250

Appendix Table 4.38: The AIC and BIC differences for the wealth models in ELSA. Fixed effects, controls and robust standard errors.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	Education	% top education in age in GOR	86.91	120.44	32250
Life satisfaction (1)	Education	% top education in income in GOR	9.86	43.39	32250
Life satisfaction (1)	Education	% top education in LA	10.77	44.30	32250
Life satisfaction (1)	Education	% top education in parent in GOR	77.66	111.19	32250
Life satisfaction (1)	Education	% top education in religion in GOR	81.79	115.32	32250
Life satisfaction (1)	Education	% top education in unemployment in GOR	98.59	132.12	32250
Life satisfaction (1)	Education	% top education in wealth in GOR	9.44	42.97	32250
Life satisfaction (1)	Education	Distance from median education in age in GOR	34.26	67.78	32250
Life satisfaction (1)	Education	Distance from median education in gender in GOR	51.62	85.15	32250
Life satisfaction (1)	Education	Distance from median education in income in GOR	14.18	47.71	32250
Life satisfaction (1)	Education	Distance from median education in LA	7.54	41.07	32250
Life satisfaction (1)	Education	Distance from median education in marital in GOR	14.33	47.85	32250
Life satisfaction (1)	Education	Distance from median education in occupation in GOR	15.92	49.44	32250
Life satisfaction (1)	Education	Distance from median education in parent in GOR	42.04	75.56	32250
Life satisfaction (1)	Education	Distance from median education in political in GOR	58.45	91.98	32250
Life satisfaction (1)	Education	Distance from median education in race in GOR	65.42	98.94	32250
Life satisfaction (1)	Education	Distance from median education in religion in GOR	60.28	93.80	32250
Life satisfaction (1)	Education	Distance from median education in unemployment in GOR	73.80	107.33	32250
Life satisfaction (1)	Education	Distance from median education in wealth in GOR	10.29	43.82	32250
Life satisfaction (1)	Education	Median education in age in GOR	70.03	103.55	32250
Life satisfaction (1)	Education	Median education in gender in GOR	111.71	145.24	32250
Life satisfaction (1)	Education	Median education in income in GOR	20.03	53.55	32250
Life satisfaction (1)	Education	Median education in LA	8.82	42.35	32250
Life satisfaction (1)	Education	Median education in marital in GOR	34.39	67.92	32250
Life satisfaction (1)	Education	Median education in parent in GOR	85.73	119.25	32250
Life satisfaction (1)	Education	Median education in political in GOR	111.03	144.56	32250
Life satisfaction (1)	Education	Median education in race in GOR	120.51	154.03	32250

Life satisfaction (1)	Education	Median education in religion in GOR	138.83	172.36	32250
Life satisfaction (1)	Education	Median education in unemployment in GOR	139.49	173.02	32250
Life satisfaction (1)	Education	Median education in wealth in GOR	14.10	47.62	32250
Life satisfaction (1)	Education	Rank education in age in GOR	8.50	42.03	32250
Life satisfaction (1)	Education	Rank education in gender in GOR	12.67	46.20	32250
Life satisfaction (1)	Education	Rank education in income in GOR	8.23	41.76	32250
Life satisfaction (1)	Education	Rank education in LA	7.98	41.50	32250
Life satisfaction (1)	Education	Rank education in marital in GOR	10.98	44.50	32250
Life satisfaction (1)	Education	Rank education in occupation in GOR	8.17	41.70	32250
Life satisfaction (1)	Education	Rank education in parent in GOR	11.07	44.60	32250
Life satisfaction (1)	Education	Rank education in political in GOR	10.60	44.12	32250
Life satisfaction (1)	Education	Rank education in race in GOR	11.87	45.39	32250
Life satisfaction (1)	Education	Rank education in religion in GOR	12.05	45.58	32250
Life satisfaction (1)	Education	Rank education in unemployment in GOR	12.67	46.20	32250
Life satisfaction (1)	Education	Rank education in wealth in GOR	8.54	42.07	32250
Life satisfaction (2)	Education	% top education in age in GOR	46.53	146.72	32250
Life satisfaction (2)	Education	% top education in income in GOR	3.27	103.46	32250
Life satisfaction (2)	Education	% top education in LA	-1.80	98.40	32250
Life satisfaction (2)	Education	% top education in parent in GOR	52.23	152.42	32250
Life satisfaction (2)	Education	% top education in religion in GOR	33.99	67.52	32250
Life satisfaction (2)	Education	% top education in unemployment in GOR	36.08	69.61	32250
Life satisfaction (2)	Education	% top education in wealth in GOR	-2.33	31.20	32250
Life satisfaction (2)	Education	Distance from median education in age in GOR	1.81	35.34	32250
Life satisfaction (2)	Education	Distance from median education in gender in GOR	-0.64	32.89	32250
Life satisfaction (2)	Education	Distance from median education in income in GOR	-2.05	31.48	32250
Life satisfaction (2)	Education	Distance from median education in LA	-2.27	31.25	32250
Life satisfaction (2)	Education	Distance from median education in marital in GOR	-2.09	31.43	32250
Life satisfaction (2)	Education	Distance from median education in occupation in GOR	-2.32	31.21	32250
Life satisfaction (2)	Education	Distance from median education in parent in GOR	0.83	34.35	32250

Life satisfaction (2)	Education	Distance from median education in political in GOR	6.69	40.22	32250
Life satisfaction (2)	Education	Distance from median education in race in GOR	6.79	40.32	32250
Life satisfaction (2)	Education	Distance from median education in religion in GOR	2.37	35.90	32250
Life satisfaction (2)	Education	Distance from median education in unemployment in GOR	7.87	41.40	32250
Life satisfaction (2)	Education	Distance from median education in wealth in GOR	-0.49	33.04	32250
Life satisfaction (2)	Education	Median education in age in GOR	35.92	69.44	32250
Life satisfaction (2)	Education	Median education in gender in GOR	25.88	59.41	32250
Life satisfaction (2)	Education	Median education in income in GOR	6.11	39.64	32250
Life satisfaction (2)	Education	Median education in LA	4.88	38.41	32250
Life satisfaction (2)	Education	Median education in marital in GOR	9.11	42.64	32250
Life satisfaction (2)	Education	Median education in parent in GOR	31.16	64.69	32250
Life satisfaction (2)	Education	Median education in political in GOR	49.23	82.76	32250
Life satisfaction (2)	Education	Median education in race in GOR	47.68	81.21	32250
Life satisfaction (2)	Education	Median education in religion in GOR	44.87	78.40	32250
Life satisfaction (2)	Education	Median education in unemployment in GOR	52.71	86.24	32250
Life satisfaction (2)	Education	Median education in wealth in GOR	-1.87	31.66	32250
Life satisfaction (2)	Education	Rank education in age in GOR	-1.17	32.36	32250
Life satisfaction (2)	Education	Rank education in gender in GOR	-2.10	31.42	32250
Life satisfaction (2)	Education	Rank education in income in GOR	-1.66	31.87	32250
Life satisfaction (2)	Education	Rank education in LA	0.13	33.66	32250
Life satisfaction (2)	Education	Rank education in marital in GOR	-2.23	31.30	32250
Life satisfaction (2)	Education	Rank education in occupation in GOR	-1.32	32.21	32250
Life satisfaction (2)	Education	Rank education in parent in GOR	-2.16	31.37	32250
Life satisfaction (2)	Education	Rank education in political in GOR	-2.29	31.24	32250
Life satisfaction (2)	Education	Rank education in race in GOR	-1.85	31.68	32250
Life satisfaction (2)	Education	Rank education in religion in GOR	-1.47	32.06	32250
Life satisfaction (2)	Education	Rank education in unemployment in GOR	-2.05	31.47	32250
Life satisfaction (2)	Education	Rank education in wealth in GOR	1.14	34.67	32250
Life meaning	Education	% top education in age in GOR	1.59	35.12	32250

Life meaning	Education	% top education in income in GOR	2.66	36.18	32250
Life meaning	Education	% top education in LA	1.52	35.05	32250
Life meaning	Education	% top education in parent in GOR	14.97	48.50	32250
Life meaning	Education	% top education in religion in GOR	7.41	40.94	32250
Life meaning	Education	% top education in unemployment in GOR	7.60	41.12	32250
Life meaning	Education	% top education in wealth in GOR	4.86	38.38	32250
Life meaning	Education	Distance from median education in age in GOR	0.92	34.45	32250
Life meaning	Education	Distance from median education in gender in GOR	8.30	41.83	32250
Life meaning	Education	Distance from median education in income in GOR	3.75	37.27	32250
Life meaning	Education	Distance from median education in LA	1.58	35.11	32250
Life meaning	Education	Distance from median education in marital in GOR	0.93	34.46	32250
Life meaning	Education	Distance from median education in occupation in GOR	3.92	37.45	32250
Life meaning	Education	Distance from median education in parent in GOR	6.24	39.76	32250
Life meaning	Education	Distance from median education in political in GOR	6.87	40.40	32250
Life meaning	Education	Distance from median education in race in GOR	4.41	37.94	32250
Life meaning	Education	Distance from median education in religion in GOR	7.59	41.11	32250
Life meaning	Education	Distance from median education in unemployment in GOR	5.16	38.69	32250
Life meaning	Education	Distance from median education in wealth in GOR	0.72	34.25	32250
Life meaning	Education	Median education in age in GOR	1.53	35.06	32250
Life meaning	Education	Median education in gender in GOR	6.37	39.90	32250
Life meaning	Education	Median education in income in GOR	1.79	35.32	32250
Life meaning	Education	Median education in LA	0.72	34.25	32250
Life meaning	Education	Median education in marital in GOR	2.15	35.67	32250
Life meaning	Education	Median education in parent in GOR	3.83	37.36	32250
Life meaning	Education	Median education in political in GOR	4.26	37.79	32250
Life meaning	Education	Median education in race in GOR	1.97	35.50	32250
Life meaning	Education	Median education in religion in GOR	5.56	39.09	32250
Life meaning	Education	Median education in unemployment in GOR	2.61	36.13	32250
Life meaning	Education	Median education in wealth in GOR	1.95	35.48	32250

