CULTURE, RELIGION AND COGNITION: BUDDHISM AND HOLISTIC VERSUS ANALYTIC THOUGHT

by

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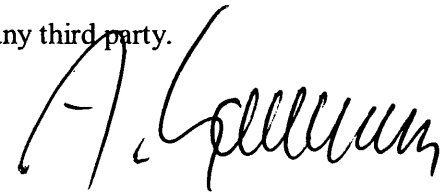

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Abstract

Some cross-cultural psychologists have shown differences in cognition between Eastern and Western cultures, described as holistic versus analytic (H-A) systems of thought. It is widely assumed that Buddhism has contributed to holistic cognition. This thesis explores holistic thought among Western Buddhists by integrating methods and theories mainly from cross-cultural and social psychology, but also the cognitive anthropology of religion.

H-A reasoning among Buddhists, Anglicans and Secular-Humanists in the UK is investigated in a main experiment, providing good backing for hypothesised H-A group differences. Moreover, it supports a hypothesis about the effect of meditation on the categorisation of visual stimuli and strength of holistic beliefs. However, only explicit H-A measures are subject to religious context effects, as evident in their association with religiosity, the religious self-concept and religious integration. Inducing a Buddhist context through religious priming does not result in a holism shift.

A follow-up study (2) uses pictorial primes and shows an interaction effect between priming condition and strength of Buddhist self-concepts on holistic beliefs. Study 3 clarifies religious versus secular differences that were found for the grouping measure used in Study 1 in a correlational design with measures of independence-interdependence, religious identification as well as attraction to Buddhist and Secular-Humanist ideas. It indicates that both self-selection and learning effects may account for secular vs religious H-A differences.

The last experiment (Study 4) further develops so-called 'tolerance of contradictions' (TC) as an aspect of H-A cognition and introduces the cognitive anthropological concept of counterintuitive (CI) beliefs. As expected, results show that religious groups have a higher tolerance of CI. Furthermore, compared to normal or bizarre concepts, CI content reduces TC only among secular individuals, and to some degree Anglicans, but has no such effect on Buddhists.

Implications for cross-cultural psychology, the psychology of religion as well as the interdisciplinary field of 'cognition and culture' are discussed.

To Adrian

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Chapter 1 – Introduction

1.1 Cognition, Culture and Religion

Despite the declining importance of organised religion in the lives of many individuals in post-industrial societies (see e.g. Furlong, 2000, on the Church of England), the domain of religion has always been home to exceptionally durable ideas—values, beliefs and practices that appear to be more robust than those found in other cultural institutions. The endurance of religious beliefs and practices has led to theories about the cognitive foundations of their transmission, including the identification of two 'modes of religiosity' with contrasting sociopolitical and psychological characteristics (Whitehouse, 2000, 2004, 2005) and cognitive universals that underlie non-natural representations (Sperber, 1996; Boyer 1994, 2000; see also Sperber and Hirschfeld, 1999; Lawson, 2001). The cognitive science of religion has become an important area of inquiry within the emerging interdisciplinary field of 'cognition and culture' (e.g. Hirschfeld & Gelman, 1994; Nisbett & Norenzayan, 2002; Nisbett, Peng, Choi & Norenzayan, 2001; Peng, Ames, & Knowles, 2001; Sperber & Hirschfeld, 1999). However, religion has not found much interest among 'culture and cognition' researchers who study cognition in a 'top down' approach: cognitive *differences* as a consequence of cultural diversity (e.g. Nisbett, 2003; Nisbett, Peng, Choi & Norenzayan, 2001). This thesis contains four studies that investigate the overarching question whether religion affects areas of cognition previously discussed under the heading of 'holistic versus analytic' (H-A) thought.

1.2 Cross-Cultural Differences in Cognition

Some attempts to explain human attitudes and beliefs as a result of broad cultural differences have made distinctions between so-called collectivist and individualist

cultures (e.g. Triandis, 1995; Hofstede, 1980), influencing the development of more interdependent or independent orientations of people towards others (Markus & Kitayama, 1991). Peng, Ames and Knowles (2001) have termed theories and research in these respective areas *values* and *self* approaches to 'culture and human inference'. The starting point for this thesis is mainly a third perspective, which Peng et al. call the folk theories or simply *theories* tradition. Recent studies in this tradition by cross-cultural psychologists have revealed significant differences in cognition between individuals from East Asia and those of Western European cultural descent, most dramatically the United States (Nisbett, 2003; Nisbett & Masuda, 2003; Nisbett, Peng, Choi & Norenzayan, 2001; cf. Fiske, Kitayama, Markus & Nisbett, 1998). Nisbett et al. (2001) classify cognitive differences associated with those cultural regions as holistic versus analytic thought (henceforth referred to as H-A cognition), 'systems of reasoning' that cluster together in a variety of experimental findings.

H-A cognition represents a pattern of thinking on several levels, involving differences in perception, attention, conceptual structures and inferences about causality. Holistic cognition assigns greater weight to fields, contexts and relationships, while analytic cognitive processes focus on objects, categories and formal logic. In addition, dialectical reasoning has been considered an aspect of holism, contrasted with analytic cognition's lower tolerance of logical contradictions. Nisbett (2003) theorises that these differences in cognition are the result of variations in social structures and practices (rooted in ecological, economic and social histories) leading to cultural differences in attention, metaphysics and folk epistemologies, which are then applied in cognitive processes.

1.3 Why Religion? Why Buddhism?

The overarching question addressed in the following chapters is whether within-cultural religious differences can explain H-A patterns of thought. Theories and research

by both cognitive anthropologists and psychologists of religion suggest that religious experience has cognitive consequences beyond the immediate context of religiosity. The anthropologist Harvey Whitehouse's 'modes theory' of religiosity (2000, 2004, 2005) proposes that two types of religion, the *doctrinal* and *imagistic,* can capture commonalities of religions in the spiritual landscape across space and time. Despite the complexity of religious systems, their endurance can be explained in part by their individual-level cognitive implications in the form of either semantic or episodic memory.

Some research in the psychology of religion has been interested in how religiosity affects other aspects of life, such as coping and health, which is influenced by cognitive processes like causal attributions (Loewenthal & Cornwall, 1993; Loewenthal, MacLeod, Goldblatt, Lubitsh, & Valentine, 2000; Lupfer, Brock, & Depaola, 1992; Pargament, 1997; in Nielsen, 2000; Parsuram & Sharma, 1996; Spilka, Shaver, & Kirkpatrick, 1985; Wikstrom, 1987). The study of H-A thought among religious and secular populations, as endeavoured by this thesis, has the potential to enhance our understanding of religions' more general cognitive effects.

The primary religion of interest in this thesis is Buddhism—in the form of individual identification, religiosity as well as social integration—as an instance of Eastern religion in the West. The motivation for this choice is twofold. First, Buddhism has been credited as an important source of East Asian thought (Fiske et al., 1998; Ho, 1995; Markus & Kitayama, 1991; Markus et al., 1997) and holistic reasoning (Bose, 2002; Hernandez & Iyengar, 2001; Nisbett, 2003; Noda, 2000; Ornstein, 1972; Ragsdale, 2003), but has never been empirically investigated from that perspective. Second, Buddhism is not only the most widespread religion in East Asia[1], but also the most

[1] *Source:* CIA World Fact Book. Buddhists are a) the largest religious population in Japan, b) equally numerous as Christianity in South Korea, and c) constitute an unknown portion of the population in Taiwan, along with Taoists and Confucians. There are no reliable statistics about religious affiliations in Mainland China and North Korea.

represented Asian religion among the white British population, with 50,000 self-identified Buddhists counted by the 2001 Census. This number represents one-third of the total Buddhist population in Britain.[2]

It has been claimed that religion is the most overlooked dimension in mainstream psychology (Weaver, Kline, Samford, Lucas, Larson, & Gorsuch, 1998) as well as cross-cultural psychology (Tarakeshwar, Stanton, & Pargament, 2003). By examining Buddhism as a mediating variable between culture and H-A thought, we may come closer to understanding some of the processes and dynamics at work in the relationship between culture and cognition. Studying Buddhism outside of its native context is also reflective of psychology in today's multiculturalism or globalisation, where populations and ideas are flowing across borders in an ever-shrinking world (e.g. Sampson, 1989; Hermans & Kempen, 1998; Hong & Chiu, 2001; Nisbett, 2003).

1.4 Thesis Outline

1.4.1 Introduction

Theoretical arguments for the cultural origins of H-A thought have been made. However, as will be shown later, they are far from complete. I believe that there are three main tasks of future research in this area. First, attempts should be made to empirically study mechanisms operating between sociocultural systems, including their components, and individual thought. This includes research on group (or subcultural) differences within cultures. Second, a shift from relatively static to more dynamic research should be made by looking at learning, change or the coexistence of different systems of thinking. Finally, the interaction between relatively universal and culturally variable cognitive processes could be investigated in order to fuse the 'top down' and 'bottom up' approaches of the 'cognition and culture' field.

[2] *Source*: Census, April 2001, UK Office for National Statistics.

1.4.2 Theoretical Chapters

The next chapter mainly addresses the first and second point outlined above by discussing the place of religion, spirituality and religious contexts of reasoning in culture and H-A cognition. In order to understand and explain H-A differences from the perspective of Buddhism, I will first review theories and research that have been conducted in the cross-cultural psychology of H-A thought. I will then concentrate on the question whether religiosity and religious contexts of reasoning may influence H-A cognition. This is done in a review of theories and findings in the area of biculturalism as well as cultural knowledge activation. Moreover, critical and complementary approaches to the study of sociocultural systems and the individual are discussed.

In an attempt to contribute towards a 'religion and cognition' model for this thesis, I review Nisbett's (2003) H-A model of culture and cognition along with Peng et al.'s (2001) 'culture and human inference' model and House's (1981) 'individual and social structure' theory. From the perspective of the latter, I will argue that a distinction between structure and content can be made not only with respect to individual thought, but also in sociological terms. To this end, I will make a case for a conceptual separation, on a collective 'systems' level, between individual integration in social structure vis-à-vis that structure's 'cultural content'. With respect to religion this means that we need to take into account individuals' spiritual values, beliefs and practices along with their contacts in religious social structures that may reinforce such 'religious content'. I expect that these cultural and structural components of religiousness may (separately or jointly) lead to effects on H-A reasoning. Hence, the model used throughout this thesis largely retains the character of the original H-A theory and research (albeit with a mid-level focus due to its emphasis on religion), but is expanded by adding closely related ideas from cross-cultural and social psychology.

Chapter 3 reviews different approaches to religion and cognition. After an introduction to the psychology of religion, the teachings of Buddhism and their relevance to H-A cognition are discussed. Keeping in mind sociological and psychological factors, I will articulate more detailed hypotheses about the relationship between religion, particularly Buddhism, and H-A cognition. In the chapter's second section, the top-down approach evident in H-A research is re-analysed by adopting a bottom-up viewpoint of universally intuitive aspects of cognition. This provides the basis underlying the concept of counter-intuitiveness (CI), contradictory beliefs that prevail in the domain of religion. Parallels between CI, tolerance of contradictions (TC) and Eastern dialectical thinking are discussed. While CI constitutes a 'cognitively optimal' feature of religiosity, Whitehouse's 'modes theory' of religiosity (2000, 2004, 2005) is concerned with more complex or 'cognitively costly' aspects of religion. It is argued that Buddhism, particularly the kind practiced by Westerners, is related to the 'imagistic' mode, compared to Christian religions that have been used as prime examples of the 'doctrinal' mode. The expected cognitive consequences of these two modes are largely congruent with those implied by the social, religious and cross-cultural psychological literature.

1.4.3 Empirical Work

A question of central importance in Study 1 of this thesis (Chapter 4) is whether individuals with a white British cultural background who practice Buddhism exhibit more holistic reasoning than other groups. Samples of Christians belonging to the Church of England and representatives of a British Secular-Humanist population serve as comparison groups in this online experiment. In addition to an analysis of group differences, this study conceptualises religion further by looking at H-A differences as a result of religious priming, religiosity, as well as religious group contact or integration. The findings of Study 1 support the hypothesis that Buddhists are more holistic thinkers

than Christian and secular groups, although results for TC are mixed. While religious priming does not lead to more holistic cognition in that group, religiosity and integration affect holistic beliefs. Along with the H-A categorisation of visual stimuli, those beliefs are also influenced by meditative practices.

Chapter 5 presents three follow-up studies that clarify the main experiment's outcomes. The first, Study 2, is a shorter experiment with a pictorial priming manipulation. It shows that a Buddhist prime can induce holistic beliefs, albeit moderated by the strength of Buddhist self-concepts. Study 3 investigates the role of the religious self-concept further and illustrates its relationship to independent-interdependent self-construals as well as holistic grouping. Findings support both cognitive self-selection and learning hypotheses to account for holistic performance on this measure. Following Study 1's strong religious differences on explicit measures, in addition to mixed findings for TC, the last experiment extends the range of TC from reflective to intuition-based variables. Consistent with predictions, it shows Buddhists to hold beliefs with the highest level of TC. Unlike their comparison groups, Buddhists are able to sustain such a tolerance even for highly counterintuitive cognitions.

Chapter 2 – Holistic versus Analytic Cognition: Cross-Cultural and Social Psychological Contexts

2.1 Holistic versus Analytic Cognition: Empirical Dimensions

2.1.1 The Social Inference Level of Holistic versus Analytic Cognition: Social Attribution and Prediction

H-A systems are evident in cognitions ranging from perceptual to reflective levels of thought, such as social attributions and predictions. Individuals' causal explanation of their own and others' behaviour has been part of a social psychological research tradition on social attribution. In Jones and Harris' (1967) classic experiment, students' attribution of others' pro or anti-Castro attitude showed correspondence to the position taken in an essay presented to the class, even if the target actors were clearly ordered to defend one or the other stance in the essay. Ross (1977; see also Gilbert & Malone, 1995) theorised that there is a Fundamental Attribution Error (FAE), referring to a universal tendency for people to underestimate the strength of influence exerted by situational factors. Persons do this even when it is logically unwarranted. It was later shown that, in the attribution of behaviour, individuals from Asian cultures tend to give contextual explanations, whereas Americans prefer dispositional ones (e.g. Cha & Nam, 1985; Miller, 1984; Morris & Peng, 1994)

Some studies, however, have provided evidence that Japanese and Chinese are just as likely to make the FAE (for a summary see Choi et al., 1999) as Westerners in the no-choice condition of the classic essay experiment (Krull et al. 1996, in Choi et al., 1999) or are at best "equally insensitive to the difference in the target person's choice and the potential effects of situational constraints" (Kashima, Siegal, Tanaka, & Kashima, 1992, p. 120). Choi and his colleagues (1999; Choi & Nisbett, 1998) demonstrate that this may only be the case when *situational constraints are not salient.*

Choi and Nisbett's (1998) version of the essay experiment manipulated salience by asking participants to write essays supporting or opposing capital punishment themselves, regardless of their own attitudes. By exposing participants to the same situational constraints as the target person, differences clearly emerged. Koreans correspondence bias decreased significantly more than that of the American sample in manipulation conditions. The same was true for the actor-observer bias.

Social inferences in the form of *predictions* of behaviour as studied by Norenzayan, Choi & Nisbett (2002) yield similar patterns. Asian subjects were influenced by situational information for the prediction of the hypothetical actor's behaviour only significantly more than Americans when they engaged in the *aggregate prediction task.* Respondents, lacking dispositional information about hypothetical actors, were asked what proportion of any 100 individuals would engage in a particular behaviour prior to reading about the individual actor and making a prediction. While Koreans were responsive to the increased salience of situational information, Americans were not.

Norenzayan et al. (2002) maintain that folk theories of the person differ across cultures, while dispositionist thinking may nonetheless be universal and intuitive under conditions that lack contextual information. A test of Erdley and Dweck's (1993; also Dweck, Hong, & Chiu, 1993) index measuring beliefs in the fixedness of personality traits (Entity Theory of Personality: e.g. 'everyone has a certain personality and it is something that they can't do much about') supported the idea that Western European cultures may think of traits more in global, abstract terms, driven by schemas in information processing, whereas the East Asian perspective may lead to specific, concrete or conditional inferences about behaviour. However, when Norenzayan et al. (2002a) directly measured actual beliefs, in the form of abstractly formulated lay theories of social behaviour, differences emerged for people's endorsement of situationist and interactionist arguments, but no cultural effect was found for a

dispositionist theory. While dispositionist and situationist arguments stressed the power of personality and context or situation, respectively, the interactionist theory argued for a joint determination of internal and external factors in influencing behaviour.

2.1.2 The Perceptual Level of Holistic versus Analytic Cognition

Patterns of reasoning about the causes of social behaviour are also reflected in (or in part arise out of) more basic perceptions of causality. Nisbett and his colleagues have pointed to Aristotelian physics as a possible source for Western thinking about causality (Fiske et al., 1998; Nisbett et al., 2001; Choi et al., 1999; Ji, Peng & Nisbett, 2000; Norenzayan & Nisbett, 2000; Nisbett, 2003). Unlike the Chinese, for example, the Greeks explained causality in terms of an object's inherent property, or essence, such as gravity. The Chinese had a concept of wave-based rather than particle-based physics and understood the concept of 'action at a distance' (Needham, 1962 in Nisbett, 2003; Nisbett et al., 2001; Choi et al., 1999; Ji et al., 2000). Although the historical origins of contemporary differences in cognition are poorly substantiated in the literature, they may be reflective or illustrative of a cultural history that has left a 'legacy of thought'.

Accordingly, Peng and Knowles' (2003) found that Chinese students were more likely to explain physical events on the basis of factors external to the object than Americans. In their samples, which were made up of students with no formal physics education, Chinese students tended to perceive causality as originating externally to a target object (e.g. gravity, friction), whereas Americans referred to causes internal to the object (e.g. shape, weight, inertia). The authors argue that people from different cultures have access to different *folk theories* about physical causality.

Related research by Ji et al. (2000) also found that Chinese have a greater capability than Americans of detecting co-variation between stimuli pairs presented to them on a computer screen. The ability to detect co-variation must be both a determinant and a product of the stimuli individuals attend to in the environment. The same can be said for

causal inference: greater attention to the context or field in which an event occurs should be directly related to causal judgments and vice versa. To what degree do individuals from various cultures differentiate an object from the field in which it is embedded? Building on experimental research on field-dependence-independence, originally conducted by Witkin and his colleagues (Witkin, Lewis, Hertzman, Machover, Meissner, & Karp, 1954; Witkin & Goodenough, 1981), Kitayama, Duffy, Kawamura and Larsen (2003; see also Ji et al., 2000; Masuda & Nisbett, 2001) used a newly devised perceptual task called the framed-line test. The test consisted of presenting subjects with a picture of a vertical line printed within a square frame. Participants were then shown another frame of the same or different size and asked to draw a line identical to the first one in either it's actual (absolute) length or in relative proportion to the dimension of the surrounding frame. Accuracy in the absolute task indicated decontextualisation (similar to field-independence), whereas relative accuracy was indicative of sensitivity to context (field-dependence). The experiment showed expected differences between Americans and Japanese.

Chua, Boland, & Nisbett (2005) found significant differences in eye movement, revealed in a Western tendency to look at salient objects sooner and longer than East Asians. The latter group attended more to background factors of the same naturalistic scenes. Chua et al. conclude that this is evidence for differences in encoding that occurs early in the cognitive process rather than at later stages when information is retrieved, mental comparisons are made, or biases in reporting may occur (for a summary on culture and H-A perception see Nisbett & Miyamoto, 2005). Miyamoto, Nisbett and Masuda (2006) note that differences in perceptions may be in part reinforced by actual differences in perceptual environments. They report significant differences in both the number of objects contained in comparable sceneries (hotels, schools and post offices) in the U.S. and Japan (Study 1B) and their *perceived* ambiguity and complexity across

cultures (Study 1A). In another experiment (Study 2), both American and Japanese students who were first exposed to Japanese scenes showed a tendency to attend to contextual information in a follow-up task.

2.1.3 The Middle Range of Holistic versus Analytic Cognition: Categorisation, Induction and Conceptual Structure

Ji, Zhang and Nisbett (2004) maintain that attention to the field, in holistic thought, also entails attention to relationships between objects and events. Analytic thinkers, by contrast, "de-contextualise an object from the field and attend to its properties so as to establish category membership, in an attempt to understand and predict the object's behavior" (p. 58). H-A reasoning, then, is also manifested in aspects of cognition that do not answer what information is attended to or where the causes of events can be found, but how the world is carved up. Scholars interested in Eastern cultures have recognised that Asian thought appears to be dominated by part-whole rather than one-many relationships (e.g. Hansen, 1985, Nakamura, 1964; Noda, 2000; Ragsdale, 2003) and that Eastern thinkers seem to concentrate more on categories of relationship than categories of substance (e.g. Hughes, 1967; cf. Ragsdale, 2003). In an early study, Chiu (1972) found that Chinese children in his sample preferred to group human and inanimate objects in relational-contextual terms. American children chose categorical properties more often in this task. For example, if presented with pictures of a woman, man and child, Chinese tended to group woman and child together ('The mother takes care of the child'), whereas Americans were more likely to match man and woman because they are both adults. Using similar visual stimuli, Unsworth, Sears and Pexman (2005) found that these differences occur at an implicit level of cognitive processing. Upon being presented with a target object (e.g. car), Canadian, but not Chinese, students' response times were significantly faster when followed by a similar object

(e.g. bus) than a relational one (e.g. tyre), indicating cross-cultural differences in the implicit activation of semantic concepts.

Ji et al. (2004) used a similar forced-choice grouping task with words instead of pictures, and found the same to be true for a sample of Chinese and American college students. The smaller importance of categories among East Asians is also highlighted by Choi, Nisbett and Smith (1997), who found that Korean college students use categories less spontaneously for inductive inferences. Indeed, Gopnik and Choi (1990) argue that categorisation and naming is learned a few months later among Korean children than among English or French speakers. Linguistic development, particularly the fact that verbs are more salient and acquired earlier in Korean than nouns, may influence this cognitive development pattern (see also Nisbett, 2003, for a summary of language and conceptual development).

Norenzayan, Smith, Kim and Nisbett (2002) administered a variety of tasks to demonstrate that East Asians reason more intuitively than formally. Their experiments consisted of student samples with similar demographic backgrounds and intellectual ability. Although East Asians were just as capable of constructing rules governing the categorisation of stimuli, this was not the case when the task was made deliberately ambiguous in a rule- vs family resemblance-based categorisation measure (Study 2). In this study, perceptual stimulus objects (such as drawings of flowers) contained three out of four possible features, which together produced a strong family resemblance structure. Only one of the four features was deterministic, i.e. shared among all objects and indicative of a rule. In the classification condition, subjects were instructed to decide which group a given target object (e.g. flower) belongs to. In the similarity judgment condition, categorisation on the basis of rule versus family-resemblance were put in conflict, as participants were asked to indicate the group to which a target object is most *similar*.

In this condition, East Asians gave family-resemblance responses 59% of the time and Americans only did so for 31% of target objects. Norenzayan et al. conclude that "intuitive [unlike formal] reasoning is experience-based, resists decontextualizing or separating form from content, relies on sense experience and concrete instances, and overlooks rules and logic when they are *at odds* with intuition" (my emphasis; p. 678).

2.1.4 Formal versus Dialectical Reasoning and Tolerance of Contradiction

While using rules or formal logic are defining features of analytic cognition, Nisbett (2003) maintains that holistic thought brings about attention to the field which "would encourage recognition of complexity and change, as well as of contradiction among its many and varied elements" (p. 36). Peng (Peng, 1997; Peng & Nisbett, 1999; for summaries see Peng & Ames, 2001; Nisbett, 2003; Nisbett et al., 2001) has argued that East Asians are more tolerant of contradictions and noted that East Asians, particularly Chinese, seem to put aside Western formal logic in favour of so-called naïve dialecticism. Formal logic excludes the possibility of contradiction. More specifically, Peng and Nisbett (1999; Peng, 1997; Nisbett et al., 2001) argue that the formal law of non-contradiction includes certain principles: an object is by definition identical to itself (the law of identity); a statement cannot be both true and false (law of noncontradiction) and it must be either true or false (law of the excluded middle). Eastern naïve dialecticism, by contrast, has principles seemingly opposed to Western formal logic: reality is dynamic and an object does not have to be identical to itself (the principle of change); change is constant and hence things can coexist in the same object or event at a given time (principle of contradiction); due to constant change and contradiction, everything is related and interdependent (principle of relationship or holism). The psychological manifestation of dialecticism lies in a greater acceptance of *apparent* contradiction and the readiness to resolve them by finding a middle way.

Peng and Nisbett's (1999) definitions of contradiction and dialecticism have been subsequently criticised by some scholars (S. Chan, 2000; Ho, 2000; Lee, 2000; Ratner & Hui, 2003; Huss, 2004). Indeed, most of Peng and Nisbett's studies are only loosely related to psychological contradictions. For example, differences were evident in a tendency for Chinese to rate dialectical arguments as far more persuasive or plausible than their American counterparts. In another study, participants from the U.S. and China rated dialectical and non-dialectical proverbs on the basis of their understanding, liking and usage of the expressions. Even for culturally unfamiliar (Yiddish) proverbs, Chinese seemed to prefer dialectical ones significantly more than Americans did. Finally, Peng studied individuals' resolutions of social 'contradictions' ('conflict' may be a better term), where East Asians tended to address issues from both sides and attempted to reconcile conflicts through compromise.

In this thesis I will make three related assumptions about tolerance for contradiction (TC). First, I will accept Peng and Nisbett's (2000) position that their research is about *apparent* and *psychological* rather than factual or logical contradictions. Second, I endorse the notion that this tolerance is a form of acceptance, not a true belief that would violate basic logical principles (Huss, 2004). Third, I adopt D. Chan's (2004) conceptualisation of TC as related to 'fuzzy' rather than 'bivalent' logic, because empirical evidence on TC only establishes differences occurring on continua—TC, so far, has not been measured as a black-or-white phenomenon.

There is one finding in Peng and Nisbett's cluster of studies that captures these assumptions well. When presented with two seemingly contradictory scientific research findings (for example, one study pointing to smoking in relation to being skinny and another to nicotine and weight gain), American subjects tended to differentiate by rating one finding as more plausible than the other. Chinese participants, in comparison, resolved the apparent contradiction by expressing intermediate beliefs. More

specifically, compared to a control condition in which ratings of plausibility for individual findings were elicited, the more plausible one of two statements presented to Americans was rated as slightly *more* plausible, while Chinese participants' ratings of plausibility actually *converged.* This finding is supported by a comparable study of surprise about expectation violations conducted by Choi and Nisbett (2000; Study 4). In a rather complex experimental design, the researchers induced a belief in a proposition among participants and then informed them that the opposite was in fact true. Participants were asked to provide their opinions of the proposition on the basis of this "corrected" evidence. Americans were far more surprised than Koreans by the less plausible proposition actually being true after initially being led to believe that it was the more plausible one.

Choi and Nisbett (2000) argue that East Asians' greater TC, along with more complex theories of behaviour, would be reflected in lower ratings of surprise about target actors' behaviour that are in conflict with the behaviour one would normally expect. In one study, a 'Bad Samaritan' vignette was used to measure Korean and American subjects' surprise about a target's behaviour. A target seminary student, described as very helpful and religious, was late for a sermon course in which he was supposed to give a practice sermon. The student encountered another person in need, and faced the dilemma of helping (consistent with the expectations we would have based on his personality) or being late and facing the consequences. Compared to U.S. subjects, Koreans were significantly less surprised upon learning that the seminary student did not help the person in need. The same pattern was found for surprise about an unhelpful individual actually helping another person (Study 2).

2.2 Holistic versus Analytic Cognition: A Typology with Shortcomings

2.2.1 Tolerance of Contradictions—A Special Case of Holistic versus Analytic Thought

As mentioned previously, dialectical reasoning or degrees of TC may be related to cross-cultural differences in attention, resulting in the recognition of complexity, change and contradiction. On the basis of this logic, Nisbett et al. (2001) theorised that TC, in the form of dialectical versus formal-logical cognition, is an aspect of H-A thought. Perhaps partially as a result of critical responses to these ideas, Nisbett and Masuda (2003) have implied that Asian dialectical versus Western European formal logical thinking may be a special case in H-A reasoning. They posit that the causal chain between culture and cognition bypasses attention and perception in a more direct flow from social practices (e.g. debate vs. harmony or reconciliation) to cognition (e.g. differentiation vs. compromise). Hence, while the *recognition* of contradictions may be related to attention, ways of *dealing with* it may be of a more social origin.

2.2.2 Interrelations Between Dimensions of Holistic versus Analytic Cognition

As mentioned earlier, H-A reasoning represents styles of thinking that have not been operationalised on the basis of a priori theories, but systems of interrelated phenomena that seem to cluster together. H-A cognition, then, is at best a parsimonious concept to explain empirical findings and at worst 'data in search of a theory'. Empirical investigations of how these measures are interconnected have not been conducted. Hence, while the common themes of analytic and holistic thinking are somewhat clear, the broad scope of the elements making up these systems makes it difficult to empirically map relationships between relevant cognitive processes. If H-A systems of thought exist, research to find a higher-order measure would be useful.

Only one study has attempted to devise a H-A scale, but it is not clear whether it truly represents a higher-order H-A measure. Choi, Dalal, Kim-Prieto and Park (2003) constructed a Holism Scale composed of ten questions capturing individuals' 'epistemological stances' in the form of abstract beliefs. Questions focused mainly on beliefs about causality and attention to relationships or contexts, including statements like 'Nothing is unrelated' or 'The whole is greater than the sum of its parts'.

Interrelations between aspects of H-A thought have been mapped out theoretically by Nisbett (2003), who has argued that, generally, differences in attention to the object versus field (which, as discussed later, have a social origin) have cognitive implications for metaphysics (beliefs about the nature of the world and how its components interact) and "tacit epistemologies" or "beliefs about how to get new knowledge" (p. 37). Epistemology, in turn, fosters the development and use of certain cognitive processes. Differences in attention and folk theories (in addition perhaps to interdependent orientations of self, discussed later) also seem to affect a conceptual organisation of the world in relational-contextual terms (Chiu, 1972; Ji et al., 2004) and social cognition in the form of attribution or prediction of behaviour. Furthermore, differences in attention can be related to intuitive versus analytic categorisation (Norenzayan et al., 2002b). Whereas holistic attention may facilitate stimulus-as-a-whole (i.e. family-resemblance, typicality and exemplar-based) categorisation, a focus on the object leads to an "attempt to categorize the object and derive rules about its behaviour based on its category memberships" (Choi et al., 1997: 29).

2.2.3 What Holistic versus Analytic Cognition Is Not

Not surprisingly, Nisbett et al. (2001) are unable to provide a succinct definition of holistic versus analytic distinction. By calling them 'systems of thought', the authors leave ample room for interpretation. The range of cognitions involved and the lack of empirically substantiated interrelations between them should rule out a description of

the H-A distinction as 'cognitive styles'. In fact, a classic example of cognitive styles comes from research on field-dependence/independence (Witkin et al., 1954; Witkin & Goodenough, 1981), variations of which have been used as an illustration of H-A perception. Other conceptualisations of cognitive style seem to resemble relational-contextual versus category-based ways of organising information, such as Kagan, Moss and Sigel's (1963) 'styles of conceptualisation' or 'conceptual strategies'. Kagan et al.'s strategies show commonalities with the perceptual styles outlined by Witkin and his colleagues. They are made up of *analytic- descriptive* (versus holistic), *inferential-categorical* and *relational-contextual* types. The first style refers to differences in responses to stimuli, whereas the latter two refer to their categorisation (see also Chiu, 1972). Broadly speaking, then, a cognitive style can be defined as a certain way of processing information. A cognitive *system*, as in H-A thought, could be defined as a group of conceptually (ideally also empirically) related or mutually supporting ways of processing information. These range from cognitions that determine those processes' input or content (perception, attention), relevant beliefs that govern the organisation of content or relationship between objects of thought (metaphysics), and explanations of how or why objects behave in certain ways (epistemology).

The use of the term 'versus' in contrasting holistic and analytic processes by Nisbett et al. (2001) appears semantically clumsy, as the H-A distinction may be interpreted as discrete systems across individuals or cultural groups. H-A cognition is only a dichotomy in the sense that certain cognitive tasks can (or can be forced to) have only one solution or the other, not in the sense that they are exclusive to different cultural populations. Cross-cultural research can only produce differences in tendencies in the application of H-A cognitive 'tools' to solve problems (Nisbett et al., 2001; Nisbett & Norenzayan, 2002; Norenzayan & Heine, 2005). Nisbett et al. agree with Resnick's (1994) definition of 'situated cognition' as thought with a cultural and intellectual

history, composed of tools that have built-in and (consciously or unconsciously) accepted theories. However, although Nisbett et al. reference psychologists who have contributed to the history of a 'tools of thought' view (e.g. Vygotsky, 1978; Cole, 1995), they do not further elaborate on the role of culture and the individual in the selection process. Have H-A tools been selected for us primarily by culture, do individuals select certain tools more than others because of cultural or contextual demands, or is it an interaction between those two processes? Although there are many unanswered and relevant questions that could be addressed along those lines, doing so would go beyond the scope of this thesis.

2.3 Values and Self Traditions of Culture and Cognition

One important gap in the literature on H-A cognition is evident in the fact that actual mechanisms involved in the culture-cognition link have been explained theoretically rather than explored empirically (see Nisbett, 2003; Nisbett et al., 2001). Hence, the cultural psychology of H-A reasoning would benefit from more research about how particular *aspects* of culture or institutions in individuals' everyday life affect cognitive processes. This requires greater sensitivity to institutions and meaning systems making up culture, as well as situations and contexts affecting individual cognition. As a component of culture, religion has the potential to provide insights into mechanisms mediating between macro culture and the individual mind.

Moreover, studies in cross-cultural cognition have, on the whole, been quite static in the questions they have sought to answer empirically. They have often relied on investigations of simple group differences without attention to subcultural or individual variation, contexts or change over time. Directing more attention to contexts in which thinking occurs and the possible coexistence of different cognitive systems would be beneficial to the field. In the following sections, I shall bring some more focus to these issues by discussing the broader theoretical context in which H-A cognition is

embedded, as well as subsequent advances in those areas. To this end, I will use Peng, Ames and Knowles (2001) distinction between the value, self and theory approaches to culture and human inference. The theory approach is best represented by the view of tacit or folk epistemologies (beliefs about causality, theories about the person, etc.) as a source of individual inference patterns (e.g. Nisbett, 2003). The complementary 'values' and 'self' traditions, which I am about to discuss, represent historical antecedents to this view.

2.3.1 Individualism-Collectivism and Independence-Interdependence

Individualism and *collectivism* have been identified as ideal-type sociocultural patterns with consequences for individual orientation and motivation by Triandis (1989, 1995; for critiques see Hermans & Kempen, 1998; Hong & Chiu, 2001; Kitayama, 2002; Miller, 2002). Individualist societies imply a notion of relatively loosely linked individuals who value their own needs, rights and self-fulfilment. A collectivist society entails closer interpersonal ties and leads individuals to emphasise collective goals, needs and in-group conformity. In Hofstede's (1980/1984) survey research of work-related values, the United States and Britain are counted among the world's most individualist cultures, while countries of Chinese cultural influence, such as Taiwan, Singapore and Hong Kong, are on the other end of the spectrum. The concepts of individualism and collectivism epitomise the value system tradition in psychology, as outlined in Peng et al. (2001). However, there is no direct evidence that the values associated with individualism-collectivism have any direct bearing on H-A thought.

Unlike the values tradition, another approach to cross-cultural differences emphasises the person as embedded in social structure—the self in relationship to others (Markus & Kitayama, 1991; see also Shweder & Bourne, 1982, for a more anthropological view). Peng et al. (2001) refer to this approach as the 'self' tradition. Markus and Kitayama (1991; see also Hernandez & Iyengar, 2001, Greenfield, Keller,

Fuligni, & Maynard, 2003) integrate theories from psychology and anthropology and argue that self-and-other construals, as well as the relationship between self and others, may be even more powerful than previously suggested (p. 224). *Independent* construals of the self refer to views of the self as autonomous, evident in self-representations of individual desires, preferences, attributes or abilities. The *interdependent* self is more interconnected and less differentiated. It is about the recognition of one's behaviour as determined by what one perceives to be others' thoughts, feelings and actions. Consequently,

> [i]f one perceives oneself as embedded within a larger context of which one is an interdependent part, it is likely that other objects or events will be perceived in a similar way. For example, a given event involving a particular actor will be perceived as arising from the situational context of which this actor is an interdependent part, rather than as stemming solely from the attributes of the actor. (Markus & Kitayama, 1991, p. 24)

Brewer and Gardner (1996) suggest that Markus and Kitayama's view of the self is mainly *relational* and should be contrasted with the *collective* self-construal implied by the 'values' tradition (see Triandis, 1989; Trafimow, Triandis & Goto, 1991). Kühnen and Oyserman (2002; also Kühnen, Hannover, & Schubert, 2001) test Markus & Kitayama's implications that an interdependent or relational self-concept should lead to context-dependent processing style. They did so by first priming individuals in a word search task with either interdependence (e.g. *we, our, us*) or independence (e.g. I, me, mine). Participants were then presented with a letter (e.g. H) made up of smaller letters (e.g. F) and had to identify either the small or large letter as quickly as possible. The researchers reasoned that identifying the small letters requires a focus on elements, while ignoring the larger letter (i.e. context) they form. It was found that a context-independent versus dependent processing style indeed led to response times in line with the priming manipulations. The same effect was replicated in a memory measure (Experiment 2) using an array of 28 objects in a larger picture. Independence primed

participants performed better in recalling what they had seen and the location (on the overall picture) they had seen it in.

2.4 Biculturalism and Holistic versus Analytic Cognition

Research on the self-concept has shown that self-construals can be subject to priming (Brewer & Gardner, 1996; Gardner, Gabriel & Lee, 1999; Trafimow, Triandis & Goto, 1991; Triandis, 1989). Evoking different orientations of self in the laboratory can have an impact on *values* on the individualism-collectivism continuum (Gardner et al., 1999) as well as information processing styles (Kühnen & Oyserman, 2002). A more dramatic illustration of the priming of cognition in the form of knowledge or theories tied to particular cultures is evident in studies on people who have been socialised into more than one culture, often discussed under the heading of 'biculturalism'. While the concept of acculturation has been considered at odds with a dynamic view of culture that allows for diversity or the mutual influence of cultures (e.g. Markus et al., 1997), the recognition of a coexistence of different cultures in individuals' lives has probably been an important step towards a fuller appreciation of culture in psychology. Research on individuals outside of their native cultural environment, such as sojourners, students or immigrants, may illustrate the extent to which psychological patterns are maintained or changed. According to Fiske et al. (1998), some ways of thinking can only be "maintained by the very nature of the sociocultural surroundings" or changed when "immersed in the appropriate cultural context"(p. 943-944). Similarly, Nisbett et al. (2001) note that research on H-A cognition is indicative of Asians moving "radically in an American direction after a generation or less in the United States," yet "total immersion in [Western] culture" may be a requirement for such acculturation.

A degree of persistence of Eastern cognitive patterns among Asians in the U.S. has been found by Morris and Peng (1994), reviewed earlier, whose sample of Chinese *temporarily* living in the U.S. exhibited sensitivity to a holistic field of social acts

similar to that of Chinese living in their native culture. However, Choi et al. (2003) used a sample of Koreans who were either born in the U.S. or had lived there for at least two-thirds of their lives. They found that this group of Asian-Americans did not differ from European-Americans in judgments about the causal relevance of information for behavioural attributions. Similarly, Norenzayan et al. (2002b), reviewed earlier, used East Asian, Asian-American and European-American samples to investigate culturally patterned reasoning. The Asian-American sample, composed of participants who were born in the United States, demonstrated reasoning patterns similar to European Americans or in between that group and the East Asian one. Finally, Kitayama et al. (2003) for the first time also looked at Westerners who had lived in the East for some time. Their framed-line test showed that Americans who had been living in Japan for only a few months on average had become more sensitive to visual context than Americans in their native environment, whereas Japanese who have lived in the U.S. were no longer significantly different from Americans in their ability to decontextualise! However, the authors cannot rule out potential self-selection issues. For example, it is conceivable that Westerners who chose to move to Japan were already cognitively inclined to holistic thought in general or contextual perception in particular.

So far, there is no evidence that *degrees of acculturation* have a bearing on H-A cognition. A potential effect of social identification or acculturation levels on H-A reasoning was absent in a sample of Taiwanese immigrants in the U.S. (Janxin Leu, personal communication, November 2002) as well as within Norenzayan et al.'s (2002b) Asian-American group, where language use and identification with Asian culture had no predictive effect (Ara Norenzayan, personal communication, November 2002). It is plausible that other measures, such as practices that are potentially central to individuals' lives (e.g. religion) or social integration in those groups, may be better able

to account for intra-generational differences in cognition among immigrants or biculturals. Minoura (1992) investigated changes in cultural meaning systems by measuring degrees of cognitive, cultural and affective acculturation among Japanese children and youth in the U.S. He found that Japanese children's density of interaction with Americans could explain the incorporation of an American pattern of thinking to the same degree as age of entry and length of stay in the host society. By the same token, my own research (Samson, 2000) has shown that objective indicators of ethnicity, in the form of ethnic group contact, can have an independent effect of the same magnitude as ethnic attitudes in determining beliefs related to ethnic identity. The same may well be the case for other forms of cognition.

2.4.1 Biculturalism and Priming

Research on first-generation immigrants in the West points to the importance of cultural content (as evident in acculturation, for example) and structure (such as ethnic group contact), signalling a need for a contextualisation of sociocultural factors in determining behaviour. Both sociologists and psychologists have advanced ideas about second-culture acquisition that stress the situational nature of culture and group membership in relation to the self. In sociology, situational ethnicity or identity theories have come to explain some of the dynamics inherent in the lives of individuals with first or later generation immigrant status in multicultural societies, often determined on the basis of self-concepts (identity) or cultural practices (e.g. Gonzalez & McCommon, 1989; Leets, Giles, & Clément, 1996; Noels, Pon, & Clément, 1996; Samson, 2000; Waters, 1990). In psychology, the mental and behavioural impact of biculturalism has been a popular focus of study (see LaFromboise, Coleman, & Gerton, 1993, for a review), which has included the priming of cultural identities (e.g. Oyserman, Sakamoto, & Lauffer, 1998). Identity priming may be a particularly useful illustration

of an integration of perspectives on culture and human inference, in this case between the *self* tradition and those of *values* or *theories*.

2.4.2 Priming and Holistic versus Analytic Reasoning

(Folk) theories-oriented research in the area of cultural knowledge activation has been done by Ying-yi Hong and fellow social psychologists (Hong, Wong & Lee, 1996; Hong, Chiu & Kung, 1997; Hong, Morris, Chiu, & Benet-Martínez, 2000; Hong & Chiu, 2001; also Benet-Martinez, Leu, Lee & Morris, 2002), who have conducted a series of priming experiments on causal and social inference. Hong et al. (1997; also Hong & Chiu, 2001) propose a new research paradigm based on cultural meaning system theory (as discussed in Markus & Kitayama, 1991, and Shweder & Sullivan, 1990), in conjunction with knowledge activation theory (e.g. Bargh, Bond, Lombardi, & Tota, 1986; Higgins, 1996; Mischel & Shoda, 1995). Shweder and Sullivan hold that cultural psychology should conceive of individuals as "semiotic subjects," rational intentional agents who respond to meaning systems. The authors contrast their view with what they take to be personality psychology and cognitive psychology. More specifically, they reject the stability and autonomy of traits often assumed by personality psychology and any cognitive psychology that externalises culture by making it extrinsic to central processing structures.

