

**AUTHENTICATED ACTION
AND THE DECISION TO STOP SMOKING**

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Abstract

In this rational reconstruction, two rival research programmes are identified as dominating the Social Psychology of decision making. Behavioral Decision Theory and the Theory of Reasoned Action embody the Rationalist programme. Social Judgment Theory and Attributional Theory exemplify the Empiricist programme. As predicted by the Methodology of Scientific Research Programmes (MSRP), the negative heuristics are shown to condense as hard cores which remain protected from refutation. The historical reconstruction of Social Judgment Theory illustrates uneven development in algorithmic and propositional heuristics. Behavioral Decision Theory shows a progressive problem shift to Multi Attribute Utility Theory (MAUT).

In a revision of MSRP to include practice shifts, the Theory of Reasoned Action illustrates progressive practice despite empirical anomalies. Attributional theory shows a progressive problem shift by predicting personal-efficacy to influence choice. Practice, however, is restrained through reliance on the ANOVA paradigm.

The experimental study partitioned locus and stability attributes for subjects' choice of therapy programmes in an anti-smoking clinic. A significant main effect was found for stability expectancy, though this did not influence choice.

The Lens Model algorithm was demonstrated to transpose successfully onto the Self-efficacy model with the intra-system capturing decisions combining the two forms of efficacy expectation. The Theory of Reasoned Action was augmented by transfer of MAUT techniques giving relative weighting to salience.

Though Rationalist and Empiricist paradigms illuminate some aspects of stopping smoking, neither adequately addresses the decision-action gap perceived by smokers who disown their original intentions when the correspondence is seen as inauthentic.

An alternative model is proposed with a basis in Objectivist epistemology. Authenticated action is explained as a means of arriving at decisions through consideration of problem and practice shifts at the individual level.

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Summary and Overview of Thesis Structure

This thesis consists of three separate but sequentially linked studies bracketed by introductory and epilogue chapters. Each part stands on the argument that human decision making research can best be understood by criticizing the epistemological basis of method, theory and subject matter.

Introduction

Concern in Social Psychology with the philosophy of science is reviewed. A number of major contributions to the Philosophy of Scientific Method are examined (Popper, Kuhn, Lakatos and Feyerabend). Lakatos's Methodology of Scientific Research Programmes (MSRP) is expounded as currently offering the most suitable means of appraising scientific research.

Study One

In this literature based survey MSRP is employed to review the Social Psychology of decision making. Two dominant traditions are reconstructed; the Rationalist and Empiricist research programmes. Each epistemological core is argued to dictate the form of possible theoretical models and corresponding methodology. In the Rationalist scheme the decision maker is said to use reason to weigh and integrate values attached to specifiable outcomes. Empiricist judgmental processes, in contrast are characterized by the control of uncertainty using direct sense data to infer the best choice.

Research work with *Behavioral Decision Theory* is identified as belonging to the Rationalist programme. *Social Judgment Theory*, in contrast, is portrayed as a part of the Empiricist programme. Both sets of theories are traced through a series of progressive and degenerating problem shifts. The two programmes are described as continuing a parallel existence of research effort with little open rivalry despite major theoretical and methodological contradictions. Both research programmes, however, are demonstrated to continue growing despite an accumulation of conceptual and empirical anomalies.

An important addition is made to the Methodology of Scientific Research Programmes by separating algorithmic and propositional heuristics. The distinction is used to explain the differential progress of the two programmes. *Social Judgment Theory* is criticized as being strong algorithmically but relatively weak in propositional power. *Behavioral Decision Theory*, in contrast, is shown to sustain progress through a major reformulation in its theoretical focus with the shift from Subjective Expected Utility (SEU) Theory to Multi Attributed Utility Theory (MAUT).

Study Two

Consideration of research practice is identified as a shortcoming of the MSRP and an essential element in the philosophy of science generally. Consequently a number of significant contributions to this area are reviewed (Shapere, Laudan, Chalmers and Schon). Baillie's (unpublished) World Four thesis, however, is championed as offering a superior epistemological basis. In addition to Popper's Three World Epistemology, it is argued that actions have an objective status independent of propositions or intentions. In turn this nascent epistemological principle is used to furnish MSRP with a means of incorporating considerations of scientific action. Practice Shifts are argued to be of equal importance to Problem shifts in the normative appraisal of scientific growth. On this basis, the two rival research programmes are criticized within the shared practice domain of smoking withdrawal.

The second literature review continues the rational reconstruction of decisional research. Since the MSRP demands that the unit of analysis be larger than single theories, two other sets of theories within the same research programmes are also compared. The *Theory of Reasoned Action* is located within the Rationalist programme and contrasted with *Attributional Theories* which are recognized as belonging to the Empiricist programme.

It is argued that advice to quit smoking by health educators and other change agents has mostly been couched in terms of the risks and benefits of continuing particular lifestyles. Appeals to the values of stopping smoking have thus been represented within the Rationalist decision framework. Failures to bring about changes have been blamed on the apparent irrationality of the target audience, hence posing a serious anomaly for the Rationalist programme. The Theory of Reasoned Action, though, is shown to sustain a form of progressive practice by explaining the apparent irrationality with reference to unseen costs (for smokers) in quitting smoking, and by the ready applicability of the Fishbein model.

Attribution Theories have offered alternative explanations within the Empiricist programme creating a progressive problem shift. Smokers are argued to resort to addiction based explanations for their own failures to implement successful action. Self-labelling of addiction is said to result in a self-defeating attributional spiral, reinforced by the prevailing medical model held by many influential anti-smoking concerns. Generally, perceived ability/personal efficacy is considered an essential element in determining choices.