Life meaning	Education	Rank education in age in GOR	1.50	35.03	32250
Life meaning	Education	Rank education in gender in GOR	3.75	37.28	32250
Life meaning	Education	Rank education in income in GOR	2.16	35.68	32250
Life meaning	Education	Rank education in LA	3.13	36.66	32250
Life meaning	Education	Rank education in marital in GOR	2.90	36.42	32250
Life meaning	Education	Rank education in occupation in GOR	1.93	35.46	32250
Life meaning	Education	Rank education in parent in GOR	5.14	38.66	32250
Life meaning	Education	Rank education in political in GOR	5.57	39.10	32250
Life meaning	Education	Rank education in race in GOR	4.02	37.54	32250
Life meaning	Education	Rank education in religion in GOR	3.70	37.22	32250
Life meaning	Education	Rank education in unemployment in GOR	3.86	37.38	32250
Life meaning	Education	Rank education in wealth in GOR	0.73	34.26	32250
Experienced affect last week	Education	% top education in age in GOR	5.30	38.83	32250
Experienced affect last week	Education	% top education in income in GOR	4.47	38.00	32250
Experienced affect last week	Education	% top education in LA	2.19	35.72	32250
Experienced affect last week	Education	% top education in parent in GOR	6.17	39.70	32250
Experienced affect last week	Education	% top education in religion in GOR	6.92	40.44	32250
Experienced affect last week	Education	% top education in unemployment in GOR	10.18	43.71	32250
Experienced affect last week	Education	% top education in wealth in GOR	2.41	35.94	32250
Experienced affect last week	Education	Distance from median education in age in GOR	0.07	33.60	32250
Experienced affect last week	Education	Distance from median education in gender in GOR	5.74	39.27	32250
Experienced affect last week	Education	Distance from median education in income in GOR	0.48	34.01	32250
Experienced affect last week	Education	Distance from median education in LA	1.08	34.61	32250
Experienced affect last week	Education	Distance from median education in marital in GOR	-0.49	33.03	32250
Experienced affect last week	Education	Distance from median education in occupation in GOR	-0.50	33.03	32250
Experienced affect last week	Education	Distance from median education in parent in GOR	0.11	33.63	32250
Experienced affect last week	Education	Distance from median education in political in GOR	0.46	33.99	32250
Experienced affect last week	Education	Distance from median education in race in GOR	0.79	34.32	32250
Experienced affect last week	Education	Distance from median education in religion in GOR	0.78	34.31	32250

Experienced affect last week	Education	Distance from median education in unemployment in GOR	-0.01	33.52	32250
Experienced affect last week	Education	Distance from median education in wealth in GOR	5.78	39.30	32250
Experienced affect last week	Education	Median education in age in GOR	0.09	33.61	32250
Experienced affect last week	Education	Median education in gender in GOR	10.33	43.85	32250
Experienced affect last week	Education	Median education in income in GOR	0.46	33.99	32250
Experienced affect last week	Education	Median education in LA	1.22	34.75	32250
Experienced affect last week	Education	Median education in marital in GOR	-0.41	33.12	32250
Experienced affect last week	Education	Median education in parent in GOR	0.13	33.65	32250
Experienced affect last week	Education	Median education in political in GOR	0.57	34.09	32250
Experienced affect last week	Education	Median education in race in GOR	1.01	34.53	32250
Experienced affect last week	Education	Median education in religion in GOR	1.33	34.85	32250
Experienced affect last week	Education	Median education in unemployment in GOR	-0.07	33.46	32250
Experienced affect last week	Education	Median education in wealth in GOR	7.80	41.33	32250
Experienced affect last week	Education	Rank education in age in GOR	0.21	33.74	32250
Experienced affect last week	Education	Rank education in gender in GOR	-0.04	33.49	32250
Experienced affect last week	Education	Rank education in income in GOR	-0.48	33.04	32250
Experienced affect last week	Education	Rank education in LA	2.58	36.11	32250
Experienced affect last week	Education	Rank education in marital in GOR	-0.07	33.45	32250
Experienced affect last week	Education	Rank education in occupation in GOR	-0.31	33.22	32250
Experienced affect last week	Education	Rank education in parent in GOR	-0.12	33.41	32250
Experienced affect last week	Education	Rank education in political in GOR	-0.25	33.27	32250
Experienced affect last week	Education	Rank education in race in GOR	0.45	33.97	32250
Experienced affect last week	Education	Rank education in religion in GOR	0.25	33.78	32250
Experienced affect last week	Education	Rank education in unemployment in GOR	0.01	33.54	32250
Experienced affect last week	Education	Rank education in wealth in GOR	-0.01	33.52	32250

Appendix Table 4.39: The AIC and BIC differences for the education models in ELSA. Fixed effects, controls and robust standard errors.

Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	Unemployment	% unemployed in age in GOR	-5.07	-5.07	32250
Life satisfaction (1)	Unemployment	% unemployed in education in GOR	-16.66	-16.66	32250
Life satisfaction (1)	Unemployment	% unemployed in gender in GOR	-13.57	-13.57	32250
Life satisfaction (1)	Unemployment	% unemployed in income in GOR	-13.64	-13.64	32250
Life satisfaction (1)	Unemployment	% unemployed in LA	-16.67	-16.67	32250
Life satisfaction (1)	Unemployment	% unemployed in marital in GOR	-16.68	-16.67	32250
Life satisfaction (1)	Unemployment	% unemployed in occupation in GOR	-16.61	-16.61	32250
Life satisfaction (1)	Unemployment	% unemployed in parent in GOR	-14.05	-14.05	32250
Life satisfaction (1)	Unemployment	% unemployed in political in GOR	-11.30	-11.30	32250
Life satisfaction (1)	Unemployment	% unemployed in race in GOR	-2.05	-2.05	32250
Life satisfaction (1)	Unemployment	% unemployed in religion in GOR	-16.04	-16.04	32250
Life satisfaction (1)	Unemployment	% unemployed in wealth in GOR	-16.44	-16.44	32250
Life satisfaction (2)	Unemployment	% unemployed in age in GOR	-8.51	-8.51	32250
Life satisfaction (2)	Unemployment	% unemployed in education in GOR	-9.06	-9.06	32250
Life satisfaction (2)	Unemployment	% unemployed in gender in GOR	-9.37	-9.37	32250
Life satisfaction (2)	Unemployment	% unemployed in income in GOR	-9.36	-9.35	32250
Life satisfaction (2)	Unemployment	% unemployed in LA	-7.80	-7.80	32250
Life satisfaction (2)	Unemployment	% unemployed in marital in GOR	-4.42	-4.42	32250
Life satisfaction (2)	Unemployment	% unemployed in occupation in GOR	-8.51	-8.51	32250
Life satisfaction (2)	Unemployment	% unemployed in parent in GOR	-9.22	-9.22	32250
Life satisfaction (2)	Unemployment	% unemployed in political in GOR	-9.34	-9.34	32250
Life satisfaction (2)	Unemployment	% unemployed in race in GOR	-9.34	-9.34	32250
Life satisfaction (2)	Unemployment	% unemployed in religion in GOR	-9.21	-9.21	32250
Life satisfaction (2)	Unemployment	% unemployed in wealth in GOR	-8.18	-8.18	32250