Hong et al.'s experiments were conducted on a sample of Hong Kong Chinese, who have historically been influenced by Anglo-Saxon (especially British) culture. Primes consisted of Chinese pictures, neutral pictures, as well as American pictures, symbolising those respective cultures (a picture of Superman or the Great Wall of China, for example). After being shown a vignette representing a given culture, subjects were asked to identify which country the picture symbolises and to use three adjectives to describe the character of the depicted figure. Then Morris and Peng's (1994) measure of attributional style was used, where a group of fish is shown with one fish swimming

ahead of it, and subjects are asked to explain the reasons for the behaviour of this one fish. In a condition with an open-ended answer format, the American picture prime produced 84% responses representing internal attributions (e.g. fish is leading group), whereas the Chinese picture condition reduced this to 52%. (A replication of these experiments using *human* instead of animal actors is reported in Hong et al., 2000).

While the work done by Hong and her colleagues has focused mainly on cultural values and social cognition as a result of cultural knowledge activation, Peng and Knowles (2003) used *identity* primes in a study of attributions of *physical* causality. Primes consisted of a short questionnaire asking individuals to recall and reflect on an experience that made their identity as an American or Asian apparent to them. Among self-identified Asian-Americans, explanations of physical causality were less dispositional for individuals who received an Asian identity prime and had little or no formal physics education. This finding is in step with surreptitious identity priming research related to stereotyping, which has found that bringing to mind one aspect of a person's identity (e.g. gender or ethnicity) usually leads to behaviour commonly associated with that group of people (see Dijksterhuis & Bargh, 2001, for a summary). The prime-behaviour link is probably the strongest if activated traits conform to both in-group stereotypes and one's self-representation (ibid).

There has also been a host of psychological studies in which the *language* used by the instrument itself has proven to serve as an effective prime (see Krauss & Chiu, 1998, for a summary) triggering different cultural values, personality measures or self-concepts. Ji et al. (2004), discussed earlier, found an effect of language on word grouping among bilingual Chinese from Mainland China and Taiwan tested both in the U.S. and at home. Use of the English language evoked an analytic (feature or category membership based) categorisation style, whereas Chinese produced greater relationship-based grouping. This was not the case among Hong Kong and Singapore Chinese. The

researchers explain these findings by pointing to the early age at which English is learned in H.K. and Singapore, and the cultural legacy of British colonialist influence. Mainland or Taiwan Chinese, having learned English later in life, may be "coordinate bilinguals" (Weinreich, 1953) who have two representations for a verbal label, whereas Hong Kong and Singapore Chinese may be "compound bilinguals" who hold one representation for a label and its translation. Hence, language may provide a cultural cue for some bicultural groups and thereby evoke culturally-appropriate reasoning.

The priming of culture by means of symbols or contextual cues, then, could have a permeating effect on cognition, which may extend to different cognitive levels of H-A thinking. The successful priming of patterns of reasoning indicates that knowledge associated with different cultures is available but not permanently accessible for bicultural individuals. This is illustrated by Nisbett and Norenzayan (2002), who propose that cultural differences in H-A thought can be explained in three ways.

First, differences could arise in the way culture creates cognitive structures as a result of innate or universal cognitive organisation. Let us use relational-contextual versus category-based grouping as an example. While humans may all have an innate capacity to make similarity-based (parallel) judgments about group membership in a process of induction, the metaphysics of Eastern culture seems to place greater emphasis on the early learning of relationships or contexts (e.g. monkey and banana) than category or shared substance (e.g. monkey and panda).

Second, there may be differences in the cognitive process selected by a given *problem*, although cultures may largely possess similar tools *available* to individuals. For example, individuals from one culture may prefer to group people in relational-contextual terms (holistic choice), while assigning non-social objects to categories (analytic choice). They have generally learned to use both holistic and analytic approaches, but may vary their choice depending on the task at hand.

Third, there may be more general differences in the *accessibility* of such thought processes, depending on how the world is structured in a given culture. For example, individuals from Eastern culture may not favour holistic grouping because they have not learned a category-based logic, but because the way they relate to and conceive of the world primes them to use one more than the other. In a society in which relationships are important, relationships are more salient and a corresponding logic more accessible.

Although the distinctions between Nisbett and Norenzayan's points may not always be clear-cut, Hong et al.'s (2000) work seems to reinforce second and third points. They argue that their priming methodology represents an important move into a more dynamic and process oriented direction on culture and cognition, as cross-cultural variations are mediated by factors like the relative *availability* and *accessibility* of domain-specific implicit theories (Hong & Chiu, 2001, p. 188). Cultural knowledge often lays dormant unless activated by cultural cues. Hong et al. (2000) maintain that their cultural priming technique is a new method to "uncover content of cultural knowledge" and permits the study of the "causal consequences of cultural knowledge" (Hong et al., 2000, p. 717). They stress that individuals can not only acquire more than one cultural meaning system, but culture itself must be viewed as "internalized in the form of a loose network of domain-specific knowledge structures, such as categories and implicit theories" (*ibid*, p. 710).

I believe that more can be done to demonstrate this proposition by studying cultural institutions, such as religion, as a potential source of domain specific knowledge structures, and their relationship to cognition. Such an approach acknowledges the domain-dependent nature of cognition across cultures (see e.g. Briley & Wyer, 2001; Conway et al., 2001; Hong & Chiu, 2001). In my empirical research, this will be done by examining H-A cognition among Western individuals with an Eastern religious identity, under conditions in which their religion is salient or non-salient.

2.5 Cultural Differences in Holistic versus Analytic Cognition: Theoretical Considerations

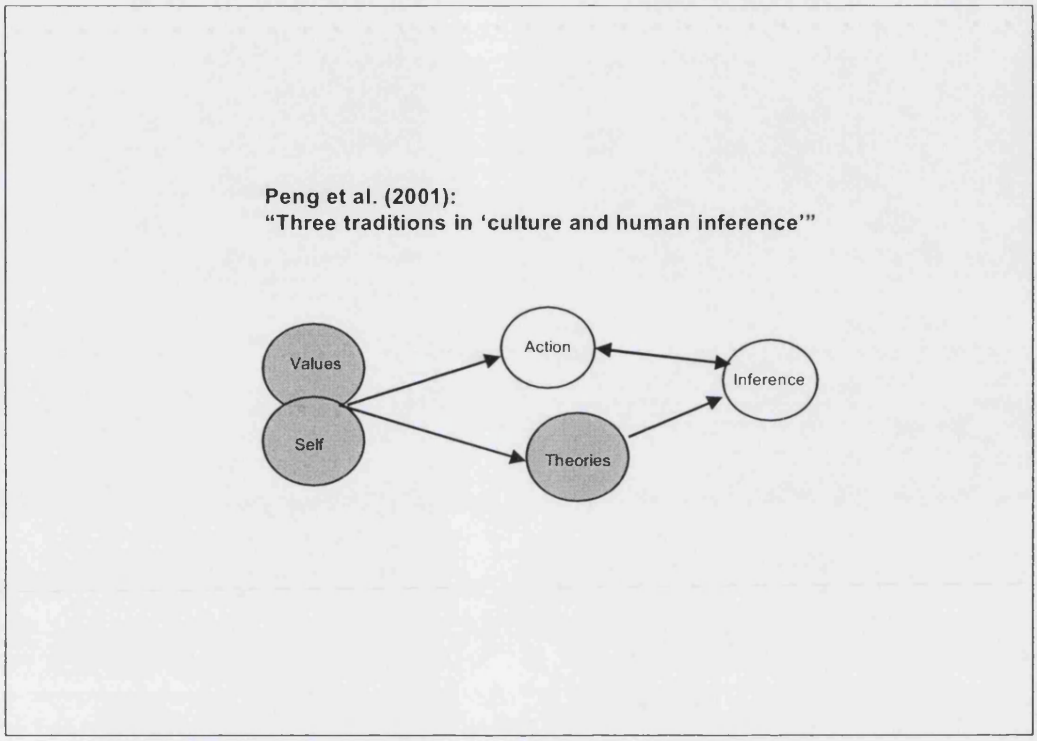
Research on biculturalism and H-A cognition raises some interesting questions, including the potential role of cultural institutions, such as religion, in producing cognitive change as well as the degree to which the practice of a religion foreign to one's own culture may constitute a 'primeable cultural domain' or even weak form of biculturalism. In order to address these questions, we need appropriate methods with the potential to activate knowledge, beliefs or theories tied to the religious domain. The priming method used in Study 1 (Chapter 4) assumes that religious values and self-concepts can bring to mind knowledge associated with the religious domain, which can then be applied to reasoning processes. According to Peng et al. (2001), cultural values and the self-concept are close allies in relation to relevant beliefs that inform human inference.

2.5.1 Models of Culture and Cognition in Psychology

Peng et al. (2001) conceive of a dynamic feedback system explaining the relationship between culture and human inference by combining three different approaches that have emerged in the field: *values*, *self* and *theories* (Fig. 2.1). In their view, values and the self are closely aligned, because the individualism-collectivism continuum represents internalised cultural values that largely determine self-orientations as more independent or interdependent. Moreover, Peng et al. suggest that values and self have an indirect effect on actual inference, as they are mediated by folk *theories* (epistemologies). Views of the self, for example, may influence beliefs we have about others, while values can direct our attention to what is considered important. Cultural values and selfhood also create a context for action that has the potential to shape inferences. Peng et al. illustrate this with the example of a transgression. Western theories may focus on the individual as the cause of a transgression, implying retributive justice directed at a person, while

Eastern theories might emphasise situations or groups as a cause, prescribing collective responsibility as an effect.

Fig. 2.1: Three Traditions in 'Culture and Human Inference'

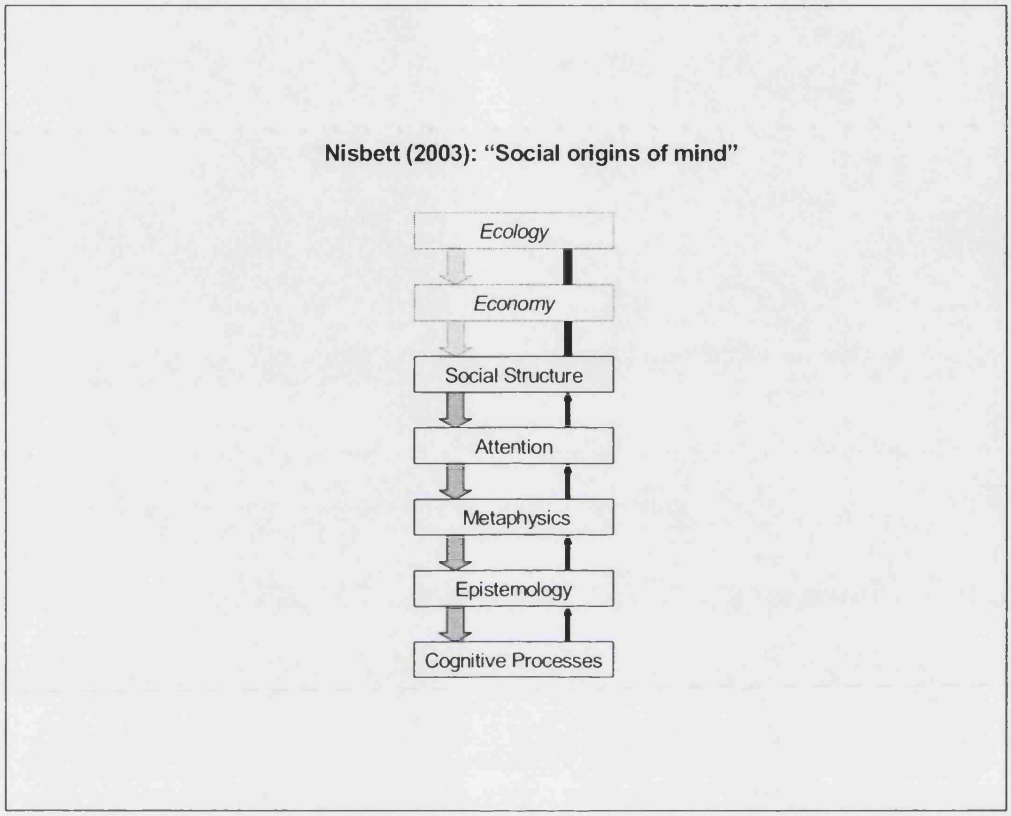


Nisbett and his collaborators (2003; cf. Nisbett et al., 2001) employ a simplified model to illustrate cross-cultural differences in inference patterns. In this model, cognitive processes are determined by a causal chain beginning with ecological and economic differences between ancient Greece and China. Early Chinese society was based on agriculture. Nisbett et al. reckon that this economic organisation was responsible for the development of cooperation with neighbours and a complex as well as hierarchical society. As a result, harmony and social order were at the core of Chinese culture, leading to the collectivist and interdependent orientations underpinning much of holistic thought. Greek ecology, the authors argue, was more suitable to hunting, herding and fishing. Trade flourished, which, along with greater

decentralisation, freedom and personal agency, encouraged debate and shaped much of today's Western worldview.

Thus, Nisbett et al's model states that ecology determines economy (e.g. hunting and herding vs. agriculture), which in turn shapes social structure (e.g. individual pursuits vs. hierarchical interdependence) and social practices (e.g. debate vs. reconciliation). They theorise that social structure and practices affect perception, attention and finally folk metaphysics (beliefs about the nature of the world), which have an impact on tacit epistemology (beliefs about how to obtain knowledge) and cognitive processes (Fig. 2.2). For example, an East Asian focus on filial piety, hierarchy and group solidarity directs attention away from individuals toward contexts and relationships. This in turn influences a view of the world as composed of interdependent parts and beliefs about causality as determined by situations and relationships. Nisbett acknowledges that multiple and bi-directional causality is also possible and that some parts of the causal chain may not be relevant for all cognitive processes. For example, dialectical thinking can be a cognitive tool to handle social conflict while also being directly derived from certain tacit epistemologies rooted in science or philosophy.

Fig. 2.2: Social Origins of Mind



Instead of focusing on layers of causality, we can also distinguish between easily identifiable areas of culture, which may affect H-A cognition in complex ways. Nisbett and his colleagues (2003; Nisbett et al., 2001) have classified different areas of culture that may be playing a role in the construction of cognitive differences. These include not only economic organisation and social practices, but also manifestations of cultural history in the law, religion, language and philosophical traditions. With the exception of language perhaps, empirical answers to the question of how these cognitive differences are created through social and cultural institutions have not been sufficiently provided. Indeed, attempts to "isolate" *aspects* of culture and social organisation in relation to mental processes may be one of the next crucial steps in advancing culture and cognition research.

2.5.2 Contributions from Sociological Social Psychology: House's Principles

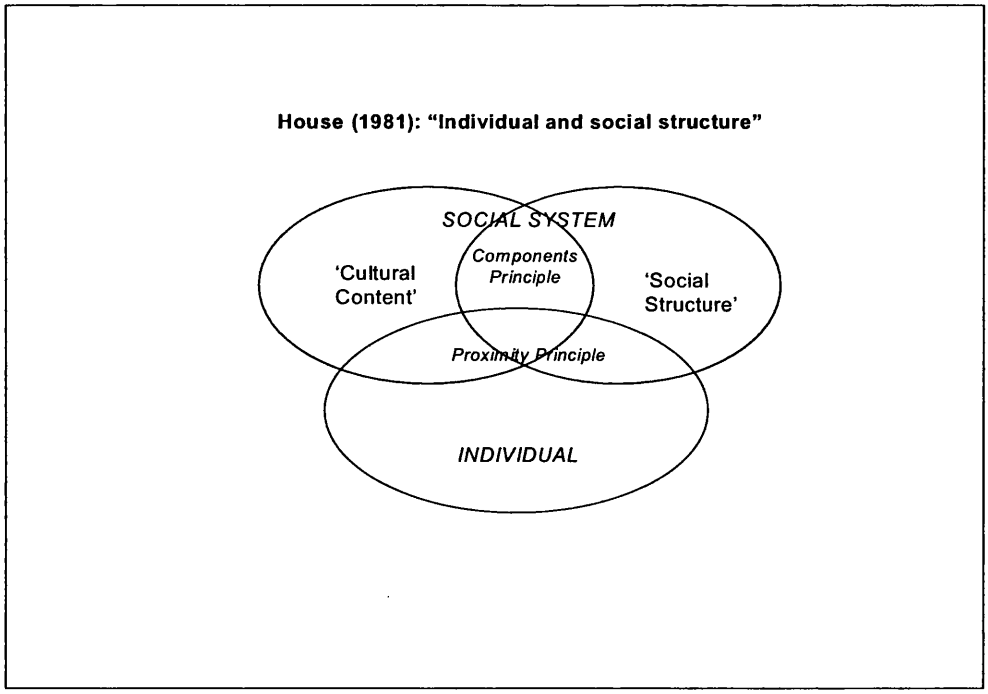
Fiske et al (1998) called for an exploration of "which cultural practices, meanings, and institutions inform which psychological processes" (945). In line with this argument, though from the viewpoint of a different research tradition, James House[3] (1977) has argued for a better integration of social psychological research paradigms in sociological and psychological subdisciplines. House (1981) has put forth a series of principles for research linking aspects of the social system to individual behaviour or mental states (see Fig. 2.3). His *proximity principle* raises the question of how everyday social relationships or experiences help in establishing links between macro variables (such as social structure or culture) and the individual. Similarly, the *components principle* demands that greater attention is paid to *aspects* of social systems in relation to individuals. Can individual thinking and behaviour simply be traced back to socialisation patterns or are there some facets of everyday life in institutions or organisations that are helpful in explaining the results?

Being a member of an organised religion, for example, is one of many sociocultural roles an individual may have, such as being an employee, mother, citizen, etc. Religion is a component of a culture's social system, while the role of a religious group member can be enacted by going to a place of worship. According to the proximity principle, understanding the effect of culture on the individual may require a closer look at points of intersection between larger institutions and the individual. Frequently attending a religious service, for example, provides the opportunity to both learn and reinforce what is expected of a religious person. If the religion is representative of larger cultural values, it may also be a relevant cultural component for the learning and reinforcement of those values.

[3] House comes from an American tradition in sociological social psychology that has been referred to as 'Personality and Social Structure'. Research in that area deals with social determinants of individual behaviour, attitudes, etc. In many cases, studies are about relationships between social structure (e.g. social class, work, race, ethnicity, gender, religion, etc.) and psychological well-being, health, and other variables.

For the purpose of analysis, it may be helpful to conceptualise the sociocultural system in sociological terms as composed of social *structure* and culture or cultural *content.* Social structure consists of relationships and positions (including hierarchies and networks), whose meaning is given by culture. Cultural content, in turn, consists of values, language, practices, symbols, artefacts, etc. For example, in an organised religion, social structure may serve two purposes. First, an individual's social integration in the religious community may provide the social contacts necessary for a person to view him/herself as part of a collective. At the same time, social integration simply provides opportunities for the enforcement of religious values, beliefs and practices through others. In line with Blumer's (1969) symbolic interactionist ideas, social practices could be conceived of as the intersection between culture and structure, which connect the individual to the larger sociocultural system through action and interaction.

Fig. 2.3: Individual and Social Structure



2.6 Culture in Holistic versus Analytic Thought

In cultural psychology, House's ideas are mirrored in dynamic views of social systems, which view culture as composed of interconnected elements, such as meanings, practices, and related mental processes (D'Andrade, 2001; Hong & Chiu, 2001; Kitayama, 2002; Kitayama & Markus, 1999; Markus, Kitayama & Heiman, 1997; Miller, 2002; Shweder, Goodnow, Hatano, LeVine, Markus, & Miller, 1998). Consistent with House's (1981) components principle, D'Andrade (2001) stresses that culture should not be viewed as an entity or thing, because culture as a collection has no *causal* powers. Although cultural items are often causally interrelated, they should be considered separately in meaningful analyses.

The same should hold for historical explanations of cognitive differences. Indeed, Nisbett et al.'s (2001; Nisbett, 2003) discussion of historical sources of H-A distinctions remains the most criticised aspect of their work (Ernst, 2004; Tunick, 2003; Ratner & Hui, 2003; Yan, 2004). Critics agree that an attribution of contemporary individual-level cognitive differences to Greek or Chinese ecological, economic and philosophical traditions seems to bypass two thousand years of history and the ecological realities of the present time. Ernst (2004), Tunick (2003) and Yan (2004) also point out that the entrenched cognitive differences implied by such a perspective contradict Nisbett's (2003) own admission that H-A thought is affected by changes in context, including priming manipulations or life in a foreign culture. As a result, the potentially dynamic nature of H-A is lost in attempts to explain cultural differences.

Norenzayan and Heine (2005) posit three levels of cross-cultural differences that vary depending on the *existence* and *use* of cognitive universals: a "true" nonuniversal, an existential universal and a functional universal. Nonuniversals denote psychological structures or processes that are truly unique to a particular culture in their existence and use. Most psychologists are probably hard-pressed to find evidence for such a

psychological property. Functional universals are human psychological features that solve particular recurring problems across cultures. Hence, both their existence and use are the same cross-culturally.

Norenzayan and Heine take the example of rule versus family-resemblance categorisation (Norenzayan et al., 2002b) as an example of an existential universal, where differences between cultural groups only emerged when one categorisation strategy competed against the other. When task requirements encouraged rule application, all cultural groups equally preferred rule-based strategies. To this we could add the example of social attribution, reviewed earlier, which has shown that East Asians are dispositionist thinkers under conditions that lack situational information, but seem to adopt more complex theories of behaviour when contextual information is available. In other words, there may be variation in function or context and frequency of use, but not existence, of H-A preferences across cultures. Clearly, H-A thought should not be taken as an expression of true nonuniversals.

Parallel to Norenzayan and Heine's ideas, Tooby and Cosmides' (1992) evolutionary psychological perspective provides definitions of two ways in which cultures come to exist in particular locations in the first place: evoked and transmitted culture. Evoked culture is culture as a product of the environment. The fact that our ancestors had to solve similar problems posed by the world around them, leading to similar cultural features, explains much of universal human psychology. For example, hunting and gathering activities were (and still are, in some cultures) based on a sexual division of labour.

Transmitted culture, on the other hand, is about culture as the result of social learning. Culture can be passed from individual to individual or generation to generation without necessarily being based in a solution of problems in the environment. It goes hand-in-hand with most social scientists' conception of the human mind as highly

malleable. By suggesting that H-A thought is based on existential universals, Norenzayan and Heine appear to take a middle ground between evoked and transmitted culture. The existence of holistic and analytic strategies or cognitive tools are *universal* across cultures, but the frequency or context in which one is preferred over the other is socially *learned*. H-A thought is neither a dichotomy nor does it represent true psychological nonuniversals.

Nisbett et al.'s explanations of the historical origins of H-A differences focus on evoked cultural differences due to distinct ecologies and resulting economic and social organisation. It is unclear to what degree continuously transmitted culture (e.g. of metaphysics and epistemologies) has to be congruent with its evoked origins in order to remain successful and there is no explanations of the interaction between universals that underlie H-A thought and the nonuniversal nature of the H-A distinction. The next chapter will be an attempt to identify some of the universally intuitive aspects underlying H-A thought.

2.7 Summary and Implications

H-A cognition is composed of two systems of thought, manifested in areas stretching from perception to social cognition: holistic reasoning, which dominates East Asian cultures, and analytic reasoning prevalent in the West. The cultural origins of these cognitive patterns are complex. Explanations have made references to history, including ecological, economic and social factors. Ultimately, Nisbett (2003) theorises that H-A cognitive processes are a matter of applying culturally-derived epistemologies. As a result, Peng et al. (2001) have located H-A research in a so-called *theories* tradition of 'culture and human inference'. This tradition is contrasted with others focusing on *values* (individualism-collectivism) and the *self* (independence-interdependence).

I have argued that the H-A area of research has suffered from an oversimplified and static view of culture in relation to the individual. What appears to be missing are

approaches taking into account both mechanisms operating between culture and the individual, as well as contexts in which cognitive differences are created, manifested and changed. Research on biculturalism and cultural priming has begun to acknowledge the more dynamic nature of culture and the person experimentally. I have suggested that, consistent with House's (1981) *proximity* and *components* principles, studies in this thesis can add to the understanding of culture's effect on cognition by trying to isolate aspects of culture. In this case, it is hypothesised that religion can shape the ways in which individuals think holistically or analytically across domains.

My discussion of *values*, *self* and *theories* oriented approaches to culture and cognition acknowledged the complementary nature of relevant research traditions, but I think that this is not enough. Researchers also have to move beyond the simple East-West dichotomies that dominate H-A research. Studying an Eastern religion in a Western context can be a means to approximate culture's more dynamic nature in relationship to the individual, by considering multiple sources of cultural influence, their interaction as well as possible context-dependent divisions in individual thought.

Chapter 3 – Religion and Cognition

3.1 Religion as a Component of Culture and Psychology

A dynamic view of culture, religion and the person is evident in Kitayama and Markus' (1999; cf. Kitayama, 2002) discussion of the Japanese Self. They conceptualise the culture/self dynamic as a bi-directional flow between cultural models of the self and psychological structures, mediated by cultural practices. In Japan, cultural models of the self include an "ethos of agricultural community" (interpersonal connectedness), "mundane realism," Confucianism (hierarchical social order), as well as Zen and Jodo Buddhism's emphasis on compassion, other-reliance and self-transcendence (p. 268).

Religion may be a particularly worthwhile cultural institution to investigate, because it represents enduring systems of values, beliefs, practices and social networks that can shape cognitive patterns. Weaver et al. (1998) have criticised the lack of interest in religion among psychologists as evidenced by quantitative studies published in APA psychology journals. Although 5.8% of research between 1991-1994 in the *Journal of Personality and Social Psychology* included a measure of religion, the majority of studies (80%) employed one-item measures, such as religious identification. The authors urge psychologists to go beyond one-dimensional measures of religion or spirituality. This sentiment is reaffirmed in Tarakeshwar et al. (2003), who have argued that religion has been an overlooked dimension even in cross-cultural psychology. According to those authors, religion's ideological, ritualistic, experiential, and social dimensions should be integrated into research that goes beyond the use of religion as a control variable.

Walach and Reich (2005) argue that Nisbett et al.'s H-A distinctions map onto cognitions in the areas of spirituality and science, two domains of thought that should be seen as complementary rather than oppositional. Among Eastern religions, Buddhism

has been named as an institution endowed with some of the cultural content that renders East Asian cognition different from the West (Bose, 2002; Hernandez & Iyengar, 2001; Nisbett, 2003; Fiske et al., 1998; Markus & Kitayama, 1991; cf. Ragsdale, 2003). Before I discuss this in more detail, let me first briefly address the extent to which the psychology of religion may inform research on H-A cognition.

3.1.1 The Psychology of Religion

In the psychology of religion tradition (e.g. Spilka, Hood, Hunsberger, & Gorsuch, 2003; Beit-Hallahmi & Argyle, 1997; Wulff, 1991), religion has been used as an independent variable mostly in studies about mental well-being, health, pro-social behaviour and other aspects of individual functioning (Beit-Hallahmi & Argyle, 1997), including the role of religion in coping and psychopathology (e.g. Pargament, 1997; in Nielsen, 2000). Studies related to coping have also been interested in religious attribution processes (Loewenthal & Cornwall, 1993; Loewenthal et al., 2000; Lupfer, Brock & Depaola, 1992; Parsuram & Sharma, 1996; Spilka, Shaver, & Kirkpatrick, 1985; Wikstrom, 1987), which may include causal attributions to God and the conditions under which individuals make secular/naturalistic versus religious attributions (Lupfer et al., 1992; Lupfer, Depaola, Brock & Clement, 1994; Lupfer & Layman, 1996).

Theories and research in this area acknowledge that religious and naturalistic meaning-belief systems are available to individuals depending on the contexts in which attributions are made and characteristics of the event to be explained (e.g. Spilka et al., 1985). However, attribution processes studied in the context of H-A cognition are about differences in naturalistic explanations that people make mainly as observers of *others'* behaviour. Spilka et al. emphasise individual motivation (e.g. self-esteem, the need for control, etc.) in their explanation of attributions, but do not acknowledge that religions

may also espouse particular secular theories of personhood or causality in relation to social inference.

The emphasis on individual motivation rather than culturally-derived theories is evident in the fact that religious attributions have been examined mainly in order to understand how people deal with various life events, usually of the kind that affect them personally. Using mixed Christian samples, Loewenthal and Cornwall (1993) found that health-related events (such as illness or death) are most likely to be attributed to God by religious individuals, while nonreligious people tended to perceive such events as produced by luck. Among religious individuals, however, greater perceived control of God did not weaken attributions to other agents, such as powerful others or the self, suggesting room for secular theories of behaviour in religious groups.

Parsuraam and Sharma (1996) showed that Indian Buddhists are more likely to attribute life events to something like *fate* than Roman Catholics, who are apt to attribute events to *God*. By contrast, Dubin (1994) found no significant differences in attributional style between advanced Buddhist meditators and a non-Buddhist religious control group. For both positive and negative life events, Buddhists did not seem to judge events as caused more by external or internal factors than non-Buddhists. There is no evidence to-date that answers questions about Buddhists' secular internal versus external attributions made for *other* people's behaviour.

Basic assumptions made in the area of religious attribution are congruent with the theoretical underpinnings of this thesis. More specifically, the *religion as meaning-belief system* (Spilka et al., 1985) or *schema* (McIntosh, 1995) perspective implies that religion can serve as a framework for the perception and interpretation of events. In other words, just like culture, we can expect religion to be a knowledge structure or domain that shapes individual thought and may be activated in different contexts. One way of making religious belief systems salient can be achieved by means of identity

priming. McIntosh (1995) argues that the relative centrality of religious schemas to the *self-concept* (cf. Markus, 1977) may have implications for the accessibility and activation of religious knowledge. My own work is an attempt to prime religion (as religious beliefs, values and practices tied to an identity or role) and analyse the activation of that knowledge in relationship to H-A cognition.

3.1.2 Buddhism and its Teachings

After this brief diversion, let me turn to the connection between Buddhism and holistic thought. Inherent in Buddhism are beliefs about multiple causes for events (Fung, 1983; Kalupahana, 1975; Rosch, 1994), dialectical thinking (Kalupahana, 1975; Lin, 1936; Puhakka, 2003; Spiro, 1982) and the ideal of self-transcendence (Bose, 2002; de Bary, 1969; Ho, 1995; Noda, 2000; Phillips, 1962; Spiro, 1982; Watson, 2000). In Buddhist metaphysics, sometimes called the Three Marks of impermanence, non-self and suffering, the concept of 'compassion' is at the centre of the religion's values (Inada, 1988). While some Western psychologists have been interested in the implications of Buddhism for the discipline of psychology (e.g. Dockett, Dudley-Grant, & Bankart, 2003), it is perhaps the Buddhist doctrine of non-selfhood that has most inspired writings about Buddhism in *contrast* to Western psychology (Ho, 1995; Noda, 2000, Pickering, 2004a, 2004b; Varela, Thompson & Rosch, 1991; cf. Dubin, 1994).

Noda (2000), for example, stresses that a holistic understanding of the human mind, including the denial of intrapsychic conflict, is at the heart of Buddhism. Unlike the 'elementism' evident in some Western (e.g. Freudian) psychologies, Noda argues that Buddhism does not see the Self or Ego as a central component of the psyche in a power struggle with other intrapsychic forces. There is no self at the core of Buddhist psychology. Indeed, according to Pickering (2004a, 2004b), the Buddhist view of (non)selfhood is one aspect in which the religion may be juxtaposed to psychology after

the 'postmodern' turn. Other dimensions of Buddhism that seem compatible with 'postmodern' thinking and theorising concern contextual/situated, holistic, as well as naturalistic views of cognition, which consider reason and emotion as intertwined processes.

Morality and the Self: Buddhist Values and Metaphysics

Huebner and Garrod (1991) explain that the realisation that life is suffering, which is caused by desire, lies at the heart of Buddhist moral reasoning. This realisation should bring about compassion towards other life forms. The goal in life is to give up desire and to understand that the Self does not exist. Hence, individuals should strive for detachment by letting go of desires and, by association, the Self (see also Ho, 1995). Unlike Western morality, then, Huebner and Garrod argue that Buddhists' "true compassion as self-concern of any type would compromise one's concern for the other person" (p.350). The result of the belief in compassion and detachment is that *actions* count for more than *abstract* moral qualities. (After a person has died, it is only the accumulated result of his or her actions that remains and works out its effects on the lives of others [Ho, 1995]).

In sum, Buddhism considers the bounded and stable ego an illusion. Watson (2000) uses the Tibetan *dGe lugs pa*[4] tradition as an illustration of the Buddhist understanding of the self. In this view, a distinction can be made between the mere self, which functions in the world, and an absolute or fictitious self. The former is the self as a process of experience, while the latter represents an "essential" self. Buddhism acknowledges the existence of an experiential self only. This self, which is in flux and becoming, has to be transcended (Spiro, 1982, in Fiske et al., 1998, p. 922). Selfish striving is discouraged; one should attempt to overcome attachments and needs through

[4] DGe lugs pa [pronounced *geluk pa*] means 'virtuous way' is a Buddhist tradition that started in 15th century Tibet.

self-control (Spiro, 1982; Huebner & Garrod, 1991). Lebra's (1992; in Markus et al., 1997) Shinto Buddhist 'submerged self' may be very reflective of the Eastern self in contrast to the Western Cartesian, split self. The nature of being is freedom from the Self, but not self-objectification by means of separation from others or the environment. If we couple this with the ideal of compassion, it is clear how Buddhism and other Eastern religions contribute to other-focused rather than ego-focused emotions (Markus & Kitayama, 1991).

Causality and Dialecticism: The Buddhist Epistemology of Holism

According to Ragsdale (2003), Buddhism (particularly Mahayana Buddhism) entails an epistemology of 'relational interdependence' of all phenomena. Similar to Gestalt psychology, Buddhist thought implies that the whole is not just the sum of its parts (ibid). The Dalai Lama (Biddulph, 1996) maintains that the Buddhist teaching of 'dependent arising' "shows that if you examine the nature of reality, you arrive at a point where you realize that nothing comes into being with an independent intrinsic identity, but rather as a result of a multitude of causes and conditions" (p. 150). Buddhism, as discussed by Fung (1983), conceives of a 'wheel of life' or stream of existence, which goes on eternally. This view extends to Buddhist psychology, where consciousness is a stream of consciousness or "moments of 'knowing' strung together over time" (Olendzki, 2003, p. 14). According to Fung, "everything is dependent upon a combination of fluctuating conditions and factors for its seeming 'existence' at any given moment. This is the Buddhist theory of causation" (p. 237), also known as the theory of dependent origination or *pa.ticcasamuppaada* (e.g. Ho, 1995; Kalupahana, 1975; Inada, 1988; Pickering, 2004; Ragsdale, 2003). In other words, everything is interrelated and constantly changing.

Aside from the belief in constant change (e.g. Fung, 1983; Inada, 1974), dialectical aspects of Buddhism are evident more explicitly or epistemologically in the ideal of the

transcendence of dualism and holism (Phillips, 1962, pp. xxxiii-xxxiv; p. 80; see also Ragsdale, 2003). According to Zen Buddhism, which is in the Mahayana tradition

> Man's real Self...is not to be sought in any dimension of himself, but only in that from which every dimension...is an abstraction. Man's real Self can only be his whole Self [...] The religions of the West are all dualistic, which means that they accept these oppositions as ultimate and always seek for truth in one direction as contrasted with its opposite. So Western religion elevates reason over passion, super-nature over nature, the ideal over the material [...] Integrity is wholeness, not halfness. Holiness is holistic living, not self-conquest. (Lin, 1936, p. xxxiv)

The Buddhists metaphysical view of transcendence or freedom from the self, then, translates into the religion's epistemology. Discriminating knowledge or the dividing form of knowledge (*maya*) can be viewed as the cause of a false conception of the self and suffering, while unifying knowledge (nirvana) leads to freedom and enlightenment through a more relational self (Bose, 2002).

Buddhist epistemology as it relates to naïve dialecticism is best reflected in Mahayana Buddhism, including the Middle Doctrine and Chinese Three-Treatise School of Buddhism, which teaches that the ultimate truth is reached through a dialectical process known as the Middle Path of Eightfold Negations (de Bary, 1969, pp. 143-144; also Ragsdale, 2003). The belief in being, nonbeing or neither being nor nonbeing has to be transcended in a synthesis until the Absolute Middle is reached (ibid, p. 144). These ideas originate in the teachings of Nagarjuna, which have profoundly influenced Tibetan and East Asian Mahayana Buddhism, and may come close to the dialecticism described by Peng and Nisbett (1999). Nagarjuna's philosophy, according to Puhakka (2003), is essentially a 'dialectic of the middle way'. Unlike the dialectic of Marx and Hegel, however, which leads to a synthesis of contradictions, the aim of Nagarjuna's dialectic is "liberating the mind from attachment to any new view or position," an approach that neither affirms nor denies (p. 132). Letting *P* represent any

given proposition and not-*P* its opposite, Nagarjuna's 'four-cornered negation', as described by Puhakka (2003), is as follows:

1. *P*
2. not-*P*
3. both *P* and not-*P*
4. neither *P* nor not-*P*

Madhyamikan Buddhist logic is derived from Nagarjuna's dialectic. It also specifies a complex model of causality that may appear tautological: an outcome may arise from itself (*P*), something other (not-*P*), self and other (both *P* and not-*P*), or have no cause at all (neither *P* nor not-*P*) (Puhakka, 2003; Rosch, 1994).

3.1.3 Buddhism and Holistic versus Analytic Cognition

Buddhists' other-focused rather than ego-focused outlook, a self determined by experience, the ideal of transcendence of self and dualism, as well as views of multiple causality, dialecticism and constant change indicate that the religion contain many of the elements of holistic metaphysics and 'tacit epistemologies'. (Although it may appear as though 'experience-based thought' and 'denial of self' cannot be reconciled, it can be argued that experiential knowledge involves a recognition of the inherently complex nature of the world and causality, which also leads to the recognition that there is no 'self' as a cross-situationally stable entity.) In addition, the social integration of Buddhists in the religious community may add a structural dimension to holistic thinking, as implied by the concept of interdependence.

Apparent Paradoxes in the Buddhism-Holism Connection

Despite its parallels with holism, a closer look at the religion also points to elements that are, at least on the surface, paradoxical or potentially inconsistent with the prerequisites of holistic thought. More specifically, the apparent conflict concerns the individual in relationship to East Asian religious doctrine (e.g. Chan, 1967; Ho, 1995).

Self-realisation, in Buddhism, is strived for in manner that is less organised and more personal or direct than in other (especially some Western) religions (Chan, 1967). It relies on the individuals' own *will* and self-direction (e.g. Chan, 1967; Huebner & Garrod, 1991), yet, perhaps paradoxically, holds on to the idea that the individual has no agency (Ho, 1995). Buddhism, then, is clearly a *salvation* rather than congregational religion (to use Max Weber's, 1978, distinction), but salvation could be "thought of as a phenomenon of change in the cosmic scheme of things—not in terms of personal redemption, as in Christianity" (Ho, 1995: 122). A core practice for its attainment is meditation (e.g. Spiro, 1982). Yet, while the focus of meditation is in a sense on the individual, it could also be seen as a process of self-transcendence by means of a fusing of the subject-object distinction of Self (Ho, 1995). Similarly, Buddhism stands for the disappearance of individuality in the after-life and the recognition that 'the one and the many' mutually involve one another (Chan, 1967) by virtue of a part-whole relationship (Hansen, 1985, Nakamura, 1964; Noda, 2000).

Degrees of an individual versus other-focus may also depend on different Buddhist doctrines (Fung, 1983: p. 238). In Hinayana Buddhism, which is dominant in Southeast Asia, salvation is a personal matter in the sense that individuals cannot do much to help others to achieve theirs (ibid). Mahayana Buddhism (of which the popular Zen Buddhism is a part), prominent in East Asia, contains teachings about enlightenment that can be sought more altruistically through self-sacrifice in order to enlighten others (Chen, 1964; Fung, 1983; Ho, 1995).

Another apparent inconsistency in relating Buddhism to holism pertains to the psychological consequences of meditation. As indicated already, meditation can be construed as self-centred, inward-focused or an 'introvertive mystical experience' (Smart in Newberg and d'Aquili, 1998). On the other hand, it can also be viewed as holistic in the sense of self-transcendence and achieving clarity or 'oneness with the

universe'. Ornstein (1972) proposes that the right half of the brain, which is active during religious experience and meditation, is a parallel (holistic and relational) processor, while the left is linear or sequential. He uses the example of Zen to illustrate this point. One Zen practice, *koan,* is an exercise that is about discarding the left hemisphere by meditating on questions that have no logical answer (e.g. "What is the sound of one hand clapping?"). The literature on meditation's effects on perception and attention is less clear. Experimental evidence seems to point to increased field-*independence,* located on the analytic perceptual pole of the H-A continuum, among practitioners of meditation, although some research has also found no change produced by the practice (see Murphy & Donovan, 1997, for a summary). This phenomenon may be due to increased concentration and focus among meditators. However, while meditation may lead to a greater perceptual acuity, the increased mental focus achieved by meditation, often on an external object or mental image, tends to produce an activation of the 'holistic operator' or right posterior superior parietal lobule (Right PSPL) in the brain *during* meditation (Newberg & d'Aquili, 1998, 2000). Thus, although meditation may lead to more analytic visual perception, it is conceivable that actual information processing is affected differently, possibly in a more holistic direction.

Buddhism, Western Religion and H-A Reasoning

As mentioned, Buddhism is a salvation religion, but unlike Protestant salvation, it occurs through self-transcendence. Buddhism also has varying levels of 'other-worldliness'. The religion shed some of the 'other-worldly' flavour from its Indian origins when it became absorbed into Chinese culture (Fung, 1983; Chen 1964; Hughes, 1967). While Indian Yoga, for example, is about disengaging oneself from the phenomenal world, Zen meditation seeks less of a withdrawal from surrounding objects as to see objects rightly (Wulff, 1991). However, even though Buddhism is a salvation

religion with otherworldly elements in some cultural areas, its core values and beliefs are down-to-earth. Buddhist salvation occurs by virtue of a right state of mind and moral conduct towards *others*, perhaps unlike some forms of Protestantism (e.g. Weber, 1976/1958). Indeed, Buddhism rejects asceticism as "painful, unworthy, and unprofitable" (Spiro, 1982: p. 64).