Study Three

An empirical investigation of smokers' decisions to stop smoking forms the third study in which a smoking withdrawal clinic provided the opportunity to measure decision making processes with real-life consequences. This combined a case study approach with experimental methodology.

Potent algorithms from different theoretical models (but within the same research programme) are predicted to be usefully transposable. Specifically, for the Theory of Reasoned Action, MAUT is used to give relative weighting to belief items *within* the attitude and subjective norm components. This is argued to help solve the major empirical anomaly associated with belief saliency.

The results from the empirical study are found to be mostly consistent with that of other researches. Some corroboration is described for the Theory of Reasoned Action in describing the intentional structure and belief elements of the decision to stop smoking. Against theory, however, Modal rather than Individual Salient Beliefs are found to be superior predictors of Intention.

Expectations of success in stopping smoking are shown to be influenced by stability as predicted by the attributional model. Intentions and actual choices, however, are not. This empirical anomaly is indicated to be compounded by the limitations of the ANOVA algorithm. For Attributional theories the Lens Model paradigm is offered as a suitably powerful algorithm for prospectively oriented attributions. In a development extending the cognitive conflict paradigm to the intra-system case, the algorithm is used to capture the meta decisions described in Self-efficacy theory.

The empirical study is affirmed to have demonstrated the principle of algorithmic transfer and to have usefully highlighted practice problems in applying the two sets of theories. It is criticized for a number of methodological shortfalls, however, and for adding to the established representation of smoking as an addiction only amenable to expert treatment.

Epilogue

Qualitative data is used to show that would-be non-smokers appraise their decision making in terms of an authenticity theme. This is taken to refer to the correspondence between their intentions and actions.

The World four thesis is proposed as an alternative epistemological basis to decision making in a Methodology of Individual Action Programmes. People are hypothesized to reconstruct their intentions on the basis of problem and practice shifts at an individual level. In the Clinic study, smokers who failed to quit are shown to generate strong judgments of inauthenticity about their decisions and actions. Some were able to make the transition in practice, that is, were actually capable of stopping their smoking behavior but then regarded the outcome as inauthentic (progressive practice combined with degenerating problem shift). Yet others held the goal of stopping as authentic but were then unable to successfully execute the behavioral stop order (progressive problem combined with degenerating practice shift). Future studies would need to

establish clear criteria for either kind of shift and capture the cognitive processes involved in authenticating action.

Epistemological concern borrowed from the Philosophy of Scientific Method is concluded to offer significant insights into the social psychology of decision making. It is argued to provide an essential basis for understanding the growth of decisional research and a key to unlock the workings of decision making at the individual level. Reflexively, a concern with the social psychology of decision making might also enhance understanding of scientific progress in the philosophy of science.

**INTRODUCTION:
SOCIAL PSYCHOLOGY AND THE PHILOSOPHY OF SCIENCE**

Research papers in Social Psychology, as in other scientific disciplines, invariably commence with a survey of relevant published material. The literature review, as it is usually called, quite clearly serves a most important function for researchers. Not only does it document previous findings, but it also provides an opportunity for extracting continuities in the progress of research, and possibly for suggesting new directions. Reviews which succeed in creating a comprehensive picture also of necessity supply an evaluation of the various research contributions. That is, unless a literature review is to be nothing more than a mere catalogue, it must also be both selective and critical.

Reviewers will be guided in their critical survey by their own theoretical outlook as well as their own better judgment. This arrangement alone, however, offers little in the way of explicit criteria for evaluating new research or for comparing different reviews of the same area. This becomes problematic when there are competing theoretical accounts of the same subject matter, each perhaps employing different methodologies, distinct terminologies, and reaching different conclusions. In short, there is no systematic means of evaluating the research enterprise.

Methodologies for the normative appraisal of scientific progress have been evolving, however, in the Philosophy of Scientific Method. The literature review is redefined as a *rational reconstruction*, in which the inter-relationship of human effort in acquiring knowledge and the intrinsic logic of explanations comes under critical scrutiny. In turn this means examining the essential nature of the research discipline and challenging the assumptions scientists make about their subject matter, theory and research methodology. To this end historiographical analysis of research work and logical analysis of knowledge structures are the main conceptual tools employed.

In the rational reconstruction presented in this thesis, the historical development of decision making research will be recreated using the Methodology of Scientific Research Programmes (Lakatos 1970) and in the critical light of Objectivist epistemology (Popper 1972).

Confidence and Crises in Social Psychology

As social science has expanded in recent years, so the prescriptions in orthodox textbooks for appraising science have proved to be inadequate, especially for Social Psychology. Psychologists generally have long shown interest in developing the scientific basis of their discipline, partly through a need to expand their repertoire of methodology, but also because the scientific sovereignty of their work has been challenged.

Since the 1970's there has been much debate about the discipline of Social Psychology being caught in various states of crisis. Harré & Secord (1972) and Israel & Tajfel (1972), Riegel (1972), Joynson (1974), Armistead (1974), Cronbach (1975), Shotter (1975), Sarbin (1977), Meehl (1978) and Harré (1979; 1980) amongst others echo similar sentiments amounting to a loss of confidence in the traditional view of scientific method. Harre (1983) best conveys the disenchantment with the scientific claims of psychologists. He says,

"It was just dressing up. Somehow the essence of the scientific enterprise eluded them."