Life meaning	Unemployment	% unemployed in age in GOR	-1.87	-1.87	32250
Life meaning	Unemployment	% unemployed in education in GOR	-1.99	-1.99	32250
Life meaning	Unemployment	% unemployed in gender in GOR	-2.70	-2.70	32250
Life meaning	Unemployment	% unemployed in income in GOR	-1.47	-1.46	32250
Life meaning	Unemployment	% unemployed in LA	3.35	3.35	32250
Life meaning	Unemployment	% unemployed in marital in GOR	-0.42	-0.41	32250
Life meaning	Unemployment	% unemployed in occupation in GOR	-0.87	-0.87	32250
Life meaning	Unemployment	% unemployed in parent in GOR	-2.62	-2.62	32250
Life meaning	Unemployment	% unemployed in political in GOR	-2.45	-2.45	32250
Life meaning	Unemployment	% unemployed in race in GOR	-1.31	-1.31	32250
Life meaning	Unemployment	% unemployed in religion in GOR	0.05	0.05	32250
Life meaning	Unemployment	% unemployed in wealth in GOR	4.77	4.77	32250
Experienced affect last week	Unemployment	% unemployed in age in GOR	-2.19	-2.19	32250
Experienced affect last week	Unemployment	% unemployed in education in GOR	-1.53	-1.53	32250
Experienced affect last week	Unemployment	% unemployed in gender in GOR	-2.25	-2.25	32250
Experienced affect last week	Unemployment	% unemployed in income in GOR	-2.31	-2.30	32250
Experienced affect last week	Unemployment	% unemployed in LA	-2.25	-2.25	32250
Experienced affect last week	Unemployment	% unemployed in marital in GOR	4.61	4.61	32250
Experienced affect last week	Unemployment	% unemployed in occupation in GOR	-2.22	-2.22	32250
Experienced affect last week	Unemployment	% unemployed in parent in GOR	0.74	0.74	32250
Experienced affect last week	Unemployment	% unemployed in political in GOR	-2.28	-2.28	32250
Experienced affect last week	Unemployment	% unemployed in race in GOR	-2.31	-2.31	32250
Experienced affect last week	Unemployment	% unemployed in religion in GOR	-2.32	-2.31	32250
Experienced affect last week	Unemployment	% unemployed in wealth in GOR	-1.68	-1.68	32250

Appendix Table 4.40: The AIC and BIC differences for the unemployment models in ELSA. Fixed effects, controls and robust standard errors.

For the AICs and BICs in ELSA, there are also the standpoint perception measures to consider. Just as when occupation was the scope in ATUS, and there were fewer observations for some models, the standpoint perception measures are compared to an absolute model that is restricted to the same sample that answered these questions. These AICs and BICs for these restricted absolute models are shown in Table 4.41 below, and the ΔAICs and ΔBICs are in Table 4.42. For the MacArthur ladder relative model in Table 4.45, all of income, earnings, wealth, education, occupation and unemployment were excluded; and for the other perceived standpoint measures, only income, earnings and wealth were excluded (recall these three measures ask people about their 'financial situation', see Table 2.5 in chapter two).

Absolute model	AIC	BIC	N
		MacArthur ladder	
Life satisfaction (1)	48921.41	49238.71	31255
Life satisfaction (2)	48536.01	48853.31	31255
Life meaning	53565.55	53882.85	31255
Experienced affect last week	59440.88	59758.18	31255
		Well off friends	
Life satisfaction (1)	22390.97	22688.76	18701
Life satisfaction (2)	23327.79	23625.57	18701
Life meaning	26422.69	26720.47	18701
Experienced affect last week	29334.73	29632.51	18701
		Well off work	
Life satisfaction (1)	6699.24	6952.42	6924
Life satisfaction (2)	6638.86	6892.04	6924
Life meaning	7329.03	7582.21	6924
Experienced affect last week	9156.91	9410.09	6924
		Well off nearby	
Life satisfaction (1)	21502.33767	21799.27177	18289
Life satisfaction (2)	22531.12038	22828.05447	182894.2
Life meaning	25680.98714	25977.92123	18289
Experienced affect last week	28174.43891	28471.373	18289

Appendix Table 4.41: The absolute AIC and BIC model fit statistics in ELSA for the perceived standpoint measures. From fixed effects models with controls and robust standard errors.

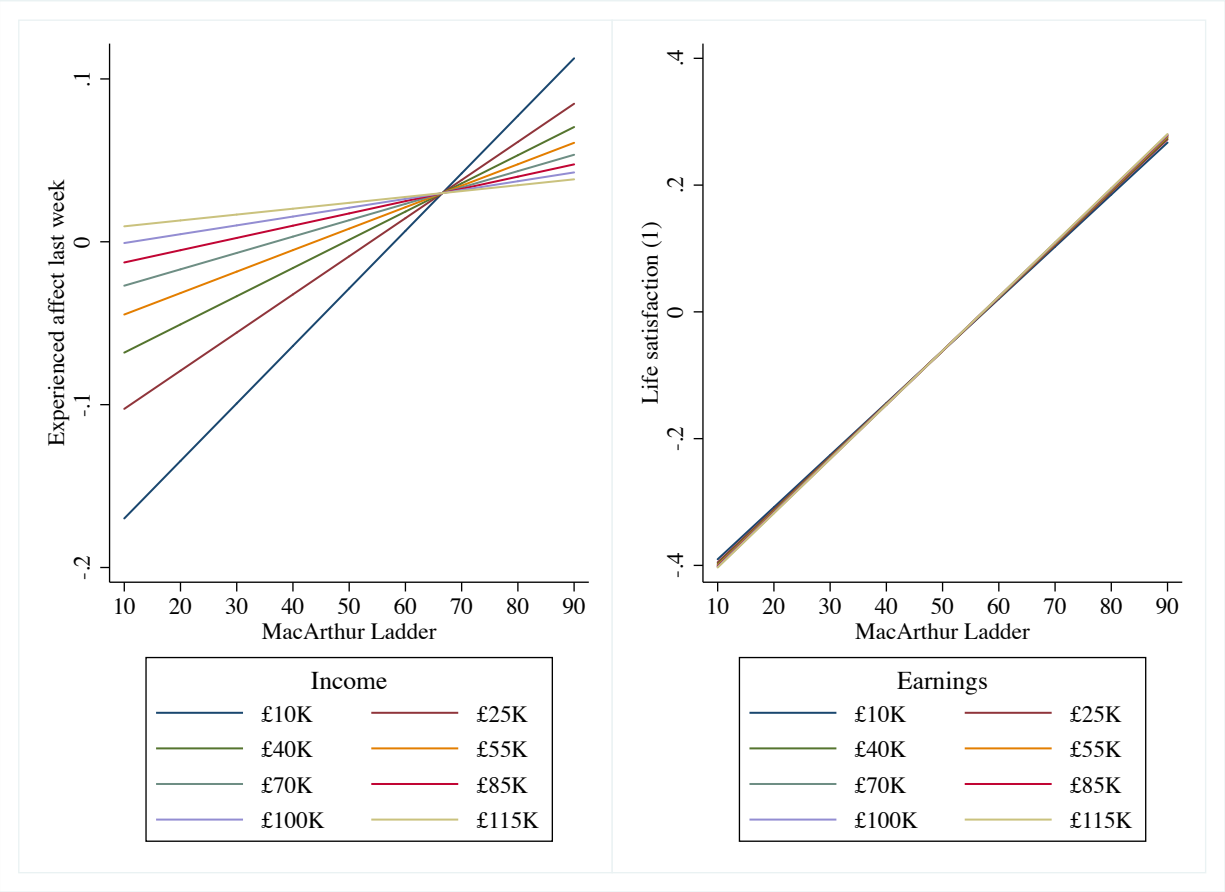
Looking at Table 4.42, on the first life satisfaction measure, all of the relative fit strongly better than the absolute models (e.g. well off nearby, ΔAIC=83.41, ΔBIC=99.04). On the second life satisfaction measure, the relative fits were always strongly better except for the ΔAIC on well off relative to friends, which was only moderate (ΔAIC=7.18, ΔBIC=22.86). For life meaning, the ΔAIC and ΔBIC always indicated a strongly better relative fit except for well off relative to friends, where the ΔAIC was only slightly better (ΔAIC=2.06,

ΔBIC=17.73), and for well off relative to those nearby, where it was only moderately better (ΔAIC=6.96, ΔBIC=22.59). For experienced affect last week, the relative fits were always strongly better except for well off relative to those nearby, where the ΔAIC was only slightly better (ΔAIC=1.47, ΔBIC=15.16).