Another important contrast between Christianity and Buddhism is the latter's nontheism—the absence of a 'God' external to the individual. According to Lin (1936), the *humanist ethic* of Buddhism make it human-centred, not God-centred (p. 101; see also Atran & Norenzayan, 2004; Pyysiäinen, 2003). In the West, morality seems to exist abstractly or by reference to a supreme being, while in Buddhism, it exists in reference to the outcome of actions towards the world. What all schools of Buddhism have in common, then, is that they "seek the loss of self, while Christians seek union with God" (Beit-Hallahmi & Argyle, 1997: p. 83). Nonetheless, the Judeo-Christian belief in the individual soul has been mentioned as one of many influences on Western individualism (e.g. Lukes, 1973, Bellah et al., 1985, in Hernandez & Iyengar, 2001). Protestantism is probably the most individualist religion in the West. Sampson (2000) argues that Western individualism and its emphasis on independence has been influenced by strong self-other demarcations evident in Protestant Christianity. Similarly, as Kitayama and Markus (1999, p. 260) maintain, the *Protestant Ethic* (as described by Weber) has contributed to Western perceptions of the person as having fixed dispositions (predestination) and coherence, in contrast to the Asian balanced view of personality. Different beliefs about the nature of personhood or the self are reflected in associated values.

Potential differences between Protestantism and Buddhism with respect to conceptions of the person should not be equated with values evident in the Protestant Work Ethic (PWE). Indeed, a comparison of Christian (Australian) versus Buddhist (Sri

Lankan) attitudes toward work by Niles (1999) indicated that his Eastern Buddhist sample did not have lower beliefs in the primacy of hard work and self-reliance than Westerners. Niles attributes this to the Buddhist emphasis on individual responsibility. However, this does not imply that Buddhists also hold individualist values that drive the desire to work hard, as suggested by Niles' finding that Sri Lankan Buddhists endorse the link between work and success to a lesser degree than Australians.

As mentioned, the potential influence of religion on holistic or analytic cognition is also interesting with respect to "lower" types of cognition, such as perception and attention. Religious group membership can also have the opposite effect of meditation, namely field-dependence, as found among Orthodox Jews in contrast to secular Jews and Protestants (Adevai, Silverman & McGough, 1970, Dershowitz, 1971, Meizlik, 1973, in Nisbett et al., 2001). In Dershowitz (1971), a group of Eastern European traditional (Orthodox) Jews turns out to be most field dependent, whereas American WASPs (White Anglo Saxon Protestants) were the least, with a group of American acculturated Jews intermediary in their scores. According to Dershowitz, this could be due to traditional Jews' life in tight-knit communities with an emphasis on following strict social rules. Thus, variations in perception can be seen as the result of structural (social) and ideological or doctrinal (cultural) aspect of religion in tandem. (My use of the term 'structural' refers to social *integration* as pioneered by Durkheim (1951/1966) who studied its effect on suicide rates among different religious groups.) In the case of Buddhism, it is conceivable that sociocultural influences, such as the degree of integration or contact with other Buddhists, would render individuals more oriented towards others and the field. Unlike specific cultural beliefs and practices, then, religion in the structural sense may have a more universal connection with paying attention to the field among highly integrated members, and, by extension, also other cognitive aspects of H-A thinking.

By investigating Western Buddhists, my first study (Chapter 4) is one possible approach to examine the yet untested assumption that Buddhist ideas and practices are related to holistic thought. In order to separate out, as far as it is possible, the unique effect of Buddhism, I will investigate the religious group differences in comparison to a Western religion, in this case Anglicanism, as well as Secular-Humanism.

3.1.4 Implications

It has been theorised that Eastern religion, such as Buddhism, among other cultural factors, has played a role in shaping a metaphysical and epistemological backdrop of holistic cognition. Indeed, Buddhism's teachings do contain values and beliefs that are reflective of holism, such as other-directedness, compassion and the ideal of self-transcendence, as well as complex causal reasoning and dialectical thinking. Although practices like mediation are an individual pursuit, the aim of Buddhism is connectedness—not only metaphysically, but also individually, by means of an experience of the world, as well as socially, in the practice of compassion.

In the light of existing research and theories, I believe that investigating Buddhism's effect on H-A cognition can make contributions to the fields of social psychology and cross-cultural psychology in several meaningful ways. I hope to have demonstrated that my research question is not only interesting because of the assumed yet untested influence of Eastern religion on holistic thinking, but also because it represents an aspect of cultural diffusion and subcultural differences in cognition. Consistent with House's (1981) *proximity* and *components* principles, studies in this thesis can add to the understanding of culture's effect on cognition by trying to better isolate aspects of culture. In this case, it is hypothesised that religion can shape the ways in which individuals think holistically or analytically across domains, as suggested by research and theories on both bicultural knowledge activation and 'religion as schema'. I have argued that a complete analysis, in this framework, requires the inclusion of not only

beliefs and practices, but also structural factors, such as religious integration, as aspects of religious group membership.

While *cross-cultural* psychologists welcome the idea of treating religion as a variable (e.g. Tarakeshwar et al., 2003), more dynamically oriented *cultural* psychologists maintain that this is not desirable or even impossible (e.g. Shweder, 1990). I do not agree with this radical position. I believe that a more integrative approach to relevant theories along with a differentiating approach to the concept of 'culture' can improve our understanding of culture's complexity. However, I am doing this within the bounds of an experimental, quantitative methodology.

In sum, the questions that Studies 1 and 2 in this thesis are trying to answer are based on the proposal that differences in H-A thought should exist not only across cultures but also subcultures. Hence, the central research question could be phrased as 'To what extent does Buddhism shape aspects of a H-A cognition?' In addition, it is hypothesised that religious knowledge—in the form of beliefs or theories as well as values—can be *activated* just like more general cultural knowledge, depending on the context in which responses to problems are elicited. The question of domain-dependence or generality of religion is expanded by asking how structural (i.e. social integration), ideological (values, beliefs) and behavioural aspects of religion contribute to potential religious differences in cognition.

3.2 A Bottom-Up Perspective: Intuition in Holistic versus Analytic Thought and Counter-Intuitiveness in the Domain of Religion

Chapter 2 outlined the concepts of holistic and analytic (H-A) thought, including naïve dialecticism, which imply a tolerance of apparent contradictions (TC). In the previous section, Buddhist metaphysics and epistemologies consistent with TC and dialectical thinking were introduced. What is particularly interesting about Buddhism is the possibility that it may act as the source of two types of 'tolerances'. The first of these involves the recognition and reconciliation of apparent contradiction, which seems to be unique to some Eastern religions and Asian culture as a whole. The second occurs on the basis of more implicit contradictions evident in non-naturalness or counter-intuitiveness, a relatively universal aspect of religious representation.

Having established possible associations between Buddhism and holistic thought, the aim of this section is to adopt a complementary bottom-up perspective of cognition and culture by outlining intuitive cognitions that are universal aspects of some processes considered in H-A reasoning. I will demonstrate that the concepts of theory of mind, essentialism and dispositionism can be viewed as the intuitive foundation for many of the empirical H-A phenomena. Contradictions evident in non-natural representations, by contrast, violate those basic intuitions.

3.2.1 The Intuitive Dimension of Holistic versus Analytic Cognition

Peng et al. (2001) argue that H-A cognitive processes can be explained by the folk theories espoused by a given culture. Unlike research interested in the top-down influence of culture on cognitive processes, modular or evolutionary perspectives on cognition (e.g. Cosmides & Tooby, 1994; Fodor, 1983; Sperber, 1996) have been concerned with identifying innate knowledge in the form of structures that handle specific input (or content) as a result of natural and sexual selection. The social

sciences, by contrast, have traditionally viewed humans' capacity to learn and apparent cognitive flexibility as evidence of a domain general mind, in the sense that cognitive processes can be applied to *any empirical domain* (Sperber & Hirschfeld, 1999). This contrasts a modular, domain-specific view of the mind accepted by some scholars using an evolutionary approach (e.g. Tooby & Cosmides, 1992). According to Sperber (1996), the "*actual domain* of a conceptual module is all the information in an organism's environment that may ... satisfy the module's input conditions. Its *proper domain* is all the information that it is the module's biological function to process" (p. 136; emphasis added). If information that activates a cognitive module is culturally produced, it could be termed part of a *cultural domain* of the module.

Domain-specificity—which implies constraints on the knowledge that humans can use (Keil, 1981)—is at the core of another folk theories or *naïve theories* perspective of cognition. Unlike Peng, Nisbett and colleagues' cross-cultural view of folk theories, the theories-as-intuitive-constraints view focuses on knowledge that is universal, yet open to restructuring due to cultural input and learning (Hirschfeld & Gelman, 1994). According to this position, humans hold intuitive naïve theories consisting of 'organised systems of knowledge and belief', such as those in the domains of biology and psychology (Wellman & Gelman, 1992; Hirschfeld & Gelman, 1994). Among those, there are two kinds of intuitive beliefs that seem particularly relevant to H-A reasoning. The first, theory of mind (ToM) stands for an intuitive naïve psychology. The second, psychological essentialism, pertains mainly to the domain of folk biology, but is possibly relevant to folk psychology and folk sociology as well. Let me discuss these types of intuitive knowledge in turn.

Naïve Psychology or Theory of Mind

According to Sperber (1996), reflective beliefs are rooted in something that is universally intuitive and in turn enables us to communicate: the ability to hold beliefs about others' beliefs. His concept of the meta-representational module shows this more clearly. Humans have the "ability to form mental representations of mental representations" (p. 146). This is based on a capacity to understand intentionality and predict behaviour in terms of underlying mental states, such as beliefs or desires, which is an important adaptation for an organism who is involved in both cooperative and competitive activity (p. 147). Theory of mind or ToM (Premack & Woodruff, 1978) is the most commonly used term to describe this faculty.

The ability to see oneself as both subject and object, as well as understanding intentionality, according to Brown (1991), are key universal features at the root of "mind reading" or the understanding of people as having desires, intentions and beliefs that may be different from one's own. ToM is usually tested by means of false belief experiments (e.g. Wimmer & Perner, 1983). Experiments are set up to see whether child subjects are able to accurately predict an agent's behaviour by virtue of that target actor holding a false belief, i.e. not knowing what the subject knows. In the standard false belief experiment, a child witnesses a story (e.g. played by puppets) in which the target Person A is made aware of an Object O (e.g. sweets) in Location L_1 (e.g. box). In the absence of Person A, Person B is introduced, who then places O in a new Location L_2. Person A comes back to the scene. After presented with the story, the subject is asked a question like 'Where will A be looking for O?' The ability to understand beliefs is denoted by answering L_1 (a false belief) rather than L_2 (reality).

The key finding among humans is that children around the age of four seem no longer to impute their own beliefs or knowledge about reality on others' minds. Children perceive others as 'mental agents'. They realise that "other persons have not

just intentions [or desires] and attention as manifest in their behaviour, but also thoughts and *beliefs,* which may or may not be expressed in behaviour—and which may differ from the 'real' situation" (Tomasello, 1999, p. 179; my emphasis; see also Wellman & Bartsch, 1988). This finding appears to hold cross-culturally. Avis and Harris (1991), for example, find that among the *Baka*, a hunter-gatherer tribe, 4-6 year old children are able to pass a false belief task, whereas younger children generally do not.

Lillard's (1998) account of cultural variations in theories of mind illustrates that many aspects of folk psychological models contain optional features or variations in the degree to which they are manifested in everyday life. One relatively undisputed universal may be humans' ability to understand that minds represent the world, as indicated in cross-cultural findings about false-belief tasks or the fact that both Chinese and American children seem to develop the capacity to distinguish appearance from reality at about the same age (Flavell, Zhang, Zou, Dong, & Qi, 1983). If we conceive of theory of mind more broadly as folk psychology, there may be additional core universals, such as a division of internal states into thoughts, feelings, and desires (e.g. D'Andrade, 1987).

Psychological Essentialism

Another intuition that has been related to our understanding of other people is essentialism. Humans appear to be psychological essentialists in the inferences they make about natural kinds. According to Gelman and Hirschfeld (1999; see also Atran, 1990; Barrett, 2001; Keil, 1989; Medin, 1989; Sperber, 1996), essences apply to a naïve understanding of the natural world in the form of a so-called *folkbiology* (see Hirschfeld, 1995/1998 for essences as folksociology, or Gil-White, 2001, on essentialism and ethnicity). They are perceived invisible, identity-determining qualities of an organism that remain constant over growth, morphological transformation and

reproduction. Essences can be considered invisible causes of living kinds' identity or physical features.

Gelman and Markman (1986) find that even preschool children use more than just superficial appearances in their inductions of natural kind categories. In an experiment, they set category membership against perceptual similarity and discovered that category information was used more often for such judgments than perceptual information. For example, children had to decide whether a triceratops is more likely to have cold blood, as a brontosaurus does, or warm blood, because the triceratops also resembles a grey rhinoceros. By matching the triceratops with the brontosaurus, 68% of children's choices in the experimental condition were made on the basis of category information rather than perceptual similarity. Gelman and Wellman (1991; also Gelman, Coley & Gottfried, 1994) suggest that children seem to have an early understanding of the non-obvious, essences inside living things in the form of 'innate potential', which may facilitate the acquisition of knowledge and more complex theories, although the development of domain specific inference may occur with an accumulation of knowledge.

Gelman, Coley and Gottfried (1994) discuss research on the acquisition of essentialist thinking about *causality* in children. For example, Gelman & Gottfried (1993; in Gelman et al., 1994) studied four-year-old children's reasoning about behaviour. After viewing taped events of animals and objects moving across a surface (with or without the visible aid of a person's hand), participants were asked to make judgments about causal mechanisms. Possible judgments were of an External Cause ("Did a person make this move?") or Internal Cause ("Did something inside this make it move?"). In the condition in which a hand carrying or pushing an artefact was visible, children were likely to attribute the cause of movement to a person; however, in the same condition, children frequently denied that a person made the object move if the

object was an *animal*. When objects appeared to move *by themselves*, children attributed causality to something inherent in the object, regardless of whether it was an artefact or animal, and despite the fact that they were unaware of the specific mechanisms involved.

Essentialism in Categorisation

Consistent with Gelman and colleagues' work, Keil (1989) has argued that conceptual development in children does not simply follow a universal perceptual-to-conceptual, characteristic-to-defining or holistic-to-analytic path. He maintains that categorisation may be based on theoretical relations very early in human development, but that this causal thinking may become more differentiated with age. Psychological essentialism, then, can be viewed as a propensity to learn or use theory-based categorisation (Medin, 1989). Theories, in turn, constrain concepts (Murphy & Medin, 1985). The importance of this is evident in Gelman's work (e.g. Gelman 1988; Gelman & Markman, 1986; Gelman & Wellman, 1991; Gelman & Hirschfeld 1999), which indicates that even young children's categorisation may be based on theories rather than just perceptual similarity.

Essentialist thinking is also relevant for rule-based categorisation about natural kinds. For example, according to Atran (1990), our folkbiology does not allow for overlap between basic taxa, and every life-form taxon has at least one phenomenal property characteristic and diagnostic of that taxon in the sense that it is not characteristic of other taxa (p. 56). From a more domain-independent perspective, it can be said that rule-based categorisation, like psychological essentialism, leads to constraints and a determination of category membership on the grounds of necessary and sufficient features. Rule-based categorisation is the *analytic* (Smith & Sloman, 1994, pp 377-378) extension of the causal or theory-based thinking evident in essentialism. As

a result, essentialism can be interpreted as an intuitive ally to analytic or rule-based categorisation.

As reviewed earlier, categorisation determined by rules has been pitted against family-resemblance based categorisation by Norenzayan et al. (2002b). The authors of this study found that, when faced with a conflict between rules and family resemblance, East Asians tend to resolve in favour of the latter, a holistic or experiential choice. Americans, by contrast, tend to choose categorisation determined by defining features that may not be immediately apparent. Unlike theory or rule-based categorisation, family-resemblance based categorisation is necessarily one of *degree,* not an all-or-none decision (Medin, 1989; Rosch, 1975; Smith & Sloman, 1994).

Reasoning on the basis of shared properties is also evident in category-based grouping, which has been studied in contrast to relational-contextual classification. When considering the concepts PANDA, BANANA and MONKEY, BANANA and MONKEY go together, because they are related experientially or relational-contextually, whereas MONKEY and PANDA both belong to the category PRIMATES—they share the element of 'primateness'. Similarly, NOTEBOOK and PEN can be grouped together because they complement or 'go together' in practice; NOTEBOOK and MAGAZINE, by contrast, are related because they share the substance of paper. For both categorisation and grouping tasks, then, holistic and analytic preferences draw on different kinds of intuitions, which may be best described as experience versus essence-based.

Dispositionism in Social Inference: A Form of Essentialism?

The psychological notion of essence has both sortal and causal components. Hence, essentialism not only speaks to ways of organising the world but also the social attribution area of H-A cognition. Psychological essentialism may be one intuitive component of the often functional "human tendency to go beyond the information

given" evident in dispositionism (Aronson, 1999, p. 312). The possibility that essentialism is related to dispositionist thinking has been raised by Norenzayan et al. (2002a; cf. Choi et al., 1999). Gelman (1992) first came up with this hypothesis by maintaining that the relationship between a biological feature or process and the inherent essence that causes it is similar to the link between a person's behaviour and the personality trait as its source. In both cases, people assume a hidden and underlying nature that causes outward properties (however, see Gelman et al., 1994, for a critical discussion[5]). Barrett (2001) points out that, from an evolutionary perspective, behavioural dispositions may have been "one of the most important whole-body properties to generalise from member to member of a particular living kind" for human-decision makers in ancestral environment (p. 11).

Haslam, Bastian and Bissett (2004) argue that personality characteristics are often understood as underlying essences. In their research (Study 2), essentialised characteristics were judged as especially important in determining people's identity and impression formation. Cross-cultural work on social inference, reviewed earlier, supports the possibility of dispositional thinking as relatively universal and possibly a form of essentialism (Choi & Nisbett, 1998; Choi et al., 1999; Norenzayan et al., 2002a). Dispositionist thinking appears to be universal when limited information is available about actors and their behavioural contexts.

If dispositionist thinking about behaviour is indeed intuitive and universal under some conditions, the term 'contradiction' may be used to describe an actor's behaviour

[5] Gelman et al. (1994) propose that the psychological domain of essentialism may be borrowing from a 'base domain' from which essentialism springs naturally, such as biology. However, Gelman et al. maintain that traits are less immutable and deterministic than biological essences. More importantly, while biological essences concern *category* identity (i.e. apply to members of a category), traits are about the distinction of *individual* people. A second possibility is that children, in contrast to adults, have an undifferentiated broad domain that lumps together social and biological things or that essentialism is domain specific in a broader sense. Another explanation could be that of multiple domain-specific essences. However, Gelman et al. argue that its plausibility would diminish if we were to discover separate essences for naïve theories of physics, biology, psychology and sociology, because it would be unparsimonious. The authors propose that a fourth possibility may be most reasonable. Essentialism may be a domain general phenomenon with domain-specific instantiations. (pp. 358-359).

that seems to violate what is *expected* as result of his or her dispositions, as investigated by Choi and Nisbett (2000) in their 'Bad Samaritan' study. Not surprisingly, a religious and helpful person not helping a person in need has been equated with a form of *counter-intuitiveness* due to the incongruity between assumed disposition and actual behaviour (Pietromonaco & Nisbett, 1982). However, knowledge of situational constraints that may have influenced disposition-violating acts, along with culturally-derived theories stressing the complexity of social behaviour and a general tolerance of contradictions, led to lower surprise levels among Asian participants in Nisbett and Choi's study.

3.2.2 Cognitive Anthropology Meets Cross-Cultural Psychology

Counter-Intuitive Beliefs

My discussion of dispositionism, and more broadly essentialism, illustrates people's innate understanding of ontology. Counter-intuitiveness can arise when intuitive "essence properties" are violated in the combination of concepts (Franks, 2003). According to some theorists (Sperber, 1996; Boyer 1994, 2000; see also Sperber and Hirschfeld, 1999; Lawson, 2001), counterintuitive concepts in the domain of religion or the supernatural—a being who is all-knowing or can walk through solid matter, for example—may be relatively universal and robust. Religious beliefs are "a recurring cultural by-product" of innate cognitive mechanisms (Atran & Norenzayan, 2004, p. 713). Pyysiäinen (2004) reasons that counter-intuitiveness must be understood as an interaction between intuitive and explicit processes. "Counterintuitiveness is based on explicit modification of intuitive concepts" to the extent that "theological thinking is characterized by both counterintuitiveness and a tendency to rationalize" (p. 143). Similarly, according to Sperber (1996), counter-intuitive concepts—beliefs that violate basic ontological expectations—may be culturally successful because they are *relevant*

mysteries. For example, Sperber mentions that a person may believe with total faith in the Holy Trinity, and at the same time be aware of the intuitive force that a father and son cannot be one and the same. In addition, many religious or supernatural concepts may be robust because they also entail intuitive expectations that are not violated (Boyer, 1994, 2000). For instance, while gods who are all-knowing may violate our intuitive theory of mind, they can also be tacitly represented as a "cognitively standard agents," believed to have desires and intentions, which again conforms to basic psychological expectations we have about persons (Boyer & Ramble, 2001, p. 537; also Barrett & Keil, 1996). Non-natural representations in the domain of religion are not restricted to religions that tend to personify the supernatural, but may also have a place in nondeistic theologies, such as Buddhism (Atran & Norenzayan, 2004; Pyysiäinen, 2003).

Boyer and Sperber imply that non-natural beliefs have a cultural transmission advantage, due to their attention-grabbing nature and memorability. These ideas have recently been tested empirically (Boyer & Ramble, 2001; Barrett & Nyhof, 2001; Lisdorf, 2004; Norenzayan & Atran, 2003). Barrett and Nyhof (2001) designed experiments on a sample of American college students in order to test the transmission advantage of expectation-violating items in stories. They did so by measuring immediate and delayed recall as well as retelling of items in several domains. Results showed that counter-intuitive items were transmitted better than common or bizarre items (e.g. exaggerated or extreme, but not violating basic ontology on a category level) in a social reproduction task (Experiment 2).

Similarly, Boyer and Ramble (2001) studied samples in France, Gabon and Nepal by using a story telling format, and found comparable advantages of counterintuitive concepts. They found that Tibetan monks remembered counter-intuitive concepts at a

similar rate as French university students. More comparisons between religious groups are needed to provide support to the universality of counter-intuitive thinking.

Parallels Between Counter-Intuitiveness and Naïve Dialecticism

Upon closer examination it seems that some counter-intuitive beliefs in the religious domain violate the Western law of noncontradiction and law of identity outlined in Peng and Nisbett (1999). Hence, they may be closely allied with Eastern dialectical reasoning and TC. The Holy Trinity, for example, is similar to the Yin and Yang principle (representing the Principle of Relationship or Holism), in that the entities they comprise (father, son and holy ghost in the former; opposing entities in the latter) become one. The laws of identity and non-contradiction are also violated by the Middle Doctrine school of Buddhism (discussed in section 3.1.2).

The potential connection between religious representations and H-A thought has been brought up by Franks (2003) and further developed by Samson (2004). Research discussed earlier indicates that East Asians are more tolerant of contradictions, because their culture promotes the recognition of complexity (in its metaphysics or epistemology) and harmony (in social practice). This culturally specific acceptance of contradictions may interact with a more cross-culturally universal "tolerance of the unexpected" evident in the domain of the supernatural or religious (Franks, 2003; Samson, 2004). According to Franks, cross-cultural research implies that holding contradictory beliefs may only be special in cultures dominated by linear logic. Given that the tolerance for non-contradiction in dialectical thinking appears to be more context-independent, Franks notes that we may need to look more closely at specific contents of religious representations in the future and investigate religious representations held under linear as opposed to dialectical logic.

I have argued (Samson, 2004) that tolerance of counter-intuitiveness and TC may be related, but should not be equated with each other. Apparent contradiction, in dialectical reasoning, has been defined as occurring "when two pieces of information [appear to be] inconsistent with each other in such a way that if one of them is true, then it is likely that the other is false" (Choi & Nisbett, 2000). Peng and Nisbett's (1999) method of measuring TC in the form of differentiation versus compromise used plausibility ratings, indicating a willingness to compromise, rather than cognitive processes like memory or recall. Moreover, Boyer's idea of non-natural concepts is about the violation of intuitive expectations from ontological categories (e.g. persons, animals, artefacts); in Nisbett and Peng, TC stems mainly from the social (e.g. practices favouring social harmony, as argued by Nisbett & Masuda, 2003) and epistemological implications of Eastern religion and philosophy (e.g. Yin and Yang or Middle Doctrine school of Buddhism). Finally, the counter-intuitiveness of religious and similar representations is about contradictions that occur in the combination of concepts, while contradictions in naïve dialecticism are often about conflicts between ideas or positions. As a result, tolerance of non-naturalness should be most similar to TC if contradictions implicit in the concepts are made explicit. Psychological contradictions occur if people have to grapple with the actual or possible existence of concepts they thought of as impossible, unlikely or unexpected. For example, most people would consider the existence of a thinking and speaking toaster highly unlikely. If we brought this fact to a person's mind and then five minutes later presented her with a speaking toaster, the contradiction would be made explicit. Having some kind of measure of her ability to "cope" with this surprise would allow us to get an idea of her tolerance of contradictions arising from the counter-intuitive (or unexpected) nature of that entity.

Modes of Religiosity

The previous section implies that naïve dialecticism may well provide a culturally-derived belief structure that supports adherence to minimally counter-intuitive (cognitively optimal) concepts. Harvey Whitehouse's (2000, 2004, 2005) account of religiosity complements Boyer's theory by explaining conditions for the transmission of more complex or 'cognitively costly' religious beliefs and practices, of which the holistic teachings of Buddhism, discussed previously, may be a perfect example. According to Whitehouse, the transmission advantage of cognitively optimal representations does not explain why more complex aspects of religious experience, in the form of both practices and beliefs, are successfully transmitted. The answers, in his theory, lie in the cognitive consequences of two main types of religiosity, the *doctrinal* and *imagistic* modes.

Whitehouse's emphasis in the modes theory is religious ritual, which, along with supernatural agents and myths, is one of three cross-culturally universal areas of religion. The doctrinal mode involves religions with frequent repetition of rituals, such as mass in Christian faiths. Doctrinal religions often employ experts, for example ordained priests, and usually rely on 'revelation' through rhetoric, narrative and logical integration. The mnemonic devices necessary for the persistence of religiosity resulting from the doctrinal mode are the cognitive schemas and scripts learned through the religion's rituals and scriptures. Hence, the memory system in charge is termed 'semantic'. However, the frequent repetition of religious practices, in the form of a routinisation of ritual, accounts for a relatively low level of arousal in the audience, who may succumb to a 'tedium effect'.

The imagistic mode of religion generally does not have this potential for low morale or boredom. Evangelical movements that draw on charismatic preachers (who seek to make religion relevant to individual or social problems) and emotionally charged

congregations, including healing rituals, may be better examples of a Christian imagistic religious experience. Imagistic religions are characterised by infrequent, sometimes shocking (but always arousing), rituals that emphasise individual experience. Initiation rituals that induce very high levels of arousal, such as extreme pain, are examples frequently used by Whitehouse. Unlike doctrinal religions, the meaning of practices in imagistic religiosity is generated rather than acquired by the individual. Revelation may be more open, ambiguous or idiosyncratic (multivalent/multivocal). The principal memory system that provides mnemonic support for its transmission is episodic memory, where individuals recall unique experiences in which they were situated. Due to the high level of arousal, recall of a ritual episode can take the form of a 'flashbulb' memory (e.g. the what-did-you-do-on-911 effect), where unusual amounts of detail are remembered.

Despite the fact that Buddhism does not thrive on "shocking rituals," Western converts to Buddhism may in many cases be motivated by the kind of self-actualisation that cannot be provided by largely non-imagistic Christian or secular practices and beliefs. As such, the conversion process itself may reflect something like an imagistic step. Whitehouse writes (2005, p. 210):

> In the case of the more shocking rituals...we find a far greater emphasis on the mystical revelations of individual participants. Instead of teachings being transmitted by word of mouth, from experts to laity, the pattern is more like a *private esoteric journey*—often a slow journey taking many years to complete—whereby adherents try to investigate religious riddles independently through personal contemplation (Whitehouse, 2005, p. 210; emphasis added)

Buddhism does not entirely conform to these imagistic features, but for the purpose of this thesis I will adopt a view of the imagistic-doctrinal distinction as 'ideal types'. In other words, the inclusion of a religion in the imagistic-doctrinal typology is based on family resemblance rather than finding necessary and sufficient characteristics that

allow it to be assigned to either one of two exhaustive categories. Buddhism diverges from one of the imagistic characteristics in the sense that its practices are generally not centred on infrequent collective rituals with high emotional arousal, particularly perhaps among Westerns. Nevertheless, if we move away from religious practice as an interaction between the individual and other members of the religious community, towards a focus on internal religious experience, we can draw parallels between seemingly different practices. More precisely, collective ritual and meditation may share a sense of 'unitary experience', a decreased perception of division between the self and the world external to the individual that comes with the activation of the same region in the brain (Newberg & d'Aquili, 2000). Thus, meditation, like ceremonial ritual, is a practice based on sensory experience and altered states of consciousness, albeit frequently repeated in order to achieve mastery. Whether its aim is described as inner peace, enlightenment, egolessness or heightened sensory awareness, Buddhist meditation has highly idiosyncratic undertones, as it is clearly internally generated. Meditation is a tool for achieving change from within rather than uniformity from without, even though it usually involves expert teachers. Unlike the less reflective learning among audiences in the doctrinal mode, Buddhist experience is often about cognitive clarity or mindfulness by raising awareness of (or learning to live in) the present moment. In other words, it can be about trying to achieve a constant state of 'episodic' perception or cognition. Similar to the imagistic mode, Buddhist practitioners may one day achieve a moment of internally generated meaning, an awareness in which the religion's holistic metaphysical teachings appear to become aligned with actual sensory or reflective experience.

Even though its imagistic character may not be adequately captured by the episodic memory of individual "life changing" episodes (Whitehouse, 2000, p. 12), Buddhism seems to promote episodic cognition both in its teachings and practices. In doctrinal

religion, learning occurs in a top-down approach or by the derivation of rules from repeated practice, while Buddhism espouses a bottom-up process in which the individual, through practice, may come to connect with the metaphysical content of the religion by interpreting or "understanding" abstract ideas for him/herself. For example, the cognitively costly idea of a self-transcendence, egolessness or 'transcendence of suffering' (Whitehouse, 2004, p. 26) may be "understood" by individual practices like transcendental meditation or simply the exercise of compassion. In more general cognitive terms, episodic memory is instance-based and thus contextual, and as such in line with the holistic cognition supported by Buddhist ideas. The doctrines, semantic schemas and script-based practices of Christian religions are comparable to linear logic or rules-based cognition. Semantic memory is general rather than contextual.

3.2.3 Summary and Implications

This chapter started with a brief review of the psychology of religion and ended with a discussion of religion in cognitive anthropology, two very different approaches to culture and cognition. In the case of the former tradition, religion can be seen as a cultural source of schemas, in the form of beliefs or theories, which often vary across religious traditions. In the cognitive anthropological tradition, the 'modes theory' of religion has been concerned with two cross-culturally universal ideal types that can explain how complex or 'cognitively costly' religious traditions persist over time and space. Other research has focused on violations of universally held *intuitive* beliefs that may lead to transmission advantages of those 'cognitively optimal' ideas. Along with the context-sensitivity of some 'top-down' approaches to culture and cognition, the addition of a 'bottom-up' perspective of religion has the potential to further contribute to a fuller and more dynamic study of religion and individual thought.

In order to provide a foundation for the understanding of counter-intuitiveness, I have discussed intuitions that are argued to represent a universal base for H-A cognitive

processes, namely theory of mind (ToM) and psychological essentialism. These intuitions may feed into so-called dispositionism or the natural tendency to make internal social attributions under conditions of limited information. From this perspective, disposition-violating behaviour can be counter-intuitive. When *concepts* violate intuitive expectations, such as the ability have false beliefs, they are often referred to as counter-intuitive beliefs, representations that are particularly prevalent in the domain of religion.

Both of the disciplines in the field of cognition and culture outlined above have been interested in the study of cognitions about *expectation-violations*. In cross-cultural psychology, TC has been investigated partly as the result of culturally-derived epistemological beliefs and social practices. In cognitive anthropology, counter-intuitiveness has been discussed as an example of the violation of intuitively held beliefs. Apparent similarities between naïve dialecticism in Eastern religious thought and non-natural beliefs make the study of tolerance of contradictions among religious groups a compelling endeavour to advance the interdisciplinary field of culture and cognition. Study 4 in this thesis will look at counter-intuitiveness and tolerance of contradictions across religious groups.

While cognitively optimal non-natural concepts appear to be compatible with cognitively costly belief systems like Eastern dialecticism (evident in the Middle Doctrine school of Buddhism, for example), the cognitive implications of the modes of religiosity theory provide another potential touch-point between cognitive anthropology and the cultural psychology of religion. However, the theory does so by taking into account religious experience as a whole, especially practices, not merely the values or beliefs espoused by religions. More specifically, the psychological features of doctrinal religions like Christianity, including low arousal in ritual performance, semantic memory and logical integration in revelational techniques overlap with analytic

cognition. Imagistic religion, on the other hand, which I argued is more descriptive of Buddhism, is associated with holism, as evident in greater sensory experience in religious practice, episodic memory and multivocality or multivalence rather than logical integration. One of the hypotheses tested in Study 1 in the next chapter looks at the effect of Buddhist meditative practices on H-A cognition.

Chapter 4 – Holistic versus Analytic Cognition among Religious Groups in the West: A Comparison of British Buddhists, Anglicans and Secular-Humanists

4.1 Introduction

Buddhism has been widely identified as a source of holistic reasoning in Asian culture, yet has not found any empirical attention in relation to H-A cognition. Both cross-cultural psychological and cognitive anthropological views indicate that Buddhism may be a particularly interesting variable in the study of culture and cognition. If the religion does indeed foster holistic thought, we should find within-cultural variation of H-A cognition in the West, where its practitioners can be expected to think more holistically than non-Buddhists. With this question in mind, the first empirical study of this thesis aims to test the hypothesis that Western Buddhists are significantly more holistic thinkers than other populations in the UK. Research on biculturalism and acculturation, together with 'religion as schema' theories, indicate that religion has the potential to induce context effects similar to individuals' cultural backgrounds. Hence, this study also investigates religious contexts of H-A cognition, including hypotheses about the effect of priming, the role of religiosity and religious integration in moderating H-A thought, as well as the impact of meditation on holistic thinking.

These hypotheses are tested in an online quasi-experiment administered to members of Buddhist, Anglican and Secular-Humanist groups and organisations. H-A thought is operationalised by using six H-A indicators from past research, ranging from relatively implicit to more explicit measures. Among religious groups, detailed information about individuals attitudes, beliefs, practices and social contacts are collected. All participants

also provide demographic information about their cultural background, ethnicity, gender, education and age. The data are analysed using factor analysis, analysis of variance and co-variance, t-tests, regressions, as well as simple correlations. They produce good evidence for the expected H-A group differences, but more mixed results for religious context effects among Buddhists. Although findings include a Buddhist priming effect, it is not in the expected holistic direction and is evident only on certain variables.

4.1.1 Theoretical Background

In Chapter 2, I discussed past research that has compared Western European (mainly American) with East Asian populations on several empirical dimensions of holistic vs analytic (H-A) thinking. I noted that the H-A area of enquiry has been primarily interested in folk *theories* as determinants of thought, compared to spheres of cross-cultural psychology concerned with the role of *values* or *self*. However, as indicated by Peng et al. (2001), these three traditions must be considered together in order to understand the complex nature of human inference (see Fig. 2.1 adapted from Peng et al., 2001). According to Nisbett (2003), who largely represents the *theories* tradition of 'culture and human inference', cognitive processes are the result of a causal chain from social systems to attention, metaphysics and epistemologies (see Fig. 2.2). Nisbett's model lacks not only the more integrative psychological approach outlined in Peng et al, but also some of the granularity necessary in explaining sources of culturally-dependent cognition on the macro level. One area in which it could be improved applies to the conceptual oversimplification of culture. Hence, I proposed the inclusion of House's (1981) theoretical separation of structural and cultural dimensions as determinants of individual-level outcomes (see Fig. 2.3).

4.1.2 Towards a Religion and Cognition Model

The model used in this thesis corresponds to a combination of these three conceptual approaches and is based on the introduction of the subcultural variable of religion (Fig. 4.1). As such, it is a mid-level model that does not purport to address more historical, collective or creative anthropological views of culture, nor does it venture into the territory of evolutionary psychology.

Since Buddhism can be considered a subculture, this model acknowledges that religion should be more than simply self-identified group membership. It is also about people's integration in the religious group, as a structural aspect of religion, alongside with religiosity, representing an individual-level measure of religion's 'cultural content'. More dynamic research on biculturalism and cognition shows that cognitive patterns can sometimes be activated by means of cultural priming. Hence, the *self* depicted in the religion-cognition model represents a possible switch for cognitive preferences. On a broader individual-level of analysis, the self is tied to cultural values, beliefs and behaviour through which individuals express their religiosity.

Nisbett's (2003) model depicts an ecology→economy→social structure→attention →metaphysics→epistemology→cognition causal chain. The religion-cognition model presented in this thesis excludes cultures' historical backgrounds evident in 'ecology' and 'economy' and also splits the connection between the sociocultural system and cognition into two strands: social structure and cultural content. Instead of Nisbett's 'social structure' → cultural content ('metaphysics', 'epistemology') → 'cognition' order of causality, 'metaphysics' and 'epistemology' are treated as an aspect of cultural content, alongside a more direct link between 'social structure' and 'attention'. Through the application of a more sociological definition of 'social structure', group membership and integration comes to stand for the individual in relation to social group. However, in correspondence with Nisbett's theory, variations in attention are still depicted as the

main effect of social structural differences (also indicated by Markus and Kitayama, 1991, distinction between independent and interdependent self-orientations). Despite a greater emphasis on this relationship, the model does not negate Nisbett's original connection between 'metaphysics' and 'attention'. Moreover, the religion-cognition model presented in this thesis does not operationalise 'metaphysics', 'epistemology' or 'attention'.

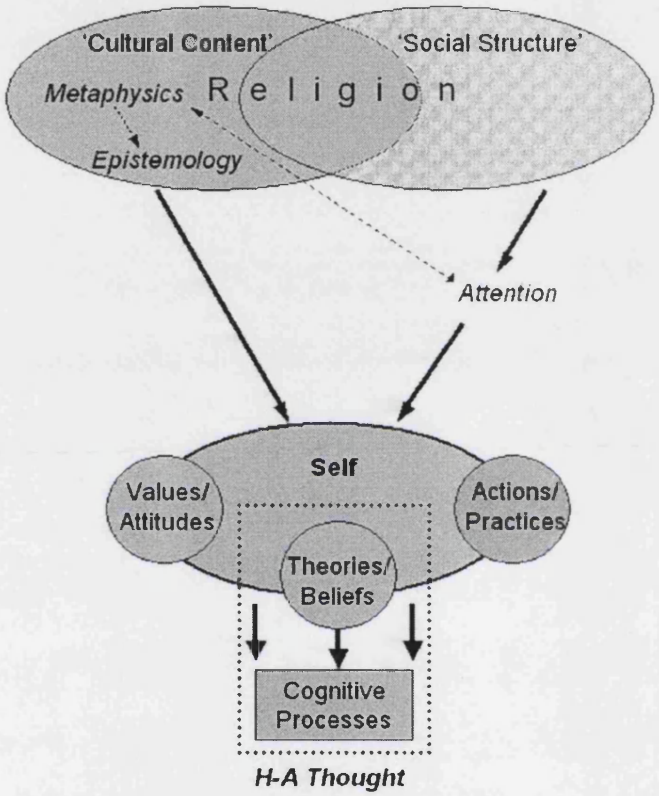
This conceptual separation is a matter of emphasis only and does not mean that there is no interaction between attention and metaphysics or that these pathways are independent of each other. For example, cross-cultural differences in social attribution may be the result of collectivist cultural values, manifested in a culture's metaphysics of interdependence and an epistemology identifying contexts or situations as sources of causality. At the same time, individuals' integration in social groups directs attention away from individuals and towards collectives or contexts. Ultimately, social attribution is the outcome of the information that is attended to and the cultural values or beliefs that are applied to the reasoning process.

In the graphic depiction of this model, grey regions symbolise conceptual areas of interest that are operationalised in this thesis. The cultural content and social structure of religion are the main independent variables. They are represented and operationalised on an individual level by the religious self-concept, values, beliefs, practices and religious group contact. For example, a Buddhist view of the person originates from the religion's teachings (part of its 'cultural content') and is manifested in individual values and beliefs about compassion, interdependence, etc., or practices, such as reading Buddhist texts or meditation. At the same time, Buddhists' integration in the religious community ('social structure') should be a component of most people's Buddhist identification, manifested in practices like involvement in Buddhist groups or organisations. Structural integration influences or reinforces religious values and

beliefs, especially interdependence. Finally, H-A cognition, the dependent variable in this research, is indicated by the endorsement of certain theories or beliefs and their application to cognitive processes.

Fig. 4.1: Religion and Cognition: Towards an Integrated Model

Fig. 4.1



4.1.3 Within-Cultural Differences in Culture and Human Inference

In the 1990's, researchers in the values tradition of culture and human inference, namely individualism-collectivism, began to appreciate possible within-cultural variations on the basis of ethnicity. Oyserman, Coon and Kemmelmeier (2002) identify about 30 studies that have been done between 1994 and 2001 using an American population and ethnic subdivisions of Latino, Asian, African and European-American

groups. However, the authors' meta-analysis of past studies yields no clear-cut picture about ethnic group differences and overall find only small variations across European-American and non-white ethnic groups. There is no empirical research in this area that has analysed religious-group differences within cultures. However, Sampson (2000), examines the religious roots of individualism and independence by discussing influences of Protestantism on Western individualism. He argues Christianity is dominated by both mind-body and self-other dualisms that have contributed to Western conceptions of human nature. Sampson contrasts this view with Rabbinic Judaism, which he claims espouses a more 'dialogic' person-other conception. In a response to the author, M. Lynch (2001) points out that there are examples of cultures in which collectivism has become linked with Christianity, while Burston (2001) and C. Lynch (2001) criticise Sampson's homogenisation of Christianity and confounding of Christianity with Protestantism and individualism. For example, it is argued that Catholicism is far more collectivist than Protestantism. While this discussion points to variations in individualism-collectivism and independence-interdependence on the basis of religion, no empirical research has yet been devoted to these questions.

The same is true for the more cognitively oriented tradition of culture and thought, exemplified by H-A reasoning, which has been largely devoid of attempts to look at within-cultural differences with two exceptions. Miyamoto et al. (2006) primed European-American students with complex Japanese sceneries and found a significant increase in contextual attention among European-Americans. More importantly, from Peng et al's theories perspective of culture and human inference, Koo and Choi (2005) recently found that *Koreans* who study holistic medicine acquire more complex causal beliefs than other Korean comparison groups. These beliefs are applied in cyclical thinking about change and the amount of information discounted in causal attributions. When presented with graphs presenting the change of a variable over time (upward or

downward trends) and asked to predict the following year's value, students of oriental medicine were more likely to expect a change in direction, whereas psychology students preferred a linear continuation of the trend. In another study, this group was less likely to discount items of information to explain a particular behaviour, indicating greater complexity in thought about causality.