Other Researchers sharing a distinctive "European" emphasis (see Forgas 1981 and Plon 1974 for example) have taken the challenge and roundly criticized the so-called Anglo-Saxon school for its over emphasis on the individual level of explanation and neglecting that which is truly social in Social Psychology. Some influential theorists have urged the discipline to embark on a new direction with a new definition of social focus (Moscovici 1961, Tajfel 1982).

During the past few years British academic interest in the European perspective has largely revolved around social representations (see Farr & Moscovici 1984). Although purported by its adherents to be a coherent theory, the social representations literature covers several divergent issues, from how people take on board novel ideas to the dissemination of beliefs and attitudes across wider social groups. Farr (1987) advocates the social representations approach as giving a more appropriate phenomenology. As he expresses,

"Social representations are 'in the world' as well as 'in the head'."

Methodologically much of this research is also at odds with the familiar Anglo-Saxon tradition. The social representation work carries, on the whole, a critique of the orthodox approach for being concerned only with content and not structures.

Restated, the dominant cognitive paradigm is said to make the inappropriate assumption that people act only from within their individual cognitive processes.

Whilst claiming to be sympathetic to the criticism of overdominant American Social Psychology, McGuire (1986) censures the emerging European perspective for being overly nationalistic. He warns,

"European dissidents risk ending up with a trivial anti-thesis to the trivial theses from which they are trying to distance themselves."

Moreover, McGuire adds that there is currently a fashion within the discipline for inserting the label "social" as a self-justified prefix to research. In practice, however, McGuire claims it is given at least six different meanings.

From a different critical perspective, Gergen (1972) portrays mainstream Psychology as blindly Positivistic, maintaining faith in assumptions of empirical evaluation, accumulating knowledge and applicability. Whereas, Gergen argues, empirical evidence has decided virtually no critical debates, especially in Social Psychology. Gergen (1980) is also pessimistic about positivistic social science delivering any "enlightenment effects", and calls instead for a reconsideration of epistemological and metaphysical assumptions.

Harré (1980) charges that although few psychologists would today endorse Positivism, many of the problems lie in the legacy of an experimental approach which uncritically accepts positivistic philosophy of science. This has two direct consequences. In the first place active human agency is ignored through portraying people as passive "subjects". Secondly, representing human action in terms of dependent and independent variables is said to distort reality by studying the individual in isolation from the wider social context.

The accumulation of such dissent from orthodoxy in mainstream Social Psychology allowed Westland (1978) to compile an exposition of a range of putative crises from a "usefulness crisis" through "ethical crisis" to the "resolution of crises-crisis". The Science Crisis, for example, is broken down into the "prematurity argument" and the "inappropriate science argument". Most of the ensuing debate ultimately converges upon orthodox Psychology allegedly aping the physical science method. Within the Philosophy of Science this would be referred to as the unity of method debate, which asks whether there is there just one kind of science, or one for the physical sciences and another for the social sciences. (Hempel & Oppenheim 1948; Popper 1957; Nagel 1961; Brodbeck 1954). From within Psychology, however, Westland, explains the crises as being as much to do with definitions and verbal confusions as with substantive issues, though cautiously concludes that the various criticisms are alone evidence of a crisis whether or not they are individually justified. Brickman (1980) similarly reflects that there has at least been a "crisis of spirit".

This concern, however, has not contributed clarity to the selection of appropriate scientific method. Rather, some confusion reigns in what psychologists see as the aim of research and the

method of science. Indeed, a number of influential writers have advocated radical departures in the approach and context of psychology, giving rise to interesting challenges to the more traditionally established areas of research. Harre and Secord (1972), Shotter (1975) and Moscovici (1972), from different viewpoints advocate a universal revision to the whole of Social Psychology, with a radical change in our image of our subject matter, and complimentary rethinking of methodology.

Some researchers (from a diverse variety of perspectives) have in recent years joined in hailing the coming of a "New Paradigm" to Social Psychology (Reason & Rowan 1981). However, Parker (1989) argues that Social Psychology is in a permanent state of crisis. He denounces modern Social Psychology for its failure to address issues of power, ideology and history. Drawing on the post-structuralist ideas of Derrida and Foucault, Parker (1989) is even critical of the "New Paradigm" for complementing what it is supposed to be opposed to.

Parker sees Social Psychology as deeply embedded within the dominant cultural value of modernity. This is said to entail a contradictory discourse in that modernity promises to solve societies problems with scientific truth, but power and meaning are seen to reside in individuals. Accordingly, Social Psychology can be seen as an unworthy paragon of positivistic science based on individual phenomenological experience.

Gaskell (1990) germanely points out that much Social Psychology is unsatisfactory for having taken a passive rather than active epistemological position. Himmelweit & Gaskell (1990) also express concern that an exclusive focus on individual explanations and consequent neglect of the social environment has had the effect of curtailing the potential impact of Social Psychology. It has had little showing in the work of other social scientists and has mostly been absent from the wider intellectual discourse in society. Constructively, Himmelweit & Gaskell (1990) urge a reorientation of the discipline into a *Societal Psychology* to embrace the social institutions and cultural forces which inform and shape social action.

The Models of Man Debate

Since the 1970's Social Psychology (in this Great Britain at least) has been awash with debate about appropriate explanatory models. The subject frequently surfaced at academic conferences and was carried along with with the ebb and flow of journal correspondence. One consequence was a much heralded conference on "Models of Man" (Chapman and Jones 1980).

From that meeting, Warr (1980) provides a most useful summary and notes that the term "model" contains a confused collection of meanings. He also points out that various reviewers of Social Psychology have dismayed at the confused variety of models and lack of theoretical integration. For Warr, however, models are separate from conceptual frameworks, paradigms and theories. Models are said to be,

"distinguishable in terms of their emphasis upon direct representation or upon importation from elsewhere."