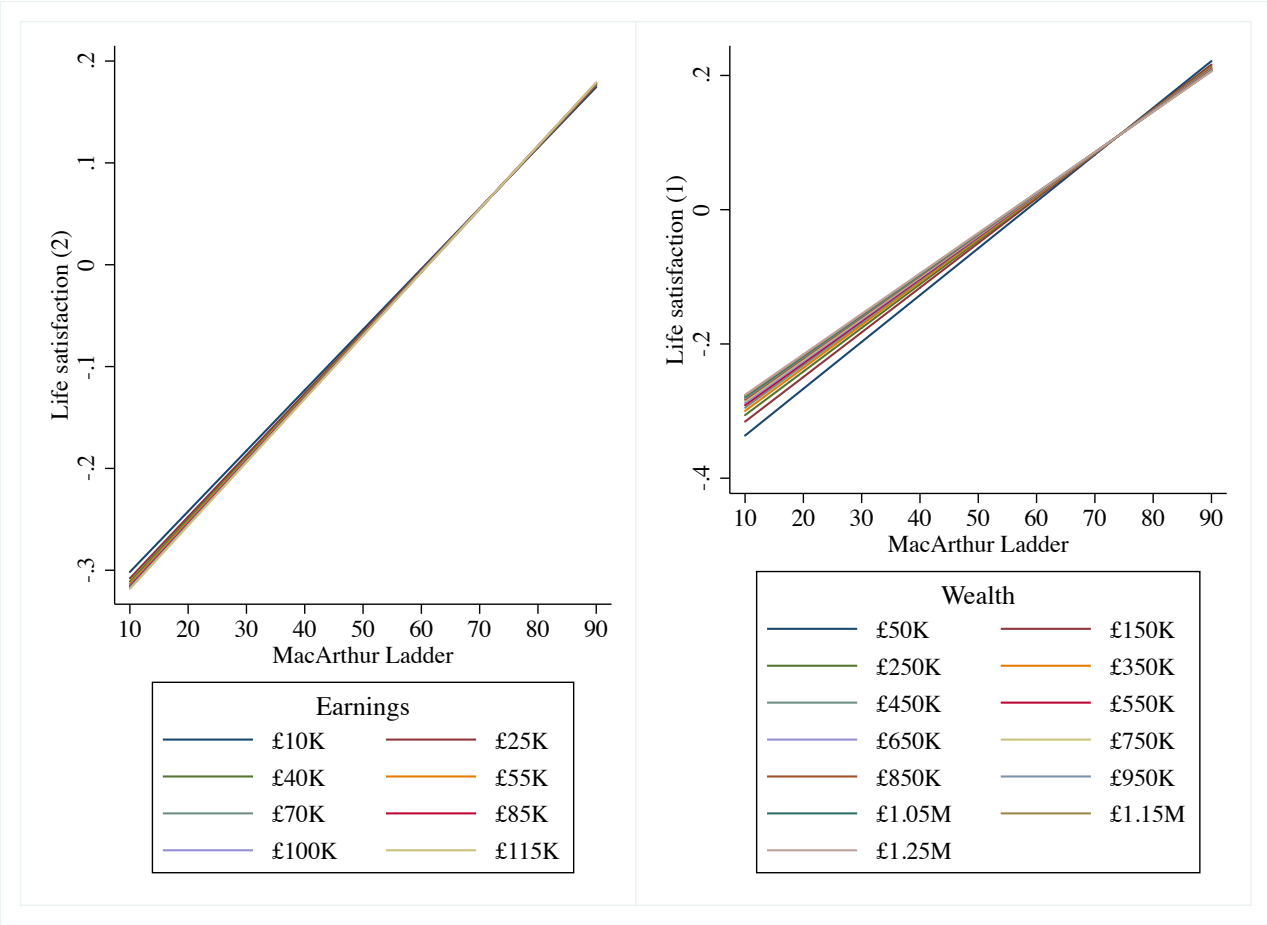
Subjective wellbeing	Socio-economic status	Relative variable	Δ AIC	Δ BIC	N
Life satisfaction (1)	'Money, education and job'	MacArthur ladder	329.71	429.91	31255
Life satisfaction (1)	'Financial situation'	Well off friends	30.36	46.04	18701
Life satisfaction (1)	'Financial situation'	Well off work	10.86	24.54	6924
Life satisfaction (1)	'Financial situation'	Well off nearby	83.41	99.04	18289
Life satisfaction (2)	'Money, education and job'	MacArthur ladder	154.18	254.38	31255
Life satisfaction (2)	'Financial situation'	Well off friends	7.18	22.86	18701
Life satisfaction (2)	'Financial situation'	Well off work	12.71	26.40	6924
Life satisfaction (2)	'Financial situation'	Well off nearby	34.87	50.49	18289
Life meaning	'Money, education and job'	MacArthur ladder	117.18	217.37	31255
Life meaning	'Financial situation'	Well off friends	2.06	17.73	18701
Life meaning	'Financial situation'	Well off work	10.30	23.99	6924
Life meaning	'Financial situation'	Well off nearby	6.96	22.59	18289
Experienced affect last week	'Money, education and job'	MacArthur ladder	50.50	150.70	31255
Experienced affect last week	'Financial situation'	Well off friends	10.63	26.30	18701
Experienced affect last week	'Financial situation'	Well off work	1.47	15.16	6924
Experienced affect last week	'Financial situation'	Well off nearby	66.24	81.87	18289

Appendix Table 4.42: The AIC and BIC differences for the perceived standpoint models in ELSA. Fixed effects, controls and robust standard errors.