4.1.4 Western 'White' Buddhism

The most obvious place to look for within-cultural differences in the West is among people who have adopted aspects of Eastern culture or lifestyles, such as Buddhism. Nevertheless, it could be argued that a complete analysis of H-A cognitive differences across religious groups also requires a cross-cultural dimension. I believe that the interpretation of a culture-by-religion interaction would be extremely difficult, as religions necessarily have different characters or meanings in different cultural contexts. We can expect a well-represented religion (especially if it has had sufficient time to grow and adapt) to be far more endemic to a given country's culture than a minority religion. For example, Christianity is as well-represented in Korea as Buddhism, hence the recruiting of participants would have to focus on people who converted to Christianity. Still, Christianity would not have a minority religion status in such a cultural context the way Buddhism does in the West. On an individual level, we can expect this to lead not only to cross-cultural differences in values, beliefs or practices associated with the same religion, but also differences in the meaning of religious conversion. This would be complicated by issues about the age at which socialisation into the religion occurs. Finally, those theoretical matters also lead to practical difficulties of recruiting large samples of East Asians who are sufficiently similar and comparable to samples obtained in the UK. Hence, the study presented in this chapter is concerned with religion in a Western context only.

Transformations have undoubtedly occurred with the importation of Eastern religion to the West. In some cases Buddhism may have become a feature of New Age religion, a recent development that can be characterised as a privatisation of religion—religion "repackaged" for individual consumption or religion as an "individual option" (Luckmann, 1999). Stark and Bainbridge (1985) call the most private form of this phenomenon the audience cult of new religious movements, defined by individuals who are interested in a religion, but may only read the occasional book or listen to the occasional lecture. Participation in client cults, by contrast, does involve some contact to other practitioners, but this may only entail the learning of certain techniques, such as completing a meditation course. Only the category of cult movement implies conversion and the genuine involvement in a religious lifestyle.

Unlike Buddhism in its native setting, Western Buddhism may be dominated by white middle class elite Buddhists (Nattier, 1998; Prebish, 1999; also Kay 2004). In some cases, this means Buddhism has become a "meditation subculture" pursuing a onefold path of spiritual practice, rather than the ideal threefold training that also entails ethical guidance and the wisdom emerging from it (Prebish, 1999). It becomes clear, then, that a one-dimensional variable, such as religious self-identification, may be an insufficient measure in understanding H-A cognition among Western Buddhists. While sampling from Buddhist organisations can weed out private or audience cult Buddhists to some degree, asking more specific questions about spiritual practices, values and beliefs may help to account for variations in the extent to which religion actually affects lifestyles.

4.1.5 Comparison Groups

An analysis of H-A cognition affected by Buddhism as a guest religion among Westerners calls for the inclusion of a comparison population representing a religion endemic to the Western cultural setting. As a result, better generalisations with respect

to the effect of Buddhism on H-A cognition can be made. The sampling of Christians, in this case Anglicans, permits an expansion of the religious scope of my inquiry. In terms of Whitehouse's 'modes' theory of religion, Anglicans are representatives *par excellence* of the doctrinal mode, compared to the more imagistic Buddhist religion. The inclusion of Christians also allows us to hold a possible net effect of religion constant, which, as I have argued, may lie in the structural aspect (social integration, networks, etc.) of religiousness and perhaps in universal religious values. Individuals who belong to secular or humanist organisations may provide good non-religious comparison data by virtue of not only their non-religious nature, but also because they may share some of the characteristics of Buddhists without the religious/spiritual component. They both belong to some form of organisation based on common beliefs and values, which allows us to compare individuals who share organisational membership and a certain degree of engagement.

Moreover, both organised religion and non-religion can be viewed as sharing a pursuit of truth, wisdom and ethics (British Humanist Association, 1972; Gilbert, 1980; Norman, 2004; Watts, 1871). However, Secularism and Humanism, in contrast to Christianity, believe that ethics derive from people, natural laws or reason rather than an external objective source or divine laws. In the Secular Humanist view, values become shared human values, but also more subjective and relativistic (e.g. Norman, 2004, pp. 90-96).

Secularism, like Buddhism, is more this-worldly than otherworldly—it is the "religion of the present life" (Watts, 1871, p. 2). Moreover, in Britain, both belief systems have modernist, freethinking and perhaps even anti-traditionalist roots. The source of Buddhism's appeal in the UK has been identified as a "rational-scientific system encouraging 'personal investigation of the truth' rather than 'blind faith'" (Waterhouse, 1997, in Kay, 2004, p. 21). Indeed, becoming a Secularist or Humanist

may be similarly motivated as becoming a Buddhist. The Dalai Lama (Biddulph, 1996), in an address to the *Buddhist Society,* has noted that

> people with a basic scientific mental outlook seem to be losing interest in their own traditional religion, in place sometimes becoming what I call a radical atheist. Buddhism is also a kind of atheism, so those people who have no interest in any religion might then be attracted to the Buddha's way as a form of humanism. (p. 147).

4.1.6 Research Questions and Variables

The main question that this study is trying to answer is simply whether there is variation in H-A thought among Westerners on the basis of religion. A second question rests on the hypothesis that, just like more general cultural knowledge, religious knowledge—in the form of beliefs or theories as well as values—can be *activated* depending on the context in which responses to problems are elicited. Hence, while my central research question could be phrased as 'To what extent can Buddhism shape aspects of a H-A cognitive system among British practitioners?', I am also interested in investigating whether these cognitive patterns are domain or context-dependent or general, and how structural (i.e. social integration), ideological (values, beliefs) and behavioural/practical (e.g. meditation) aspects of religion contribute to those potential differences. In short, this study is concerned with the relationship between a subculture and H-A cognition, taking into account the structural (i.e. integration) and cultural (i.e. religiosity) aspects of religious group membership as well as the potential dependence of variations in cognitive "style" on context (i.e. primed salience of religion). The dependent variable, H-A cognition, consists of several indicators that have been used in the past, including items measuring categorisation, grouping and tolerance of contradictions, as well as more abstract items measuring 'theories of personality' and holistic thinking.

4.1.7 Measures and Hypotheses

Religious Group Membership, Religiosity and Religious Integration

The independent (or intervening) variables of religiosity and religious social integration can be operationalised by measuring both objective and subjective aspects of religiousness, including the strength and importance of religious beliefs and values, the frequency of religious practices, such as meditation or prayer, the centrality of the religious self-concept, as well as degrees of social involvement or integration in the religious community. To this end, I wrote questions consisting of standard items used to measure religiosity, including religious identification, as well as items in the European Religious and Moral Pluralism Survey (e.g. Piedmont & Moberg, 2003) or the World Values Survey (e.g. Inglehart, Basanez, Diez-Medrano, Halman, & Luijkx, 2004). These measure self-reported religiosity, attendance of religious services and frequency of prayer. The wording of the questions was adapted to suit Christian and Buddhist populations. While Christians were asked about their frequency of prayer, frequency of meditation is included as a practice among Buddhists. Attending religious services (which is rare in Buddhism) was replaced with the more generic wording of "visiting one's church [temple]". In addition, cross-culturally meaningful questions about the frequency of reading religious texts and having felt 'close to the divine' (DeJong, Faulkner, & Warland, 1978 [1999]) were included, along with a question about the centrality of religion as part of the self-concept. For the purposes of creating a religious context further, I added a final question asking respondents to identify three core values of their religion. This is similar to Hong et al. (1997) who requested that respondents list three adjectives representing the culture associated with a cultural symbol presented to them. Priming religion by combining religious identity—on the basis of religious identification and religiosity measures—and religious values has the potential to be more effective than either one of these used by itself.

The religiosity (religious prime) questions were piloted on a sample of 48 voluntary respondents from Western Anglo-Saxon Buddhist (n=28) and Protestant (n=20)

communities.[6] Overall, there was some inter-item correlation for the indicators of religiosity used. However, differences between religious groups emerged. While subjective religiosity ('Whether or not you go to a church [temple], to what extent would you say that you are a [spiritual or] religious person?') showed a correlation with other subjective religious variables among Protestants', the pattern among Buddhists was different, where religious practice was far more indicative of self-reported religiosity. More specifically, frequency of meditation and the influence of religion on decisions in individuals' lives ('My spiritual or religious beliefs have a great deal of influence on the decisions I make in my life') were the best predictors among Buddhists. Having felt close to a divine being was most strongly correlated with religiosity among Christians. Among Buddhists, this finding may in part be indicative of a more practice-oriented religion.

Exploratory factor analysis using a principle component extraction method performed separately for each religious group showed that having felt close to a divine being [divine state of being] may not measure the same aspect of religiosity as other variables. Among Buddhists, furthermore, agreement with the statement 'My spirituality or religion is an important part of who I am' also stood apart from other questions. Hence, results warranted a removal of these two variables from a future religiosity index. Although the frequency of church visits has been used as an indicator of (Western) religiosity in the past, it became clear that it should not be included in a religiosity index. Another factor analysis of the five remaining religiosity variables yielded one single factor among Protestants, but separated out temple visits among Buddhists. This may be evidence of a different meaning of such visits in the religions in question. In other words, church visits may be more central to the more congregational

[6] Australians were chosen in order to minimize contamination (and maximize the available respondent pool) of a future UK population. The samples were obtained by contacting individuals working for religious organizations that were listed on the Internet. Respondents then completed an electronic survey online.

character of Christian religion in contrast to that of Buddhism. (While going to mass is an integral part of being a practicing Christian, the Buddhist practice of meditation can be done alone.) Instead, it makes more sense to use the 'church or temple visits' variable as a measure of integration in the religious community.

As a result, we are left with a cross-culturally meaningful religiosity index composed of four variables, namely frequency of prayer/meditation ('About how often do you pray [meditate]?'; 7-point scale from 'less than once a year' to 'every day') and reading religious texts ('About how often do you read texts or scriptures related to Christianity [Buddhism]?'; 7-point scale as previous item) as objective measures of religiosity, along with two subjective ones, self-reported religiosity ('Whether or not you go to a church [temple], to what extent would you say that you are a spiritual or religious person?'; 7-point scale from 'not at all...' to 'very...') and the influence of religion on decision making ('My Christian [Buddhist] beliefs have a great deal of influence on the decisions I make in my life'; 7-point scale from 'definitely no' to 'definitely yes'). A scale reliability analysis of these four items across religious populations yielded a Cronbach's alpha of .76. According to Nunnaly (1978) values above .7 indicate an acceptable level of reliability. (In this case we also have to keep in mind that the scale is designed to measure the religiosity of quite different religious groups.)

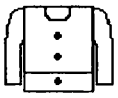
I constructed a simple index to quantify the frequency of contact individuals have to other individuals of their religion. Social integration indexes have been frequently used in the psychology of health (see e.g. House, Landis, & Umberson, 1988; Cohen, 1988 for summaries). House and Kahn (1985; in Cohen, 1988) distinguish between three categories of social support measures: social networks, social supports and social relationships. Cohen and Syme (1985; in Cohen, 1988) suggest two main categories of either structural or functional social integration. The religious contact measures in my studies include structural or social relationship based aspects of social integration

(Cohen, 1988), loosely adapted from previous social integration studies (e.g. Berkman & Syme, 1979; Berkman, Melchior, Chastang, Niedhammer, Leclerc, & Goldberg, 2004; House et al., 1988) and Moberg's (1982 [1965]) social integration in churches index.

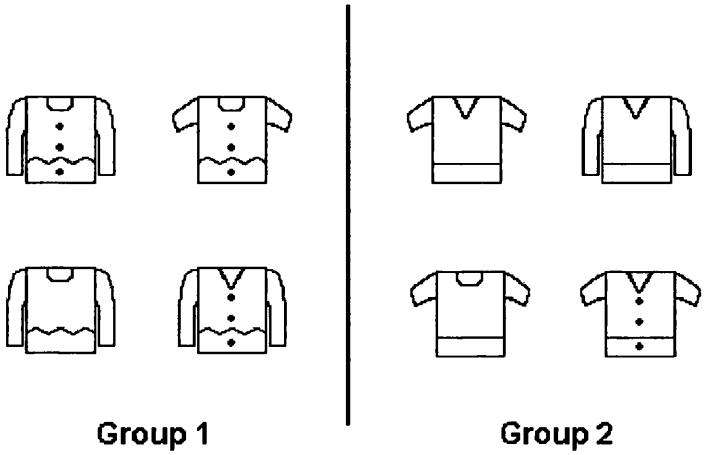
Individual items measuring religious social integration include: the proportion of close friends who share one's religion and the frequency of meeting any one of those friends; the frequency of church or temple visits; the frequency of meeting people of the same religion through religious groups or organisations other than a church or temple; and finally, whether one's spouse as well as one, both or none of one's parents share the same religion as the respondent's.

Measures of H-A Cognition

Indicators of H-A cognition consisted of an adaptation of previously constructed measures that reflect H-A thinking on different levels and are suitable for a survey design (see Appendix). They range from relatively explicit, direct or folk theories oriented questions down to more implicit or "applied" H-A measures. With respect to the latter, most measures of perception (e.g. field-dependence/independence) seem unsuitable for a questionnaire design due to control issues. I believe that the most basic type of cognition that can be safely adapted to a less controlled design is Norenzayan et al.'s (2002b) rule versus family-resemblance categorisation task, in which respondents are asked to categorise abstract perceptual stimuli on the basis of their *relative* features. This task pits perceptual (family-resemblance) against conceptual (rule-based) categorisation and may be particularly representative of holistic versus analytic processing (cf. Kemler-Nelson, 1984; also Smith & Sloman, 1994). The following is an example of a target stimulus:



Participants are asked which of the following groups (1 or 2) the object is most similar to:



The target object's buttons, sleeves and neckline resemble most of the objects in Group 1, the family resemblance or holistic choice, but the straight-line pattern (as opposed to the zigzag in Group 1) defines Group 2, which is the rule-based or analytic choice. This task has produced robust cross-cultural differences. The majority of stimuli (about 68%) were categorised on the basis of a rule by Americans, whereas East Asians mainly used family resemblance (about 59%).

As another measure of the way in which information is organised, Ji et al.'s (2004; Ji, 2001) grouping task relies on the forced grouping of concepts in the form of words. This category-based versus relational-contextual grouping may be a good representative of relationship-based thinking as indicated by Markus & Kitayama (1991). For example, one of the tasks includes the words POSTMAN, POLICEMAN and UNIFORM. Participants are asked which two of the three things are most closely related. In this case, choosing UNIFORM and either POLICEMAN or POSTMAN is a relational-contextual or holistic choice, whereas POLICEMAN and POSTMAN is a category-

based choice. As a further contrast to the family-resemblance based categorisation of abstract visual stimuli, it could be argued that relational-contextual grouping of concepts also has an experience-derived aspect. For example, when presented with SEAGULL, WATER and SQUIRREL it is the association between the SEAGULL and WATER that is derived from the experience of contexts in which we may have seen a SEAGULL – contexts bringing together those two animals are probably more rare and putting them together relies on their classification of them both belonging to the category of ANIMAL. Using this instrument, consisting of ten groups of three items and ten filler items, Ji et al. found that Chinese participants favoured relational-contextual groupings for approximately two-thirds of all items. European Americans, on the other hand, grouped about the same proportion of items in category-based terms.

The main instrument measuring tolerance of contradictions in naïve (or 'folk') dialecticism are ratings of plausibility about seemingly contradictory research findings consisting of ten 9-point scale items ranging from 1 (strongly disbelieve) to 9 (strongly believe). These are taken from Peng & Nisbett's (1999) differentiation versus compromise study. For example, participants may be asked to rate the believability of the following:

A: A sociologist who surveyed college students from 100 universities claimed that there is a high correlation among college female students between smoking and being skinny.

B: A biologist who studied nicotine addiction asserted that heavy doses of nicotine often lead to becoming overweight.

Peng and Nisbett found that, when asked to rate the believability of two superficially contradictory research findings, East Asians' answers converged, while this was not the case among Americans who had a tendency to favour one at the expense of the other. In the original study, it was found that for each statement pair, a particular one of two statements was consistently rated as more plausible regardless of culture. Differentiation

was indicated by the difference in believability ratings between the two statements compared to a baseline rating of each statement. Among Americans, the less plausible statement remained equally believable while the more plausible statement gained in believability somewhat, whereas Koreans' believability ratings of the more plausible statement declined and that of the less plausible one increased. As a result, there was a significant difference in the cultural groups magnitude of differentiation between the believability of the two statements.

My adaptation of Peng and Nisbett's study focuses on this differentiation vs compromise by taking into account possible variations in the baseline plausibility of each research finding across individuals and groups. This is achieved by computing the mean of the absolute values of Peng and Nisbett's five statement pairs' believability ratings, which is the same as taking the means of values obtained by subtracting the rating of the less plausible from the more plausible one. The order of presentation of the first and second statements is counter-balanced.

Choi and Nisbett's (2000) Bad Samaritan (and its opposite, the Busy Levite) vignette can be used as another measure of tolerance for contradictions. In one vignette, respondents are presented with a story of a seemingly helpful (honest, loyal, etc.) religious seminary student who does not help a person in need due to time constraints in order to get to deliver his (religiously informed) speech. They are then instructed to indicate how surprised they were about the outcome. A second vignette uses the opposite scenario: a seemingly unhelpful (ambitious, selfish, etc.) student actually helping. Due to the expectation-violating nature of the stories, Choi and Nisbett argue that lower ratings of surprise are indicative of greater tolerance of contradictions along with endorsing more complex theories of behaviour. In the context of this study, the task also pits *explicit* aspects of religious beliefs (i.e. compassion, helping, etc.) against more *implicit* aspects of H-A causal thinking (i.e. internal vs external attributions).

Unlike Peng and Nisbett's study, this task is rooted in social attribution theory and as such has a strong social psychological dimension. Moreover, in the differentiation vs compromise task, apparent contradictions arise from two seemingly opposed outcomes originating from the same cause or two seemingly opposed causes leading to the same outcome. Choi and Nisbett's study, on the other hand, is about the intuition-based expectations of actors behaving according to their dispositions and the contradiction that may arise if they do not Both variations of the vignette are about an actor with certain dispositions (helpful vs selfish) in a context with to opposed "pulls" (compassion dictated by the religious setting vs a selfish act dictated by the constraints of the situation). In short, tolerance for contradictions here is not about the possibility of both A and B being true at the same time, but Z leading to B instead of the expected A.

In order to avoid the possibility of differential group attribution biases in rating religious actors, more ambiguous words that could refer to either Buddhists or Christians were added or substituted. For example, 'religious person' was replaced with 'spiritual person', 'God' with 'divine power', the 'Good Samaritan' (as topic for a religious speech) with one about 'sympathy', etc. The parts of the adapted stories that had religious references (excluding the helpful/non-helpful personality descriptions and helpful/non-helpful behavioural outcomes) were then piloted on a sample of 31 British students. For each vignette, participants were asked to rate the likelihood that the actor is a 'British Buddhist' or 'British Christian' on a 7-point scale. One-sample *t* tests indicated no significant bias in favour of interpreting the actor as a British Buddhist versus Christian [$t(30)=.317$, *ns*, and $t(30)=-278$, *ns*].

In the original research, Choi and Nisbett's Bad Samaritan and Busy Levite instruments produced comparably quite robust results indicated by a mean difference of about 3 points (on an 11-point scale) in surprise ratings between Americans and Koreans. Since the vignettes tap into a certain tolerance of contradictions and the

relative complexity of thinking about social behaviour, it can also be used as a proxy for social inference used alongside a measure of 'lay theories' about social behaviour. As a measure of the latter, I included three items asking individuals to indicate their agreement with dispositionist, situationist and interactionist lay theories discussed previously (Norenzayan et al., 2002a). For example, the dispositionist theory read as follows (rated on a 9-point scale from strongly disagree to strongly agree):

> How people behave is mostly determined by their personality. One's personality predisposes and guides an individual to behave in one way, not in another way, no matter what circumstances the person is in. In a sense, behaviour is an unfolding of personality. One's behaviour is remarkably stable across time and consistent across situations because it is guided by personality. Therefore, if we know the personality of one person, we can easily predict how the person will behave in the future and explain why that person behaved in a particular way in the past.

Finally, as a direct or explicit indicator of beliefs or folk theories pertaining to H-A reasoning in general, I used selected items of Choi et al.'s (2003) holism scale. The authors of this study found that individuals' holism scores differed across cultures and correlated in the expected direction with a social attribution related variable. However, because these items were taken out of scholarly texts describing holistic cognition, many of the original items were formulated very abstractly. I chose to include four items from each factor identified in the original study with some minor alteration in wording in order to make them more understandable. One of these factors is most indicative of beliefs about the complexity of *causality* and interrelatedness (e.g. 'every event has [numerous] causes although some of the causes are not known' or 'nothing [in the universe] is unrelated'); the second factor seems to measure *attention* to the field or context (e.g. 'a marker of good architecture is how harmoniously it blends with other buildings around it' or 'the whole is [always] greater than the sum of its parts').

In sum, H-A measures in this study are made up of:

H-A Organisation of Information [perceptual and conceptual]:

a) Rule- vs Family-Resemblance based Categorisation (Norenzayan et al., 2002b)
b) Category-based vs Relational-Contextual Grouping (Ji et al., 2004)

H-A Beliefs/Theories relating to Holism and Social Inference

c) Holism [holistic beliefs] Scale (Choi et al., 2003)
d) Folk Theories of Social Behaviour (Norenzayan et al., 2002a)

Tolerance for Contradictions: Social Behaviour and Differentiation vs Compromise

e) Surprise about Expectation Violating Behaviour (Choi & Nisbett, 2000)
f) Differentiation vs Compromise (Peng & Nisbett, 1999)

Hypotheses

We may expect that, to a Western European individual, Buddhism would be closely tied to a role in a religious subculture with a potential to change patterns of reasoning. A certain degree of integration in such a subculture may be necessary to alter the way people think. In the acculturation and biculturalism literature, Minoura (1992) found that Japanese immigrants' cognitive, cultural and affective acculturation in the U.S. was equally determined by degrees of social interaction with Americans as age of entry together with length of stay in the host society. This view is also endorsed by Fiske et al. (1998), who argue that culturally-based differences in reasoning can only be "maintained by the very nature of the sociocultural surroundings" an individual finds herself in (p. 943), and Nisbett et al. (2001), who predict a radical cognitive shift after a generation or less given "total immersion" in the new culture. Such a cultural immersion perspective, then, would hold that full participation in a new culture will lead to cognitive change relatively quickly and implies that religion alone (as merely one cultural institution or subculture) may not make a difference.

Interestingly, while Nisbett et al. seem to endorse a cultural immersion view, they also advocate a toolkit or dual processing perspective, which may lead to a different conclusion with respect to Eastern religious beliefs and practices among Western Europeans. If we assume that individuals have both holistic and analytic reasoning tools *available* to them in either culture, the question simply becomes under what conditions these are also *accessible*. Research on bicultural individuals seems to support the possibility that holistic tools can be made accessible (through cultural priming) perhaps even to Buddhists in the West. The fact that Hong Kong Chinese who do not actually live in a Western country can be primed to think more like Americans (Hong et al., 1997; Hong & Chiu, 2001) backs this argument and seems to challenge the cultural immersion perspective. Hence, the Western Buddhist group may be most susceptible to religious context (i.e. religious identity is salient) in having an effect on H-A cognitive preferences. In sum, compared to baseline data from a secular and Christian Western groups, I expect Western Buddhists to think more like Asians when primed with their religion or spirituality.

Although the main hypotheses tested in this study are simply about overall differences in H-A thought, some predictions about more *specific indicators* of H-A cognition can be made.

Categorisation and Grouping: If Buddhists are more holistic thinkers, they should categorise objects more on the basis of family resemblance than rules, while also being more likely to group concepts by using relational-contextual rather than category-based logic. Nisbett's (2003) adopted framework for the causes of H-A thinking suggests that social structure directly affects attention. Hence, religious social integration may moderate cognitive differences. Nisbett's framework implies that social integration may potentially play a greater role than the strength of religious beliefs and values in determining less reflective types of cognition, such as categorisation. A similar

prediction can be made for H-A cognition as indicated by grouping, where interdependent orientations may foster a relational-contextual grouping style.

The categorisation of perceptual stimuli may also be affected by meditation practices. Following Ornstein's (1972) neurophilosophy, the part of the brain that is most active during religious experience and meditation should be its parallel (holistic/relational) processor in the right hemisphere. Neuropsychologists have pinned down the area of the brain involved in religious experience more precisely as the right PSPL of the brain or 'holistic operator' (Newberg & d'Aquili, 1998, 2000). Both ceremonial rituals and meditation seem to produce a 'sense of unity'. Meditative states, however, are at an advantage in sustaining unitary states due to a lack of reliance on external forces or rhythmic activity (ibid). Murphy and Donovan (1997) report evidence in line with holistic perception, more precisely a holistic shift in the interpretation of visual stimuli (Rorschach images) among advanced meditators. My interpretation of Buddhism and its practice of meditation as an instance of Whitehouse's imagistic mode of religiosity are consistent with those findings. In terms of this theory, the emphasis on episodic cognition from imagistic practices should give rise to more holistic perception along with intuitive rather than formal or rules-based logic. As Norenzayan et al. (2002b) have noted, family-resemblance versus rule-based categorisation is an instance of intuitive cognition, which is "experience-based, resists 'decontextualizing' or separating form from content, relies on sense experience and concrete instances, and overlooks rules and logic when they are at odds with intuition" (p. 678). Taken together, the literature suggests that we should find a learning effect through meditation in holistic categorisation.

Lay/Folk Theories of Behaviour: The Buddhist doctrine of non-selfhood as well as values (e.g. compassion) leading to other-orientation should make Buddhists endorse

dispositionist theories to a lesser extent than situationist theories. In addition, Markus and Kitayama (1991; also Peng et al., 2001) propose that interdependent orientations of the Self affect reasoning about causality in social inference. By contrast, beliefs about people having more fixed dispositions are evident in Anglo-Saxon individualism, which has gone hand-in-hand with post-Reformation Christianity (e.g. Kitayama & Markus, 1999, Sampson, 2000).

Holism Score: Since holism is evident throughout Buddhist teachings, we would expect a relatively clear difference between groups on this direct measure of holistic beliefs. Hence, I expect cognition among Western Buddhists to be most holistic in its agreement with items on the Holism scale, which may be taken as normative beliefs relevant to Buddhism. If, as Nisbett (2003) and Peng et al. (2001) suggest, learned culturally-contingent theories or beliefs most directly affect cognitive inferences, we would expect *religiosity*, as an explicit or perhaps idealised cultural content (beliefs, values, etc.), to be more predictive of directly measured holistic attitudes and beliefs (holism score) than other H-A items.

Whitehouse's theory implies that religious practices in the *imagistic* mode have memory consequences that aid the survival/transmission of cognitively costly aspects of religiosity, such as the complex ideas espoused by Buddhism. The highly reflective and complex beliefs evident in the holism score, then, should be subject to the same meditative learning effect as the perception-based categorisation variable.

Differentiation vs Compromise: Buddhists, especially in the Mahayana tradition, are more tolerant of contradictions and hence more willing to compromise, based on beliefs like the Middle Doctrine. (Eastern social practices that foster harmony rather than conflict, as discussed in Nisbett & Masuda, 2003, may have a similar effect.)

Surprise about expectation violating behaviour: Choi and Nisbett (2000) theorise that having a greater tolerance of contradictions and endorsing more complex theories of the person should lead to lower surprise levels about persons behaving contrary to their dispositions. We would expect interactionist and situationist theories of behaviour and 'differentiation vs compromise' to correlate accordingly with surprise levels. Among Buddhists, we can expect lower surprise levels compared to Christians, who should endorse a more stable view of the self.

A drawback in my research is a potential self-selection among Western Buddhists. Individuals who become Buddhists may think more holistically than other Western Europeans in the first place. However, while I may not have a baseline of individuals-about-to-become-Buddhists to compare to more advanced Western Buddhist practitioners, asking individuals about their age and the amount of time (i.e. number of years) they have been practicing or identified with the religion may be the best approximation of a longitudinal study. Moreover, priming can make up for self-selection issues to some degree by allowing me to investigate cognition in religious versus non-religious contexts. We would expect a religious prime to have a smaller effect on individuals who already were relatively holistic thinkers prior to becoming Buddhists (with the opposite possibly true for converted Christians).

4.2 Methods

4.2.1 Participants

Research participants were members of religious and secular organisations in England. More specifically, they were affiliated with 10 different Buddhist centres and 16 Anglican churches as well as the nation's largest Secular-Humanist organisations, the National Secular Society and the British Humanist Association. Gatekeepers at the

organisations were contacted by mail and email. They were asked whether they would forward a recruiting text to their members/congregation via email or post it in newsletters and on Web sites. Due to this convenience sampling technique, it is not possible to ascertain response rates. To compensate participants, both a prize draw entry and a small donation (£2.50) to their organisation on behalf of each completed survey were offered.

4.2.2 Design

The majority of past research on H-A cognition has been administered in classrooms or psychology labs. An Internet-based experiment in the form of a standardised questionnaire seemed to be the most feasible way to collect data from the specialised and large sample required by this study. Online research has a ten-year history in psychology. Over the course of the last few years, psychologists have come to acknowledge its status as a viable way of collecting data (Birnbaum 2000, 2004; Gosling, Vazire, Srivastava, & John, 2004; Kraut, Olson, Banaji, Bruckman, Cohen, & Couper, 2004; Reips, 2002a). With the increasingly more widespread use of the Internet in industrialised nations, early assumptions about Internet users as a population with specific personality characteristics (e.g. social maladjustment) or particular demographics have lost some of their applicability (Gosling et al., 2004). Nevertheless, researchers seem to agree that the disadvantages of online research are evident in a potential lack of experimental control, including the setting in which surveys or experiments are completed and multiple submissions, self-selection as well as potential dropout rates. Most of these disadvantages, however, represent the flip side of a coin. For example, while the anonymity of the Internet may be responsible for some of these potential problems, it also has the advantage of possibly reducing experimenter effects.

Experimental control may be of greatest concern to studies with perceptual measures if visual or auditory stimuli have to be accurately perceived. Studies where responses to

relative differences across stimuli are elicited are probably less affected. Indeed, Pagani and Lombardi (2000) found no significant effect of hardware (e.g. monitor size, screen resolution, computer used) and software (e.g. browser used) differences in cross-cultural research studying facial features communicating surprise. In general, experimental control is also less of an issue in between-subjects designs with random distribution of participants to experimental conditions, as potential errors become randomised rather than systematic (Reips, 2000, 2002a). In my own design, hardware differences are nonetheless controlled for by an automatic detection of participants screen resolution, while setting is taken into account by asking participants about the location in which they completed the survey (home, work, school/university or other). In any event, although Internet research lacks experimental control, it is more likely to have ecological advantages than shortcomings. Assuming for the sake of argument that specific physical or social contexts do have an impact on more general reasoning processes, settings in which Internet studies are completed are more likely to be representative of environments in which people think and interact than psychology labs.

Multiple submissions can be minimised by explicitly asking participants to complete the survey/experiment only once, deleting multiple submissions from the same IP address, as well as checking internal consistency of data. Generally speaking, the issue of self-selection, furthermore, may be a greater problem for sociologists or political scientists trying to infer the attitudes, beliefs or behaviours of the general population from an Internet sample than for a comparative design in psychology with specialised populations (Birnbaum, 2004; Kraut et al., 2004). However, this only holds if we assume that self-selection works similarly across comparison groups. It is still possible, of course, that self-selected participants in one religion tend to be more analytic or holistic compared to other groups. This risk, which is unavoidable in a sample of

voluntary participants, can be minimised but not completely eliminated by standardising recruiting procedures and incentives.

Incentives for the completion of the survey or experiment, such as immediate feedback or financial rewards, more importantly serve to reduce potential dropout rates (Reips, 2000). Other technical procedures to reduce dropout can also be adopted. In my study, these consist of the 'high hurdle' technique, as suggested by Reips (2000), including

a) a deliberate increase in the loading time of the introductory page (to test the patience of potential respondents),
b) giving an estimate of how long participation will take (in the experiment's introduction),
c) asking personal (demographic) questions before the experimental measures,
d) keeping participants informed of their progress (on the top of each page, e.g. 'Section 2 of 5'), as well as
e) asking for participants' email address to enter the prize draw at the *end* rather than the beginning of the experiment.

Gosling et al. (2004) have empirically examined some of the potential pitfalls of Internet-based research by comparing a Web-sample (N=361,703) to traditional ones. Their conclusion is that most negative preconceptions of Internet research do not turn out to be a problem. For example, they indicate that Internet findings generalise across presentation formats and are not adversely affected by repeat responders. Gosling and colleagues successfully replicated the Big Five Inventory among Internet samples. Krantz and Dalal (2000) find a surprising match between laboratory and Web versions of surveys, scales, and experimental variables.

The advantages of Internet-based research are evident in the ability to either recruit large heterogeneous samples or target specialised populations. Unfortunately, the main weakness of student samples in some social science research, namely the lack of generalisability due to limited variation in education and age, etc., may also be its main strength in comparative experimental research. In a pilot that I conducted on an American sample (n=50), age, gender and education produced no significant differences

for Peng & Nisbett's (1999) differentiation vs compromise scores. However, Ji et al.'s (2004) grouping task yielded a statistically significant interaction effect of age and education ($F=5.409$; $p<.05$). Hence, it became clear that it would be necessary to get samples that are large enough to control for gender, education and age, which is greatly aided by Internet-based research.

In order to restrict the participant pool, recruitment through organisations is one of the more viable means available to researchers conducting online studies (Birnbaum, 2004). In addition to enabling the recruitment of a large, specialised sample, an Internet-based survey/experiment has several technological advantages over other survey methods and allows one to meet basic demands of experimental designs.[7] First, JavaScript allows researchers to randomly assign participants to conditions. Moreover, it is possible to ensure the completion of questions or tasks in the intended order (e.g. Reips, 2002b), which is crucial for priming methodology. Finally, the content of questions can be guided depending on information provided in previous questions. In my experiment, participants are presented with religiosity measures appropriately worded to match their religion (e.g. asking Buddhists about their frequency of meditation rather than prayer) on the basis of their answer to a preceding religious identification question.

Several additional features were designed to protect the integrity of my data. These included:

a) Code that prevents search engines ("robots") from finding and indexing the experimental pages, which protects the online survey from becoming accessible to the "general public" by means of Web searches, etc.

b) Sub-directory (folder) and file names that are non-predictable (e.g. /120cf/, exp14c.html, etc.) and the blocking of directory listings when access to a directory (e.g. 120cf/) is attempted

[7] The domain psychologysurvey.com was registered exclusively for my own research purposes. Administering my own domain allowed me to have access to the server's log file, which recorded all site visits and stored the data submitted by participants. The basic design of my experiments was done with the help of WEXTOR, an online experiment generation engine developed by psychologists at the University of Zurich. The HTML and JavaScript code produced by the online generator was modified to suit my own needs.

c) ID numbers assigned to participants (in order to ensure that each response recorded in the log file is assigned to the right respondent)

d) Automatic recording of response times

e) Detection of screen resolutions

4.2.3 Procedure

The study was introduced to participants as research recruiting individuals from various groups and organisations in the UK in order to investigate the way people organise information, make judgments about others as well as think about scientific research findings. As compensation, participants were given the option of entering their email address in a prize draw for book/music vouchers from an online retailer in addition to having a small donation (£2.50) for each participant made to the organisation from which they were recruited. In the religious prime condition, subjects provided their religious identification as the last item in the demographics form administered at the beginning of the experiment. Depending on their answer, e.g. 'Buddhist: Mahayana', they were then directed to a page consisting of the religious prime (religiosity) questions tailored to their religion.

Items in the questionnaire were presented in a between-subjects counter-balanced order. Consequently, participants in Study 1 were randomly assigned to one of four conditions:

1a) Religious prime -> Question order 1
1b) Religious prime -> Question order 2
2a) No prime -> Question order 1
2b) No prime -> Question order 2

In order to control for possible context effects, the more conceptual tasks, grouping and categorisation, were completed in counter-balanced order. In addition, these relatively abstract categorisation and grouping questions were presented before the remaining questions in order to minimise respondents awareness of having been primed (which is

likely to be greater if religious questions were followed by reflective, i.e. belief-based, measures).

Categorisation/grouping tasks were followed by the differentiation versus compromise and surprise about expectation violations in behaviour measures. The H-A measure on the last page consisted of questions about actual beliefs or theories (folk theories of personality, holism scale). They represented the last section of the survey because of their potential to make salient or activate different beliefs or folk theories and hence could have contaminated the intended function of priming. For these reasons, explicit (i.e. attitudes or beliefs) measures usually are the last ones presented to subjects in priming research (see e.g. Lido, Calitri, Samson, & Brown, in preparation).

At the end of the questionnaire, participants were queried about the location at which they completed the experiment, were given the opportunity to enter their email address for the prize draw and then were directed to a debriefing page.

4.3 Results

4.3.1 Descriptives

Samples from the National Secular Society and British Humanist Association were combined to represent a Secular-Humanist baseline in this study. This could safely be done, as they are not only both devoted to forms of secularism, but also have overlapping membership[8] and, in my sample, did not significantly differ on the dependent measures. In total, 120 Buddhists and 121 Anglicans (in prime and no-prime conditions) and 62 Secular-Humanists (no-prime condition only) met the criteria of being British-born and resident as well as being of European (white) cultural heritage. The Buddhist sample was composed of roughly half non-sectarian Buddhists (n=66), while the rest identified with Mahayana Buddhism (n=37) and Theravada or Vajrayana

[8] Marylin Mason (BHA administrator), personal correspondence, December 3, 2004.

(n=17). Among Anglicans, half of all respondents considered themselves Broad Church Anglicans, while the rest was split between High Church (more strongly influenced by Catholicism) and Low Church (more Protestant-Evangelical) identifiers.

The mean age was about the same for Secular Humanists and Buddhists (41.9 and 42.2, respectively), but was somewhat higher for Anglicans (44.7), probably reflective of England's ageing churchgoing population. Among Buddhists, the mean age at which individuals began to practice their religion was 31 and they were Buddhists for an average of 11 years. The modal response for educational attainment was a First (Bachelor's) degree, which was similar across samples. The proportion of individuals with postgraduate degrees, however, was greater among Secular Humanists and Buddhists (about 28% each) than Anglicans (about 19%). Finally, males were more dominant in the sample, accounting for about 53% of Anglicans, 58% of Buddhists and 66% of Secular Humanists.

4.3.2 Secular and Religious Group Differences in Holistic versus Analytic Cognition

Buddhists and Christians in the no-prime condition (n=60 and n=61, respectively) were analysed alongside the Secular-Humanists sample (n=62). In order to identify meaningful dimensions of H-A cognition that could be analysed together, exploratory factor analysis with Varimax rotation[9] (Table 4.1) was conducted on seven dependent measures, resulting in three latent variables (to be discussed in more detail later). Since the probability of incurring Type I errors increases if separate analyses of variance are conducted for each dependent variable, multivariate analyses of covariance (MANCOVA) were performed by grouping H-A variables into three clusters. A multivariate analysis of variance approach also takes possible correlations between

[9] Oblique rotation methods, commonly used if there are theoretical grounds to expect latent factors to be correlated, produced the same results as Varimax, which is an orthogonal rotation method.

variables into account. Unlike past research on H-A cognition that was conducted on student samples, variations in age, educational levels and gender had to be accounted for as control variables.

Table 4.1: Rotated Component Matrix (Factor Loadings) for H-A Measures

Variables	Dimensions of Holistic vs Analytic Thought		
	Factor 1	Factor 2	Factor 3
Categorisation	.074	**.630**	-.291
Grouping	**.793**	-.267	.067
Holism Score	**.774**	.288	-.046
Situationism-Dispositionism	-.012	**.541**	.489
Interactionism	-.044	**.727**	.105
Surprise about Behavioural Expectation Violations	.042	-.149	**.550**
Differentiation vs Compromise	-.025	.125	**.758**

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax.

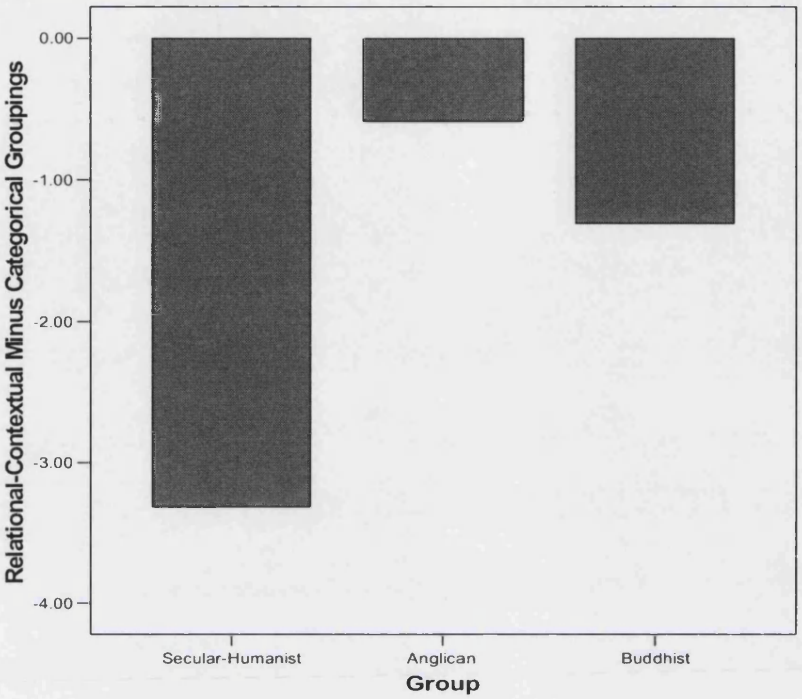
Relational-Contextual vs Category-Based Grouping

The grouping task measured preferences in the organisation of information in ten pairs of concepts that could be grouped on the basis of either category membership or relationships/contexts. Ji et al. (2004) calculated a net grouping score by subtracting the number of categorical groupings from the number of relational-contextual ones, resulting in positive scores as an indication of mostly holistic and negative scores as mostly category-based groupings.

In this study the order in which the grouping and categorisation tasks were completed were counter-balanced, hence the version of the instrument (categorisation first versus grouping first) was included as a factor. The resulting 3 [religious group] by 2 [version] MANCOVA controlling for age, educational level and gender shows a main effect of religious group, $F(2, 140) = 7.01, p = .001$. As expected, higher educational attainment also leads to somewhat more analytic (category-based) groupings, $F(1, 140) = 4.24, p = .041$. However, *both* Buddhists and Anglicans were more holistic

(relational-contextual) in their responses than Secular Humanists (means of –1.3, -.6 and –3.3, respectively) in this task (Fig. 4.2).