Warr further shows that although the language varies considerably most contributors to the debate differentiate two types of models. The first are simplified representations of some aspect of reality, portraying a literal or descriptive image of nature. The second are analogies or metaphors used to assist understanding about nature. Most influential in the models debate, however has been Rom Harré.

Harré (1979) claims that models have come to the fore in the Philosophy of Science in response to the failure of "logician" programmes. Suppe (1977), however, doubts of Harré that,

"Although his work does concern a number of contemporary issues (for example, growth of scientific knowledge) and is highly regarded in some quarters, it has not been primarily influential in shaping what I take to be the most important recent developments and trends in the philosophy of science."

Suppe notes that Harré's work is closely related to that of Mary Hesse (1966), the implication being that it also shares strong epistemic assumptions about regularities of patterns in nature which are essentially inductive in character.

Hesse (1966) attempts to distinguish models *of* the world and models *in* the world, and argues further that the two may illuminate each other, or have reflexivity. Hesse holds that most theories have definite limits of applicability (a concept akin to Kelly's [1953] *range of convenience*). Most importantly, Hesse is one of a number of theorists who have attempted to justify probabilistic induction as the scientific method. Because theories are assumed to be limited to a finite range of circumstances, Hesse contends that it becomes possible to confirm them with finite evidence. Hence, in principle, non-zero probabilities can be attached to states of evidence. Since she also argues that models are analogies between instances (observations of the world) which can be generalized to a finite set of other instances, models for Hesse, are inductive in character.

Although, Harré's thinking may be influenced by Hesse, Harré (1979) differs in advocating a constructive role for models in the social sciences in checking the "authenticity" of explanations offered by social scientists. That is, the explanatory (scientific) models should reflect the individuals (lay) modeling of the world. Hence, for Harré, reflexivity equals illumination as much as verification.

Within the Philosophy of Science generally, models appear to be regarded as unproblematic, and are usually described as preliminary or temporary devices to assist the scientist's thinking rather than logically necessary components of theory building. Lakatos (1970), for example says,

"A model is a set of initial conditions (possibly together with some of the observational theories) which one knows is bound to be replaced during further development of the [research] programme."

Nagel (1961) gives a stronger role to models for fleshing out the logical skeleton of a theories explanatory structure. As he describes,

"in terms of more or less familiar conceptual or visualizable materials.

That is, models make the theory concrete. Theories, in Nagel's view, cannot provide adequate explanation without models.

In the social sciences a similar notion to Nagel's can be found in Blalock (1971) who argues models enable a transition from the verbal form of theories to more precise research techniques. Mathematical formulations in particular, Blalock sees as helping "recast" verbal theories as models.

Suppe (1977), however, criticizes the idea that models are essential for theoretical explanations and cites Quantum Theory as an example not dependent upon models. Instead, Suppe contends that models may be heuristically fruitful but not necessary as integral components of theories.

Social Psychologists, however, have been concerned to make explicit the underpinnings of their theories, at least as a means of characterizing their human subject matter. To describe a theory as based upon a "model of man as economist" or "model of man as scientist" is to posit a dominant driving force for human nature (in the first case as searching for maximum profit/minimum cost, and in the latter as searching for truth or explanation).

The greatest difficulty with adopting a model of man as a guiding principle for social psychological theory is the appropriate selection of a model. In short, the selection must either be pragmatic and arbitrary or (and this is more to the point) chosen to reflect epistemic assumptions.

It is interesting to note, though, that most models of man are seldom followed through. At a descriptive level the model's wider and more extensive role behaviors are excluded. As a normative (or ideal) account, the underlying principles receive only the crudest analysis.

The search for models of man has been condemned by Peter Kelvin (1980), who sees it as being empty. As he expresses,

"As long as we conceive some other field as the basis of a model, or set of models, of man, it will be the case that psychology is in a state of logical positivism. To think in terms of models is primitive. We should look for the phenomena for which we have to find an account."

Restated, there is a danger of circularity in reasoning from models of man to theories of psychological functioning. Can a part be used to explain the whole?

A clue to the concern of social psychologists with models of man can be found, as Harre maintains, in the reflexivity. It is the problem of understanding how we understand ourselves. This is best seen in the comments of two of the discussants following Warr's paper at the Models of Man conference. viz;

A.P. Baillie:

"Many problems raised here have been taken to be problems arising from adapting different models of man...Perhaps, therefore the conference should have been entitled 'models of knowing'. Communication might be facilitated if the various issues were examined from that perspective."

D.S. Wright:

"I agree. A missing element here has been any attempt to explain the fact of what we are doing here. Man is a model-maker and we have not yet tried to deal with that..."

(Chapman & Jones 1980)

The Philosophy of Scientific Method

Whether or not the very foundations of orthodox Social Psychology have been shaken, the criticisms illustrate the cramped and teetering structure of a scientific method built on unsound philosophical grounds. The continuing proliferation of such critiques, moreover, suggests that Social Psychologists will have to become increasingly conversant with the Philosophy of Scientific Method, and more sophisticated in their solutions.

As with all disciplines, the Philosophy of Scientific Method is best understood through the problems it attempts to solve rather than the current focus of its content.

Interestingly, Ernst Gellner (1974) argues that the Philosophy of Science has also been working through a crisis of legitimacy. Like politics generally, he argues, it fluctuates between poles of liberalism and authoritarianism. The first tries to protect science from,

"the arbitrariness, stagnation and the enforced errors of authority,"

and the second attempts to protect it from,

"the chaos, violence and - likewise - the arbitrariness and stagnation of anarchy".