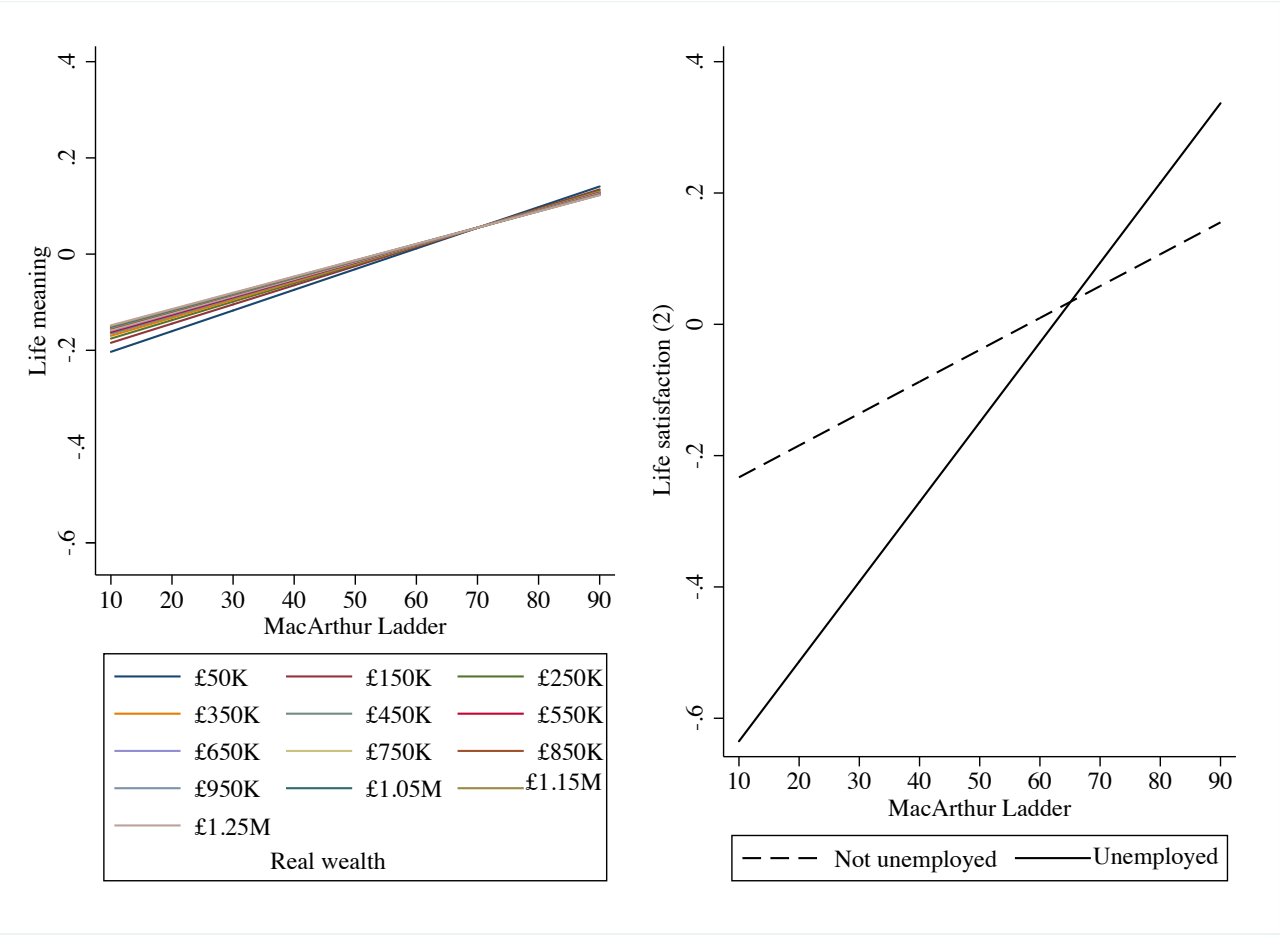
Appendix D – Supplement to Chapter Five



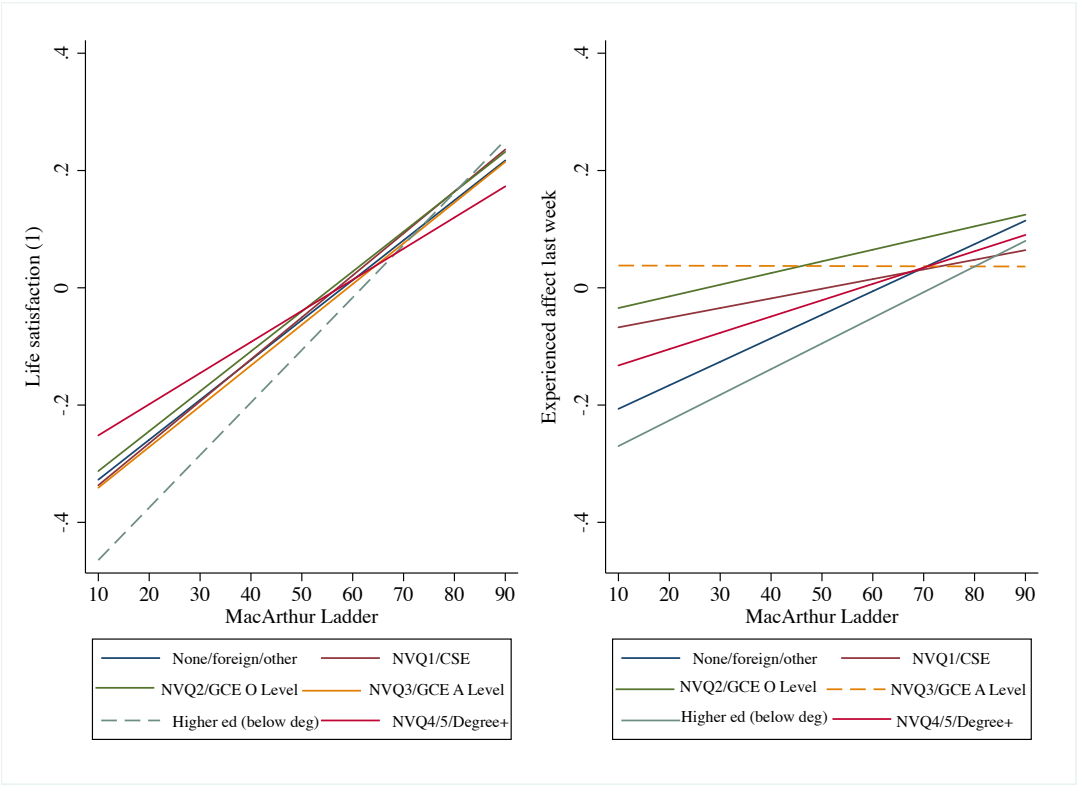
Appendix Figure 5.1: Fitted values of experienced affect last week at selected values of the MacArthur ladder and log income, and of life satisfaction (1) at selected values of the MacArthur ladder and log earnings. Labels show unlogged values. Covariates at means. From fixed effects regressions with controls and robust standard errors. Not robust to multiple imputation.



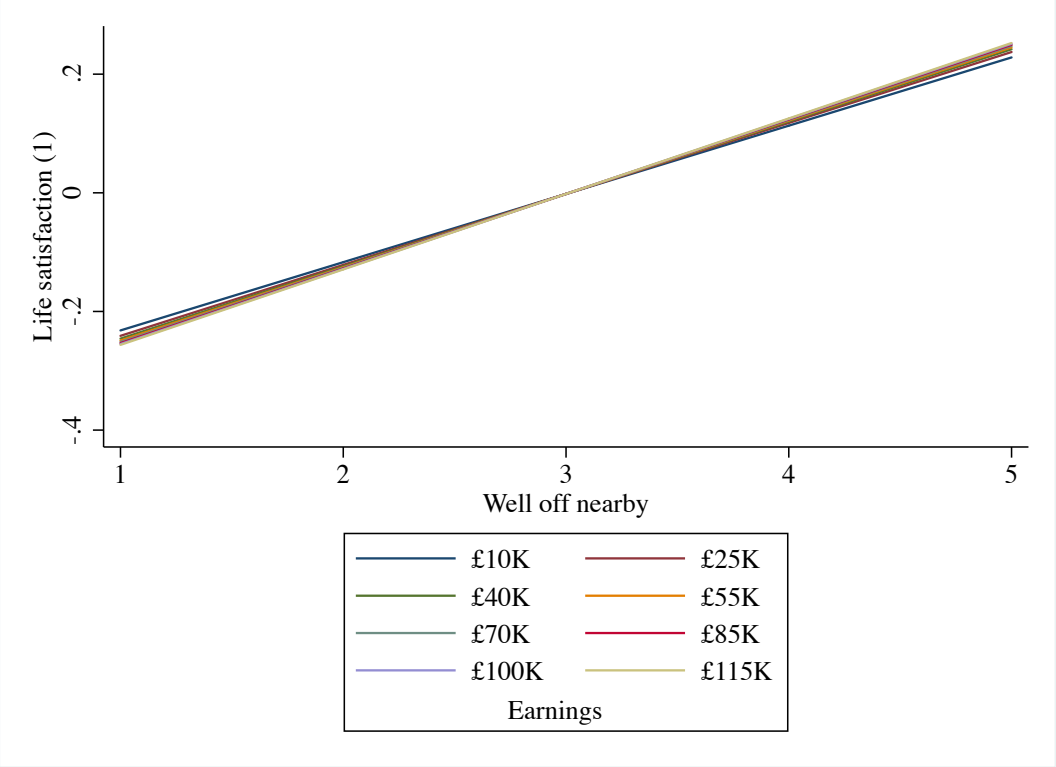
Appendix Figure 5.2: Fitted values of life satisfaction (2) at selected values of the MacArthur ladder and log earnings, and of life satisfaction (1) at selected values of the MacArthur ladder and log wealth (labels show unlogged values). Covariates at means. From fixed effects regressions with controls and robust standard errors. Not robust to multiple imputation.



Appendix Figure 5.3: Fitted values of life meaning at selected values of the MacArthur ladder and log wealth, and of life satisfaction (2) at selected values of the MacArthur ladder for those who are not unemployed and those who are unemployed (labels show unlogged values). Covariates at means. From fixed effects regressions with controls and robust standard errors. Not robust to multiple imputation.



Appendix Figure 5.4: Fitted values of life satisfaction (1) at selected values of the MacArthur ladder for each educational group, and of experienced affect last week at selected values of the MacArthur ladder for each educational group. Covariates at means. From fixed effects regressions with controls and robust standard errors. Not robust to multiple imputation.



Appendix Figure 5.5: Fitted values of life satisfaction (1) at selected values of the well-off nearby and log real earnings. Labels shown unlogged values. Covariates at means. From fixed effects regressions with controls and robust standard errors. Not robust to multiple imputation.

Model	b	se	p	n (activities)
Rank earnings in income group in state	Happy			
Rank earnings in income group in state	-0.37	0.49	0.45	
Log earnings	0.04	0.01	0.005	38561
Rank earnings in income group in state X log earnings	0.02	0.04	0.76	

Appendix Table 5.4_MI: Multiple imputation of Table 5.4. There are no substantive differences to the main analyses.

Model	b	se	p	r2	n (activities)
Rank earnings in income group in state	Happy				
Women	-0.72	0.20	4.80E-04	0.13	38561
Men	-0.45	0.20	0.02	0.15	38561

Appendix Table 5.5_MI: Multiple imputation of Table 5.5. There are no substantive differences to the main analyses.

	Happy			
	Rank earnings in income group in state			
Model	b	se	p	n
Age groups				
15-24 years	-0.55	0.55	0.32	38561
25-34 years	-0.35	0.30	0.25	38561
35-44 years	-0.18	0.25	0.47	38561
45-54 years	-0.92	0.30	1.91E-03	38561
55-64 years	-0.37	0.35	0.29	38561
65-74 years	-0.44	0.48	0.35	38561
75-85 years	-1.16	0.84	0.17	38561
Age interactions				
Relative variable	-0.38	0.69	0.58	
Age	-0.0014	0.01	0.58	
Age squared	0.000029	0.00011	0.79	38561
Relative variable X age	-0.015	0.029	0.60	
Relative variable X age squared	0.00024	0.00031	0.45	
Constant	-3.18	0.74	1.79E-05	

Appendix Table 5.6_MI: Multiple imputation of Table 5.6. There are no substantive differences to the main analyses.

	Life satisfaction (1)			Life satisfaction (2)		
	b	se	p	b	se	p
Median education in gender in GOR	-0.07	0.01	7.27E-08	-0.04	0.01	1.82E-03
Education						
NVQ1/CSE	-0.01	0.09	0.89	-0.04	0.08	0.60
NVQ2/GCE O Lev	-0.09	0.05	0.07	-0.09	0.05	0.07
NVQ3/GCE A Lev	-0.01	0.07	0.93	-0.08	0.07	0.28
Higher ed (below deg)	-0.04	0.06	0.48	-0.07	0.06	0.27
NVQ4/NVQ5/Degree+	0.00	0.06	0.97	-0.08	0.06	0.22
Median education in gender in GOR…						
X NVQ1/CSE	0.04	0.04	0.37	0.01	0.04	0.87
X NVQ2/GCE O Level	**0.04**	**0.02**	**0.06**	0.01	0.02	0.49
X NVQ3/GCE A Level	-0.02	0.03	0.51	-0.01	0.03	0.72
X Higher ed (below degree)	0.01	0.02	0.65	0.001	0.02	0.97
X NVQ4/NVQ5/Degree+	-0.01	0.02	0.70	0.01	0.02	0.77
Constant	-3.60	0.53	4.25E-11	-1.40	0.53	6.76E-03
N	42984			42984		

Appendix Table 5.11_MI: Multiple imputation of Table 5.11. Results that differed in statistical significance to the main analyses shown in **bold.** Reference category for education is none/foreign other.

In the main analyses, the negative average effect of median education in gender group in GOR (b=-0.08, se=0.01, p=7.36E-11) was higher for those with NVQ2-equivalent education than for those with no/foreign other education (b=0.04, se=0.02, p=0.04), NVQ-3 equivalent education (b=0.05, se=0.03, p=0.05), and NVQ4/5/Degree+ education (b=-0.05, se=0.02, p=0.02). In the multiple imputation analyses there was still a negative average effect (b=-0.07, se=0.01, p=7.27E-08) but those with NVQ2-equivalent did not differ to those with none/foreign/other (b=0.04, se=0.02, p=0.06) or any other educational level (p>0.05).