Fig. 4.2: Religious Differences in Grouping



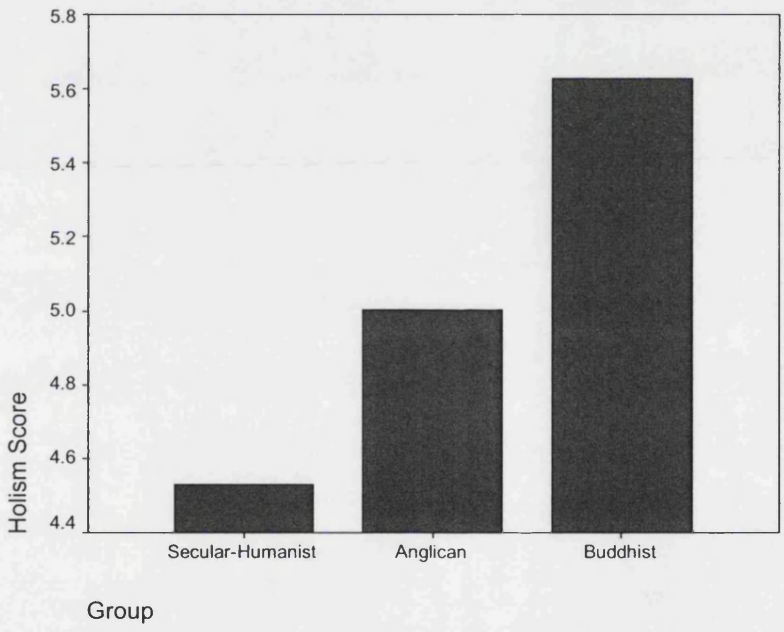
Holism Score

The holism score (adapted from Choi et al., 2003) more directly measured holistic beliefs and was based on individuals' mean agreement with eight statements. The initial factor analysis indicated that this score is part of an underlying dimension along with the grouping measure. Similar to relational-contextual versus category-based grouping, the holism score taps into the way people think about the world, but does so by measuring more abstract beliefs. Confirmatory factor analysis of holism score items also revealed the same two underlying factors found in Choi et al., one providing a better measure of part-whole relationships (e.g. 'It's not possible to understand the pieces without considering the whole picture' or 'The whole is always greater than the sum of its parts') and the other causality (e.g. 'Every event has numerous causes, although some of the causes are not known' or 'Nothing in the universe is unrelated'). The holism score is positively correlated with holistic grouping, driven primarily by the

factor measuring beliefs about part-whole relationships. On the whole, then, the holism scale is akin to the more applied relational-contextual thinking quantified by the grouping task.

The holism score yields dramatic differences between all three groups, $F(2, 140) = 22.11$, $p = .000$ [model], p = .000 [Sec. vs Buddh. contrast], p = .000 [Anglic. vs Buddh. contrast], with Secular-Humanists scoring the lowest, Anglicans intermediately and Buddhists the highest (means of 4.53, 5.0 and 5.63, respectively). No other main or interaction effects were present. It appears as though religion has an "additive" effect on holistic beliefs (Fig. 4.3).

Fig. 4.3: Religious Differences on Holism Score

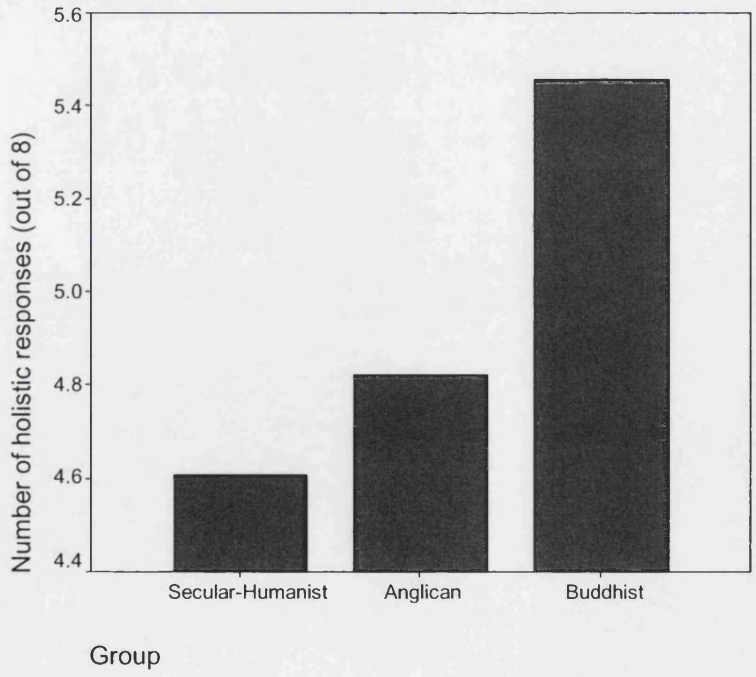


Family Resemblance vs Rule-Based Categorisation

A second cluster of H-A cognition included the categorisation measure adapted from Norenzayan et al. (2002b), which was the only task that used visual stimuli in this experiment. It consisted of eight category judgments and could be either based on the overall family-resemblance of target objects with one of the target groups or a defining feature (rule), which the target object shared with objects in one of the target groups. In

order to make the data as comparable as possible to those obtained under laboratory-conditions, response times (in milliseconds) and screen resolutions were recorded for each participant. Screen resolutions were coded as either low (800 x 600 and below) or high (1024 x 768 and above). There was no correlation between response time and categorisation, $r(177)=.12$, *ns*. However, screen resolution seemed to have a small effect on categorisation, with larger resolutions (which make objects appear smaller) leading to somewhat more family-resemblance based responses [$t(176) = -2.04$, $p = .043$; $r(177)=-.20$, $p = .008$]. In the 3x2x2 MANCOVA of religion [Secular Humanist vs Anglican vs Buddhist] by version [categorisation first versus grouping first] by screen resolution [low vs high], controlling for gender, education and age shows main a effect of religion, $F(2, 147) = 3.63$, $p = .029$ [model], $p = .014$ [Sec. vs Buddh. contrast], $p = .039$ [Anglic. vs Buddh. contrast]. Secular-Humanists categorised objects most analytically (mean = 4.6) and Buddhists most holistically (mean = 5.5), with Anglicans intermediate (mean = 4.8; see Fig. 4.4). In addition, there was a main effect of age, $F(1, 147) = 6.27$, $p = .013$, with higher age leading to more holistic responses.

Fig. 4.4: Religious Differences in Categorisation



Theories of Social Behaviour

The exploratory factor analysis presented earlier suggests that family-resemblance versus rule-based categorisation and situational vs dispositionist theories of behaviour have something in common. One possible explanation of this commonality would point to rule based categorisation and dispositionist attributions as sharing deterministic thinking on the basis of features that are constant across contexts. In the case of categorisation, rules are deterministic by virtue of being a necessary and sufficient feature that determines category membership. In dispositionist social inference, causality is reduced to features that remain stable across contexts.

In this study, participants' agreements with statements describing dispositionist, situationist and interactionist folk theories of behaviour (adapted from Norenzayan et al., 2002a) were measured. In order to make these variables comparable to other variables which were reflective of a H-A continuum, a net score for situationist versus dispositionist explanations of behaviour was computed by simply subtracting the dispositionist rating from the situationist one (as done by Ji et al. to obtain a single grouping score). Among Buddhists situationism outweighed dispositionist thinking (mean = 1.30; sit. = 5.19; disp. = 3.89) more than among both Anglicans (mean = -0.34; sit. = 4.83; disp. = 5.17) and Secular Humanists (mean = -0.03; sit. = 4.73; disp. = 4.70), $F(2, 147) = 6.34$, $p = .002$ [model], $p = .001$ [Sec. vs Buddh. contrast], $p = .007$ [Anglic. vs Buddh. contrast] (Fig. 4.5). Interestingly, there was also a main effect of age, where higher age was associated with more dispositionist thinking, $F(2, 147) = 4.19$, $p = .042$. Differences were non-significant for ratings of the interactionist theory, $F(2, 147)=1.88$, *ns,* with only a marginal contrast effect between Buddhist (mean = 7.49) and Secular-Humanist (mean = 7.08) Groups, $p = .055$, (Fig. 4.6). This may be due to the fact that respondents were asked to rate theories of behaviour after having already read examples illustrating the complexity of behaviour (the 'surprise about expectation violations in

behaviour' measure, i.e. individuals behaving contrary to their personality by helping or not helping a person in need; see Section 4.3.2.6).

Fig. 4.5: Religious Differences in Situationist-Dispositionist Theories

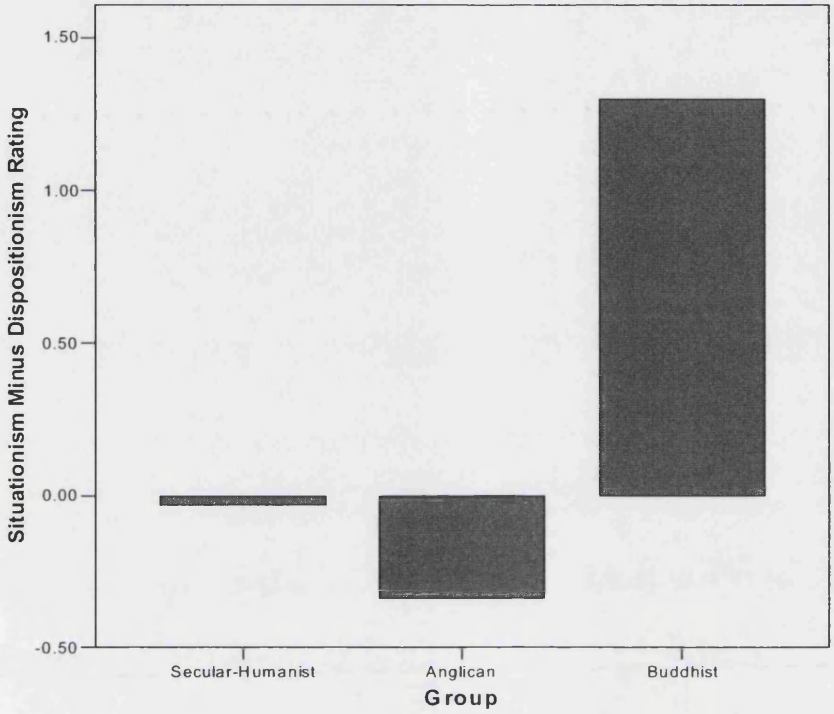
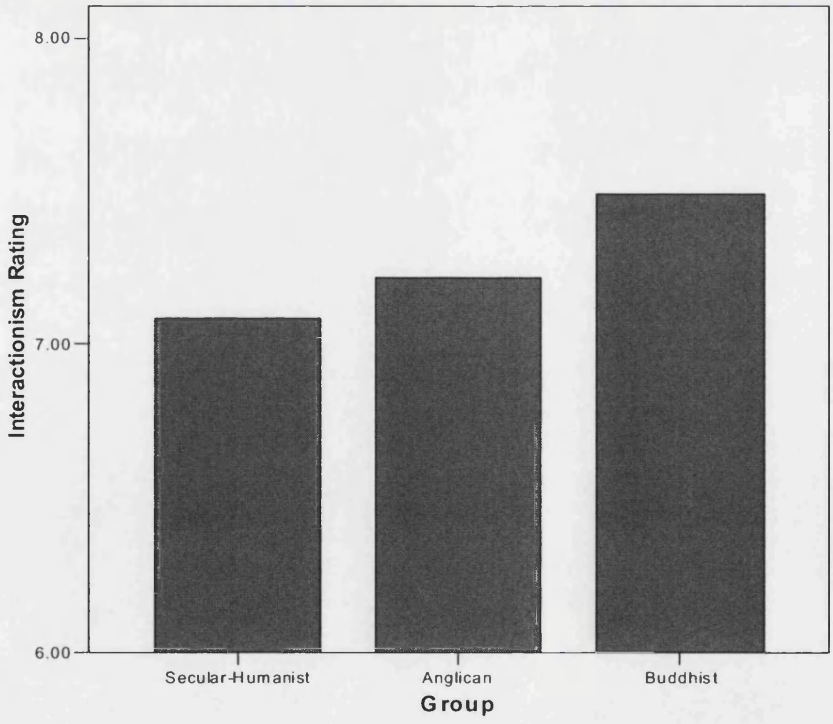


Fig. 4.6: Religious Differences in Interactionist Theory



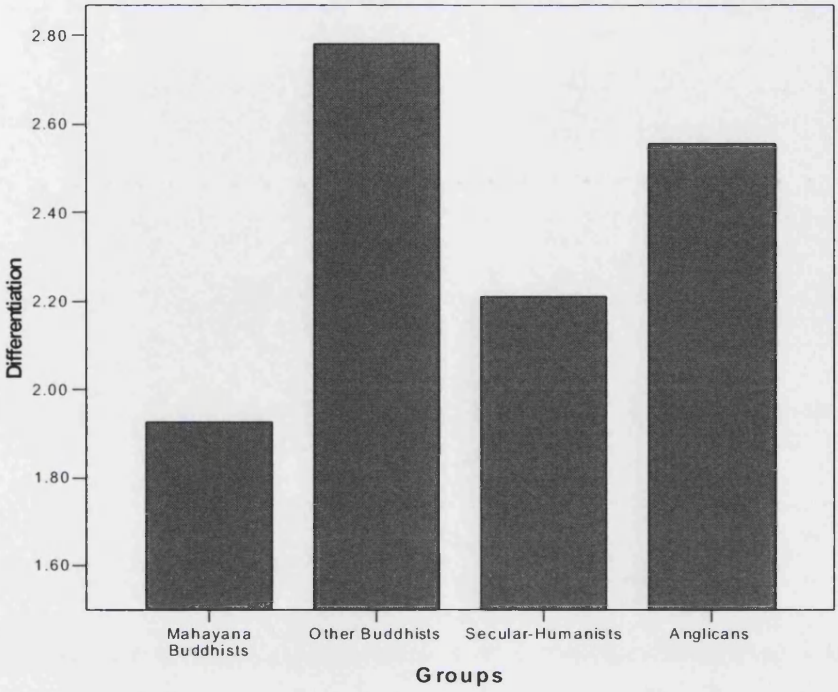
An additional item, not included in the original holism scale, measured agreement with the statement that, in order to understand an object's behaviour, it is more important to focus on the properties of the object than the conditions under which the behaviour occurs. Group differences in the mean rating of this belief about causality were directly reflected in endorsements of an actor-centred theory of social behaviour. Overall, attributing causality to an object correlated positively with dispositionism ($r = .18$, $p < .05$) and negatively with interactionism ($r = -.16$, $p < .05$).

Tolerance of Contradictions: Differentiation vs Compromise

The results of the previously outlined exploratory factor analysis indicated that one of the latent variables evident among the H-A tasks might indeed measure a certain 'tolerance for contradictions'. In the 'differentiation vs compromise' task, the mean absolute value of differences between two seemingly contradictory statements' plausibility ratings (for five statement pairs) is computed. Differentiation is indicated by higher values (i.e. relative divergence), whereas compromise is reflected by lower values (relative convergence).

The MANCOVA on 'tolerance for contradictions' variables yields no significant difference between groups for the 'differentiation versus compromise' measure (means of 2.21 for Secular Humanists, 2.56 for Anglicans and 2.43 for Buddhists), $F(2, 151) = 1.26$, *ns,* and none of the demographic variables affect differentiation significantly. Since Mahayana Buddhism has been cited as promoting greater tolerance of contradictions, however, it is useful to compare this group to Anglicans and the secular sample. Despite the small subsample of Mahayana Buddhists, the data suggest those Buddhists to be less differentiating (mean = 1.93) than Anglicans (mean = 2.56), $F(2, 118)=2.48$, $p = .088$ [model], $p = .043$ [Anglic. vs Buddh. Contrast] but not compared to Secular-Humanists (mean = 2.21) (Fig. 4.7).

Fig. 4.7: Religious Differences in Differentiation vs Compromise



This finding illustrates Chan's (2004) argument that tolerance of contradictions is related to endorsing fuzzy rather than bivalent logic. In addition to differences between statement ratings being closer to zero, then, we would also expect to see that Mahayana Buddhists are more likely to choose the neutral point of the believability scale (neither agree nor disagree). This is indeed the case and directly mirrors differentiation scores. Among the total of 10 ratings obtained, 27.2% of Mahayana Buddhists' answers are neutral, whereas only 17.7% of Anglicans' ratings and 22.2% of Secular-Humanists are on that point.

Ratings of Surprise about Expectation Violating Behaviour

The second measure related to tolerance of contradictions was based on ratings of surprise about actors who seem to behave contrary to their dispositions. Mean surprise about expectation violating behaviour was computed by taking the mean of surprise ratings from two scenarios (presented in counterbalanced order): a potentially helpful religious person not helping a person in need and a potentially non-helpful religious

person actually helping. The ratings were based on an 11-point scale ranging from 0 (not surprised at all) to 10 (very surprised). The Bad Samaritan scenario pitted central religious values, such as helping or altruism, against stronger recognition of the power of the situation (being late, expectation of sanctions, etc.). There was no significant difference across religious groups in mean surprise ratings (means of 5.17 for Secular Humanists, 5.70 for Anglicans and 5.15 for Buddhists), $F(2, 151)=.92$, *ns.*

A separate MANCOVA for the 'helpful not helping' and 'non-helpful helping' vignettes uncovers a strong order effect as a result of counterbalancing the two scenarios, $F(1, 155) = 13.074$, $p = .000$, for helpful not helping, $F(1, 155) = 19.986$. $p = .000$, for non-helpful helping, with a tendency for higher surprise ratings for the second vignette presented (means of 4.98 and 5.67, for 'helpful not helping' followed by 'non-helpful helping'; 3.81 and 6.79 for the counter-balanced version). However, this was largely due to Buddhists' being consistently and significantly more surprised about the story that was presented to them second, regardless of whether it was about helping or non-helping, $F(1, 50) = 10.621$, $p = .002$, for helpful not helping (means of 4.18, followed by 6.04), $F(1, 50) = 12.027$, $p = .001$, for non-helpful helping (means of 3.24, followed by 7.14).[10] The most convincing explanation of this phenomenon would point to an inadvertent priming effect in the no-prime condition. In other words, the religious content of the first vignette may have led to a priming effect in Buddhists' judgment of the second story's outcome (see section 4.3.3 on the results of religious priming).

In order to account for this effect among Buddhists and the strong overall order effect, mean surprise ratings were computed only for the behaviours presented first, with the type of behaviour (either non-helpful helping or helpful not helping) as a

[10] In addition, a paired-samples t-test for the difference between the first and second surprise rating indicated that only Buddhists are significantly more surprised about the outcome presented to them second, t = -3.647, p < .001. This was not the case among Anglicans (t = -1.608, ns) and Secular-Humanists (t = -1.869, ns).

between subjects factor and age, education and gender as control variables. This yielded a significant contrast between Anglicans (mean = 5.1) and Buddhists (mean = 3.7), $F(2, 151) = 2.27, p = .11$ [model], $p = .035$ [Anglic. vs Buddh. contrast], but not for the overall model or an Anglican-Secular contrast, $p = .330$ (Fig. 4.8). A separate analysis of only Anglican and Buddhist groups reveals strong differences between the religious groups $F(1, 99)=6.81, p = .01$.

Due to the religious context of the vignettes an objection could be made: perhaps participants' levels of religiosity across the two groups may have accounted for the observed differences. Taking into account the variation in surprise levels that can be explained by religiosity does not significantly detract from religious group differences between Buddhists and Anglicans, $F(1, 95)=5.30, p = .024$. By the same token, religious group differences are further accentuated by the fact that about 90% of Buddhists listed compassion and related values as being central to their religion, whereas only 74% of Anglicans mentioned pro-social values, such as love or caring (Fig. 4.9).[11] Mean scores in surprise ratings among non-Mahayana Buddhists (3.85) and the Mahayana subsample (3.50), thought to be more tolerant of contradictions, suggests that the Mahayana group may have helped disproportionately in creating this contrast, although the subsamples are too small to confirm this statistically.

[11] Since group differences are computed for the no-prime condition only, it would be problematic here to juxtapose surprise ratings to the values listed in the same condition, hence values given by participants in the religious prime condition were used.

Fig. 4.8: Surprise about Expectation Violating Behaviour: Helping vs Non-helping

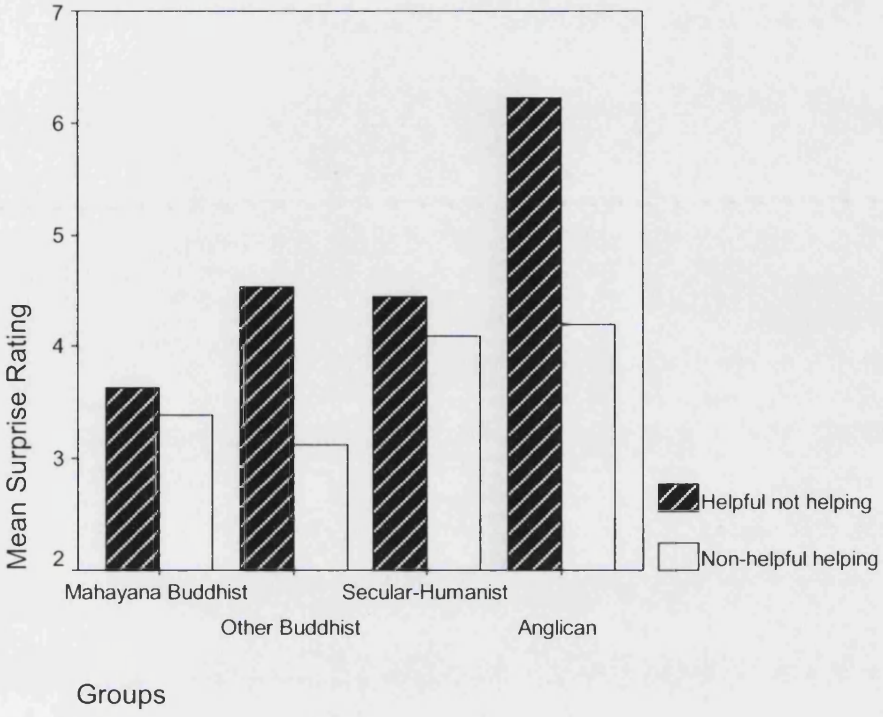
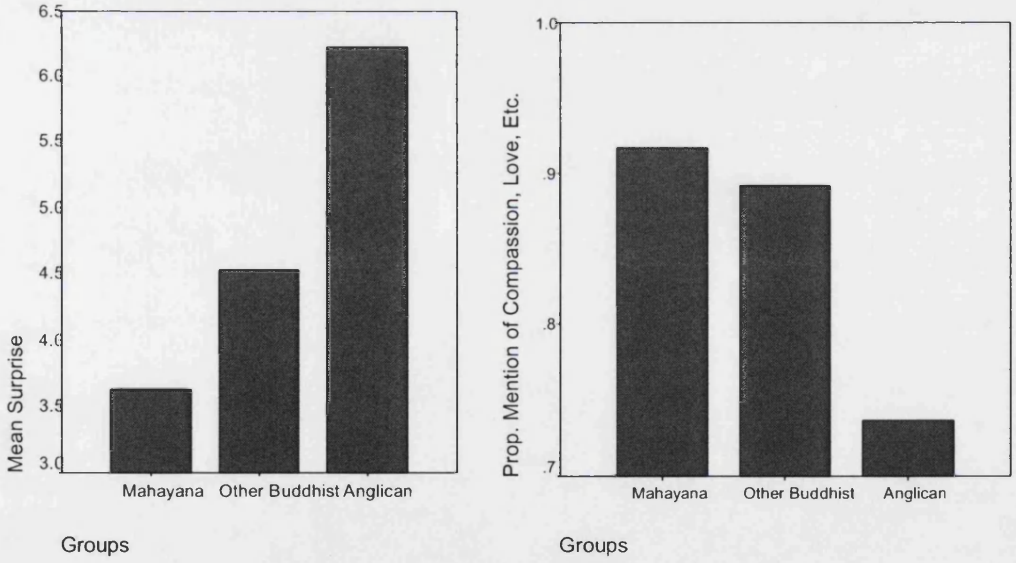


Fig. 4.9: Surprise About Non-Helping Behaviour vs Mention of Pro-social emotions



Choi and Nisbett point out that more complex (or less dispositionist) theories of behaviour should have a negative influence on surprise ratings. In order to put this

theory to the test, I correlated surprise ratings with differentiation (tolerance of contradictions) and theories of behaviour variables. Due to the strong order effect observed among Buddhists, this group was excluded from the analysis. Results were inconsistent. In the version of the experiment that presented the helpful not helping vignette first, differentiation was not related to surprise. In addition, individuals who were more situationist thinkers tended to be more surprised overall in this condition, which is contrary to what we would expect. Results for the version in which the non-helpful-helping vignette was presented first, on the other hand, provided some support for the theoretical assumptions made by Choi and Nisbett (Table 4.2). There was a negative relationship between the situationism-dispositionism net score and surprise ratings on the 'non-helpful helping' vignette, while greater differentiation was positively associated with surprise about the 'helpful not helping' story.

Table 4.2: Pearson Correlation Coefficients for Correlations Between Surprise about Expectation Violating Behaviour Ratings and Selected Independent Variables

	Version 1 (helpful not helping first)			Version 2 (non-helpful helping first)		
	Helpful not helping (first)	Non-helpful helping (second)	Mean	Helpful not helping (second)	Non-helpful helping (first)	Mean
Theories of Behaviour						
Situationism-Dispositionism	.139 (87)	.173 (87)	**.254**** (89)	.045 (87)	**-.292**** (87)	-.158 (88)
Interactionism	.022 (88)	.003 (88)	.024 (90)	.119 (87)	-.064 (87)	.048 (88)
Tolerance of Contradictions						
Differentiation vs Compromise	.071 (86)	-.023 (86)	.071 (86)	**.234*** (89)	-.001 (89)	.164 (89)

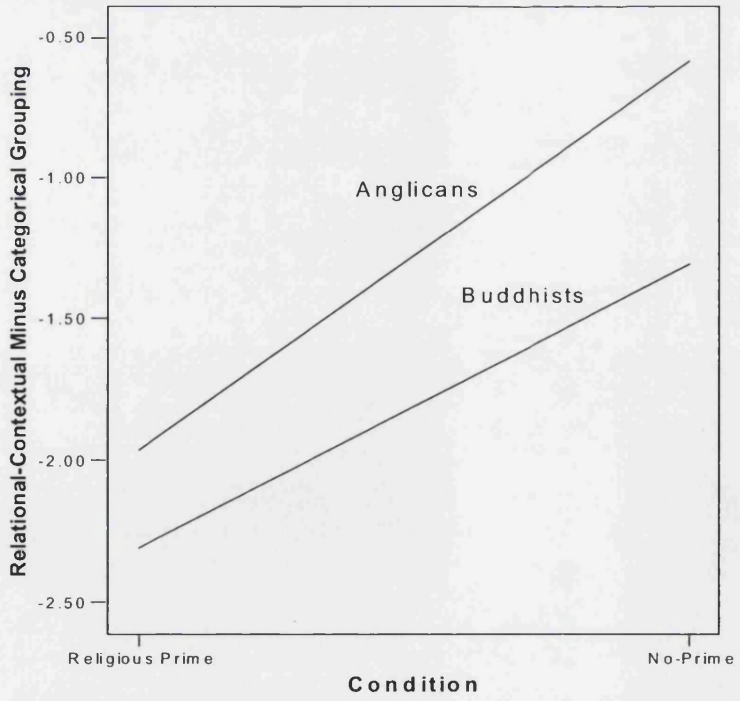
Note: * $p < .05$ ** $p < .01$
Numbers in parentheses are number of cases

4.3.3 Religious Contexts and Holistic versus Analytic Cognition: Effects of Religious Priming

A central hypothesis tested in this study was that practicing an Eastern religion may represent a separate schema or knowledge system for Western individuals and may be subject to priming. I expected Buddhists primed with religion to think more holistically than individuals in a no-prime condition. Using 2x2 MANCOVAs with the same variable combinations as in the previous analyses, this hypothesis could not be supported.

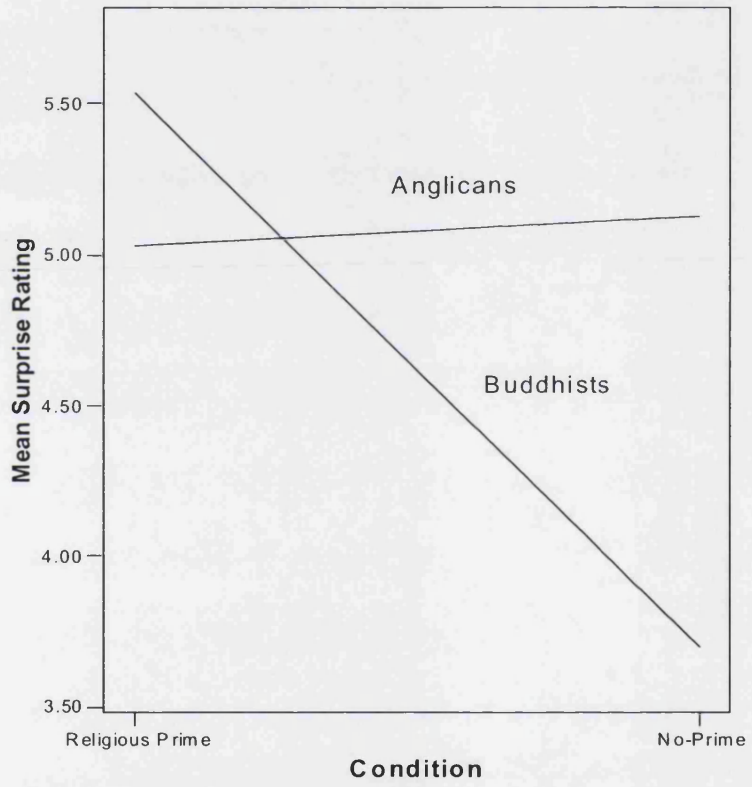
Instead, a main effect of priming across the two religious samples emerged for the grouping variable, with religious priming leading to overall more *analytic* (category-based) responses, $F(1, 188) = 4.97$, $p = .027$. Considering that both religious groups were significantly more relational-contextual than Secular Humanists in the no-prime condition, this finding suggest either a contrast effect or an unforeseen context effect induced by the religious prime.

Fig. 4.10: Effect of Religious Prime on Grouping



However, Buddhists were susceptible to priming on the surprise about expectation violating behaviour variable adapted from Choi and Nisbett (Fig. 4.11). This was evident in a significant interaction effect between religion and priming condition on surprise ratings, $F(1, 199)=6.86$, $p = .010$. In other words, when a religious context was invoked, Buddhists, but not Christians, tended to be more surprised about a religious actor behaving seemingly contrary to his dispositions.

Fig. 4.11: Effect of Religious Prime on Surprise about Expectation Violating Behaviour



4.3.4 Religious Contexts and Holistic versus Analytic Cognition: Religiosity and Social Integration

I argued that a better understanding of the effect of religion as culture or subculture must take into account both its structure and content. Hence, in addition to the

differences in H-A thought across religious groups, there may be within-group variation determined by individuals' religious integration and religiosity. In this section, I will examine the effect of these variables on H-A thought in two ways: first, by considering social integration and religiosity as moderating variables that may influence the effect of religious priming, and second, by analysing the influence of these variables on H-A cognition in general in a hierarchical regression model.

Index Construction

The religiosity index was constructed from the four variables that, in a pilot test, emerged as equally meaningful indicators of religiousness across religious groups and included self-reported religiosity, frequency of reading religious texts, frequency of meditation or prayer, as well as the rated importance of religion on everyday decision making. Religiosity scores were remarkably similar across religious groups, with a mean of 20.9 among Anglicans (sd = 3.65) and 19.8 among Buddhists (sd = 3.95). Controlling for age, gender and education, Anglicans turn out marginally more religious than Buddhists, $F(1, 207)=3.69$, $p = .056$.

Social integration was evident in several measures: frequency of church or temple visits, contact to people of the same religion in religious groups or organisations other than one's church or temple, the proportion of close friends who have the same religion as well as the frequency of contact to those friends, parents' religion and spouse's religion. An exploratory factor analysis (principal components) produced two dimensions of religious integration among Buddhists. Factor 2 included parents' and spouse's religion (Family), while Factor 2 was composed of the other variables. Among Anglicans, however, an additional dimension made up religious integration, with a separation of more organised social contact (church visits and contact to religious organisations) making up its own latent variable. As a result, religious integration scores were calculated separately for each group.

Table 4.3: Religious Social Integration Factor Loadings: Buddhists

Variable	Dimensions of Religious Social Integration	
	"Organised Rel. & Friends"	"Family"
Buddh. Friends Ratio	.672	--
Friends Frequency	.700	--
Temple Frequency	.631	--
Rel. Org. Frequency	.775	--
Parent's Religion	--	.610
Spouse's Religion	--	.743

Note: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax.

Table 4.4: Religious Social Integration Factor Loadings: Anglicans

Variable	Dimensions of Religious Social Integration		
	"Organised Rel."	"Friends"	"Family"
Anglic. Friends Ratio	--	.806	--
Friends Frequency	--	.850	--
Church Frequency	.795	--	--
Rel. Org. Frequency	.725	--	--
Parent's Religion	--	--	.554
Spouse's Religion	--	--	.819

Note: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax.

Interaction Between Religious Priming and Religiosity/Integration

In order to assess the influence of religiosity and religious integration on religious priming, a one-factor religious integration regression score was calculated. Moderation analyses were done as first suggested by Baron and Kenny (1986). In their influential article, the authors noted that whenever we seek to establish specification effects between variables X and Y on the basis of a third variable Z, it is important to distinguish between moderation and mediation effects. In such analyses, moderating variables are characteristics of participants brought into the experiment that are causally prior and may affect the outcome of experimental manipulations. Moderation was computed as suggested by Brown, Croizet, Bohner, Fournet, and Payne (2003). Using

this procedure, no moderating effect of religiosity or religious integration on religious priming was found.

Religiosity and Religious Integration and their Effect on H-A Cognition

For the purposes of examining the effect of religious social integration and religiosity on H-A thinking, hierarchical linear regression models were constructed for each religious group, with demographic variables as a first block, followed by priming condition, religiosity and religious integration, religious self, years of religious practice and age of conversion. As expected, religiosity and integration had no effect on H-A thought among Anglicans. In the Buddhist sample, both religiosity and religious integration were predictive of different dimensions of H-A *beliefs* in which this group scored distinctively more holistic than Anglicans and Secular-Humanists.

The religiosity index significantly contributed to predicting the holism score, made up of holistic belief ratings (Holism Score: Model 1; Table 4.5). Moreover, the 'religious self' variable, which was not included in the religiosity index, proved to be an equally useful predictor of holism (Holism Score: Model 2). Religious integration, on the other hand, influenced beliefs related to social cognition. More social integration in the Buddhist group led to lower endorsement of a net situationist-dispositionist folk theory of behaviour (Situationism-Dispositionism: Model 1). No such effect was found among Anglicans, which suggests that it is not simply due to a net effect of social integration.

Table 4.5: Standardised Coefficients for Hierarchical Regression of Holism Score and Situationism-Dispositionism on Selected Independent Variables (Buddhists)

	Holism Score: Model 1		Holism Score: Model 2		Situationism-Dispositionism: Model 1		Situationism-Dispositionism: Model 2	
Independent Variable	Beta	t	Beta	t	Beta	t	Beta	t
Block 1								
Age	-.051	-.426	7.830	.998	-.077	-.662	-1.683	-.208
Gender	.064	.540	.029	.246	.030	.258	.034	.283
Education	-.019	-.163	.027	.232	.056	.481	.064	.525
Block 2								
Priming Condition	.052	.452	.041	.365	-.058	-.516	-.054	-.467
Block 3								
Religiosity Index	**.304***	**2.143**	.223	.669	.254	1.840	.310	.908
Relig. Integration Score	-.004	-.031	.084	.111	**-.413****	**-2.987**	-.236	-.305
Block 4								
Religiosity*Integration			-.194	-.208			-.228	-.238
Block 5								
Religious 'Self'			**.338***	**2.478**			.037	.267
Block 6								
Years of Practice			-5.011	-.981			1.125	.211
Age of "Conversion"			-7.217	-1.017			1.406	.192
R^2	.087		.202		.112		.123	

Note: * $p < .05$ ** $p < .01$

4.3.5 Religious Contexts and Holistic versus Analytic Cognition: The Effect of Meditative Learning

My hypothesis on meditation and holism derived from various theorists and researchers, namely Ornstein (1972), Newberg and d'Aquili (1998, 2000), Murphy and Donovan (1997) and Whitehouse (2000, 2004, 2005), holds that the categorisation of perceptual stimuli should become more holistic with higher levels of meditative learning. In other words, individuals who learn practices that foster episodic (rather than semantic) cognition should change their perception and organisation of the world in favour of a more intuitive way—one that "resists 'decontextualizing' or separating form from content," and "relies on sense experience and concrete instances" (Norenzayan et

al., 2002b, p. 678). As a result, meditation should lead to a disinclination to use rules in favour of the more contextualised family-resemblance based strategy in assigning stimuli to groups. A second hypothesis derived from Whitehouse's 'modes of religion' holds that meditation also helps Buddhists to absorb more cognitively costly aspects of religiosity, leading to a similar effect of meditation on complex system of thinking evident in reflective holistic beliefs.

Support for both of these hypotheses would be provided by a significant effect of meditative learning, computed as an interaction between the frequency of meditation and years of Buddhist practice, controlling for age and other relevant variables. Table 4.6 shows the results for a regression of categorisation and holism score. Results are consistent with the hypotheses, with greater meditative learning leading to more holistic responses. For the holism score, this effect remains even when the strong influence of degrees of Buddhist identification ('Religious self' reported in the previous section 4.3.4) was entered as a control variable (Holism Score: Model 2). There was no effect of meditation on other H-A variables.

Table 4.6: Standardised Coefficients for Regression of Rule vs Family-Resemblance Categorisation and Holism Score on Meditative Learning (Buddhists)

	Rule vs Family-Resemblance Based Categorisation		Holism Score Model 1		Holism Score Model 2	
Independent Variable	Beta	t	Beta	t	Beta	t
Age	-.049	-.395	-.177	-1.456	-.207	-1.775
Gender	.040	.376	.069	.642	.031	.295
Education	.058	.549	-.030	-.291	.051	.502
Priming Condition	.011	.111	.074	.726	.037	.373
Version (variable order)	.140	1.327	.009	.083	.003	.026
Screen resolution	.103	1.007	--	--	--	--
Meditative learning (frequ. of medit. * yrs of practice)	**.253***	**2.022**	**.266***	**2.171**	**.246***	**2.047**
'Religious self'	--	--	--	--	**.300****	**2.977**
R^2	.09		.06		.15	

Note: * p < .05 ** p < .01

4.4 Summary and Discussion

Before summarising and discussing this study's outcomes, I would like to note potential limitations of this research, particularly those arising out of Internet-based methodology. Although the demographics of Internet-users have undoubtedly become more representative of the general population in recent years, conducting online experiments necessarily leads to some sampling constraints. This study did not directly target Buddhists living in monasteries. Hence the sample came to include mainly lay practitioners and may not be representative of some sections of organised religion. The possibility that self-selection has different implications across groups also remains. For example, it is conceivable that this Internet-based research led to the participation of more analytic thinkers in one of the groups investigated, whereas it may have attracted more holistic thinkers from another. Standardisation in recruiting and the incentives given for participation sought to minimise this possibility as much as possible. Finally, unlike research in a laboratory, some of the controls of traditional experimental research were not present. Consequently, Internet-based research always operates under the assumption that differences attributable to hardware and environment, if present and not controlled for, are randomised across conditions rather than systematic. The non-perceptual nature of most H-A tasks investigated reduced potential problems to some extent, but could not eliminate them entirely.

4.4.1 Observed Group Differences in Holistic versus Analytic Cognition

My analysis of Secular-Humanist, Anglican and Buddhist group differences in H-A cognition generated good results in support of this study's main hypothesis. Six dependent variables indicating H-A thought were included in the experiment. Four of these were core H-A measures and two were tolerance of contradictions variables.

Buddhist scores were significantly more holistic than those of Secular-Humanists on four of the six variables under investigation. Vis-à-vis the Anglican sample, Buddhists differed in the expected direction on five out of six indicators, although results were mixed for the differentiation versus compromise variable. The most convincing evidence for overall group differences emerged for categorisation, theories of behaviour and above all the holism score. Buddhists were more holistic than both the religious and secular comparison groups for those variables. They were more likely to categorise objects on the basis of family-resemblance than rules, while also scoring closer to the holistic end of the situationist-dispositionist theories of behaviour continuum and exhibiting higher agreement with holistic beliefs. Relational-contextual versus categorical grouping was the only one of the main H-A variables for which no difference was found between the Buddhist and Anglican samples.

On the grouping task, both religions scored more holistically than their secular counterparts. Religious priming also had similar effects on this task among Buddhists and Anglicans, as it led to a more categorical than contextual grouping of words. Given that Secular-Humanists were more analytic in this task than both religious groups together, the priming-induced shift toward more analytic grouping suggests the possibility of a contrast effect. Such effects often occur as a response to blatant priming (Higgins, 1996). However, although the religious prime itself was not subtle, a contrast effect usually requires an awareness of the manipulation by making a connection between the prime and the actual experimental task. It is not immediately clear whether participants in this experiment associated the rather abstract grouping measure with the priming manipulation. Another way of producing contrast effects is evident in Benet-Martinez, Leu, Lee and Morris (2002), who found that primed Asian-American biculturals with cultural identities perceived as *incompatible* or oppositional tend to

exhibit contrast effects in internal vs external attributions of behaviour. (A similar explanation has been given in stereotypes priming research where a self-vs-stereotype discrepancy can lead to contrast effects, see Wheeler & Petty, 2001, p. 816). However, it is not clear how incompatible identities could explain the effect of religious priming on grouping. If people were to generally deem category-based grouping as the more "scientific" choice, it could be speculated that the contrast effect among religious respondents occurred due to a perceived incompatibility between 'science' (what the experiment itself purports to be) and 'religion'.

Another explanation would suggest that the analytic shift in grouping following the prime is not a contrast effect, but a natural result of the mindset induced by a religious priming manipulation. This is compatible with Whitehouse's modes theory, which suggests that serious engagement with religious doctrine—necessitating degrees of sense-making and hence logical integration—is one of the determinants of semantic or analytic cognition. The lack of a similar analytic shift in categorisation may be due to the fact that the categorisation task used visual stimuli rather than concepts.

Following up on either one of those explanations would be beyond the scope of this thesis. However, future research could test these alternative hypotheses by using a subcultural identity prime on different religious and non-religious groups with various levels of adherence to doctrine. In addition, data about individual levels of doctrinal 'learnedness' (e.g. history and frequency of reading relevant texts, participation in doctrinal discussion groups, etc.), along with other religiosity variables, could be collected. A main effect of priming on analytic grouping only among religious groups would most clearly favour a contrast effect explanation. A moderation effect of 'learnedness' on analytic grouping among both religious and other 'doctrinal' groups would most clearly support a 'semantic' hypothesis.

What may explain the overall grouping differences between religious and non-religious samples in the no-prime condition? Thinking of the world in terms of relationships is indicated by Markus and Kitayama's (1991) theory that perceiving oneself as "embedded within a larger context of which one is an interdependent part," is likely to lead to a similar perception of objects or events (p. 24). If perceived interdependence (though not necessarily actual social integration) is more characteristic of organised religion than organised secular-humanism, we might find differences between religious and non-religious groups. Holistic belief ratings obtained in this study support the possibility that religious groups share a certain orientation to relationships. The holism score included beliefs reflective of relational thinking and was correlated with grouping scores. Both Anglicans and Buddhists scored significantly higher than Secular-Humanists on this variable, although Buddhists' scores were also significantly more holistic than those of the Christian sample.