Gellner goes on to identify two corresponding modes of resolving the crisis. One is to invoke something bigger than all of us; "the great norm-endorsing Other". Something, that is, objective. The alternative means of validation is to discredit the Great Other and believe only in mankind's internal premises. Whatever mankind is, or does supplies this agnostic and anthropocentric solution (subjectivist relativism).

For Gellner, theories of knowledge take on a political force with the movement from one pole to the other.

In the struggle for epistemological survival, theories of knowledge act as selectors. They dictate the scientific method which sorts out the legitimate from the illegitimate forms of research, and consequently demonstrate the accepted means of discovering truth. In the parlance of the Philosophy of Scientific Method, a universal demarcation criterion is created. (Popper 1959, 1963). This consists of asking how science can be differentiated from pseudo or non-science, and how rival theoretical accounts of the same subject matter can be reconciled. In turn, this is used to decide what is scientific and admissible and what is not. It assumes practical importance when there are competing research enterprises vying for limited resources. It is most critical when, as with the race and I.Q. debate, there are direct implications for programmes of social engineering. (Urbach 1974).

The second major concern of the Philosophy of Science has been in attempting to illustrate the nature of scientific progress. In turn this means adopting some kind of historical approach. Lakatos (1976) neatly expresses this in a paraphrase of Kant's dictum,

"Philosophy of science without history of science is empty; history of science without philosophy of science is blind."

Similarly, closer to home, Boring (1950) says,

"A psychological sophistication that contains no component of historical orientation seems to me to be no sophistication at all."

The Philosophy of Scientific Method then directs us to appraise research in the light of the generalized demarcation problem. This is approached through two complementary paths; the

epistemological bases of the scientific method, and historiographical reconstructions of scientific progress.

The Epistemological Basis

Understanding human knowledge is more than a paradox. More than the vain pursuit of armchair philosophers, it is ultimately our only touchstone of truth. But to say that the shape of all knowledge is guided by our view of what knowledge is or should be is, of course, a mere metaphysical adage. And like most well-worn issues, its significance declines over time. The original puzzle of understanding knowledge which so preoccupies philosophers can come to be seen as an impossible and largely irrelevant quandary. After all, it might be said, what point is there in procrastinating about such intangibles when there are real and practical issues to solve. More strongly, the same notion, that there are certain irreducible aspects of human existence can be taken as a justification for activism, the ideology which opposes any kind of complacency (Popper 1957).

Even scientists, those stalwart seekers of truth, show little patience, on the whole with problems of epistemology. In trying to expand their body of systematic knowledge they focus only upon specific problems related to the content of their discipline. As the content of Social Psychology also concerns human knowledge, however, epistemology is unavoidable. Westland's "crises" and other forms of unrest within the discipline concern epistemological problems as much as other value issue (Laungani, Baillie & Rawson 1976).

Now scientists can, and arguably do, practice successful science without an explicit formulation of the epistemological assumptions underlying their methods. Claiming to hold no specific philosophy is, however, at best a pretense and at worst total naivete. Perhaps of greatest consequence, implicit epistemologies are more difficult to criticize and therefore, improve, than are explicit formulations. Epistemology is in this sense unavoidable. As Alexander Rosenberg (1988) aptly describes,

"Even the claim that philosophical reflection is irrelevant to advancing knowledge in social science is itself a philosophical claim."

Knowledge Without a Knower: Objectivist Epistemology

Theories of knowledge, according to Popper (1934; 1945) can be conveniently described as either active or passive. Those epistemologies which emphasize pure observation as the appropriate means to acquire knowledge tend to be passive theories, diminishing the contribution of the observer. Facts in this scheme of things speak for themselves. It represents an attempt to read the book of nature by letting ones eyes wander through the pages absorbing the truth written there. Provided there are no confounding factors such as biases in the observer, the truth should

be writ large for all to see. Popper (1959), however, points to the absurdity contained in the instruction, "Observe"! Clearly, even an unbiased observer would need to know what to observe. Even so, mental activity is considered inappropriate to this method since it would only pervert the purity of the observation and hence corrupt the ensuing knowledge of the truth. Classical Empiricism or Inductivism epitomize this principle.

Against the passive theories of knowledge, activist epistemologies take cognition as the basic building block of knowledge. Immanuel Kant first proposed that we understand the world through self-erected, "conceptual frameworks" constructed out of our mental activity. Pessimistic Kantians saw conceptual frameworks as self created prisons, forever restricting our knowledge to the confines of our own thoughts. Optimistic Kantians, on the other hand, thought the conceptual framework to be created by a divine architect and planned to fit the world in perfect harmony. Lakatos (1970) advocates the position of revolutionary activists, in which,

"It is we who create our 'prisons' and we can also, critically, demolish them."

In his *Objective Knowledge*, Popper (1972) extends the distinction characterizing the active and passive theories of knowledge as "searchlight" and "bucket" theories of the mind. He also proposes that we should conveniently split the universe into three conceptually separate but related worlds. World One is the world of material reality, World Two is the domain of our subjective experience, and World Three is the location of propositions and ideas.

World One is said to contain all physical matter. It is a material world assumed to have an existence independent of our thoughts about it. Thus it is founded on the assumption of realism. Physical things are conjectured to have an objective existence and not simply be phantasms created by our psyches. Our perceptions may not accurately reflect the objective existence of World One, but that is an issue relating to World Two, the domain of our subjective impressions. It is principally the world of our conscious experience. Knowledge in World Two is thus inherently subjective and remains intricately linked to our psychological processes. Knowledge in this world is contained in beliefs reflecting our dispositions or states of mind.