	Life satisfaction (1)			Life satisfaction (2)		
	b	se	p	b	se	p
% top income in gender in GOR	-0.69	4.7	0.88	*Intentionally blank*		
Log income	0.02	0.02	0.4			
% top income X log income	-0.18	0.48	0.7			
Constant	-3.4	0.56	1.10E-09			
N	42984					
% top earnings in age in GOR	-3.7	0.44	1.16E-15	-1.9	0.42	5.09E-06
Log % earnings	0.01	0.003	1.97E-03	0.002	0.003	0.47
% top income X log % earnings	-0.19	0.06	1.19E-03	-0.04	0.06	0.46
Constant	-3.8	0.52	1.94E-12	-1.5	0.52	3.56E-03
N	42984			42984		

Appendix Table 5.12_MI: Multiple imputation of Table 5.12. There are no substantive differences to the main analyses.

	Life satisfaction (1)			Life satisfaction (2)			Life meaning			Experienced affect last week		
	b	se	p	b	se	p	b	se	p	b	se	p
MacArthur ladder	0.01	0.003	1.52E-05	0.01	0.003	2.85E-06	0.01	0.003	0.04	0.01	3.20E-03	0.03
Log income	0.02	0.02	0.27	0.03	0.02	0.15	0.002	0.02	0.91	0.02	0.02	0.29
Ladder X log income	-3.40E-04	3.00E-04	0.26	-0.001	2.80E-04	0.07	-6.00E-05	3.50E-04	0.86	**-3.30E-04**	**3.30E-04**	**0.32**
Constant	-4	0.54	5.63E-13	-2	0.53	1.97E-04	-2.9	0.58	6.25E-07	-2.5	0.56	8.30E-06
MacArthur ladder	0.01	4.80E-04	7.68E-62	0.01	0.001	2.53E-30	0.01	0.001	1.81E-25	0.004	0.001	6.04E-11
Log earnings	-0.01	0.004	0.13	-0.004	0.004	0.26	-3.40E-04	0.004	0.93	-5.00E-05	0.004	0.99
Ladder X log earnings	**1.10E-04**	**6.00E-05**	**0.07**	**6.50E-05**	**5.50E-05**	**0.23**	-7.50E-06	5.90E-05	0.9	1.30E-05	6.30E-05	0.84
Constant	-3.9	0.5	6.46E-14	-1.8	0.5	4.75E-04	-2.9	0.54	1.37E-07	-2.4	0.53	6.01E-06
MacArthur ladder	0.01	0.001	2.76E-24	0.01	0.001	1.10E-13	0.01	0.001	1.69E-10	0.01	0.002	9.22E-05
Log wealth	-3.10E-04	1.00E-04	0.003	-1.90E-04	9.90E-05	0.05	-1.90E-04	1.10E-04	0.08	-1.80E-04	1.20E-04	0.12
Ladder X log wealth	**0.003**	**0.01**	**0.68**	-0.002	0.01	0.74	**-0.001**	**0.01**	**0.9**	0.01	0.01	0.49
Constant	-4	0.51	1.41E-14	-1.8	0.5	2.81E-04	-3	0.54	6.19E-08	-2.4	0.53	4.45E-06
MacArthur ladder	0.01	4.80E-04	4.62E-62	0.01	0.001	1.49E-30	0.01	0	2.99E-25	0.004	0.001	1.82E-10
Unemployed	-0.49	0.16	0.003	-0.36	0.18	0.04	-0.33	0.17	0.05	-0.37	0.2	0.06
Ladder X unemployed	**0.01**	**0.003**	**0.04**	**0.005**	**0.003**	**0.11**	0.005	0.003	0.12	0.005	0.003	0.15
Constant	-3.9	0.5	8.89E-14	-1.7	0.5	0.001	-2.9	0.54	1.40E-07	-2.3	0.52	7.53E-06
N	42984			42984			42984			42984		

Appendix Table 5.13_MI: Multiple imputation of Table 5.13. Results that differed in statistical significant to the main analyses shown in **bold**.

None of the interaction effects in Table 5.13 were still significant in the imputation analyses in Table 5.13_MI. For experienced affect last week in the main analyses, the positive association of the MacArthur ladder (b=0.02, se=0.003, p=4.25E-04) decreased with increasing log income (b=-0.001, se=4.5E-04, p=4.08E-03), however, this interaction was not significant in the imputation analyses (b=3.3E-04, se=3.3E-04, p=0.32). In the main analyses, the positive association of the MacArthur ladder with life satisfaction (1) was b=0.01 (se=0.001, p=8.16E-39), which increased with increasing log earnings (b=1.4E-04, se=5.9E-05, p=0.02). But this interaction was not significant in the imputation analyses (b=1.10E-04, se=6.00E-05, p=0.07). In the main analyses, the positive association of the MacArthur ladder with life satisfaction (2) was b=0.005 (se=5.00E-04, p=3.81E-23), which increased with increasing log earnings (b=1.1E-04, se=5.6E-05, p=0.05); however, this interaction was not significant in the imputation analyses (b=6.5E-05, e=5.5E-05, p=0.23). For life satisfaction (1) in the main analyses, the positive association of the ladder (b=0.01, se=0.002, p=3.03E-09) decreased with increasing log wealth (b=-3.00E-04, se=1.4E-04, p=0.03) but this interaction was not significant in the main analyses (b=0.003, se=0.01, p=0.68). For life meaning in the main analyses, the positive

association of the ladder (b=7.4E-03, se=1.5E-03, p=1.24E-06) decreased with increasing log wealth (b=-2.8E-04, se=1.2E-04, p=0.02) but the interaction was not significant in the imputation analyses (b=-0.001, se=0.01, p=0.90). For life satisfaction (2) in the main analyses, the

positive association of the MacArthur ladder was b=0.005 (se=0.001, p=3.76E-22), and this was 0.007 units higher for the unemployed versus the employed (se=0.003, p=0.04) but there was not a significant difference in the imputation analyses (b=0.005, se=0.003, p=0.11). There was one significant effect in the imputation analyses that was not in the main analyses. The positive effect of the MacArthur ladder on life satisfaction (1) (b=0.01, se=4.8E-04, p=4.62E-62) was 0.01 units higher for the unemployed (se=0.003, p=0.04) but the difference was not significant in the main analyses (b=0.01, se=0.003, p=0.11). This is only a marginally significant effect and is small in magnitude, and it is not interpreted as being practically significant.

	Life satisfaction (1)			**Life satisfaction (2)**			**Life meaning**			**Experienced affect last week**		
	b	se	p	b	se	p	b	se	p	b	se	p
MacArthur ladder	0.01	0.001	2.27E-30	0.01	0.001	6.75E-15	0.01	0.001	4.71E-14	0.004	0.001	6.72E-08
Education												
NVQ1/CSE	0.01	0.14	0.95	-0.06	0.14	0.69	-0.01	0.17	0.97	0.09	0.15	0.53
NVQ2/GCE O Lev	-0.07	0.09	0.44	-0.04	0.09	0.63	-0.02	0.09	0.80	0.12	0.09	0.21
NVQ3/GCE A Lev	-0.09	0.13	0.48	-0.19	0.12	0.11	-0.06	0.12	0.64	**0.11**	**0.13**	**0.40**
Higher ed (below deg)	-0.14	0.10	0.14	-0.13	0.10	0.19	-0.05	0.10	0.61	-0.08	0.11	0.47
NVQ4/NVQ5/Degree+	-0.04	0.11	0.74	-0.08	0.11	0.49	-0.003	0.10	0.98	-0.03	0.12	0.83
MacArthur ladder…												
X NVQ1/CSE	4.00E-04	0.002	0.86	2.30E-04	0.002	0.92	0.001	0.003	0.67	-0.002	0.002	0.46
X NVQ2/GCE O Lev	3.00E-04	0.001	0.82	-0.001	0.001	0.54	-4.10E-04	0.001	0.76	-0.002	0.001	0.23
X NVQ3/GCE A Lev	4.70E-04	0.002	0.81	0.001	0.002	0.49	0.001	0.002	0.48	-0.002	0.002	0.43
X Higher ed (below deg)	0.001	0.001	0.33	0.001	0.002	0.68	0.001	0.001	0.46	0.001	0.002	0.75
X NVQ4/NVQ5/Degree+	-1.20E-04	0.001	0.93	-1.70E-04	0.002	0.91	9.90E-05	0.001	0.94	6.00E-05	0.002	0.97
Constant	-3.80	0.51	1.44E-13	-1.70	0.50	0.001	-2.90	0.54	1.68E-07	-2.40	0.52	5.08E-06
N		42984			42984			42984			42984	

Appendix Table 5.14_MI: Multiple imputation of Table 5.14. Results that differed in statistical significant to the main analyses shown in bold. Reference is none/foreign/other.