An alternative explanation for the grouping results may single out Secular-Humanists rather than religious groups. It is possible that Anglicans and Buddhists are representative of the general population, while Secular-Humanists have a strong tendency to organise information on the basis of categories. Although Buddhists and Secular-Humanists had similar mean levels of education, the fact that there was a positive relationship between educational achievement and analytic grouping may point to a factor that underlies both Secular-Humanist and highly educated ways of thinking. Supplementary research on a sample from the general population would be necessary to rule out one of these two explanations.

Results with respect to tolerance of contradictions were mixed. As expected, and consistent with differences in ratings of folk theories of behaviour, Anglicans were significantly more surprised than Buddhists about an actor who appears to behave contrary to his personality. This finding is especially interesting if we consider the

marked difference attributable to ratings of surprise about a religious and helpful individual not helping, despite the fact that more Buddhists than Anglicans mentioned compassion, love and related pro-social values as being central to their religion.

There were no differences between Buddhists, Anglicans and Secular-Humanists on the differentiation vs compromise variable. However, the data suggest Mahayana Buddhists to have a higher acceptance of contradictions, as indicated by lower differentiation between the plausibility of superficially contradictory research findings. Compared to the Anglican religious group, this subgroup was significantly more compromising than differentiating in their mean ratings.

4.4.2 Religious Contexts and Holistic versus Analytic Cognition

The sample of 120 British Buddhists did not produce the expected shift toward more holistic responses when their religion was made salient first. In the religious prime condition, Buddhist respondents became significantly more surprised about a religious individual acting contrary to his dispositions. This was not the case among Anglican Christians and may be due to an invocation of the central Buddhist value of compassion by the religious prime. However, as the order effect in the no-prime condition of this measure implied, a religious context may also lead to greater surprise about a non-helpful person actually helping. Hence, perhaps primed Buddhists do become more dispositionist rather than sensitized to a religion-helping link. If so, I think that there are two possible explanations. Firstly, the modes theory of religion implies that the imagistic characteristic of Buddhism, in the form of generating religious or spiritual meaning for oneself, may lead people to see strong links between psychological states and behaviour or vice versa. In doctrinal religions, by contrast, the emphasis on orthodoxy and repetition of rituals could lead to a disjunction between true beliefs (or personality) and behaviour. Secondly, a related argument might be that having experienced a quest for meaning, either before or after conversion to Buddhism, may

account for perceptions of religiosity as an unfolding of one's "true" self. Regardless of its interpretations, findings provide general support to the religion as meaning-belief system (Spilka et al., 1985) or schema (e.g. McIntosh, 1995) perspectives, implying that religion can serve as a framework for the perception and interpretation of events.

Religiosity and religious integration were examined as possible moderators of priming and contributors to overall H-A results. Although no moderation effects occurred, Buddhists' religiosity, captured by both the religiosity index and an item measuring the centrality of one's religious self-concept, was a significant predictor of the holistic belief score. Buddhist religious integration was negatively related to dispositionist thinking. The latter provides partial support for the hypothesis derived from the cross-cultural literature (Minoura, 1992; Fiske et al., 1998; Nisbett et al., 2001; cf. House, 1981) implying a relationship between immersion in a cultural group and patterns of inference. However, as a key dimension of *social* H-A cognition, this particular result also reinforces Markus and Kitayama's (1991) view on the role of interdependence in shaping thought. Both of these findings underscore overall group differences on measures of beliefs. They also provide some support to House's (1981) proximity and components principles, which call for a breakdown of macro variables into indicators that are more reflective of culture and social structures (e.g. religion) affecting individual outcomes (e.g. beliefs).

Buddhist meditation only had an effect on holistic categorisation and beliefs, which supported my hypotheses derived from Whitehouse's cognitive theory of imagistic religions. More specifically, a 'meditation frequency' by 'years of practice' interaction variable significantly correlated with rule-based versus family-resemblance categorisation and the holism score. These findings show that there is some extent of learning of holistic thought through the practice of Buddhism, even when the strength of the Buddhist self-concept is controlled for.

4.4.3 Implications

This study was unable to support the hypothesis that Western Buddhists have a separate holistic knowledge system subject to priming manipulation, as implied by the religion as meaning-belief system theory (Spilka et al., 1985) in conjunction with research on biculturalism (e.g. LaFromboise et al., 1993; Hong et al., 1997; Ji et al., 2004, Peng & Knowles, 2003) and the H-A cognition as 'toolkit' perspective (Nisbett et al., 2001; Nisbett & Norenzayan, 2002). We are left to conclude that relatively more holistic thinking is chronically accessibility to Western Buddhists, but further priming research is needed to confirm this theory.

Results provide evidence for religious differences in H-A cognition as determined by religious group membership. As such, findings go beneath the cultural-level distinctions that have been made by Nisbett and his colleagues (Nisbett et al, 2001; Nisbett, 2003). In terms of the 'religion and cognition' model used in this thesis (Fig. 4.1), an independent influence of religious 'cultural content' and 'social structure' on H-A beliefs or *theories* was found. This is evident in the effect of religiosity (capturing the strength of Buddhist values and practices) and the strength of the Buddhist self-concept on holistic beliefs, as well as the impact of religious integration on theories of behaviour. Meditative practices were able to predict explicit holistic beliefs, while penetrating even deeper into more implicit H-A processes in the form of categorisation.

It is likely that cognitive self-selection into both Buddhism and Secular-Humanism accounts for some of those differences, since membership in those groups tends to be the result of some sort of conversion. Compared to Anglicans, Secular-Humanists were significantly more analytic on the grouping and holism variables. The latter measure showed the most dramatic group differences, with Anglicans scoring intermediately between secular and Buddhist groups. Self-selection for Buddhists more specifically could not be ruled out (and a learning effect not supported), indicated by a lack of

influence of years of overall Buddhist practice (when age is held constant) on any of the dependent variables. However, a backing of the 'meditative learning' hypothesis by this study's data suggests that the frequency of engaging in Buddhism's core practice over time may have an effect on aspects of holistic thought.

Secular-Humanists, whose educational attainment and age was closely matched by the Buddhist sample, did not differ from Buddhists on the two variables indicating tolerance of contradictions. I believe that this is not entirely surprising, as TC appears to be a cognitive pattern related to but not necessarily indicative of H-A thought. As noted by Nisbett (2003), holism encourages the "recognition of complexity and change, as well as of contradiction among its many and varied elements" (p. 36). But in order to go from a recognition of contradictions to actual willingness to compromise or find a middle way we may also have to consider TC origins in social practices (Nisbett & Masuda, 2003) or beliefs about how knowledge can be obtained (Samson, 2004). As argued in the beginning of this chapter, Buddhists and Secular-Humanists have been said to share a critical outlook of the world that encourages reason in the form of "'personal investigation of the truth' rather than 'blind faith'" (Waterhouse, 1997, in Kay, 2004, p. 21; also Biddulph, 1996). It is plausible that a resulting complexity in epistemological thinking can account for the groups' similarity in tolerance for contradictions. Alternative measures of TC are needed to develop this argument further.

Religious priming had an effect on the variable with the most explicit religious content among Buddhists. Moreover, the strongest evidence for overall group differences in H-A thought were manifested among reflective inferences in the form of holistic beliefs and folk theories of behaviour, which, among Buddhists, were themselves also predicted by religiosity and religious integration. Findings thereby demonstrate a theoretical link between values or attitudes and the self-concept, on the one hand, and theories or beliefs on the other, as suggested by Peng et al. (2001).

However, while this study uncovered a particularly strong relationship between religion and explicit beliefs for two of the three H-A factors, the 'tolerance for contradictions' dimension did not include a more general measure of TC. I will attempt to provide additional evidence on group differences for this acceptance in the next chapter.

Chapter 5 – Follow-Up Studies

5.1 Introduction

Religious context effects in Study 1, including religious priming, religiosity/identification and religious integration, were mainly found for *explicit* H-A variables directly measuring beliefs (holism score and theories of behaviour) as well as variables with religious *content* (surprise about expectation violating behaviour). Group differences were also particularly strong for variables measuring beliefs, such as the holism score. The most consistent differences emerged between Buddhists and Anglicans with the exception of relational-contextual versus category-based grouping, where both religious groups stood apart from the secular sample. Relative to the two comparison groups, Buddhists were significantly more holistic thinkers than *both* groups for three of the measures and more holistic than either the secular or Christian group on two measures. Out of 12 (6 variables, 2 comparison groups) possible holism contrasts, Buddhists score eight, Anglicans two and Secular-Humanists zero (see Table 5.1).

Table 5.1: Relative Holism Scores for H-A Dimensions in Study 1

H-A Dimensions	Comparative Holism Score		
	Secular-Humanist	Anglican	Buddhist
1. Grouping [a] / Holism [b]	0 / 0	1 / 1	1 / 2
2. Categorisation / Theories of Behaviour [c]	0 / 0	0 / 0	2 / 2
3. TC: Differentiation / Expectation Viol. [a]	0 / 0	0 / 0	(1) / 1
TOTAL	0	2	8

Notes:
1 = signific. more holistic than one comparison group
2 = signific. more holistic than two comparison groups
(1) = Mahayana Buddhists only

Religious context effects (Buddhists):
[a] = religious prime (analytic shift)
[b] = religiosity/self-concept (holistic shift)
[c] = religious integration (holistic shift)

Although priming had an impact on grouping and surprise about expectation violating behaviour, the effect was not in the expected direction. One key question raised by these results is simply whether holistic thinking can be primed. Considering the effect of religiosity and the strength of the Buddhist self-concept on the holism score, Study 2 in this chapter tests whether a primed religious context can influence responses on this task. Study 3 seeks to further clarify the observed religious vs secular differences on the grouping task. Finally, another area of H-A thought that needs explanation based on Study 1's results is that of tolerance of contradictions (TC), where group differences were least convincing (see Table 5.1). A third follow-up study in this chapter (Study 4) extends the range of TC further by including a more explicit or higher-order TC variable along with one that has quasi-religious *content*.

5.2 Study 2: Priming Holistic Beliefs among Western Buddhists

Study 1 could not support the expected effect of a Buddhist religious prime on holistic thought. Several explanations for the missing priming effect in the expected direction are possible. The first explanation would hold that H-A *cognition* is not subject to contextual variation and hence cannot be influenced by means of priming, but this is not supported by past research. Some aspects of H-A cognition have already been successfully primed in the past, such as a language prime for grouping (Ji et al., 2004), an identity prime for attributions of physical causality (Peng & Knowles, 2003) as well as a pictorial prime for social attributions (e.g. Hong et al., 1997; Benet-Martinez, et al., 2002). In addition, Study 1 shows overall effects in grouping across both religious groups, which indicate that H-A thinking can in fact be manipulated. (However, there were no differences across religious groups and priming tended to lead to more analytic thinking.) The possibility that different dimensions of H-A thought are not all equally susceptible to priming, on the other hand, is more plausible.

A second explanation of the first study's findings may claim that *religious contexts* cannot be primed. This is an unlikely option, as the results of Study 1 demonstrated that a religious context could be successfully induced. However, differences were only evident in Buddhist ratings of 'surprise about expectation violating behaviour', which had the most explicitly religious content (religious setting; religious value of compassion), as well as related beliefs about behavioural attributions.

In light of the relationship between holistic beliefs and religiosity/identification, a more convincing explanation would state that both H-A cognition and religion can be primed, but religious priming did not adequately activate relevant knowledge. Asking people about their religious practices, identification and values does not also activate a meaning system associated with H-A cognition. It is possible that a different prime would more successfully activate holistic cognition. In addition, a shortening of the

study can allow for the possibility of priming effects decaying with elapsing time and the number of tasks completed. Although the completion of multiple tasks in priming experiments is not uncommon (e.g. Lido et al., 2005), it is possible that certain tasks interfere with the activated knowledge by a "restacking" of accessible cognitive constructs (Higgins, 1996, p. 148). In Study 1, the holism score was completed as the last H-A measure, which may explain why it was not affected by the priming manipulation, even thought it strongly correlated to the strength of the religious self-concept.

5.2.1 Hypotheses and Measures

Hypotheses

Due to strong group differences found in Study 1 for the explicit holism score, along with the effect of religiousness, we would expect the Buddhist priming condition to either directly influence holism (a main effect) or indirectly through the strength of the religious self-concept (a moderation effect). Relational-contextual vs category-based grouping, the implicit measure corresponding to the holism score, did not co-vary with religiosity or religious integration. In fact, it showed a shift in an analytic direction as a result of the Buddhist prime. Hence, we should not expect to find a holistic shift for the grouping task.

Prime

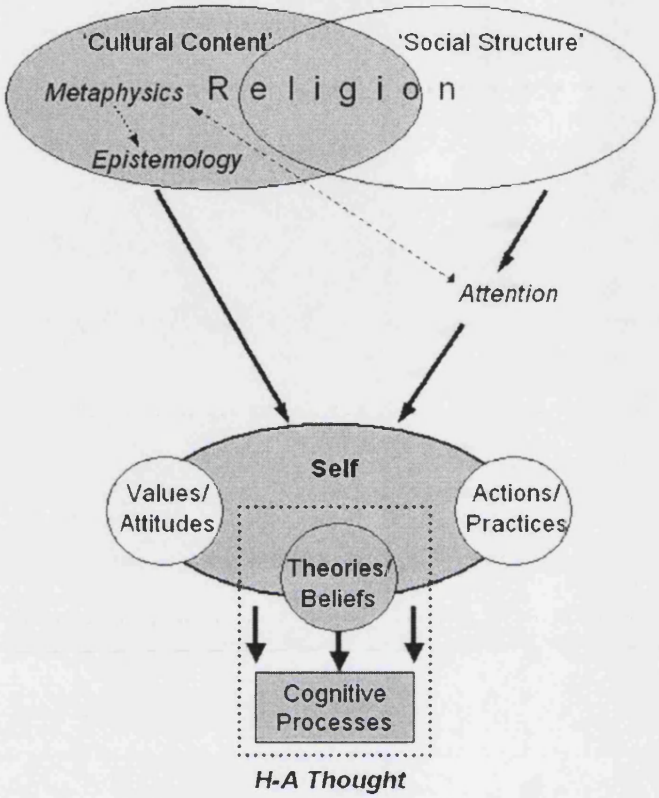
This experiment used pictorial primes, designed as a cue for participants to reflect on cultural or religious beliefs. Study 1's findings on meditative learning and family-resemblance based categorisation, which backed the distinction between doctrinal (e.g. Anglican) and imagistic (e.g. Buddhist) modes of religion, suggest that using a perceptual stimulus may be more effective in creating a religious context. The most universally recognised symbol for Buddhism, the 'Wheel of Life', was presented to participants who were then asked to summarise (in no more than 2-3 sentences) the

beliefs that they thought were represented by the symbol. In a comparison and "neutral" condition, American and Swiss flags, respectively, were shown and participants asked to summarise the *cultural beliefs* that they thought were associated with those countries. The American prime condition served as a cultural comparison that was aligned with participants' ascribed identity as Americans. The Swiss cultural comparison, representing a European country with Christian heritage and political neutrality, was chosen as a "neutral" comparison condition, because it did not match participants' ascribed identity as either Americans or Buddhists.

In sum, this study seeks to establish a link between H-A cognition and the 'cultural content' of Buddhism, through the metaphysical and epistemological beliefs symbolised by the 'Wheel of Life', and by means of the 'Self' as a switching mechanism between relatively holistic and analytic thought (Fig.5.1; relevant concepts in grey). Two related H-A measures are the dependent variable – holistic beliefs (an explicit or 'theories' level of H-A thought) and H-A grouping (a more implicit measure). Based on Study 1's findings, we cannot expect the ideas evoked by the religious prime to have a 'trickle down' effect on grouping in a holistic direction.

Fig. 5.1: Study 2 Model

Fig. 5.1: Study 2



Dependent and Moderating Variables

For this experiment, H-A variables consisted of the holism score, which was strongly correlated with Buddhist religiosity, and its implicit kin, the relational-contextual vs category-based grouping measure. The 'religious self' or degree of religious identification question was included as a potential moderating variable in this experiment, as it was most strongly associated with individuals' holism score.

5.2.2 Method

Participants

Ninety-six American Buddhists from four Buddhist organisations participated in the experiment, eighty-two (61 female, 21 male) of which met the criteria of being white American-born US residents and were included in the analysis. Respondents were between 23 and 74 years of age (mean of 53.1), half of which were educated to postgraduate level. Participants were rewarded with a chance to enter the prize draw and a small (US$1) donation to the organisation through which they were recruited.

Design and Procedure

The same Internet-based design used in Study 1 was adapted for this experiment, with a JavaScript-based random assignment to conditions. Participants first completed the priming task, presented to them as a symbol interpretation task as part of my PhD work. They then completed the grouping and holism score measures, introduced to them as an unrelated pilot study. At the end of the experiment, participants accessed a page with the opportunity to enter their email address for the prize draw and a debriefing text.

5.2.3 Results

Main Effect of Priming

Participants' answers to the pictorial primes were diverse. A selection of examples of cultural and religious beliefs mentioned by individuals is provided below.

Buddhist Prime:

- Cycle of birth and death, karma and reincarnation, interconnectedness of life
- Actions and intentions have consequences; interdependent origination
- Realms of existence/experience
- "You keep going around until you get it right"
- "We are trapped in a cycle of birth and death but through enlightenment we can escape that cycle"

American Prime:

- Individual choice, freedom, right to choose and speak freely
- Democracy, equal opportunity, progress, "American dream"
- Diversity, melting pot, different interests united
- Materialism, greed, (religious) fundamentalism, tyranny

"Neutral" (Swiss) Prime:

- Autonomy, independence, neutrality

- Duty, stability, dependability, hard work
- Compassion, Christianity
- Peace, simplicity, multi-ethnicity

As expected, a multivariate analysis of covariance (MANCOVA) on the grouping and holism scores, including the control variables of education, age and gender, indicated no shift towards holism for grouping scores in the Buddhist prime condition, $F(2, 71) = .18$, *ns.* There was a marginal difference for the Swiss (mean = 5.48) vs Buddhist (mean = 5.81) prime contrast on the holism score, $F(2, 71) = 1.73$, $p = .067$.

Moderating Effect of Buddhist Self-Concept

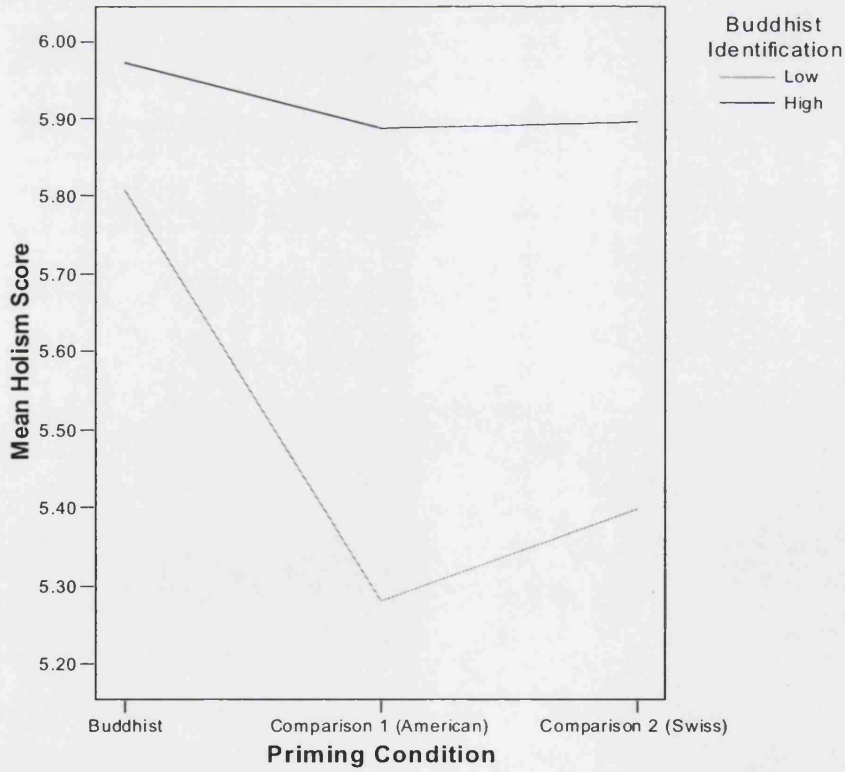
In order to analyse a possible moderating effect of the religious self-concept on priming, multiple regression with standardised (centred) independent and dependent variables was used to investigate the relationship between priming condition and holism, as done in Brown et al. (2003). This involved a recoding of the three priming conditions into two contrast variables (see also Fox, 1997, pp. 198-199) in order to better analyse the contrast of interest (the Buddhist vs comparison conditions) along with the orthogonal complement (American vs Swiss comparison conditions). The first model of the regression analysis revealed the effect of control and potential moderator variables, followed by an adding of the contrast variables in a second model and the contrast-moderator interaction terms in a final model (see Table 5.2). The addition of interaction term in model 3 decreased the significance of the 'Buddhist vs Comparison' priming contrast, suggesting a moderating effect of the religious self-concept (see Figure 5.2), with a tendency for lower-identification Buddhists to be more affected by priming. No significant effects were found for grouping (probably due to the smaller sample size in this experiment compared to Study 1), although means were in the same direction as Study 1, with the Buddhist prime actually leading to more analytic grouping choices for low-identification Buddhists (means of –4.5 for the Buddhist prime and –2.3 for comparison conditions).

Table 5.2: Standardised Coefficients for Stepwise Regression of Holism Score on Selected Independent Variables Showing Moderation Effect of Religious Self-Concept

	Model 1		Model 2		Model 3	
Independent Variable	Beta	t	Beta	T	Beta	T
Control variables						
Age	-.130	-1.195	-.132	-1.230	-.163	-1.578
Gender	-.026	-.242	.006	.057	-.015	-.146
Education	.160	1.474	.211	1.917	.166	1.558
Moderating variable						
Buddhist Self-Concept	**.404*** **	3.670	**.419*** **	3.788	**.456*** **	4.091
Contrast variables						
US vs "Neutral"			-.035	-.322	-.075	-.711
Buddhist vs Comparison			**.223***	2.059	.202	1.914
Interaction terms						
Self * [US vs "Neutral"]					-.006	-.054
Self * [Buddhist vs Comp.]					**-.293****	-2.750
R^2	.21		.25		.33	

Note: * p < .05 ** p < .01 *** p < .001

Fig. 5.2: Religious Self-Concept (Identification) Interaction with Priming Condition



5.2.4 Discussion

Study 1 demonstrated not only clear religious variations in H-A cognition, but also the importance of taking into account contexts in which those differences are produced. Holistic beliefs were significantly influenced by strengths of religiosity among Buddhists, measured by questions on religious identity, practices and values. At the same time, beliefs about the attribution of social behaviour co-varied with individuals' integration in their religious community. This was only the case among Buddhists, indicating that the effect of integration may be different across religious groups. A religious prime in the form of first asking Buddhist participants to reflect on their religion, however, did not produce the expected holistic shift in cognition. Instead, it seemed to invoke a Buddhist context of thought in the form of either the core value of 'compassion' or generally a more dispositionist view of religious actors. Resulting surprise levels about unexpected behaviour indicated greater internal attributions compared to the no-prime condition, where lower surprise levels (implying more complex attributions) consistent with holistic thought became evident. Although a religious mindset could be activated in Study 1, it appeared to supersede holistic thinking.

Using a pictorial stimulus and asking Buddhists to reflect on associated beliefs, Study 2 shows that Western Buddhists can be primed to think more holistically on the explicit holism measure. However, holistic beliefs are more chronic with increasingly strong religious self-concepts. This provides direct backing for McIntosh (1995), who argues that the degree of a religion's centrality to the self-concept affects the accessibility and activation of beliefs related to religion. It also lends further support to a need to understand the 'theories' tradition of culture and human inference in relation to that of the 'self', as stipulated by Peng et al.'s (2001) integrative theory. The importance of such an approach becomes evident in Benet-Martinez et al. (2002), for

example, who found that Chinese-Americans who saw their cultural identities as compatible responded in congruent ways to cultural priming, whereas those who perceived their identities as oppositional exhibited contrast effects.

Study 1 indicated that holism and grouping scores represent variables of the same latent dimension. Yet grouping scores were subject to an *analytic* shift as a result of the religious prime in Study 1. Study 2 again demonstrates an absence of holism shift for grouping preferences in the Buddhist prime condition, which challenges some of the assumptions about theory-cognition links outlined by Nisbett (2003). More research is needed to investigate whether the apparent lack of a holism-grouping connection is a one-off or if it is representative of other theories-cognition connections within H-A thought. If the theories-cognition relationship is similar for different types of H-A thoughts, it is possible that, while religious beliefs can be activated and applied to explicit H-A thought, they are not readily applied to more implicit H-A cognitive tasks.

If the holism-grouping dimension represents a unique case, on the other hand, it is possible that beliefs or theories are more effortlessly applied to the explanation of events, like causal reasoning evident in social attribution, than the organisation of information, such as relational-contextual vs category-based grouping. Although Ji et al. (2004) successfully triggered holistic responses by using English vs Chinese research instruments, past studies that involved non-linguistic primes (as in Study 1) aiming at the activation of values or beliefs were mainly concerned with their effect on judgments about social behaviour or physical causality. I would suggest that dimensions of H-A thought with a stronger applied 'theories' component might be more susceptible to priming.

This research provides further encouragement for studies on acculturation or biculturalism and cognition (e.g. Hong et al., 1996, 1997, 2000). From the perspective of cultural psychology, it could be said that quasi-bicultural processes are at work even

for people who do not live in a foreign country or were socialised into two cultures. However, religious contexts, though moderated by the religious self-concept, only affected explicit or beliefs-based variables.

In Study 1's sample, the average reported age at which people started to practice their Anglican religion was around ten years. Most of them stated that they were raised with their current religion. This was very rarely the case among Buddhists, where the average "age of conversion" was thirty years. Minoura (1992), discussed previously, has theorised that the age range between 9 and 14 is a crucial stage in acquiring a cultural meaning system. In his research, older children were more aware of cultural differences and exhibited greater resistance to incorporating the meaning system of the host society. Similar to Ji et al.'s (2004) explanation of the effect of language on grouping preferences, learning a new culture simultaneously with another early in life may result in cultural beliefs, just like languages, becoming representationally fused (e.g. Weinreich's [1953] 'compound bilinguals'). Acquiring a culture later in life, after another one has already been acquired, may lead to more distinct cognitive compartments (e.g. Weinreich's 'coordinate bilinguals') and hence susceptibility to priming manipulations. It would be interesting in future research to compare cognitive differences between Western 'converted' Buddhists and those whose parents had already adopted the religion.

5.3 Study 3: Religion and Holistic versus Analytic Grouping: A Correlational Approach

The only variable in Study 1 where no differences between Christians and Buddhist emerged was that of H-A grouping. I proposed two possible explanations for this finding. First, it is possible that being a member of a religious group is generally associated with organising the world in more holistic terms, as indicated by the holistic beliefs, categorisation and grouping tasks in Study 1. In the case of grouping, where religious-secular differences were most marked, greater perceived interdependence among religious individuals may also be responsible. Feelings of interdependence may be the result of religious doctrine (e.g. caring or compassion), greater social integration among religious or spiritual individuals, or both. If relational-contextual thinking is associated with interdependent self-orientations, as proposed by Markus and Kitayama (1991), one source of the religious-secular differences should be found in self-construals.

A second explanation would hold that Buddhist and Christian responses were reflective of the general population, while the Secular-Humanist group may be the one that stands out. Buddhists and Secular-Humanists had similar mean levels of education, but in the light of the positive relationship between levels of education and analytic grouping, there may be something about the Secular Humanist world view akin to that of highly educated individuals.

Another question that arose in Study 1 pertains to the possibility of self-selection. Unlike many Christians, most Secular Humanists and Buddhists made a decision at some point in their lives to join a group or organisation dedicated to their creed. As a result, the proportion of cognitive differences due to self-selection rather than enculturation cannot be known. Ideally, research on H-A self-selection into religious groups would try to obtain a sample of individuals who are about to convert, but it

would be a very difficult task to find such a sample from the general population. There was some evidence for learning effects through Buddhist meditative practice over time in Study 1. Nevertheless, we can expect that individuals' attraction to the ideas espoused by those creeds is greater among potential joiners. The following small experiment on American students is designed to provide answers to issues about Buddhist vs secular grouping differences in the light of possible self-selection issues.

5.3.1 Hypotheses and Measures

Hypotheses

Evidence for a H-A cognitive self-selection effect into Buddhist or Secular Humanist groups would be evident in a correlation between an attraction to those worldviews and grouping. An effect of only the strength of the religious self-concept on grouping, on the other hand, would provide greater support for a 'religious learning' (practice effect) hypothesis. If the strength of the religious self-concept, along with liking of Buddhist ideas, are associated with holistic grouping, the hypothesis of grouping differences due to religion is supported. If this occurs with a correlation between attraction to Secular Humanist rather than Buddhist ideas and analytic grouping, we would find support for the hypothesis that grouping differences are the result of secular thought. Both of these cases, however, suggest self-selection and socialisation or learning effects operating together.

Hypotheses Study 3:

H1: 'Self-selection':	*Liking of B or SH*	→	*H or A grouping*
H2: 'Religious Learning':	*Religious self*	→	*H grouping*
H3: 'Religious Difference':	*a. Liking of B*	→	*H grouping*
	b. Religious self	→	*H grouping*
H4: 'Secular Difference':	*a. Liking of SH*	→	*A grouping*
	b. Religious self	→	*H grouping*

If Markus and Kitayama's (1991) theory were correct, we would expect variations in independence-interdependence to be reflected in grouping. If such an effect occurred along with a relationship between INDINT and the religious self-concept, there would be evidence in support for a hypothesis that religious differences in grouping (3) are caused by (at least in part) greater interdependence among people who practice a religion or spirituality.

H5: 'Indep.-Interdep.' *INDINT* → *H-A grouping*
H6: 'Religion and Interdependence': Religious self → *INT*
H7: 'INDINT explanation of religious difference': *H3 + H5 + H6*

Measures

Texts expressing the beliefs underlying Buddhism and Secular Humanism were taken directly from the most popular Internet sites on the subjects.[12] Only minor editing was necessary to ensure equal length. The Secular Humanist text consisted of the principles behind the creed, such as a concern for the growth of humankind on the basis of reason rather than blind faith, openness to the exchange of ideas as well as a preference for scientific methods of inquiry. Buddhist beliefs centred around text on Buddha's Four Noble Truths and the Noble Eightfold Path, covering concepts of impermanence, craving, suffering, compassion and self-awareness. These beliefs were relatively universal and non-sectarian, similar to those epitomised by the Wheel of Life used in Study 2. Likeability, familiarity and understanding of those ideas were measured on 7-point scales (ranging from 'not at all familiar'/'very easy [to understand]'/'strongly dislike' to 'very familiar'/'very difficult'/'like very much'). The second question (understanding) was reverse-coded in order to reduce acquiescence effects. Participants

[12] A word search for 'Buddhism' and 'Secular Humanism' was conducted on *Google* the search engine, which automatically returns sites ranked by relevance. For Buddhism, the site was buddhanet.net, for Secular Humanism it was secularhumanism.org. Both of these sites are dedicated to providing an educational resource to the public about those worldviews.

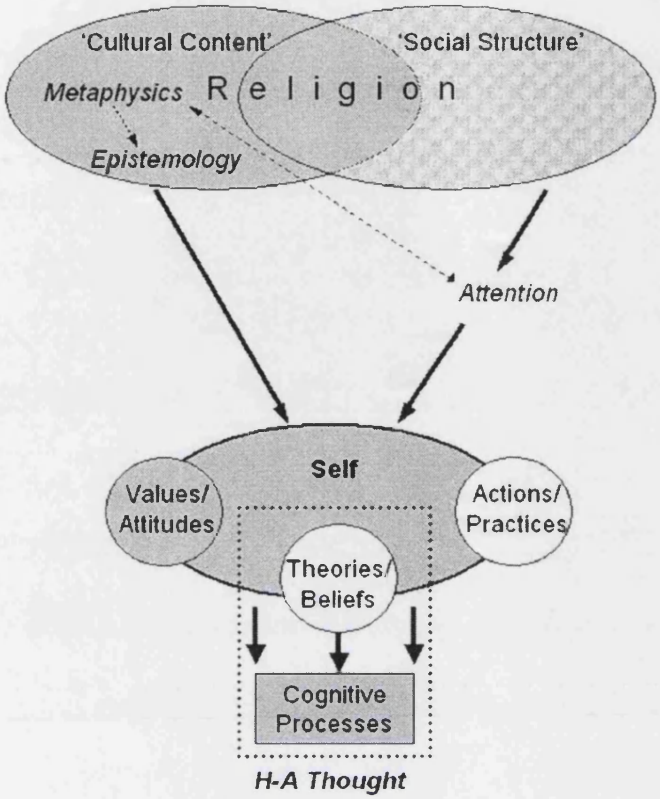
also answered a question about their own religious identity and the question measuring degrees of importance of that self-concept, which were used in Studies 1 and 2.

Jung and Polyorat's (2005) short version of Independent versus Interdependent (IND-INT) self-construals scale originally developed by Singelis (1994) was used, consisting of 12 items with 7-point Likert-type scales (ranging from 1-disagree strongly to 7-agree strongly). Independence was indicated by agreement with statements such as 'I enjoy being unique and different from others' or 'I act as a unique person, separate from others'. Interdependence involved statements like 'My happiness depends on the happiness of those in my group' or 'I would sacrifice my self-interests for the benefit of my group'. An overall INDINT score is obtained by subtracting the independence score (mean of 6 IND items) from the interdependence score (mean of 6 INT items), resulting in positive values indicating relatively greater interdependence. The grouping measure was the same as in Studies 1 and 2.

The introduction of an INDINT variable in this study represents an individual-level attitudinal measure of the 'self' in relation to 'social structure' (Fig. 5.3). The study as a whole examines possible connections between attraction to the teachings of Buddhism or Secular-Humanism ('cultural content' that may or may not be reflected in individual 'values'), self-orientations (INDINT 'values') and H-A thought in the form of grouping choices ('cognitive processes').

Fig. 5.3: Study 3 Model

Fig. 5.3: Study 3



5.3.2 Method

Participants

105 American-born students (66 white, 39 non-white) with mean age of 24.3 years participated for psychology course credit at a Californian community college.

Design and Procedure

The study was designed to be correlational. Participants were randomly assigned to one of two question order conditions (Secular Humanism first versus Buddhism first) in order to achieve a counterbalance. After answering demographic questions, they first completed the grouping task. Participants then read the Buddhist and Secular humanist texts and rated their familiarity, understanding and liking of each. This was followed by

the INDINT questions. Finally, they were asked their religious affiliation and the strength of the religious self-concept.

5.3.3 Results

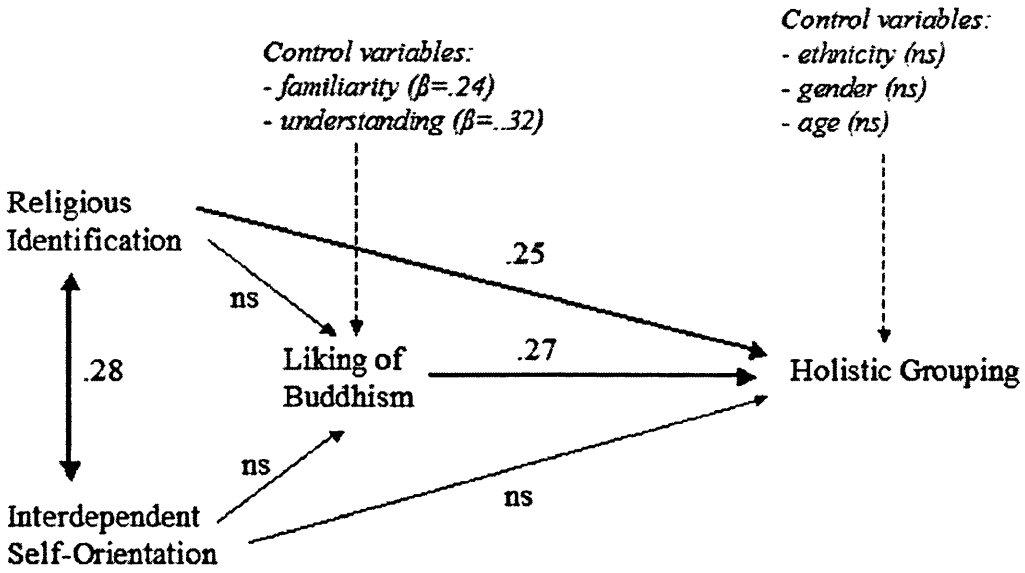
As we would expect, Asian-American students' (about one-third of who identified with Buddhism) scores were more holistic on grouping (mean = 0.2, vs -1.3 for white and –1.0 for other non-white) and more interdependent on their INDINT ratings (mean = -1.1, vs –1.8 for white and –2.0 for other non-white). They also were more familiar with Buddhist ideas (mean = 5.2, versus 4.1 for white and 4.3 other non-white). Other American-born ethnicities (mainly Hispanic/Latino) did not differ from white Americans on any of the variables and were kept in the sample, while ethnicity was controlled for in all analyses.

A correlational path model (Fig. 5.4) was constructed in order to simplify the analysis. This was based on a regression of grouping scores on all independent variables (Religious self, INDINT, Liking of Buddhism [or Secular-Humanism, in a separate regression]), controlling for understanding of and familiarity with Buddhist [or Secular-Humanist] worldviews, as well as demographic variables. Liking of Buddhism [Secular-Humanism] was regressed on INDINT and the religious self-concept (identification), controlling for understanding of and familiarity with Buddhism [Secular-Humanism]. Finally, a bivariate correlation was run between religious self-concept (identification) and INDINT.

The data in this sample do not support the hypothesis (H4) that attraction to Secular Humanist ideas is associated with analytic thinking as measured by the grouping variable. Buddhism, on the other hand, appears to attract relational-contextual thinkers (H3a), as evidenced in a significant correlation between the liking of Buddhist ideas and holistic grouping (H3a; see Figure 5.4). At the same time, there is an independent effect of the strength of the religious self-concept (identification) on grouping, with a tendency

for more religious individuals to be relational-contextual thinkers.[13] Taken together, these results lend support to both a cognitive self-selection (H1) and religious learning hypothesis (H2). More importantly, it suggests that the secular versus religious grouping differences found in Study 1 are more likely due to the effect of religion (H3) than that of Secular Humanism (H4).

Fig. 5.4: Effect of the Religious Identification (Self-Concept), Liking of Buddhism on H-A Grouping



Self-orientations could not directly predict grouping preferences, as suggested by Markus and Kitayama's theory (H5), while interdependence ratings varied with degrees of the religious self-concept (H6). Consequently, the independence-interdependence hypothesis of religious difference (H7) could only be partially supported. Nevertheless, although neither INDINT nor the strength of the religious self-concept ratings can be assumed to be causally prior, it could be argued that there is an indirect effect of self-orientations on grouping. This is because feelings of interdependence or independence

[13] Although both religious self-categorization and degrees of religious identification were measured, the data suggest no added benefit from the inclusion of self-categorization (secular vs religious), as self-identified secular individuals—including agnostics and atheists—gave corresponding (i.e. low) ratings on the scaled religious identification variable. In fact, the use of a religious self-categorization by degrees of identification interaction variable yields very comparable results.

should influence the magnitude to which an individual perceives group membership (i.e. religion) as an important part of who they are.

I would like to suggest three explanations for the finding that there is no *direct* effect between INDINT and grouping. First, it may be the case that INDINT scores are too abstract to map onto a more implicit measure like grouping. Degrees of importance of religion in an individual's self-definition, by contrast, are a concrete application of self-perceptions in relation to group membership. Perhaps future work on INDINT scales would benefit from a focus on self-ratings applied directly to group memberships, such as religion, being a student, employee, etc.

Secondly, it is conceivable that self-orientations correspond to certain ways of organising the world only across cultures due to profound differences in socialisation that cannot be found in within-cultural variations. A more convincing third reason for the result may lie in differences between measures about how the world is organised in contrast to explanations of causality, discussed in the previous study, where holistic beliefs could not predict holistic grouping preferences. Markus and Kitayama propose that "[i]f one perceives oneself as embedded within a larger context of which one is an interdependent part, it is likely that other objects or events will be perceived in a similar way" (1992: p. 24). The lack of relationship between INDINT beliefs and grouping in this study indicates that it may be true that the perception of events (e.g. behaviour) is influenced by self-orientations, but that the same does not apply to objects (e.g. organising information). In fact, the correlation between religious integration and situational explanations of behaviour found in Study 1 bolsters this explanation. All of these proposed explanations warrant future investigations into the relationship between INDINT self-orientations and H-A cognitions.

5.3.4 Discussion

One of the questions that emerged in the previous two studies was why religion, particularly Buddhism, has a stronger effect on explicit H-A thought. I would propose that this is the case because the implicit variables used in this research, namely categorisation and grouping, are only weakly related to explicit beliefs. The causal path described by Nisbett (2003), leading from social organisation to theories and lastly cognition may apply to the explanation of events, but less clearly the organisation of information. The latter is more likely to be the result of both beliefs and social factors. Study 3 provides some evidence in support of this proposition. It shows that self-concepts that are strongly influenced by religious group membership are associated with holistic grouping choices, although INDINT ratings at best had an indirect effect on that variable. In Study 1, holistic choices in rule versus family-resemblance based categorisation were empirically related to theories supporting complex social attributions. From the perspective of intuition, rule-based categorisation, just like dispositionist thinking, can be seen as a form of essentialism. The theory supported by Nisbett and colleagues holds that greater interdependence leads to perceptual field-dependence (not measured in this thesis), which in turn should influence attention to whole-object attributes rather than individual features.

I would suggest that the results of this research, fused with Peng et al's theory about values, theories and self approaches to cognition, calls for a two-pronged causal chain between social systems and human cognition, which validates the conceptual model used throughout this thesis. The first chain takes into account social structures that influence perceptions. It may best answer the question what information is attended to and enters the reasoning process. The second of these is interested in cultural content in the form of values and beliefs that may inform individual cognitive inferences. It represents the question of how norms and theories are applied to the information in

order to arrive at a judgment. In this process, the self-concept may give greater or lesser weight to different cognitive alternatives.

5.4 Study 4: A New Look at Tolerance of Contradictions

Among the three H-A dimensions that emerged out of the first study's data, tolerance of contradictions (TC) was the dimension with the weakest evidence for group variation, whereas the other two H-A areas showed clear differences between the Buddhist and secular samples. There was some support for the hypothesis that Buddhists are more tolerant of contradictions than Anglicans, while Secular-Humanists' TC level fell between those two groups. TC was measured by virtue of its application to concrete instances (i.e., the plausibility of scientific research findings and surprise about particular actors' behaviour). While religious cognitive differences in the other two dimensions of H-A thought were most evident in explicit variables measuring folk epistemologies or metaphysics, TC did not include a higher-order variable or more general measure of TC beliefs.

In Study 1, contradictions were relatively implicit. In the case of surprise about expectation violating behaviour, contradictions were evident in the contrast between stated personality type and actual behaviour. In the differentiation versus compromise task, contradictions were the result of seemingly incongruent information. In order to investigate this area further, two additional measures will be used that extend the range of TC from the reflective to the intuitive, while also making contradictions more explicit. The first of these is represented by an explicit beliefs-based TC variable developed by Chan (2004). The second dwells deeper in the realm of the counter-intuitive (CI), a quasi-religious region of thought that has been likened to a form of TC by Franks (2003) and Samson (2004). As argued in Chapter 3, TC and CI primarily overlap based on the common property of acceptance for the *unexpected.* In contrast to TC measures in Study 1, contradictions in CI concepts are not explicit unless their unexpectedness is made salient. This is done by taking into account individual expectations of CI concepts before presenting a counter-factual scenario. Results will have the potential to show

whether there is indeed a difference in TC between Buddhist and Anglican groups while clarifying the more ambiguous position of Secular-Humanists.