Most importantly, Popper distinguishes the content of thoughts which inhabit World Two from the knowledge content of World Three. World Three is the world of objective knowledge, in the sense that it is independent of the knower. Objective knowledge is synonymous with the content of ideas which stand in relation only to each other, in the form of arguments, problems and propositions, and not in relation to psychological processes. Knowledge is thus said to be objective in this realm not by its veracity (as an accurate reflection of World One), but by its independence from the knower. For Popper, World Three, the domain of objective ideas is thus the proper home for scientific knowledge.

Although each of the worlds is considered to be conceptually independent, they are, however, only semi-autonomous. World Three, the world of scientific knowledge is said to grow with the subjective world (World Two) acting as mediator between the physical world (One) and scientific knowledge. The aim of science, according to Popper's Three World thesis is an increasing correspondence between the content of World Three and the other domains, but principally World One. Science thus aims at a better approximation of truth, rather than achieving absolute truth. The search for verisimilitude, as Popper calls this, is arguably a more practical aim for science than the attempt to explain the absolute nature of the universe.

Magee (1973) says of the Three World Thesis that it is Popper's most significant contribution to philosophy in that it challenges epistemology which tie knowledge to the limits of the knower's own particular experiences. The Three World Thesis will be strongly resisted, however, not only by those holding a purely subjectivist epistemology, but by those stressing the cultural relativity of thought.

Within Social Psychology, Moscovici (1981) champions a similar call for relativist science. In Popper's terms, however, the social relevance of science is distinct from its epistemological status, just as the psychological expression of an idea is independent of its epistemological content.

Historical Reconstructions of Scientific Progress

It is noteworthy that the most popular representation of science closely follows the passive theory of knowledge. The scientist is traditionally portrayed as possessing a clear, logical mind, unimpeded by human emotions. (Consider, for example, the personification of science in the character of *Mr. Spock* in the popular science fiction epic *Star Trek*, or before that the cold but methodical intellect of Sherlock Holmes).

The traditional view of scientific method for scientists and philosophers also corresponds to the passive view of knowledge. Francis Bacon first systematized the passive theory in his *Philosophy of Scientific Induction*. Reacting against classical scholasticism and aristotelian logic, Bacon devised a method for discovering truth based on principles of drawing inferences from pure observation. This is best seen in Bacon's solution to the demarcation problem. In true Renaissance manner, Bacon emphasizes the role of experimentation. To decide between competing theories which both account for the available evidence, Bacon proposed the Crucial Experiment. All that is required is that two rival theories generate a single prediction of mutually exclusive outcomes for a given test condition. Whichever theory predicts the correct outcome is the one which is verified.

As Popper (1972) notes,

"Such cases are 'crucial' in Bacon's sense; they indicate the cross-roads between two (or more) theories."

A number of weaknesses reside in Baconian crucial experiments, however. Most profoundly, there is the glaring assumption that rival theories form an exhaustive set of all possible explanations. That is, absolute truth will be discovered through a single experiment. Clearly, this would be difficult to establish. The most that can be said of the outcome of a crucial experiment is that for the time being, one particular explanation has withstood refutation. The victorious theory received corroboration not verification. Moreover, no observation or series of observations could ever verify or prove any theory. (Popper 1959).

Scientific Empiricism in the form of Logical Positivism dominated the Philosophy of Science for nearly half of this Century. The received view as Frederick Suppe (1977) labels it set limits in the basic framework for analyzing problems in scientific method. Critics have argued that Psychology, in its haste to gain scientific respectability, tied itself to the same sinking philosophical ship (Armistead 1974, Harré 1979).

The problem of induction remained central to Logical Positivism in accounting for how observation ultimately gives rise to (or induces) theoretical explanations. At its most sophisticated, the method was defined in terms of a probabilistic inductive logic. Carnap (1945) argues strongly for statistically based explanations on the grounds that scientists can only give, as it were, their best guess of the true nature of the universe. That is, knowledge is regarded as both instrumental and probable. This thinking allowed a distinction to be made between descriptive and explanatory theories. In turn this led to problems with the structural identity thesis (which supposes a symmetry in the descriptive, predictive and explanatory power of theories). Hempel (1965) modifies the distinction to include the idea of explanation sketches, whereby theories could be unfolded *in principle* to make predictions.

Since the 1950's, however, the received view has come under attack. Controversies about the instrumental or realist nature of science were redefined as debates over the generalized demarcation problem. Popper (1959) provides a major challenge to probabilistic induction by showing that empirical probabilities are distinct from inductive probabilities. The acceptance or rejection of theories must hence be made on non probabilistic or fallibilist grounds. As Suppe (1977) notes, both Kuhn and Feyerabend follow the same point. Just as importantly, a number of influential rivals arose, culminating in a major upheaval in the 1960's so that by the end of that decade most philosophers of science had repudiated the received view.

The most potent challenges to the received view came from Popper, Lakatos, Kuhn and Feyerabend (Suppe 1977). A brief outline of each position follows:

Popper and Falsificationism

Popper's early work advocated a tough minded, or dogmatic form of falsification as a yardstick of scientific veracity. As Popper's (1959) powerful criticisms of inductivism show, there is a definite asymmetry between verifiability and falsifiability, which results from the logical form contained in the explanatory statements. Employing the *modus tollens* from classical logic, Popper showed that although universal statements cannot be derived from singular statements, they can in fact be contradicted by singular statements. Truth, therefore, can only be preserved in the deductive and not the inductive direction. This amounts to saying that although we can never verify a theory, we can nevertheless falsify it.