In the main analyses, the positive average effect of the MacArthur ladder (b=0.004, se=0.001, p=1.45E-05) was weaker for those with NVQ3-equivalent education than those with no, foreign, or other education (b=-0.004, se=0.002, p=0.05) but this was not significant in the imputation analyses (b=0.11, se=0.13, p=0.40). On life satisfaction (1) in the main analyses, the positive average effect of the MacArthur ladder (b=0.008, se=0.001, p= 3.57e-12) was stronger for those with higher education but below a degree than for those with NVQ4/5/Degree+ education (b=0.003, se=0.001, p=0.043) but this interaction was not significant in the imputation analyses (b=0.002, se=0.001, p=0.38).

	Life satisfaction (1)			Experienced affect last week		
	b	se	p	b	se	p
Well off nearby	0.19	0.06	0.004	0.19	0.07	0.01
Log income	0.03	0.02	0.16	0.04	0.02	0.07
Well off X log income	-0.01	0.01	0.16	-0.01	0.01	0.05
Constant	-3.8	0.54	2.00E-11	-2.6	0.57	3.30E-06
Well off nearby	0.1	0.01	3.48E-19	0.06	0.01	3.71E-09
Log earnings	3.30E-05	0.004	0.99	0.003	0.004	0.52
Well off X log earnings	**1.10E-04**	**0.001**	**0.91**	-0.001	0.001	0.59
Constant	-3.5	0.51	1.75E-11	-2.3	0.53	1.44E-05
Well off nearby	0.16	0.03	7.28E-08	0.12	0.03	1.53E-05
Log wealth	0.02	0.01	0.001	0.02	0.01	0.002
Well off X log wealth	-0.01	0.002	0.01	**-0.01**	**0.002**	**0.02**
Constant	-3.6	0.51	3.51E-12	-2.4	0.53	5.87E-06
N	42984			42984		

Appendix Table 5.15_MI: Multiple imputation of Table 5.15. Results that differed in statistical significant to the main analyses shown in **bold**.

In the main analyses, the average positive association of well off nearby with life satisfaction (1) (b=0.07, se=0.01, p=1.55E-07) was stronger with increasing log earnings (b=0.01, se=0.002, p=0.002) but this interaction was not significant in the multiple imputation analyses (b=1.10E-04, se=0.001, p=0.91). In the main analyses, the positive average association of well off nearby with experienced affect last week was b=0.15 (se=0.05, p=0.001) and this did not depend on log wealth (b=-0.01, se=0.004, p=0.08) but it did in the imputation analyses (b=-0.01, se=0.002, p=0.02).

	b	se	p	n
MacArthur ladder	**Life satisfaction (1)**			
Women	0.01	0.001	1.35E-38	23806
Men	0.01	0.001	1.18E-39	19178
Well off nearby				
Women	0.1	0.01	2.36E-14	23806
Men	0.09	0.01	2.79E-11	19178
Median education in gender in GOR				
Women	-0.08	0.01	6.04E-12	23806
Men	-0.04	0.02	0.02	19178
% top income in gender in GOR				
Women	-2.9	0.82	4.80E-04	23806
Men	-2.1	0.82	0.01	19178
% top earnings in age in GOR				
Women	-3.7	0.56	6.27E-11	23806
Men	-3.4	0.66	6.64E-07	19178
MacArthur ladder	**Life satisfaction (2)**			
Women	0.01	0.001	2.58E-20	23806
Men	0.01	0.001	2.13E-27	19178
Median education in gender in GOR				
Women	-0.04	0.01	0.001	23806
Men	-0.05	0.02	0.01	19178
% top earnings in age in GOR				
Women	-2.2	0.57	1.04E-04	23806
Men	-1.5	0.64	0.02	19178
MacArthur ladder	**Life meaning**			
Women	0.01	0.001	1.28E-17	23806
Men	0.01	0.001	3.20E-17	19178
MacArthur ladder	**Experienced affect last week**			
Women	0.005	0.001	1.28E-08	23806
Men	0.004	0.001	2.11E-05	19178
Well off nearby				
Women	0.07	0.01	2.29E-07	23806
Men	0.05	0.01	2.61E-05	19178

Appendix Table 5.16_MI: Multiple imputation of Table 5.16. There are no substantive differences to the main analyses except that the relative size of the coefficients between genders was different for the summary measures, as discussed on p. 314.

	Life satisfaction (1)			
	b	**se**	**p**	**n**
MacArthur ladder	0.09	0.02	1.28E-05	42984
Age	0.24	0.04	2.11E-09	
Age squared	-0.002	2.87E-04	3.06E-09	
Ladder X age	**-0.002**	**0.001**	**2.90E-04**	
Ladder X age squared	**1.47E-05**	**4.42E-06**	**0.001**	
Constant	-8.73	1.38	2.93E-10	
Well off nearby	0.87	0.34	0.01	42984
Age	0.18	0.04	7.97E-07	
Age squared	-0.001	2.61E-04	2.46E-07	
Well off X age	-0.02	0.01	0.02	
Well off X age squared	1.68E-04	7.45E-05	0.02	
Constant	-5.93	1.22	1.13E-06	
Median education in gender in GOR	-0.8	0.34	0.02	42984
Age	0.09	0.02	2.09E-04	
Age squared	-0.001	1.74E-04	1.92E-04	
Med. education X age	0.02	0.01	0.04	
Med. education X age squared	**-1.40E-04**	**7.46E-05**	**0.06**	
Constant	-2.83	0.78	2.90E-04	
% top income in gender in GOR	-34.69	23.3	0.14	42984
Age	0.08	0.03	0.01	
Age squared	-0.001	2.14E-04	0.004	
% top income X age	**0.9**	**0.68**	**0.18**	
% top income X age squared	**-0.01**	**0.005**	**0.21**	
Constant	-2.33	0.99	0.02	
% top earnings in age in GOR	-19.51	19.61	0.32	42984
Age	0.1	0.03	8.27E-05	
Age squared	-0.001	1.76E-04	2.70E-06	
% top earnings X age	0.26	0.56	0.64	
% top earnings X age squared	-0.001	0.004	0.89	
Constant	-2.76	0.9	0.002	

Appendix Table 5.17_MI: Multiple imputation of Table 5.17. Results that differed in statistical significant to the main analyses shown in bold.

In the main analyses, the positive association of the MacArthur ladder with life satisfaction (1) was b=0.05 (se=0.02, =0.05), which did not depend on age or age squared (p>0.05). But the interactions with age and age squared were significant in the imputation analyses (for age, b=-0.002, se=0.001, p=2.94E-04; for age squared, b=1.47E-05, se=4.42E-06, p=0.001). In the main analyses for life satisfaction (1), the negative association of median education in gender in GOR

was b=-1.13 (se=0.34, p=0.001), which depended on both age (b=0.03, se=0.01, p=0.003) and age squared (b=-2.11E-04, se=7.46E-05, p=0.005) but in the imputation analyses the interaction with age squared was not significant (b=1.4E-04, se=7.46E-05, p=0.06). In the main analyses, % top income in gender in GOR had a negative association with life satisfaction (1) (b=-73.01, se=25.51, p=0.004) that depended on both age (b=1.97, se=0.76, p=0.01) and age squared (b=-0.01, se=0.01, p=0.01) but the interactions were not significant in the imputation analyses (for age, b=0.90, se=0.68, p=0.18; for age squared, b=-0.01, se=0.005, p=0.21).

	Life satisfaction (2)			
	b	**se**	**p**	**n**
MacArthur ladder	**0.07**	**0.02**	**0.001**	
Age	0.14	0.04	2.84E-04	
Age squared	-0.001	2.82E-04	2.39E-04	42984
Ladder X age	**-0.002**	**0.001**	**0.01**	
Ladder X age squared	**1.12E-05**	**4.30E-06**	**0.01**	
Constant	-5.33	1.37	1.03E-04	
Median education in gender in GOR	0.18	0.33	0.58	
Age	0.06	0.02	0.005	
Age squared	-4.84E-04	1.64E-04	0.003	42984
Med. education X age	-0.01	0.01	0.46	
Med. education X age squared	5.89E-05	7.25E-05	0.42	
Constant	-2.04	0.73	0.01	
% top earnings in age in GOR	-2.38	19.63	0.9	
Age	0.05	0.03	0.06	
Age squared	-4.32E-04	1.83E-04	0.02	42984
% top earnings X age	-0.06	0.57	0.92	
% top earnings X age squared	0.001	0.004	0.83	
Constant	-1.37	0.92	0.14	
	Life meaning			
MacArthur ladder	**0.06**	**0.02**	**0.02**	
Age	0.17	0.04	1.25E-04	
Age squared	-0.001	3.22E-04	3.00E-05	42984
Ladder X age	**-0.001**	**0.001**	**0.05**	
Ladder X age squared	**9.72E-06**	**5.03E-06**	**0.05**	
Constant	-5.77	1.56	2.23E-04	
	Experienced affect last week			
MacArthur ladder	**0.05**	**0.02**	**0.01**	
Age	0.14	0.04	0.001	
Age squared	-0.001	2.97E-04	0.002	42984
Ladder X age	**-0.001**	**0.001**	**0.03**	
Ladder X age squared	**8.96E-06**	**4.46E-06**	**0.04**	
Constant	-5.3	1.43	2.00E-04	
Well off nearby	0.75	0.37	0.04	
Age	0.12	0.04	0.002	
Age squared	-0.001	2.86E-04	0.003	42984
Well off X age	**-0.02**	**0.01**	**0.06**	
Well off X age squared	**1.52E-04**	**8.12E-05**	**0.06**	
Constant	-4.45	1.34	0.001	

Appendix Table 5.18_MI: Multiple imputation of Table 5.18. Results that differed in statistical significant to the main analyses shown in **bold**.