5.4.1 A Higher-Order Tolerance for Contradictions: Hypotheses and Measures

In the light of existing results for the area of TC and H-A measures, we would expect a beliefs-based (explicit) measure of TC to elucidate group differences. A strengthening of the finding that Buddhists exhibit higher TC scores than Anglicans but not necessarily Secular-Humanists would lend further credibility to the results of Study 1. An absence of difference between secular and Buddhist samples in that area would also reinforce arguments that TC does not clearly follow the logic of other areas of H-A thought, where Buddhist were unmistakably more holistic than Secular Humanists.

Alternatively, if Buddhists turn out to have higher TC than all of the comparison groups, overall H-A differences found in Study 1 would be bolstered, while further supporting the importance of reflective, higher-order beliefs in explaining H-A distinctions across religions. Finally, differences between religious and non-religious groups, or no difference between any of these samples, would detract from the suggestive findings about TC in Study 1 and drive a conceptual wedge between TC and core measures of H-A thought.

Chan (2004), a researcher in the psychology of work, claims to have developed a measure that taps into a higher-order 'tolerance of contradictions' (TC). He devised a 10-item TC index consisting of agreement ratings with statements such as 'People who maintain that it is possible for two opposing interpretations of the same event to be both true are illogical or unrealistic' or 'In assessing whether someone is supporting a team, team members often make statements such as 'He is either for us or against us'. Team members who make such statements fail to see many other real possibilities'. In a study conducted with Asian participants, Chan presents both convergent and discriminate

validity evidence in favour of TC as a separate construct. As expected, he shows TC to be correlated with certain personality constructs. For example, TC was positively related to tolerance of ambiguity and negatively related to personal need for structure, although it is not clear whether these associations indicate greater open-mindedness or simply apathy among high TC scorers. Importantly, however, research by Dubin (1994) found Buddhists to have greater tolerance of ambiguity than other religious groups, rendering Chan's TC scale (as a separate but related construct) an even more compelling measure to adopt in a study of religious differences.

5.4.2 Tolerance for Contradictions in Counter-Intuitive Concepts

Theoretical Background

In cross-cultural psychology, TC has been investigated as the result of culturally-derived epistemological beliefs and social practices. Cognitive anthropologists (see Chapter 3) have discussed supernatural representations as violations of universal intuitively held beliefs (Sperber, 1996; Boyer 1994, 2000; see also Franks, 2003; Sperber and Hirschfeld, 1999; Lawson, 2001). Counter-intuitive beliefs are "explicit modification of intuitive concepts" (Pyysiäinen, 2004, p. 143) that are inherently contradictory and as such can be likened to a form of TC that prevails in religious domains (Franks, 2003; Samson, 2004). For example, a person who can walk through a wall violates our intuitive knowledge of the law of physics, while a person who can predict the future contradicts our intuitive knowledge of psychology. Studies have shown counter-intuitive concepts to be more memorable under some conditions and hence enjoy a cultural transmission advantage (Boyer & Ramble, 2001; Barrett & Nyhof, 2001; Lisdorf, 2004; Norenzayan & Atran, 2003).

Research also indicates the counter-intuitive category of persons—rather than artefacts or animals—to be a promising area for an investigation of group differences. This is the case for three reasons. First, Boyer and Ramble (2001) found that Buddhist

monks in Asia, unlike French students, have higher recall rates for artefact violations than person violations, implying that they are more used to (or tolerant of) person violations in supernatural concepts. Second, Boyer (2000) has theorised that we should expect supernatural templates activating our theory of mind expectations to be more salient, because they are more socially and culturally relevant. Such concepts include all members of the person category or a transfer of psychological expectations to a member of the artefact category. Third, person or theory of mind violations are probably the most central and cross-culturally similar types of counter-intuitive representations in the religious domain (cf. Barrett & Keil, 1996).

The Role of Surprise and Predictability

The so-called 'bizarreness effect' (e.g. Hirshman, Whelley, & Palu, 1989; Michelon, Snyder, Buckner, McAvoy, & Zacksa, 2003; Worthern, Garcia-Rivas, Green, & Vidos, 2000) relates to phenomena investigated in cognitive psychology that are akin to the recall of counter-intuitive concepts, but it has been largely disregarded by the cognitive anthropological literature. The effect refers to the memory advantage of atypical or incongruous stimuli, such as the sentence 'the pig fed the farmer' or a depiction of a thing that is half toaster and half horse. It has been found that such items are better recalled if they are presented alongside common items (see Worthern et al., 2000, for a summary).

Examples of incongruous visual information, such as the toaster-horse, have been found to improve the frequency of recall mainly due to an *elaboration effect*, an enhanced cognitive effort in the encoding of information (Michelon et al., 2003). Alternatively, Hirshman et al (1989) have proposed a *surprise effect* due to the expectation-violating nature of such bizarre items. Consider bizarre sentences like 'the rattle put the baby in its mouth', used in Hirshman et al. (1986; Experiment 6). The researchers found that reducing surprise by making people aware of the bizarreness and

normalness of sentences (i.e. adding the parenthesised word 'normal' or 'bizarre' in the sentence, such as 'the baby put the rattle [normal] in its mouth') made the rate of recall of bizarre items similar to normal ones.

To my knowledge, the 'bizarreness effect' literature has not examined counter-intuitive concepts. However, *surprise* effects seem to have characteristics shared with Upal, Owsianiecki, Slone, & Tweney's (2005) notion of the memorability of counter-intuitive concepts as rooted in levels of *predictability*. Upal and colleagues hypothesise that the superior memorability of minimally counter-intuitive concepts occurs in contexts of low predictability along with a high postdictability. Predictability is related to expectations and should lead to varying levels of surprise, while postdictability is associated with a sense-making process. More precisely, predictability depends on the prior context in which a concept appears in any given narrative context. Norenzayan and Atran (2003) showed that predictability of CI items could also be lowered by including normal or natural concepts. This was done in a study that was presented as a memory exercise, requiring participants to learn counter-intuitive items from a list. When non-natural concepts were presented alongside intuitive ones, rates of recall and degradation depended on the ratio of intuitive-to-counterintuitive concepts. Lists with only few counter-intuitive concepts and mostly intuitive ones enjoyed the highest rate of overall delayed recall and the lowest rate of memory degradation.

In sum, findings from both the psychology of bizarreness and counter-intuitiveness indicate that low predictability is a key factor for levels of surprise, which in turn leads to variations in memorability.

Belief vs Acceptance

Boyer and Ramble's (2001) investigation of non-natural concepts asked individuals to categorise representations as 'normal', 'possible but very rare' and 'impossible' in order to determine their inclusion in the counter-intuitive category. For the purpose of

an assessment of a *tolerance* for counter-intuitiveness, a better approach may be to also measure people's surprise about intuition-violating beliefs, as done in Choi and Nisbett's (2000) experiments on expectation violating behaviour adapted in Study 1 of this thesis. Surprise is used as an indicator of the ability to 'accept the unexpected'. Indeed, Huss (2004) has argued that Peng and Nisbett's tolerance for contradictions is essentially about *acceptance*, not *belief* per se. According to Huss, actual beliefs are more involuntary than acceptance; they are feelings aimed at the truth. Acceptance, by contrast, is an act of the will—a suspension of disbelief. A dramatic example may be that of a lawyer who accepts the innocence of her defendant, even though she believes him to be guilty. A greater ability to accept an event to be true should be reflected in lower levels of surprise if, contrary to expectations, it turns out to be true.

In Study 1, surprise about expectation violating behaviour was investigated. In that measure, two pieces of information were contained in a story: one about a target actor's predispositions and the other about his actual behaviour. The apparent contradiction arose because, intuitively, we would expect a person to behave in line with the dispositions (e.g. helpfulness) that are made explicit in the story, leading to surprise if the resulting expectations are not met (e.g. not helping). Similarly, counter-intuitive representations contain contradictions that arise from what we intuitively know or expect a person's physical or psychological capabilities to be (e.g. able to have false beliefs) and what s/he is represented to be (e.g. capable of in supernatural thought, such as being all-knowing). However, unlike the 'Bad Samaritan' example, information on which expectations can be based is not made explicit in non-natural concepts. Someone who is not surprised about the idea of a supernatural person may simply have stronger beliefs in the existence of such unusual beings. Hence, one way to get at actual tolerance or acceptance would include the measurement of baseline expectations about the existence of such non-natural representations. Tolerance of contradiction *arising*

from counter-intuitive representations, then, is indicated by surprise ratings that are lower than those we would anticipate based on expectation ratings. The larger the gap between those two ratings, the larger the acceptance or tolerance.

It could be argued that expectations or beliefs and surprise about counter-intuitiveness measure the same cognitive phenomenon. I do not think that this is the case. Although a person's expectation of a supernatural concept should co-vary with the amount of surprise experienced if it were true, degrees of expectation and surprise are conceptually dissimilar because their levels of representation are different. Huss' construal of actual belief as something akin to a 'feeling' (the lawyer may ask 'how likely is it that my defendant is not guilty?') and acceptance as an 'act of the will' essentially mirrors first-order intuitive and second-order metarepresentational beliefs. As argued by Donaldson (1985), the human capacity for surprise is related to the ability to have beliefs about beliefs. By asking individuals how surprised they would be if something implausible turned out to be true, we invite them to suspend (intuitive) expectations, a process that requires a capacity for second-order thought. Tolerance for contradictions about counter-intuitive concepts in Study 4, therefore, is based on levels of surprise about such concepts, taking into account baseline levels of predictability or expectations.

Hypotheses

Boyer's idea of non-natural concepts is about the violation of intuitive expectations from ontological categories, while some measures of TC have been based on less "strongly" intuitive expectations. In the measure of surprise about expectation violating behaviour used in Study 1, TC is derived from a human tendency to think in terms of dispositions, especially in contexts in which no situational information is available. Investigating TC by introducing CI content allows us to look at more strongly held intuitions that are relevant to religion.

In contrast to TC measures in Study 1, contradictions in CI concepts are not explicit unless their unexpectedness is made salient. This can be achieved by taking into account individual expectations of CI concepts before presenting a counter-factual scenario. By quantifying degrees of surprise about such scenarios, TC about CI comes to represent a measure of one's ability to "cope" with the unexpected or intuition-violating content. The religious or quasi-religious nature of CI allows us to assess whether TC can vary depending on the content of the expectation-violations individuals are presented with.

Due to their quasi-religious content, non-natural person concepts should be judged as more credible or probable (and therefore less surprising) by members of religious relative to secular groups. The first hypothesis to be tested in this study is that religious groups have higher tolerance of counter-intuitiveness (TCI) relative to the secular group, where CI_E stands for expectations of learning about the existence of counter-intuitive concepts and CI_S designates surprise about their actual existence.

H1: 'TCI': CI_E: Buddh./Angl.. > Sec.; CI_S: Budd./Angl. < Sec.

At the same time, Study 1 indicates that a general tolerance for contradictions is greatest among Buddhists. From this we can derive a second hypothesis, namely that Buddhists' TC for counter-intuitive concepts (TCCI) is higher than that of the other two groups (see Table 5.3). Higher TCCI is indicated by relatively higher values when TCI measured by surprise (TCI_S) is subtracted from TCI measured by expectation (TCI_E).

H2A: 'TCCI': $TCI_E - TCI_S$: Buddh. > Angl./Sec.

Table 5.3: Religious Groups and Tolerances for Contradictions and Counter-Intuitiveness

H-A Dimensions	Comparative Score		
	Secular-Humanist	Anglican	Buddhist
Tolerance of Contradictions (Study 1)	Intermed.	Low	High
Tolerance of Counter-Intuitiveness (CI) (Hypothesis 1, this study)	Low	High	High
Tolerance of Contradictions about CI (Hypotheses 2 + 3, this study)	Low-Intermed.	Intermed.	High

Among Secular Humanists, TCCI should also be evident in a drop of tolerance for contradictions if the source of the contradiction is rooted in intuition-violating concepts rather than intuitive items. TC should also be weakened among Christians, where supernatural content would increase the explicitness or salience of the contradiction. However, since it is a group that should tolerate quasi-religious representations, this drop in tolerance should be less severe than for the secular sample. Finally, the drop in TCCI relative to intuitive/natural control items should be least severe among Buddhists, who should have both high TC and high TCI.

H2B: 'TCCI': TCControl - TCCI: Sec. > Angl. > Buddh.

Measures

Counter-Intuitive Concepts

In order to identify counter-intuitive concepts, I conducted a confirmatory study with 53 students from a British university who participated for course credit. Measures consisted of person violations adapted from Boyer and Ramble's (2001) research on counter-intuitive concepts and their transmission. A total of eight category incongruous concepts were used. Four of those were physical breaches (e.g. 'a person who can walk through walls without damaging the walls or him/herself') and four were psychological or theory of mind breaches (e.g. 'a person who can see events as they will actually happen in the future') of intuitive expectations we hold about persons. Counter-intuitive items were randomly interspersed with so-called kind-incongruous items (what Barrett

& Nyhof, 2001 have termed 'bizarre' concepts, such as 'a person who can fell a tree with his bare hands') as well as standard items (e.g. 'a person who has short hair'). Half of the participants were asked how *plausible* they considered the concepts, while the other half rated their *surprise* about the hypothetical existence of those persons, based on a 20-point scale ranging from 'not surprised [plausible] at all' to 'very surprised [plausible]'.

As expected, the sample showed the lowest tolerance for counter-intuitive concepts and the highest for standard ones (mean difference of about 10). Ratings between bizarre and both psychological and physical counter-intuitive person concepts differed significantly, but not surprisingly, tolerance for persons violating intuitive psychology was greater than for intuitive physics. Factor analysis warranted the inclusion of three out of four items in the experiment.

Measuring First-Order Beliefs

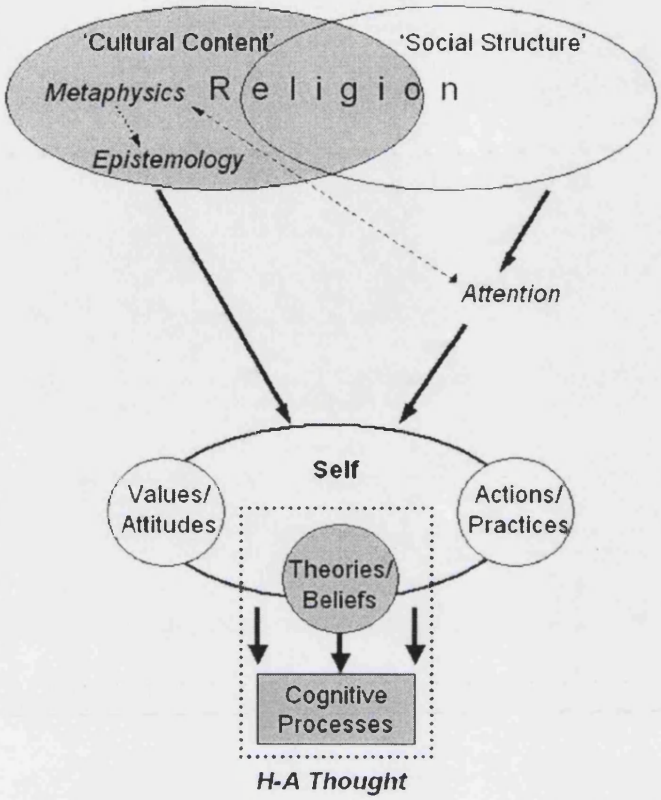
How can we measure baseline beliefs about counter-intuitive concepts? One option may be to ask people about degrees to which they think the *existence* of those persons is *possible* or likely. Unfortunately, the interpretation of such questions about intuitions of possibility, as discussed in the literature on modal logic (e.g. Hughes & Cresswell, 2001; Bealer, 2002; Melia, 2003), may itself be strongly influenced by cultural or religious differences. It would not be feasible to determine the degree to which questions of possibility are affected by second-order religious beliefs.

Hence, Boyer and Ramble's (2001) question whether concepts are 'normal', 'possible but very rare' or 'impossible' are problematic. In some groups, 'impossible' could refer to epistemic possibility, whereas other groups may tend to think of it as a metaphysical possibility (Bealer, 2002, p. 81). Epistemic possibility is a judgment based on actual knowledge. Metaphysical possibility, by contrast, is about conceivability: it is possible for a ghost to exist, even though the existence of ghosts is not known. While

the non-existence of supernatural phenomena can be falsified, this is not the case for arguments in favour of their existence, which often rely on an appeal to metaphysical claims and inherent limits of science to understand certain phenomena. The concept of faith or belief, in most religions, is all about metaphysical belief or conceivability. As a result, epistemic expectations come closest to a comparable bottom-line measure for counter-intuitive concepts. This study's baseline ratings, then, consisted of 20-point scales asking about the individuals' perceived likelihood of learning about the existence of different persons, composed of people with normal, bizarre or counter-intuitive features. Participants were then asked about their levels of surprise applied to a scenario in which certain kinds of persons were discovered and their existence verified beyond doubt. By reducing the interference of metaphysical possibility in baseline measures as much as possible, while also asking about their personal expectations (rather than a diffuse possibility), this procedure should induce a contradictions between expectations (or intuition) and the counter-factual scenario.

Broadly speaking, then, this study investigates (quasi-) religious content, reflected in individual beliefs and forms of TC ('cognitive processes') (Fig. 5.5).

Fig. 5.5: Study 4 Model



5.4.3 Method

Participants

The sample consisted of people recruited from the same organisations who took part in Study 1 one and one-half years prior to the current study, yielding a total of 62 Buddhists (mean age 47.3; 36 males, 26 females), 61 Anglicans (mean age 49.5; 29 males, 32 females) and 107 Secular Humanists (mean age 46.3; 41 females, 66 males). All respondents participated voluntarily. Response rates were 75% for Buddhists, 87% for Anglicans and 89% for Secular-Humanists. Educational attainment of people represented in the sample was similar to that of Study 1, with a median education of 'university graduate' in each group.

Design and Procedure

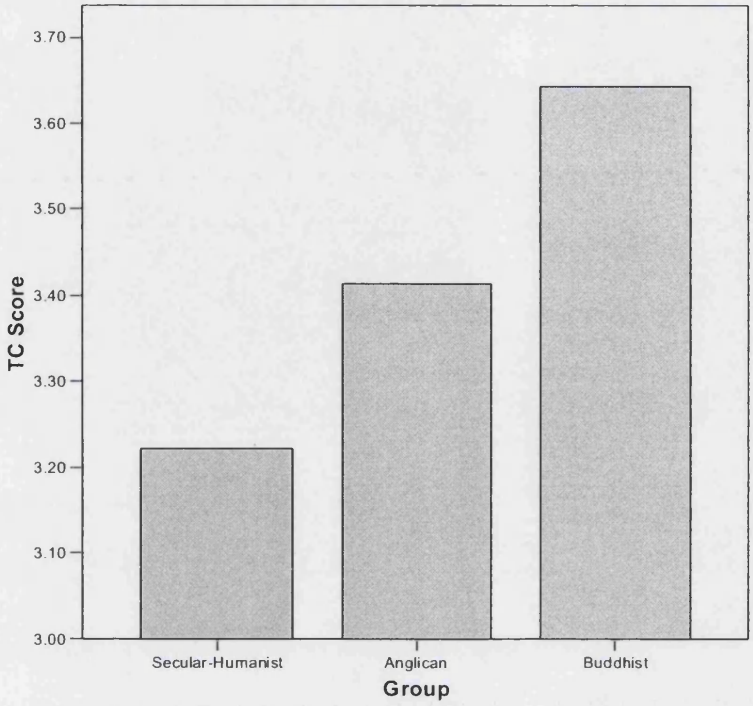
Potential respondents were contacted by email and asked to participate in a study about how people solve problems in everyday life and how they think about unusual persons. Participants first completed Chan's TC questions, consisting of ten 5-point Likert scale items (with answers ranging from 'strongly disagree' to 'strongly agree'), asking about explicit beliefs related to tolerance of contradictions. These were followed by baseline ratings of epistemic expectations in the form of judgments about the likelihood of ever learning about the existence of normal (3 items), bizarre (3 items) and counter-intuitive (6 items; 3 psychology-violating and 3 physics-violating) persons, measured on a 20-point scale ranging from 'not at all likely' to 'very likely'. In the 'counter-intuitive' condition, participants were then presented with the scenario of psychology and physics-violating concepts turning out to be true and asked about their ratings of surprise. In the control condition, ratings were done for normal and bizarre items.

5.4.4 Results

Religious Difference on the TC Score

As expected, Buddhists' TC scores (mean=3.66) were higher than those of Anglicans (mean=3.39), replicating findings about tolerance for contradictions found in Study 1. Moreover, this measure shows particularly striking differences between the Eastern religious group and Secular-Humanists (mean=3.22), mirroring finding from the beliefs-based holism score in Study 1, $F(2, 216) = 18.98, p = .000$. There was no effect of age, gender or education.

Fig. 5.6: Religious Differences on TC Score



A closer analysis of responses indicates that differences between religious and secular groups are particularly striking for agreement with the statement 'People who maintain that it is possible for two opposing interpretations of the same event to be both true are illogical or unrealistic'. For the Secular-Anglican contrast another item with strong differences was 'When my friend's view on an issue is opposite to my view, I usually think of situations in which both my view and my friend's view can be valid at the same time'. This may well be influenced by a more reconciliatory orientation towards conflict with significant others among religious individuals. The Buddhist-Anglican contrast was particularly evident in a statement that seems to tap into the heart of the TC construct, namely 'When faced with a puzzling issue in which there are two opposing but equally possible interpretations, I would typically gather information to rule out one of the two interpretations'. Finally, contrasting worldviews with respect to

moral relativism were manifested in Buddhists' lower agreement with the statement that in 'most situations, whether an act is morally right or wrong is clear cut'.

Religious Differences in Tolerance of Counter-Intuitiveness

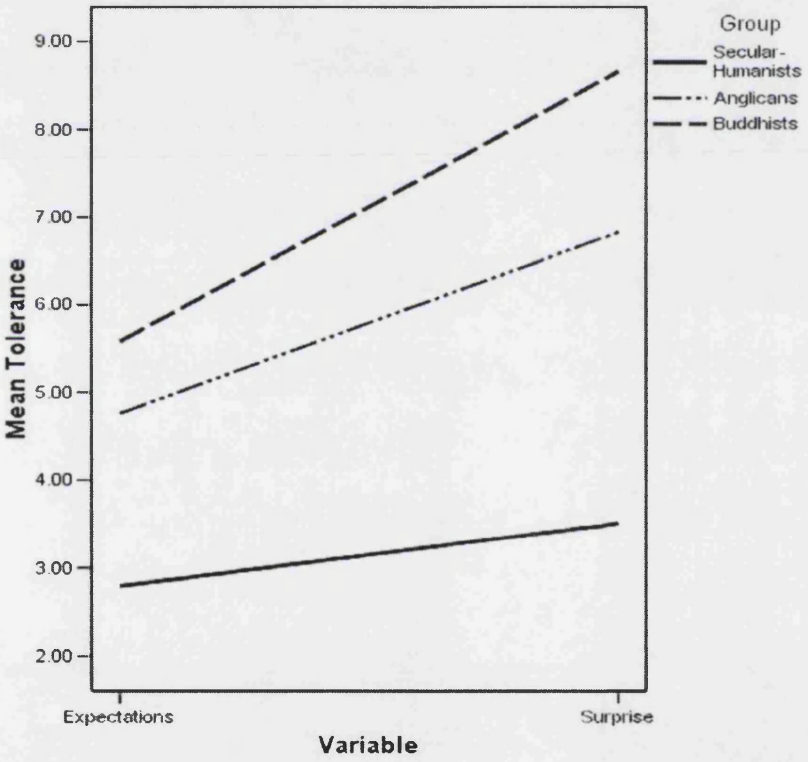
Tolerance of contradictions with different kinds of content is measured in the second part of the study, ranging from counter-intuitive to bizarre and normal person concepts. There are three types of 'tolerances' that are addressed, a general tolerance of counter-intuitiveness (TCI), a general tolerance of contradictions (TC), as well as tolerance of contradictions about counter-intuitiveness (TCCI).

A general tolerance of counter-intuitiveness is simply evident in relatively high epistemic likelihood (expectation) ratings of those concepts, alongside relatively low surprise ratings about their existence. For example, a person might give a score of 15 out of 20 for a CI concept's likelihood of existence ($TCI_E = 15$) and a corresponding 5 out of 20 rating about their surprise if the CI item did exist. Since lower surprise ratings indicate greater tolerance, TCI_S is indicated by the reverse-coded score: 15. In this example, TCI is high, but the surprise rating corresponds exactly to the expectation rating. General tolerance of contradictions (TC), on the other hand, is reflected in a lack of need for consistency between expectations and surprise for any type of representation. A 'tolerance of contradictions about counter-intuitiveness' (TCCI) would be indicated by TCI_S being greater than TCI_E. For example, a person with high TCCI might consider it unlikely to ever learn about the existence of a person who knows the future (e.g. expectation rating of 5, hence $TCI_E = 5$), while also indicating that she wouldn't be particularly surprised about their actual existence (e.g. surprise = 5; hence, $TCI_S = 15$).

The first hypothesis (H1) tested in this study was that counter-intuitiveness is more tolerated among religious groups than its secular comparison group. A multivariate analysis of covariance (MANCOVA) of religious group on both expectations of and surprise about counter-intuitive persons, controlling for age, education and gender,

confirms the hypothesis that religious groups have both higher expectations (measured on a 20-point scale, with means of 4.76 for Anglicans, 5.58 for Buddhists) and lower surprise levels (means of 13.17 and 11.34, respectively) for quasi-religious concepts compared to Secular-Humanists (means of 2.79 and 16.47), $F(2, 101) = 11.36$, $p = .000$, and $F(2, 101) = 10.31$, $p = .000$. None of the control variables had a significant effect. Figure 5.7 illustrates these differences with surprise levels reverse-coded (TCI_S). Hence a higher position of the line indicates greater overall TCI. A greater slope of the line represents higher levels of TCCI.

Fig. 5.7: Overall Tolerance of Counter-Intuitive Concepts

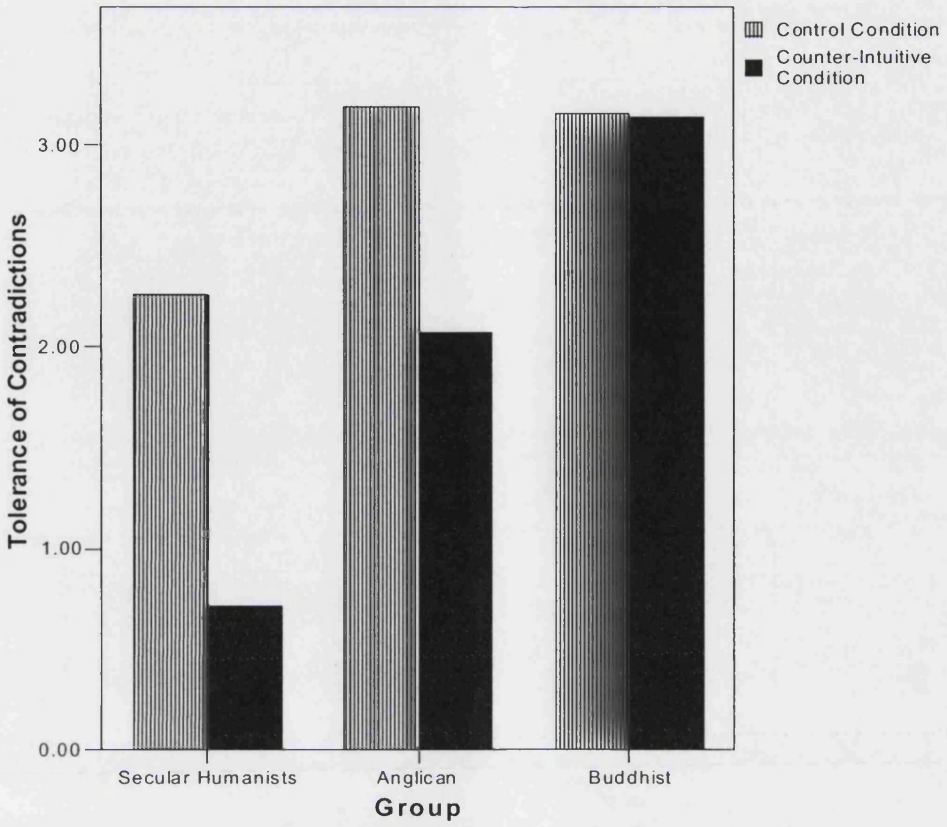


TCCI arises when the difference between the surprise-based tolerance (TCI_S) and expectations-based tolerance (TCI_E) is relatively great, due to low surprise even when, epistemically, individuals expect a low likelihood of learning about the existence of

certain person concepts. It was hypothesised (H2A) that Buddhists, a religious group with relatively high tolerance of contradictions overall, have a high tolerance of contradictions for quasi-religious content. This was in fact the case, indicated by TCCI that was greatest for Buddhists (mean=3.14), intermediate for Anglicans (mean=2.07) and lowest for Secular-Humanists (mean=0.74), $F(2, 118) = 4.80$, $p = .01$ (see Figures 5.7 and 5.8).

For groups either lacking in the religious component (Secular-Humanists) or TC component (Anglicans), tolerance levels should drop with counter-intuitive content, because the contradictions become increasingly salient. T-tests corroborate the expected difference in tolerance of contradictions in the counter-intuitive condition (H2B), which is significant for Secular-Humanists, $t(105) = -3.08$, $p < .01$, but not Buddhists, $t(58) = -.01$, *ns*. The intermediate position of the Christian sample is reflected in a significant decline of TC for counter-intuitive physics violations, $t(59) = -3.37$, $p = .001$, but not intuitive psychology breaches, $t(59) = .28$, *ns*. This was not the case in the other samples under examination.

Fig. 5.8: Tolerance of Contradictions: Control vs Counter-Intuitive Concepts



5.4.5 Discussion

Tolerance of contradictions was investigated in this study by expanding its range 'upwards', to a reflective level, and 'downwards', to a more implicit level of thought. The results of the experiment are able to both complement and strengthen findings in Study 1. Strong religious differences on the TC score directly mirror variations in H-A beliefs measured previously, with Buddhists showing levels of TC that are higher than both Christian and secular comparison groups. This places renewed emphasis on robust H-A differences with respect to explicit beliefs. A replication of Study 1 including the TC Score would be needed to confirm whether this variable clearly fits into the 'tolerance of contradictions' dimension of H-A thought or even represents a higher order variable.

By bringing the concept of counter-intuitiveness to bear on tolerance of contradictions, quasi-religious content was introduced in a more fine-grained analysis of TC. While past work in H-A and tolerance of contradictions has been primarily interested in structures or processes, the present study investigated the intersection between content and structure. It was hypothesised that religious groups would be more accepting of person concepts that violate intuitive psychology or physics. This was indeed the case, as both Anglicans and Buddhists demonstrated significantly higher expectations and lower surprise about non-natural representations than their secular counterparts.

In the 'surprise about expectation violations in behaviour' variable adapted for Study 1, expectations were not directly measured. Contradictions were implied (or made indirectly explicit) by the discrepancy between the actor's dispositions and his actual behaviour. The instrument in this study, by contrast, made contradictions explicit by both introducing more strongly counter-intuitive content and by first asking participants about their perceived likelihood of learning about counter-intuitive persons' existence before being presented with a counter-factual scenario. I expected that the salience of this contradiction would be influenced by both tolerance of counter-intuitiveness and tolerance of contradictions. Among Secular-Humanists, a group with relatively low levels of both types of tolerances, the resulting tolerance of contradictions about counter-intuitive concepts was hypothesised to be low. On the other hand, by virtue of being a religious group with high TC levels, Buddhists were expected to have high tolerance for contradictions arising from counter-intuitiveness. Anglicans, a religious group with low tolerance of contradictions, were hypothesised to score intermediately. The data provided a very good backing for this hypothesis. More specifically, it emerged that Christians' intermediate level of TCCI was the result of tolerance of contradictions that were higher for psychology than physics violations.

Perhaps a group with high TC and low tolerance of counter-intuitiveness would be a useful addition in future research in order to learn about the dynamics between the two types of tolerances. For now, the findings of this study may represent a first step in bringing together cross-cultural psychology and cognitive anthropology, fields that converge in the emerging area of 'cognition and culture' research, but approach similar questions from different directions. More specifically, future investigations should direct attention to the intersection of culture and religion. What happens when tolerance for counter-intuitiveness meets tolerance for contradictions, such as among religious groups in Eastern cultural areas? What is the effect of this convergence on the memorability, transmission and spread of quasi-religious representations?

Chapter 6 – Conclusions and Implications

6.1 Summary

Buddhism, the most popular East Asian religion in Western culture, contains metaphysical and epistemological teachings that are enmeshed with holistic thought, including compassion, the ideal of self-transcendence, assigning multiple causes to events, as well as dialectical thinking. Although there may be varying emphases on some of these teachings across different Buddhist traditions, a certain degree of homogeneity was assumed for the purpose of this thesis, which focused on Buddhists in the UK. The central theme discussed in this exploration was the question whether Westerners practicing an Eastern religion think more holistically than other religious or secular groups in our cultural region. By applying measures adapted from the cross-cultural psychology of 'holistic versus analytic' thought, four studies were conducted, consisting of one main experiment and three follow-up studies that clarified some issues raised by the initial data. Taken together, findings provide support for within-cultural differences in H-A cognition, while also raising new questions about the nature and dynamics of those cognitive patterns. Although the research upon which this thesis is based is not without limitations, its theoretical and practical implications are far-reaching, spanning from our understanding of contexts of thought to mechanisms operating between culture and individual reasoning.

Study 1 was administered to ethnically white British-born Buddhists, Anglicans and Secular-Humanists and included six H-A measures, which ranged from more implicit to explicit variables and together made up three underlying dimensions. In contrast to Anglicans, Buddhists scored more holistically on the H-A continuum in five out of six variables. The strongest group differences emerged for 'theories of behaviour' and the 'holism score', both of which were reflective, beliefs-based variables. They were also

subject to context effects among Buddhists, in the form of religious group integration and religiosity (Study 1) as well as religious priming (Study 2). The importance of religion as part of the self-concept was a moderator of Buddhists' holistic beliefs (Studies 1 and 2) and holistic grouping in a mixed student sample (Study 3). In 'relational-contextual vs category-based grouping', both religious groups stood apart from Secular Humanists in their holistic preferences. Study 3 demonstrated that this difference is more likely due to religious group membership than secular thought, although this may be partly produced by cognitive self-selection among Buddhists (see section 6.3). 'Differentiation vs compromise' and 'surprise about expectation violating behaviour' variables constituted the 'tolerance for contradictions' dimension in Study 1, but only showed significant differences between Christian and Buddhist samples. Study 4 increased the range of TC, leading to the expected and robust group differences when using either a beliefs-based TC score or making contradictions more salient.

Overall, religious differences in the results of this thesis show a diversity of thinking that goes beyond the realms of what may often be assumed to be part of religiosity, such as values, beliefs and norms associated with being a good person, coping with life or hoping for an afterlife. Although the strongest differences in H-A thought did emerge for beliefs, which were themselves subject to variations in religious contexts, there were also differences in cognitive preferences on a cognitively 'deeper' or more implicit level. Thinking processes of this kind cannot be taught directly by religious doctrine or practice.

6.2 Theoretical Implications

6.2.1 The Cross-Cultural Psychology of Holistic versus Analytic Thought

For cross-cultural scholars, the findings of this research provide both affirmations and challenges to Nisbett et al.'s (2001, 2003) H-A 'systems of thought'. The most

obvious support for the cultural *origins* of H-A distinctions is provided by the convincingly more holistic cognition present among Western groups who have adopted an East Asian religious lifestyle. However, equating H-A thought with East-West cultural distinctions implies that cognitive differences are the result of socialisation and a continued cultural reinforcement in their respective social environments. Western Buddhists' cognitive patterns confront this assumption. Buddhists in the West are only a subculture, but exhibit differences previously found only in cross-cultural studies. Considering also that their "age of conversion" does not usually occur until adulthood (thirty years on average in Study 1), and assuming that H-A differences are in part the outcome of religious practice rather than their cause, findings produced by this thesis indicate that 'culture' does not have to be internalised before adulthood in order to change cognitive patterns. In that sense, Buddhists are at a clear learning disadvantage compared to individuals who have absorbed two cultures from an early age, yet they exhibit some of the characteristics of a bicultural group. This is not only evident in their more holistic cognition overall, but also in variations due to the strength of the religious self-concept, practices and integration.

If, on the other hand, we consider holistic thought among British Buddhists as a 'natural' variation of H-A within a Western cultural area, parallels to within-cultural distributions of personality structures could be drawn. However, my results seem to challenge strong views of such a culture—personality link and cross-cultural differences. The best know of these relatively reductionist and totalising theories in the anthropological tradition of 'culture and personality' (for an overview see Inkeles & Levinson, 1969; Toren, 1996) is probably that of 'national character' (e.g. Benedict, 1946), a school of thought that generalized personality traits for whole populations and was particularly popular in the post-WWII U.S. However, my findings are not necessarily inconsistent with the 'modal personality' strand of this school (for early

work see e.g. DuBois, 1960), which allows for more within-cultural variation in psychological characteristics. Western Buddhists could simply be located on the holistic tail of the H-A distribution. Since the work of Alex Inkeles (1953), some of the modal personality ideas have 'merged' or been replaced with ideas in the 'personality and social structure' area of sociology (House, 1981), which has become more interested in investigating sub-units of culture in relationship to personality.

Results presented in this research challenge some implicit assumptions about H-A systems' internal consistency and dynamics. The six H-A indicators used in Study 1 made up three different latent dimensions that were not correlated, suggesting that the connection between components of H-A systems cannot be readily supported by empirical evidence. One of the three H-A clusters even gave rise to a paradox. Grouping preferences became more analytic as a result of the religious prime in Study 1, while its explicit sibling, the holism score, was affected in a holistic direction in Study 2. Moreover, H-A categorisation, which was presented either before or after grouping in a counter-balanced design in Study 1, was subject to an order effect (controlled for in the analysis) that was close to the magnitude of religious group differences. These unexpected findings warrant further scrutiny of the nature of H-A cognition as a whole, as well as particular contexts in which it occurs.

In Chapter 2, I noted a lack of empirical exploration of interrelations between H-A measures and no attempt to find a higher-order H-A variable in past research that could back up the 'holistic-analytic' distinction. H-A differences are not an actual dichotomy, but degrees of cognitive preferences that tie together perception/attention, metaphysics and epistemologies that seem to dominate certain cultural areas. I concluded that H-A thought should be seen as systems of theoretically related styles of information processing rather than cognitive styles. Norenzayan and Heine's (2005) distinction between true non-universals, existential universals and functional universals, discussed

in the beginning, may be a useful point of reference. According to the authors, true non-universals only exist if cognitive tasks lead to completely different preferences or solutions across cultures, regardless of context. If there is a variation only for certain functions/contexts, or if differences are based on frequency of use, we can only refer to them as 'existential universals' across cultures. The results of this thesis indicate that H-A cognition is at best about such 'existential universals'. Not only are H-A differences a matter of degree, exhibited on cultural and subcultural levels, but apparent non-universality is also strongly affected by context effects. Both expected and unexpected context effects uncovered in this thesis can be interpreted as a challenge to Nisbett and colleagues' emphasis on entrenched cross-cultural differences; at best, the findings call for the construction of more dynamic H-A models.

Peng et al. (2001) labelled the approach that Nisbett and most of his students have used as the 'theories' tradition of culture and human inference, which must be understood in a dynamic system with the 'values' (individualism-collectivism OR INDCOL) as well as the 'self' (independence-interdependence or INDINT) traditions in cross-cultural psychology. The first three studies in this thesis highlighted the importance of viewing H-A thought as the product of those processes, particularly the 'self' in relationship to the 'theories' dimension. In Study 1, the strength of individuals' Buddhist self-concept was an even more powerful predictor of holistic beliefs than the more complex religiosity measure. Study 2 showed how degrees of this 'Buddhist self' may lead to different levels of accessibility of holistic beliefs, while Study 3 illustrated its relationship to both INDINT and H-A in the form of relational-contextual grouping preferences.

Evidence in support of the 'meditative learning' hypothesis derived from Whitehouse's modes of religiosity theory indicates that religious practices (in this case meditation) have a bearing on both 'lower' and 'higher' cognitive processes. More

advanced meditation not only seemed to lead to greater holistic categorisation preferences, but also an enhanced appreciation of more reflective holistic theories, suggesting that religious practices could play a role in the absorption of 'cognitively costly' aspects of religion. This finding, along with the association between religiosity/self-concept/integration and holistic beliefs underscores the relevance of House's (1981) proximity and components principles in statistical comparisons of different sociocultural groups or positions. Group membership alone does not tell us much about the mechanisms operating at the intersection of culture and the individual, such as social integration or practices that may produce individual-level differences in thoughts and behaviours. House's view complements the socialisation or enculturation perspective inherent in most of Nisbett et al's H-A literature.

6.2.2 The Psychology of Religion

With respect to the psychology of religion, research findings on context effects suggest that religion can act as a schema (Spilka et al., 1985; McIntosh, 1995). Evidence obtained in Study 2, more particularly, lends credence to McIntosh (1995), who argues that the relative centrality of religious schemas to the self-concept should have implications for the accessibility and activation of knowledge. Differences in H-A cognition overall also demonstrate the impact of religion on thought that goes beyond the content or context of religion itself, most dramatically apparent in the implicit measures used in my research. Following past studies on causal attribution among religious populations (e.g. Loewenthal & Cornwall, 1993; Lupfer et al., 1992; Parsuram & Sharma, 1996; Spilka et al., 1985), H-A cognition may be a promising area of inquiry into cognitive mediators between religiosity and outcomes ranging from general decision making to well-being.

From the perspective of causal (social) attributions more specifically, results demonstrate no dramatic differences between Anglican and nonreligious populations.

The inclusion of non-Western religions, however, shows a possible new direction that goes beyond religious versus naturalistic attributions for events. H-A thinking, in the main, could be investigated as a possible link between religiosity and everyday thoughts and behaviours. For example, the interaction between H-A cognition, especially attribution, and degrees of religiosity, integration or identification could be studied in more detail in relationship to coping and well-being. In a more social psychological vein, the scope of causal thinking could be expanded to self and other as well as in-group and out-group attributions. Do H-A preferences across religions interact with religious values and beliefs (e.g. fundamentalism) that influence levels of out-group intolerance, or do affective components of religion drown styles of thinking in determining those kinds of outcomes? In order to address those kinds of issues, more research may be needed to reduce complex H-A systems of thought into a reliable set of coherent H-A indicators.