In his *Conjectures and Refutations*, Popper (1963) argues that falsification could be used as a demarcation criterion between science and pseudo or non-science. The falsificationist demands that all scientific theories be capable of potential falsification. This means that all theories should be testable or refutable in principle. In Popper's words,

"A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice."

To decide between competing theories, Popper originally amended Bacon's solution into a *negative* crucial experiment, which could be used to falsify but not verify a particular theory.

Criticisms have been levelled at this solution to the effect that his basic test model is inappropriate (Duhem 1905, Quine 1953). According to the Duhem-Quine thesis, theories can be rescued from falsification simply by a relevant adjustment to the background knowledge in which it is embedded. Thus crucial experiments do not hit only at particular theories, or more narrowly, hypotheses, but at total systems of background knowledge. The problem is to locate which components are refuted by a given test implication. The Duhem-Quine thesis is not, however, the unitary argument it is sometimes quoted as *being*.

Lakatos (1970) distinguishes in the development of Popper's writing three forms of falsificationist solution; dogmatic, methodological and sophisticated. Methodological falsification differs from the dogmatic version in separating disproof or refutation from the act of rejection. With this scheme the cutting edge of the demarcation criterion is softened and relies on the empirical basis to theories. The negative crucial experiment thus forms the main decision rule. Sophisticated falsificationism, however, has no use for negative crucial experiments, but instead emphasizes the idea of growth in science by postulating a symmetry between theoretical fertility and empirical abundance. Lakatos (1970) expresses this most succinctly,

"The sophisticated falsificationist allows any part of the body of science to be replaced but only on the condition that it is replaced in a 'progressive' way

so that the replacement successfully anticipates novel facts."

The Duhem-Quine thesis can thus be given both strong and weak interpretations as methodological criticism of falsificationism. In the weak variant it only denies the falsification of individual components of a theory. Thus it hits only at dogmatic falsificationism. The strong version, however, allows the replacement of theoretical components in an arbitrary and pragmatic way. Hence it excludes the possibility of a rational and normative rule for selecting among alternative theories. Both naive and sophisticated falsificationism strongly oppose this interpretation.

Popper continues to influence the growth of the Philosophy of Science, but mostly through his thinking on epistemology, rather than his solution to the generalized demarcation problem.

Lakatos and the Methodology of Scientific Research Programmes

Imre Lakatos (1970, 1971) advocates his own kind of Popperian sophisticated falsificationism which he terms the *Methodology of Scientific Research Programmes* (MSRP). According to this account, theoretical systems rather than single theories are the appropriate starting point for understanding progress in science. They are characterized by the existence of a positive and negative heuristic. (By "heuristic" is meant a set of logically related rules entailing other properties which direct the nature of scientific problem solving activity.) The positive heuristic serves to shape the direction of empirical research while the negative heuristic defines those areas of the research programme which are sacrosanct and should not be investigated. The negative heuristic is thus said to form a hard core of the research programme which is protected by a peripheral layer of auxiliary hypotheses generated by the machinery of the positive heuristic. Generally, the hard core is thought to remain largely undefined and therefore immune from refutation. Test implications from empirical research are considered to falsify only the vulnerable hypotheses in the peripheral layer, so leaving the core of the research programme intact.

Hard cores which are particularly rich and possess a productive positive heuristic will give rise to a vast thick belt of protective hypotheses, and so are likely to be able to withstand considerable numbers of negative test results, or anomalies, before the direction of research is seriously disrupted. Lakatos (1970) puts it thus,

"The direction of science is determined primarily by human creative imagination and not by the universe of facts which surround us."

Lakatos's solution allows for components of research programmes to be modified to cope with anomalous test results, provided this is done progressively. Movements from one theory to

another within a research programme which are progressive and therefore acceptable constitute a progressive problem shift. Acceptability for this accolade is determined by the succeeding theories ability to account for all the anomalies not digested by its predecessor plus the prediction of novel facts. Another Popperian way of stating this is that the progressive research programme must contain excess theoretical and empirical content.

In contrast, degenerating problem shifts are apparent when theory must be adjusted to cope with recalcitrant test implications, and novel facts predicted by a rival must be explained post hoc.

MSRP offers a conventionalist methodology for evaluating research programmes. It does so not by appraising truth content (which its Popperian fallibilist basis would in any case prohibit), but by comparing the effectiveness of rival research programmes according to their problem-locating and problem-solving heuristic machinery. Rival research programmes are described in terms of progressive and degenerating problem shifts.

The methodology described by Lakatos (1970) also distinguishes internal history (that is, the characterization of science as heuristic systems), from the external history (which describes the events surrounding , and including the activity of scientists engaged in the research programme). In accounting for scientific progress, Lakatos advocates a dialectical approach, describing the external history from the perspective of the internal history (that is, creating a rational reconstruction of progress within the research programme), and then criticizing this from the point of view of external history.

Feyerabend (1975) specifically acknowledges Lakatos's methodology to be the most sophisticated but rejects it finally because Lakatos admits there is always the possibility of a degenerating programme being revived and taking ascendancy. Lakatos, furthermore specifies no limits beyond which a research programme may be said to be unrecoverable. In short, there is a paradox. The most sophisticated methodology in the end must admit that there can be no methodology.