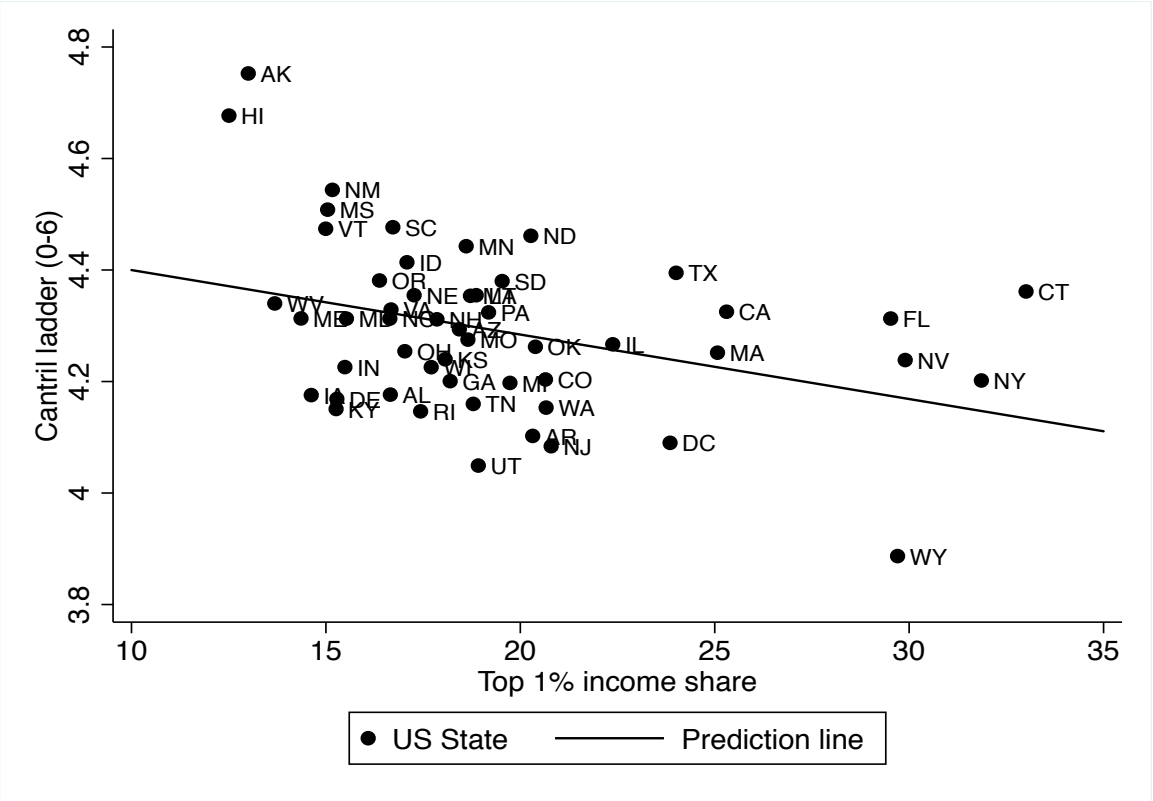
In the main analyses, the positive association of the MacArthur ladder with life satisfaction (2) was b=0.03 (se=0.02, p=0.23), which did not depend on age or age squared (p>0.05). But the interactions with age and age squared were significant in the imputation analyses (for age, b=-0.002, se=0.001, p=0.01; for age squared, b=1.12E-05, se=4.30E-06, p=0.01). In the main analyses, the positive association of the MacArthur ladder with life meaning was not significant, nor were the interactions with age and age squared (p>0.05). But in the imputation analyses, the positive association of the MacArthur ladder with life meaning was significant (b=0.06, se=0.02, p=0.02) and this depended on both age (b=-0.001, se=0.001, p=0.05) and age squared (b=9.72E-06, se=5.03E-06, p=0.05). The MacArthur ladder was also not significantly associated with experienced affect last week in the main analyses and did not interact significant with age or age squared (p>0.05). But in the imputation analyses, the positive association of the MacArthur ladder with experienced affect last week was significant (b=0.05, se=0.02, p=0.01) and depended on both age (b=-0.001, se=0.001, p=0.03) and age squared (b=8.96E-06, se=4.46E-06, se=0.04). In the main analyses for experienced affect last week, the positive association was b=1.67 (se=0.67, o=0.01) and this depended on both age (b=-0.05, se=0.02, p=0.02) and age squared (b=3.33E-04, se=1.45E-04, p=0.02) but these interactions were not significant in the imputation analyses (for age, b=-0.02, se=0.01, p=0.06; for age squared, b=1.52E-04, se=8.12E-05, p=0.06).

Relative variable	*Age*	**Life satisfaction (1)**			**Life satisfaction (2)**			**Life meaning**			**Experienced affect last week**		
		b	se	p	b	se	p	b	se	p	b	se	p
MacArthur ladder	50-54	0.01	0.003	2.61E-06	**0.01**	**0.003**	**2.48E-05**	0.01	0.003	5.99E-05	0.01	0.002	0.02
	55-64	0.01	0.001	1.57E-33	0.01	0.001	5.16E-22	0.01	0.001	8.21E-15	0.005	0.001	2.44E-07
	65-74	0.01	0.001	3.54E-14	0.01	0.001	6.87E-10	0.005	0.001	1.73E-06	0.002	0.001	0.07
	75+	0.01	0.001	1.02E-14	**0.01**	**0.001**	**2.45E-10**	0.01	0.001	1.92E-09	**0.004**	**0.001**	**0.001**
Well off nearby	50-54	0.11	0.05	0.03	*Intentionally blank*			*Intentionally blank*			0.11	0.04	0.01
	55-64	0.09	0.01	7.08E-13							0.05	0.01	2.41E-04
	65-74	**0.06**	**0.01**	**1.40E-05**							**0.002**	**0.001**	**0.07**
	75+	0.11	0.02	1.14E-07							0.08	0.02	1.30E-04
Median education in gender in GOR	50-54	**-0.01**	**0.06**	**0.59**	-0.07	0.07	0.27	*Intentionally blank*			*Intentionally blank*		
	55-64	-0.04	0.01	0.001	-0.03	0.01	0.03						
	65-74	-0.07	0.02	1.24E-06	-0.07	0.02	1.91E-05						
	75+	**-0.11**	**0.02**	**2.46E-09**	-0.05	0.02	0.01						
% top income in gender in GOR	50-54	-0.47	3.6	0.9	*Intentionally blank*			*Intentionally blank*			*Intentionally blank*		
	55-64	-1.36	0.84	0.11									
	65-74	-4.05	0.98	3.45E-05									
	75+	-5.43	1.32	3.64E-05									
% top earnings in age in GOR	50-54	-8.65	3.12	0.01	-4.19	3.21	0.19	*Intentionally blank*			*Intentionally blank*		
	55-64	-4.01	0.74	6.69E-08	-2.04	0.71	0.004						
	65-74	-5.83	0.88	4.56E-11	-3.25	0.86	1.61E-04						
	75+	0.6	0.77	0.43	0.23	0.79	0.77						

Appendix Table 5.19_MI: Multiple imputation of Table 5.19. Results that differed in statistical significant to the main analyses shown in **bold**.

In the main analyses for life satisfaction (1), well off nearby was not significantly associated with SWB among ages 65-74 years (b=0.03, se=0.02, p=0.28) but it was in the imputation analyses (b=0.06, se=0.01, p=1.4E-05). In the main analyses, again for life satisfaction (1), median education in gender in GOR was associated with SWB for those aged 50-54 years (b=-1.84, se=0.83, p=0.03) but it was not significant in the imputation analyses (b=-0.01, se=0.06, p=0.59). On the second life satisfaction measure for the MacArthur ladder, in the main analyses there was not a significant association for those aged 50-54 years (b=0.01, se=0.003, p=0.07) and 75+ years (b=0.001, se=0.001, p=0.22) but these relationships were significant in the imputation analyses (50-54 years, b=0.01, se=0.003, p=2.48E-05; 75+ years, b=0.01, se=0.001, p=2.45E-10). On experienced affect last week in the main analyses, the MacArthur ladder was not significantly associated with SWB among those 75+ years in age (b=0.002, se=0.001, p=0.12) but was in the imputation analyses (b=0.004, se=0.001, p=0.001). Well off nearby was significantly associated with experienced affect last week in the main analyses for those aged 65-74 years (b=0.05, se=0.03, p=0.04) but it was not in the imputation analyses (b=0.002, se=0.001, p=0.07).

Appendix E – Supplement to Chapter Six



Appendix Figure 6.1: The bivariate relationship of top 1% shares by states and average Cantril ladder scores by states in the ATUS (top 1% income shares imported from the World Wealth and Income Database).