6.2.3 Culture and Cognition: Bringing Together Top-Down and Bottom-Up Approaches

In the introduction of this thesis, I identified the emerging area of 'culture and cognition', a field in which the search for cultural differences by psychologists has not adequately accounted for the work by cognitive anthropologists and evolutionary psychologists who are interested in cognitive universals. I discussed two relevant theories in cognitive anthropology that seek to explain how religion is transmitted: religious representations as counter-intuitive 'cognitively optimal' concepts (e.g. Boyer 1994, 2000) and Whitehouse's (2000, 2004, 2005) 'modes of religiosity' theory for more 'cognitively costly' aspects of religiosity.

Whitehouse's *doctrinal* and *imagistic* modes of religiosity seem to capture the cognitive consequences of Christian and, to some extent, Buddhist religions. The transformative power of religious experience in the imagistic mode, through practices

like Buddhist meditation, along with the study of its complex metaphysical teachings, is one possible explanation for differences in cognition outside of the religious context. Rather than the relatively passive learning and repetition of religious beliefs, values and rituals in the doctrinal mode, Buddhism may have the power to change individuals' perception and interpretation of the world around them in more profound ways. Although both Christians and Buddhists value pro-social emotions and behaviour, Buddhist teachings and practices go beneath the surface of those ideals, for example by raising a requisite awareness of interdependence in the form of a relationship between mind, body and the physical as well as social environment. The data in Study 1 showed some of the cognitive implications of meditative practices.

Unlike scholars interested in universal aspects of religion, much of the cross-cultural psychology of H-A reasoning has been preoccupied with cognitive processes that operate independently of their content, with the notable exception of causal reasoning about social behaviour. As discussed in Chapter 3, some intuitive foundations of human psychology, theory of mind and essentialism, have already captured the attention of cross-cultural researchers in this area. I argued that, in contrast to the more experience-based intuitive aspects of holism, essentialism captures analytic thought particularly well. It can be viewed as the core of how the world is organised (e.g. by categorising objects according to necessary and sufficient rules or grouping concepts on the basis of shared essences) and low TC, which often relies on the non-violation of essence properties, such as individual dispositions. Viewing people's dispositions as essences extends the concept of essentialism to the realm of social attribution. However, universal dispositionism is thought to occur only under conditions where information about the context of behaviour is absent. As a result, real-world social attributions tend to be modified by cultural theories about the causes of behaviour. Clearly,

dispositionism lacks the strong intuitive foundations that are violated in non-natural counter-intuitive beliefs occurring in the domain of religion.

Study 4 highlighted the importance of varying degrees of counter-intuitive content in the person domain. By looking at TC for CI concepts, it was an attempt to investigate the interaction of content and process. It revealed that, while Christians were least tolerant of contradictions in some areas (Study 1), relative to the secular group their TC levels were greater when quasi-religious content was introduced. They were more tolerant of counter-intuitive person concepts that violate basic assumption about psychology and physics than their secular counterparts. However, Buddhists were most tolerant of *contradictions* arising between expectations and the possible existence of those persons. In addition, content that was strongly counter-intuitive reduced TC among secular individuals, and less so Anglicans, but had no such effect on Buddhists.

The distinction between cognitively optimal and costly aspects of religion runs parallel with intuitive versus reflective levels of thinking. Study 4 showed that reflective beliefs related to TC, in the form of a TC score, are highest for Buddhists, intermediate for Anglicans and lowest for Secular Humanists. Similarly, tolerance of cognitively optimal non-natural concepts (TCI) is higher among religious groups, but increasing the explicitness of the contradictions apparent in those representations only left Buddhists' TCCI unaffected. If TC, like holistic beliefs, is an expression of cognitively costly religious teachings and practices, these findings can be interpreted as an example of the interaction between cognitively optimal and costly aspects of religion. In other words, they reinforce Pyysiäinen's (2004) reasoning that counter-intuitive concepts are explicit modifications of the intuitive beliefs and that thinking in the religious domain is "characterized by both counterintuitiveness and a tendency to rationalize" (p. 143). Study 4 shows that, compared to Anglicans, Buddhists may have superior tools (TC) to *rationalise* beliefs that run counter to our intuition.

These findings are an important step in creating synergies between cognitive anthropology and cultural psychology in culture and cognition research. The cross-cultural discipline would do well in bringing intuitive foundations to bear more closely on cognitive differences in order to gain a better understanding of the complexity of human thought. My work on TC and CI could be advanced by using story-telling formats and then measure rates of recall. Those stories could then be re-told in order to simulate cultural transmission. Are there different implications for recall of CI concepts among populations with varying levels of TCCI? We should expect that high TCCI is associated with low rates of recall due to a decreased ability of those concepts to be attention-grabbing and hence memorable.

A second implication of TC in conjunction with CI relates to domains or contexts in which counter-intuitive beliefs thrive. If TC were indeed a tool to "rationalise" CI, we would expect tolerance for supernatural concepts to more readily spill into domains *outside* of religion among high TC cultures. This hypothesis could be investigated by comparing religious and secular groups' TC, TCI and TCCI across cultures, potentially revealing less significant subcultural differences in high TC cultures. In addition, it could be explored whether CI concepts are more prevalent in texts outside of the religious domain in certain cultures.

6.2.4 Implications for a 'Religion and Cognition' Model

The 'religion and cognition' model presented in this thesis (see Section 4.1.2) was an attempt to fuse relevant theoretical approaches concerned with the understanding of cultural effects on individual thinking from cross-cultural cognitive psychology, social psychology and sociology. Due to the origins of the model's main components (from closely related disciplines with similar methodologies), it cannot account for dynamics that anthropologists or evolutionary psychologists might consider equally relevant, ranging from historical and collective aspects of culture, religion and cognition, to

innate cognitive structures, as well as the bi-directional flow between the individual and culture.

In the model, religion was represented as a subculture with two main conceptual dimensions: social structure and cultural content. In my empirical work, cultural content stood for a religion's teachings, expressed in its metaphysics and epistemology, and ultimately individuals' values and beliefs. Social structure, on the other hand, took the form of a more objective measure of religious integration (Study 1) and, on the level of the self, values related to independence versus interdependence (Study 3). As indicated by Nisbett (2003; also Markus & Kitayama, 1991), perceptions of interdependence are themselves a reflection of attention (to self versus social group or object vs context), which mediates the relationship between social structure and individual thought. Study 1 demonstrated that greater religious integration decreases dispositional thinking, while Study 3 showed that the strength of religious self-concepts could itself be predicted by values in favour of interdependence. Considering that the religious self-concept, along with overall religiosity, was also a determinant of holistic beliefs (Study 1) and moderator of religious context effects (Study 2), results taken together suggest a triangular relationship between social structure, cultural content and the self.

It could be said, then, that the self-concept, such as degrees of religious identification, serves as a switch or dial adjusting the impact of religion on individual thought. Religious practices, included in Study 1's religiosity measure and separately in the form of meditation, showed to have an impact on holistic beliefs, and, on a more implicit level, categorisation. As a result, my analysis indicates that a cognitive 'trickle down' effect of learned explicit beliefs that become applied in everyday inference, as illustrated by Nisbett's model, are too simplistic in explaining H-A differences. This thesis supports a more complex causal model taking into account effects of both beliefs/theories and social structures/integration, on the system level of religion,

affecting cognition via the self-concept, the strength of internalised values and beliefs, as well as individual-level religious practices, such as meditation.

6.3 Limitations

Despite some compelling findings produced by this thesis, they are not without limitations. Due to the large number of measures developed in past H-A studies, this research had to be limited to a selection of variables. Similarly, although the use of Internet-based methods allowed for an efficient large-scale recruiting from specialised and dispersed populations, it restricted the scope of variables that could safely be included in the research instrument. Most notably, perceptual measures that would have made a useful addition to implicit H-A variables, but rely on strict experimental controls, were absent. Internet experiments do not provide a constant setting like a laboratory, invariable screen size and viewing distance, or even a reliable measurement of response times. Assuming that the less stringent controls possible in this research did not lead to systematic biases, any remaining influences that could not be controlled for must be relegated to random error in the interpretation of results.

The use of Internet technology may also have influenced the demographics of the samples, although this problem has decreased over time as the age range and socio-economic backgrounds of Internet users has increased. In the case of Buddhists, technology (along with general accessibility issues) contributed to the fact that recruiting efforts excluded individuals at Buddhist monasteries. However, it is reasonable to assume that highly devoted Western Buddhists, such as monks, would have produced cognitive differences on the same or even larger scale than the actual lay samples.

Studies 1 and 2 tried to curb response biases by offering both prize draw entries and donations, while students in Study 3 participated for course credit. Nonetheless, some response biases or self-selection issues are likely to remain. These would be particularly

problematic if, despite the offering of different incentives, motivations for participation were markedly different across the populations studied. Since experimental research is about the comparison of groups, contributing to internal validity, random assignment to conditions renders non-random self-selection issues somewhat less challenging than other methods. Nevertheless, as is the case for most experimental studies in psychology, the generalisability of finding always has to be interpreted with caution.

A second type of self-selection could have occurred earlier at the stage of individuals joining religious or secular groups. In contrast to most Anglicans, the majority of Buddhists and Secular-Humanists joined or converted at some point in their adult lives. People who become Buddhists or Secular-Humanists may already have certain holistic or analytic preferences or patterns of thinking in place. For Buddhists, this was indicated by the correlation between likeability of Buddhist beliefs and holistic grouping in Study 3. Due to their reflective and normative nature, we should expect self-selection to be most apparent in explicit H-A variables, as evident in Anglicans' intermediate position on the holism and TC scores. Years of practice, in an interaction with meditation frequency, did seem relevant in explaining aspects of H-A thoughts, but this thesis did not produce sufficient evidence in support of a training, learning or socialisation effect of Buddhism on H-A cognitive outcomes. Indeed, the significance of the religious self-concept in explaining cognition indicates that subjective variables may be even more powerful in explaining more reflective aspects of H-A thought than objective measures like meditation practices.

Finally, a cautionary note should be made about research with specialised samples. Student samples can be largely considered naïve subjects with respect to the aims of experiments, which is particularly relevant in priming research. Recruiting from specialised populations, who tend to be targeted by other social scientists as well, leads to participants who may suspect that they are being recruited due to their religion or

lifestyle. Even though I attempted to reduce this problem in the wording of my calls for participation, a risk of biases can never be ruled out.

6.4 Directions for Future Research

As mentioned, some unresolved questions remain at the end of this thesis. Clearly, a need for a fuller understanding of interrelationships between components of H-A thought remains, although I hope to have shown some of their complexities. This includes differences between explicit (beliefs-based) and implicit (applied) holism and their relevance for learning, change and contexts in H-A reasoning. In the case of religion, expanding the scope of variables to include perceptual measures, such as field-dependence versus independence, would improve our understanding of Buddhism's effect on different H-A dimensions and their connection with social structures, cultural content and religious practices. By the same token, variables measuring people's explanations or predictions of events might show whether, as posited, religious or cultural priming manipulations are more relevant for judgments that directly apply theories (epistemology) to cognitive processes, such as causal reasoning as opposed to the organisation of information (metaphysics). A look at a wider spectrum of Buddhist practices (spanning collective rituals and more 'individualistic' meditation practices examined in this thesis) and their role in producing cognitive differences would be useful to have a more complete understanding of the mechanisms operating between religion and reasoning. Finally, investigations of religious conversion in relationship to H-A cognition could advance our knowledge of possible self-selection and learning issues.

The religious groups investigated in this thesis directly correspond to cultural areas in which H-A distinctions are most evident. There may be an opportunity for future research to broaden the span of cultural groups and contexts under investigation,

including other world religions like Hinduism (which emerged in the same cultural area as Buddhism), Judaism or Islam. The latter two cases may be particularly interesting because they represent religions that can be found in various cultural areas, ranging from the United States to East Asia. Unfortunately, I am not familiar enough with either religion's doctrine to speculate about their implications for H-A cognition, but I suspect there may be ample variation across different cultural contexts. The reason behind this line of reasoning is simply that there are other aspects of religions that influence thought, not just teachings directly relevant to H-A metaphysics and epistemology (such as egolessness or dialecticism in Buddhism). I would also speculate that monotheism in Abrahamic religion is more closely allied with analytic thought, while nontheistic and especially perhaps polytheistic religions should espouse holism. Other important factors relate to structural and cultural aspects to do with degrees of individualism-collectivism, where we might find differences between tightly-knit and highly collectivist religions in contrast to individualistic religions with dispersed communities.

For now, research on religions in different cultural contexts could start with a natural extension of this thesis' work: an investigation of Christians in East Asia. Ultimately, research of this kind can shed more light on the interaction between cultural and subcultural influences. In addition, research on both East-to-West and West-to-East flows of culture and cognition can address the issue whether analytic cognition in the East is acquired at the same rate as holistic cognition in the West. A tentative argument in favour of analytical thought being more easily learned than its holistic counterpart could be made. Holism, particularly its dialectical dimension, promotes complexity in reasoning. For instance, judging behaviour on account of both contexts and dispositions or giving equal credence to seemingly opposed propositions at the same time should be more difficult than reducing causes to essential properties or avoiding apparent contradictions.

However, a different take on the matter would highlight the less formal nature of holistic cognition and imply a learning advantage by virtue of intuitiveness, as evident in family-resemblance based categorisation, for example. It is likely that the ease of change or acquisition of holistic as opposed to analytic thought is different for reflective than implicit cognition. On the level of H-A beliefs, issues of resistance to change may be important. Hence, I think that the verdict is still out there and serious empirical investigations would be needed to answer questions about differences between holistic-to-analytic or analytic-to-holistic transitions. The results of this kind of work may allow us to probe deeper into the cognitive mechanisms underlying the H-A distinction.

6.4.1 Research in the World of Business

Assuming that H-A cognition is a meaningful distinction, we have to ask ourselves to what degree statistically significant H-A differences also translates into meaningful differences in the thoughts and actions of everyday life. The psychology of H-A thought would greatly benefit from approaches that seek to relate those cognitions to more practically relevant behaviour, including decision-making processes. Nisbett's (2003) book *The Geography of Thought* was an attempt to bring H-A differences between Eastern and Western cultures to a wider audience, including politicians and business people, who are increasingly faced with intercultural communication issues. For example, do H-A differences affect the ways in which managers evaluate the performance of their employees, their business or the product that they are selling? Are they more likely to look for causality in relationships between larger contexts (e.g. the economy as a whole) and their business or do they tend to isolate causes? What is the implication of H-A differences on styles of argumentation and persuasion?

Another illustration from the world of business is the Net Promoter Score (NPS), a benchmarking tool that measures customer loyalty and word-of-mouth. Due to its simplicity, the NPS has become increasingly popular in recent years (Reichheld, 2003;

Marsden, Samson & Upton, 2005; Samson, 2006). The score is based on research conducted in the U.S. and uses an 11-point scale question asking people about their likelihood of recommending a company to someone they know. It is computed by subtracting the percentage of 'detractors' (0-6 scores) from 'promoters' (9-10 scores). There is no published cross-cultural work on the NPS to-date, but there are issues for which H-A thought might be relevant. Firstly, research on differentiation versus compromise would suggest that people with holistic cognitive backgrounds are more likely to give neutral ratings whereas analytic thinkers would use more extremes, changing the meaning of cut-off points on the scale. Secondly, there is the issue of what 'goes into' people's responses. Based on H-A research, we know that analytic reasoning emphasises links between dispositions and behaviour more than between contexts and behaviour. Can we expect answers to the NPS question to be more predictive of actual behaviour among analytic thinkers? Or, at the very least, are holistic thinkers more cautious in making predictions about their likelihood of behaving in a certain way?

6.4.2 Cognition and Emotion: Tolerance for Contradictions and Religious Fundamentalism

Similarly, the relationship between emotions and cognition has been neglected in H-A theories and research. Emotion already has a prominent role in connection with cognition for at least three of the theories discussed in this thesis. In Markus and Kitayama (1991), ego-focused (e.g. pride) versus other-focused emotions (e.g. compassion) are indicative of the INDINT distinction between cultures, believed to contribute to H-A cognitive differences. In the psychology of religion, emotional well-being has been studied as an effect of religiosity, mediated by cognitive processes like causal attributions. Finally, in 'modes of religiosity' theory, the emotional effect of ritual plays an important part in the kind of memory system produced by doctrinal

versus imagistic types. Empirical evidence for a connection between Buddhist versus Christian religious practices, emotion and H-A cognition is still needed.

One interesting starting point may be provided by the fact that the majority of both Christians (74%) and Buddhists (90%) in the first study of this thesis mentioned other-focused emotions as core values of their religion, but only Buddhists' H-A cognition was affected by a religious context. Buddhists', but not Anglicans', surprise levels about a religious individual not helping a person in need increased significantly as a result of the religious prime. The priming effect could be either the result of a dispositionist shift among Buddhists or a matter of the degree to which other versus self-focused emotion is valued in Buddhist and Anglican religions. For example Buddhists may be more strongly encouraged to express egolessness or other-focus in religious practice, ranging from pro-social behaviour to meditation. As a result, they may be more compelled to think (or feel) in a manner consistent with their religion's core value. Nevertheless, the interesting part about this story is evident in Buddhist surprise levels being *lower* than that of the Anglican group in the no-prime condition, indicating greater TC and more complex theories of behaviour for Buddhists. These findings suggest that Buddhists' holistic way of thinking may be subject to possible clashes with religious emotions or values.

The history and current state of humankind, with its many examples of both cooperation and conflict, can only be understood by taking into account human emotion. A highly pertinent concept may be religious fundamentalism (e.g. Armstrong, 2000; Marty & Appleby, 1995). With this in mind, TC is perhaps the most promising H-A area, with the potential of giving insights about not only psychological but inter-personal and inter-group conflict resolution. Buddhism, the core focus of this thesis, may well be one of the least dogmatic and most peaceful world religions. By comparison, fundamentalist interpretations of monotheistic religions appear to give rise

to a paradox. This occurs if contradictions are accepted internally, within a religion's teachings, but not externally between different worldviews. For example, not taking the lives of other human beings may well be a universal religious value. In practice, however, the past and present has shown devastating results when the world is reduced into believers and non-believers or good and evil, which in turn justifies the violation of fundamental humanitarian values espoused by most religious creeds.

The application of H-A thinking to religious dynamics in psychological and social areas of conflict would be a fascinating area of future investigation, addressing questions about the relationship between religious groups, emotion and cognition. It is possible that there is a mutually reinforcing relationship between fundamentalism and analytic stances, particularly a lack of TC. Fundamentalism may be both influenced and affected by an analytic or low TC tendency to reduce the nature of objects and causes of events to essential properties, as well as a general need for clarity and differentiation.

More specifically, a differentiation vs compromise measure similar to that used in Study 1 could be devised with content relevant to religious beliefs. The context in which those beliefs are framed could then be varied in order to compare intra-religious (contradictions within a religion's teachings) and inter-religious (contradictions between different religions' teachings) TC. This could be achieved by using pro-social values that are relatively constant across religions, as well as content that is more specific to particular creeds. Aside from elementary social, economic and political factors that determine inter-religious strife (see e.g. Atran, 2003, on causes of suicide terrorism), I would hypothesise that religions made up of individuals with high intra-religious TC but low inter-religious TC are most prone to encourage religiously-motivated conflict. A cross-culturally validated measure of religiosity that covers emotional aspects of religion, such as religious fundamentalism, could be included as a possible moderating factor. The resulting data would allow us to compare or "rank" religions according to

their TC levels by taking into account affective characteristics of religiosity that may influence TC.

6.4.3 Globalisation and Holistic versus Analytic Cognition

The same globalising forces that may have stirred conflict on local and international levels have also raised the need for cross-cultural cooperation. East Asian emerging markets, especially China, and their rise in global importance will only intensify the need for an understanding of the holistic worldview. At the same time, I think that we should also expect globalisation to have a potentially homogenising effect on the way people think, although the past decades may have favoured the spread of Western (especially American) culture eastwards more than a flow of culture in the opposite direction (e.g. Barber, 1996). Discussions of globalisation and resulting 'world culture' would agree with this in the sense of at least a Western-dominated homogenisation process. The sociologists Boli and Lechner (2001) argue that cultural homogenisation has an ontological dimension with cognitive outcomes that is still open to investigation: increasing individualism, a disenchantment of nature, and a "reliance on rationalized images of society," promoted by "modern institutions [like] formal education, experimental science, national accounting and statistical systems and advanced-technology engineering" (p. 6263). In the process, far older worldviews manifested in religious traditions have played a role in cultural differentiation and conflict, but also cultural diffusion of the kind studied in this research.

In the lives of many Western individuals, then, adopting Eastern religious spiritual practices like Buddhism may be both an outcome of and antidote to globalisation in 'late modernity', with religion representing a possible tool for individuals to deal with uncertainty and fragmentation of life (cf. Giddens, 1991) or the self in the 'postmodern' condition (Pickering 2004a, 2004b). Similarly, theories about Western "postmaterialist" society (Inglehart, 1977) imply that religions more compatible with anti-

authoritarianism, while also allowing for self-actualisation, would be readily embraced in place of traditional institutionalised Christianity. Whether or not we subscribe to some of those theories, I think it is likely that people with certain backgrounds (e.g. middle class Westerners) will continue to draw on an intercultural pool of spiritual and lifestyle alternatives. I hope to have shown that the outcome of those choices is not only a change of values and customs, but ways of thinking that go beyond the realms of the religious.

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Appendix – Research Instruments

STUDY 1: RELIGIOSITY / RELIGIOUS PRIME

Please answer some questions about your spirituality or religion...

In an attempt to better understand people who identity with a particular religion, faith or spiritual teaching, please allow me to ask some more detailed questions.

How long have you identified with or practiced Buddhism?

- ☐ less than one year
- ☐ one year or longer
- ☐ all my life (I was brought up with the religion)

If you chose "one year or longer" above, please specify the approximate number of years:

[▼]

Whether or not you go to a temple, to what extent would you say that you are a spiritual or religious person? Please choose a point on this scale

not at all religious	☐	☐	☐	☐	☐	☐	☐	very religious
	1	2	3	4	5	6	7	

About how often do you meditate?

[▼]

About how often do you read texts or scriptures related to Buddhism?

[▼]

How often do you visit a temple?

[▼]

How much do you agree with the following statements?

My spiritual life is an important part of who I am.

definitely no	☐	☐	☐	☐	☐	☐	☐	definitely yes
	1	2	3	4	5	6	7	

My spiritual or religious beliefs have a great deal of influence on the decisions I make in my life.

definitely no	☐	☐	☐	☐	☐	☐	☐	definitely yes
	1	2	3	4	5	6	7	

Finally, in the box below, please write **three values** that you consider to be central aspects of Buddhist teachings:

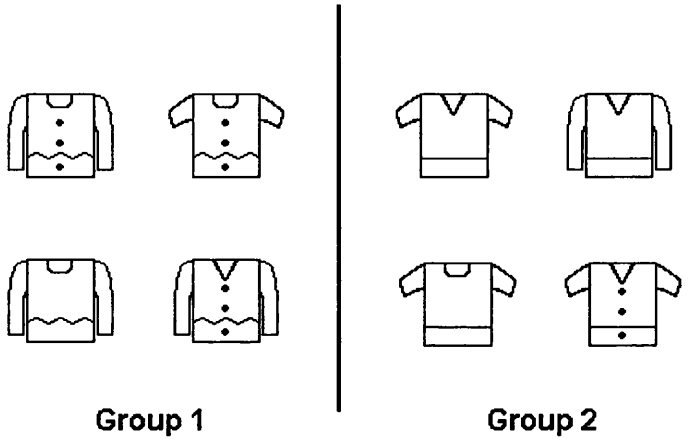
STUDY 1: Categorisation (Page 1)

As your first task in this online questionnaire, I would like you to make category judgments.

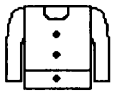
On the next eight pages, you will be shown a target object along with two groups of objects. For each target object, please determine **which one of the two groups shown** the object is **most similar** to.

Please take your time while responding, but do not spend too much time on any single item. Don't worry if you think that other people might not agree with you - there are no right and wrong answers. Just mark it the way you see it.

Before we begin, please use the following **example** as a practice item:



Which of the two groups above is this object most similar to?



Answer:

Group 1 (left) ☐

Group 2 (right) ☐

Click on 'next' below to get started. For each of the following pages in this task, please note that you will not be able to use your browser's 'back' button.

STUDY 1, 2, 3: Grouping

In the following lists, among the three things listed together, please indicate **which two** of the three **are more closely related** by checking the corresponding boxes. Don't worry if you think that other people might not agree with you - there are no right and wrong answers. Just mark it the way you see it.

☐ Seagull	☐ Grass	☐ Squirrel
☐ Black	☐ White	☐ Blue
☐ Magazine	☐ Pen	☐ Notebook
☐ Piano	☐ Violin	☐ Guitar
☐ Direction	☐ Travel	☐ Map
☐ Child	☐ Teenager	☐ Adult
☐ Computer monitor	☐ Antenna	☐ Television
☐ Colourful	☐ Gallery	☐ Paintings
☐ Winter	☐ Spring	☐ Autumn
☐ Airplane	☐ Duck	☐ Hawk
☐ Letter	☐ Stamp	☐ Postcard
☐ Second	☐ Minute	☐ Hour
☐ Bright	☐ Sky	☐ Sunshine
☐ Panda	☐ Banana	☐ Monkey
☐ Monday	☐ Wednesday	☐ Friday
☐ Educated	☐ University	☐ Professor
☐ Hair	☐ Shampoo	☐ Conditioner

☐ Morning	☐ Evening	☐ Afternoon
☐ Postman	☐ Policeman	☐ Uniform
☐ Child	☐ Woman	☐ Man

STUDY 1: Differentiation versus Compromise

Scientific findings are not always consistent with each other, and sometimes there is a discrepancy between scientific research findings and popular beliefs. In this section, I want to ask you how much you believe the following statements based on recent research results.

Statement 1A:

A developmental psychologist studied adolescent children and asserted that those children who were less dependent on their parents and had weaker family ties were generally more mature.

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

neutral

Statement 1B:

A social psychologist studied young adults and asserted that those who feel close to their families have more satisfying social relationships.

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

neutral

Statement 2A:

A sociologist who surveyed college students from 100 universities claimed that there is a high correlation among college female students between smoking and being skinny.

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

neutral

Statement 2B:

A biologist who studied nicotine addiction asserted that heavy doses of nicotine often lead to becoming overweight.

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

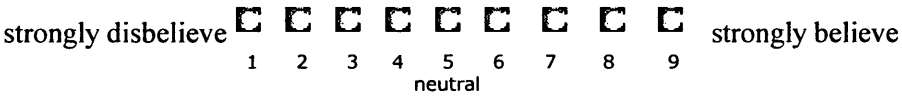
neutral

Statement 3A:

A study by a health organization suggests that it is much more healthy to be a strict vegetarian who does not eat meat at all.

.

How much do you believe this statement to be true?

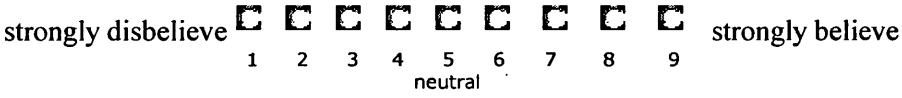


Statement 3B:

A health magazine survey found that people who live a long life eat some sorts of white meat, e.g., fish or chicken.

.

How much do you believe this statement to be true?

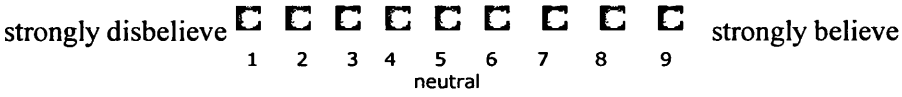


Statement 4A:

A report on the prison overcrowding issue suggests that older inmates are less likely to commit new crimes. Therefore, if there is a prison population crisis, they should be released first.

.

How much do you believe this statement to be true?

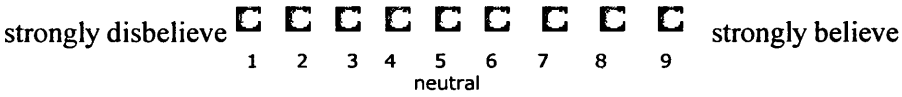


Statement 4B:

A survey found that older inmates are more likely to be ones who are serving long sentences because they have committed severely violent crimes. The authors concluded that they should be held in prison even in the case of a prison population crisis.

.

How much do you believe this statement to be true?



Statement 5A:

A group of environmental science undergraduate students examined fuel usage in a large number of developing countries and asserted that recent practices are likely to multiply already worsening environmental problems such as "global warming."

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

neutral

Statement 5B:

A meteorologist studied temperatures in 24 widely separated parts of the world and asserted that temperatures had actually dropped by a fraction of a degree each of the last five years.

.

How much do you believe this statement to be true?

strongly disbelieve ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly believe

1 2 3 4 5 6 7 8 9

neutral

STUDY 1: Surprise about Expectation Violating Behaviour

In this part of my questionnaire I am trying to investigate how people make judgments about others.

Please read the following short story. When you are done, you may continue on to the next page.

John was a student at a school for the study of theology and philosophy of religion. He was physically short and somewhat stocky with a wide face. He was quiet and a bit aloof, though not shy. The personality tests in his high school indicated that he was honest, had a good sense of humour and that, although he would not be an easy person to get to know, he was probably loyal and intense on relationships with his closest friends.

John was a very spiritual person. He always tried to approach his life from a religious point of view. He believed that all his activities, goals and future experiences would be determined by a divine power.

Last year, he was taking a class on how to make religious speeches by Professor Earlham. One of the course requirements was to record the student's own speech four times during the semester and to turn in the tapes. John was supposed to record his first speech that day in a recording room next to Professor Earlham's office. The topic of the speech was 'sympathy'. Since Professor Earlham did not allow his students to use any notes for speeches, John had to memorise all the things he wanted to say. Since he did not want any distractions, he went to a small prayer/meditation room to rehearse his speech.

After a while, John suddenly realised that he was already 10 minutes late for the recording. Professor Earlham was notorious for criticising his students for not being on time. John was very worried and hurried to the recording building which was next to where the prayer/meditation room was.

While he was passing the doorway leading to the recording building, John found a man sitting slumped, head down, eyes closed, not moving. The man coughed twice and groaned, keeping his head down as John was passing by.

John noticed the man, but kept on going without stopping to offer him assistance.

STUDY 1: Surprise about Expectation Violating Behaviour

When you read the outcome of the story, how surprised were you to hear that John did not help the man?

not surprised at all												extremely surprised
	0	1	2	3	4	5	6	7	8	9	10	

STUDY 1: Surprise about Expectation Violating Behaviour

In this part of my questionnaire I am trying to investigate how people make judgments about others.

Please read the following short story. When you are done, you may continue on to the next page.

Tom was a student at a school for the study of theology and philosophy of religion. He was physically tall and somewhat thin with a narrow face. He was active and assertive. The personality tests in his high school indicated that he was quite ambitious and untrustworthy.

Although Tom was a religious person, he was quite selfish. He never allowed his colleagues to use his notes before exams.

Last year, he was taking a class on how to make religious speeches by Professor Earlham. One of the course requirements was to record the student's own speech four times during the semester and to turn in the tapes. Tom was supposed to record his first speech that day in a recording room next to Professor Earlham's office. The topic of the speech was 'sympathy'. Since Professor Earlham did not allow his students to use any notes for speeches, Tom had to memorise all the things he wanted to say. Since he did not want any distractions, he went to a small prayer/meditation room to rehearse his speech.

After a while, Tom suddenly realised that he was already 10 minutes late for the recording. Professor Earlham was notorious for criticising his students for not being on time. Tom was very worried and hurried to the recording building which was next to where the prayer/meditation room was.

While he was passing the doorway leading to the recording building, Tom found a man sitting slumped, head down, eyes closed, not moving. The man coughed twice and groaned, keeping his head down as Tom was passing by.

Tom noticed the man and stopped immediately to offer assistance.

STUDY 1: Surprise about Expectation Violating Behaviour

When you read the outcome of the story, how surprised were you to hear that Tom helped the man?

not surprised at all ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ extremely surprised

0 1 2 3 4 5 6 7 8 9 10

STUDY 1: Folk Theories of Social Behaviour

Please rate how much you disagree or agree with the following arguments.

1. How people behave is mostly determined by their personality. One's personality predisposes and guides an individual to behave in one way, not in another way, no matter what circumstances the person is in. In a sense, behaviour is an unfolding of personality. One's behaviour is remarkably stable across time and consistent across situations because it is guided by personality. Therefore, if we know the personality of one person, we can easily predict how the person will behave in the future and explain why that person behaved in a particular way in the past.

.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7 8 9

2. How people behave is mostly determined by the situation in which they find themselves. Situational power is so strong that we can say it has more influence on behaviour than one's personality. Often, people in a particular situation behave very similarly, despite large individual differences in personality. Therefore, in order to predict and explain one's behaviour, we have to focus on the situation rather than personality. Personality plays a weaker role in behaviour than we used to think.

.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7 8 9

3. How people behave is always jointly determined by their personality and the situation in which they find themselves. We cannot claim that either personality or the situation is the only determinant of our behaviour. Our behaviour is an outcome of the complex interaction between personality and situational factors. We always have to consider their personality and situation simultaneously. Therefore, we cannot predict and explain a person's behaviour with personality or situation alone.

.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7 8 9

STUDY 1, 2: Holism Score

Finally, please rate how much you disagree or agree with the following statements.

1. It's not possible to understand the pieces without considering the whole picture.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

2. Every event has numerous results although some of the results are not known.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

3. Every event has numerous causes although some of the causes are not known.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

4. A marker of good architecture is how harmoniously it blends with other buildings around it.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

5. Nothing in the universe is unrelated.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

6. The whole is always greater than the sum of its parts.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

7. Paying attention to the context in which things exist is more important than

paying attention to those things themselves.

.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

1 2 3 4 5 6 7

8. The empty space in a painting is just as important as the objects depicted.

.

s strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

1 2 3 4 5 6 7

9. In order to understand an object's behaviour it is more important to focus on the properties of that object than the conditions under which the behaviour occurs.

.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

1 2 3 4 5 6 7

STUDY 1: Religious Integration

You already stated how often you visit a temple in an earlier question. In this question, I would like to ask how often you meet other Buddhists in settings *other* than a temple (any group or organization that has to do with Buddhism).

When you were growing up, were one, both or neither of your parents also Buddhists?

- ☐ both parents
- ☐ one parent
- ☐ neither parent

Are you currently married?

- ☐ yes
- ☐ no (never married, separated, divorced, or widowed)

If you are currently married, does your spouse consider her/himself a Buddhist as well?

- ☐ yes
- ☐ no

How many close friends (**not** including your spouse, if you are married) would you say that you have?

Number of close friends:

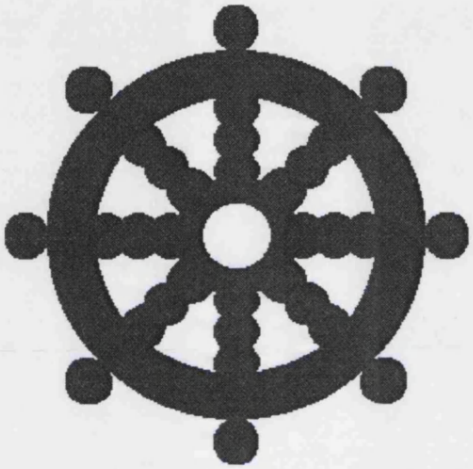
How many of these persons (not including your spouse) are also Buddhists? (If you are not certain, please enter your best guess).

Number of close friends who are also Buddhists:

Regardless of how important religion or spirituality is to you in those relationships, how often are you in contact with at least one of these close friends (not including your spouse) who are also Buddhists?

STUDY 2: Buddhist Prime

Part of my Ph.D. concerns itself with ways in which people from various spiritual backgrounds interpret symbols. Below you should see a depiction of the Buddhist 'Wheel of Life'. Please answer the question following the image.



*Please briefly summarize the **beliefs** that you think are represented by the Wheel of Life.*

STUDY 3: Liking of Buddhism / Secular-Humanism

You are presented with two texts describing worldviews. Please read each one carefully, then answer the questions below each text.

1.
Secular Humanism is a term which has come into use in the last thirty years to describe a world view with the following elements and principles:

- A primary concern with **fulfillment, growth,** and **creativity** for both the **individual** and **humankind** in general.
- A **concern for this life** and a commitment to making it meaningful through better **understanding of ourselves**, our **history**, our **intellectual** and **artistic achievements**, and the **outlooks of those who differ** from us.
- A search for viable individual, social and political **principles of ethical conduct,** judging them on their ability to **enhance human well-being** and **individual responsibility.**
- A conviction that with **reason,** an **open marketplace of ideas,** good will, and **tolerance, progress** can be made in building a better world for ourselves and our children.
- A conviction that **dogmas, ideologies and traditions,** whether **religious,** political or social, must be weighed and **tested by each individual** and **not simply accepted on faith.**
- Commitment to the use of **critical reason, factual evidence, and scientific methods of inquiry, rather than faith and mysticism,** in seeking solutions to human problems and answers to important human questions.
- A constant search for **objective truth,** with the understanding that new knowledge and experience constantly alter our imperfect perception of it.

QUESTIONS:

How familiar were you with the ideas expressed in this text before you read it?

not at all familiar ☐ ☐ ☐ ☐ ☐ ☐ ☐ very familiar
1 2 3 4 5 6 7

How difficult is it for you to understand the ideas in this text?

very easy ☐ ☐ ☐ ☐ ☐ ☐ ☐ very difficult
1 2 3 4 5 6 7

To what extent do you like or dislike the beliefs in this text?

strongly dislike ☐ ☐ ☐ ☐ ☐ ☐ ☐ like very much
1 2 3 4 5 6 7

2.
Buddhism is a worldview with the following elements and principles:

- The **"world out there" is constantly changing**, everything is **impermanent** and it is impossible to make a permanent relationship with anything at all.
- The first noble truth is that **life is suffering**. This is an irrefutable fact that cannot be denied. Buddhism explains how suffering can be avoided and **how we can be truly happy.**
- The second truth is that **suffering is caused by craving and aversion.** Wanting deprives us of contentment and happiness.
- The third truth is that if we **give up useless craving and learn to live each day at a time** (not dwelling in the past or the imagined future) then we can become **happy and free**. We then have more time and energy to help others. This is Nirvana.
- The fourth truth is that the Noble Eightfold Path is the path which leads to the end of suffering.
- The Noble Eightfold Path is **being moral** (through what we say, do and our livelihood), **focusing the mind on being fully aware of our thoughts and actions, and developing wisdom and compassion for others.**

Compassion includes qualities of sharing, readiness to give comfort, sympathy, concern and caring. In Buddhism, **we can really understand others, when we can really understand ourselves.**

QUESTIONS:

How familiar were you with the ideas expressed in this text before you read it?

not at all familiar ☐ ☐ ☐ ☐ ☐ ☐ ☐ very familiar
1 2 3 4 5 6 7

How difficult is it for you to understand the ideas in this text?

very easy ☐ ☐ ☐ ☐ ☐ ☐ ☐ very difficult
1 2 3 4 5 6 7

To what extent do you like or dislike the beliefs in this text?

strongly dislike ☐ ☐ ☐ ☐ ☐ ☐ ☐ like very much
1 2 3 4 5 6 7

STUDY 3: Independence-Interdependence Scale

Please rate how much you disagree or agree with the following statements.

1. The security of being an accepted member of a group is very important to me.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

2. My personal identity, independent of others, is very important to me.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

3. I enjoy being unique and different from others.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

4. I would sacrifice my self-interests for the benefit of my group.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

5. My relationships with those in my group are more important than my personal accomplishment.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

6. Having a lively imagination is important to me.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

7. It is important to consult close friends and get their ideas before making decisions.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

8. I act as a unique person, separate from others.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

9. I have an opinion about most things: I know what I like and I know what I don't like.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

10. My happiness depends on the happiness of those in my group.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

11. It is important for me to act as an independent person.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

12. I try to meet the demands of my group, even if it means controlling my own desires.

strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
1 2 3 4 5 6 7

STUDY 4: TC Score

This questionnaire is designed for you to indicate the typical ways in which you approach or solve problems in everyday life. There are no right or wrong answers. For each item, please use the following 5-point rating scale to indicate the **extent to which you agree or disagree that the statement accurately describes the way you typically approach or solve problems.**

1. When a problem appears to have two equally effective but opposing solutions, it is likely that the problem has been poorly defined or poorly represented.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

2. When faced with a puzzling issue in which there are two opposing but equally possible interpretations, I would typically gather information to rule out one of the two interpretations.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

3. When my friend's view on an issue is opposite to my view, I usually think of situations in which both my view and my friend's view can be valid at the same time.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

4. People who often give ambiguous answers when answering a question should take a position and give a more exact answer.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

5. People who maintain that it is possible for two opposing interpretations of the same event to be both true are illogical or unrealistic.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

6. Within a team, cooperation and competition can exist at the same time.

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
strongly disagree	disagree	neutral	agree	strongly agree

7. A single action or behaviour can often achieve opposite objectives at the same time.

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
strongly disagree	disagree	neutral	agree	strongly agree

8. "If A is true, then B must be true. If B is false, then C must be true. Given that A is false, is C true or false?" Such questions lead to ineffective problem-solving skills in many areas of life.

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
strongly disagree	disagree	neutral	agree	strongly agree

9. In assessing whether someone is supporting a team, team members often make statements such as "He is either for us or against us." Team members who make such statements fail to see many other real possibilities.

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
strongly disagree	disagree	neutral	agree	strongly agree

10. In most situations, whether an act is morally right or wrong is clear cut.

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
strongly disagree	disagree	neutral	agree	strongly agree

STUDY 4: Tolerance of Counter-Intuitiveness / Tolerance of Contradictions in Counter-Intuitiveness: Baseline Expectation Ratings

There are many different kinds of people in the world, ranging from ordinary to more unusual persons--some familiar and others less familiar to you.

Please rate **how likely** you think it is that **you will ever learn about the actual existence** of the persons listed below.

.

A person who can fell a tree with his bare hands.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who understands jokes.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can see events as they will actually happen in the future.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can walk through walls without damaging the walls or him/herself.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who eats often during the day.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who has no shadow even when light is shining at him/her.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can fluently speak thirty different languages.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who sometimes vanishes then reappears.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who runs faster than a galloping horse.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can remember everything that has ever happened.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who always wears warm clothing.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can hear conversations from the past as if they are actually taking place now.

not at all likely ☐ very likely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

STUDY 4: Tolerance of Counter-Intuitiveness / Tolerance of Contradictions in Counter-Intuitiveness: Surprise Ratings, Counter-Intuitive Condition

Now suppose scientists have recently discovered a person who has one of the more unusual abilities or properties described previously. Due to the extraordinary nature of the discovery, the person's existence has also been independently verified by another group of scientists, journalists and lay people from the community. As a result, there is no longer any doubt about the existence of this kind of person.

For each of the following examples, please rate **how surprised** you would be if the existence of the person in question could be established beyond any doubt as described above.

A person who can see events as they will actually happen in the future.

not surprised at all surprised ☐ extremely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can walk through walls without damaging the walls or him/herself.

not surprised at all surprised ☐ extremely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who has no shadow even when light is shining at him/her.

not surprised at all surprised ☐ extremely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who sometimes vanishes then reappears.

not surprised at all surprised ☐ extremely

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

A person who can remember everything that has ever happened.

A person who can hear conversations from the past as if they are actually taking place now.