Kuhn and Scientific Revolutions

Another major challenge to the received view has been the work of Thomas Kuhn (1957; 1962). Kuhn's descriptions of scientific revolutions especially has been welcomed in much Social Psychology. He argues that paradigm shifts take place as social movements in the scientific community, with researchers abandoning old research programmes, or paradigms, after a gestalt switch in which the new paradigm is seen to assimilate and go beyond the older established one. Critics of orthodox Social Psychology, in particular seem fond of brandishing Kuhn's paradigm shifts as portentous, but one sided, Damoclean swords. Armistead (1972, 1974), Shotter (1975) and Harré (1980) amongst others have been vociferous in advocating a major paradigm shift for both the approach and context of the whole of Social psychology. Although the self-styled "New

Paradigm" has been influential in stimulating debate on the scientific basis of Social Psychology, it has not led to a mass exodus of scientists away from the normal science paradigm. One problem is undoubtedly that several quite diverse, if not contradictory, perspectives align themselves with the nascent revolutionary science (compare, for example, Reason & Rowan 1981). In the absence of a workable and unitary alternative no clear revolution has been forthcoming (Laungani, Baillie & Rawson 1976).

Like sophisticated falsificationism, Kuhn demands excess theoretical content for succeeding paradigms. Although Kuhn clearly identifies the appropriate unit of analysis as being more than single theories, the term "paradigm" retains an elusive meaning. Masterman (1970) criticizes Kuhn for holding multiple definitions. Kuhn's main use of paradigms, however, is in describing evolutionary cycles in the progress of science. During the phase of Pre-science, diverse theoretical positions are said to crystallize into a single paradigm resulting eventually in Normal Science. During this middle phase the scientific community adhere to a single consensus in appraising research, and devote their efforts to puzzle-solving, thereby consolidating the dominant paradigm. As falsifications become apparent, however, and anomalies accrue a state of crisis develops which can only be resolved through the emergence of a new paradigm. A scientific revolution takes place when scientists transfer their allegiance to the new paradigm in a sudden "gestalt switch".

Unlike the falsificationist based solutions, Kuhn's excludes a rational normative appraisal, instead relying upon the scientists' ability to recognize truth (or at least the prospects of a going concern). As Kuhn (1970) expresses,

"Scientific knowledge, like language, is intrinsically the common property of a group or else nothing at all."

Lakatos (1970) criticizes this solution as being little more than "mob science", that is, science demarcated through consensus in the scientific elite.

Chalmers (1976) claims that Kuhn's popularity is undeserved and that he conflates three distinct views which Chalmers terms Subjectivist, Consensual, and Objectivist (actually, all possible solutions to the generalized demarcation problem). Although Kuhn argues for elements of all three, Chalmers points out that he ultimately chooses the consensual criteria for appraising science.

As external history, however, Kuhn's account may be justifiably popular through providing a more or less common sense explanation of major cognitive restructuring. Career changes, the commencement of parenthood, religious conversions and other major life events may be well described as gestalt switches of paradigms at the individual level. At the very least there may be

a reflexive paradox here for Social Psychology, in attempting to explain science in social psychological terms when Social Psychology is itself subject to the same constraints of science.

In recent years Kuhn's work has suffered a declining influence amongst philosophers of science, partly because the historiographical basis is regarded as too simplistic. The idea of cycles between normal and revolutionary science has been difficult to sustain in particular. The epistemological basis has also received considerable criticism. Kuhn claims that rival paradigms are incommensurable, that is they employ different standards and different languages. This makes Kuhn's a relativist position, even though he explicitly denies it.

Feyerabend and Epistemological Anarchism

Also acknowledging the incommensurability of theories, Feyerabend's thesis (1975) advocates a more extreme form of relativism. A self-confessed anarchist and dadaist, Feyerabend argues that all theories are equally right or wrong and therefore equally acceptable or rejectable.

Feyerabend challenges that all rational normative solutions to the generalized demarcation problem would have the effect of shackling scientific progress. As he declares,

"..a determined application of the methods of criticism and proof which are said to belong to the context of justification, would wipe out science as we know it- and would never have permitted it to arise."

Lakatos (1970), however, argues that unless we are to create a situation of real anarchism (where pseudo science has equal status with true science) there is a need for a rational and conventional methodology for appraising science. In Popperian terms, Feyerabend conflates Worlds Two and Three; or in Lakatos's methodology, conflates the internal and external history of scientific progress, since rationality in the Philosophy of Science must focus upon rational action rather than rational belief (Lakatos 1968).

But, Feyerabend contends, all rational alternatives are founded on unrealistic assumptions about epistemological commensurability of theories. Rather, he sees knowledge growing through an increasing ocean of incompatible ideas, Epistemological anarchism therefore, is offered as the only tenable solution, providing a neat remedy for the restrictive methodology imposed by rationalism. Feyerabend's commensurability thesis, however, is weakened by a lack of persuasive historical evidence. (McMullin 1970).

Generally, however, it is difficult to know to what extent Feyerabend sometimes speaks, as it were, tongue in cheek. If not deliberately ignoring them, he is at least uncaring of his critics. Provocatively, Feyerabend (1975) addresses Lakatos as a fellow anarchist. Lakatos, however, would undoubtedly have rebuffed this sentiment as applied to his work as well as his personal beliefs. Whilst Lakatos applauded a touch of irrationalism in the discovery of science, he

strongly rejected chaotic solutions to the demarcation problem. For Feyerabend, however, discovery and justification are in practice inseparable. He says,

"We are dealing with a single uniform domain of procedures all of which are equally important for the growth of science."

In a "doctrine of proliferation", Feyerabend suggests scientists should proceed counterinductively as well as inductively, and that in brief, "anything goes". This might be best regarded as a form of brainstorming in the scientific community. Although Feyerabend's methodological and epistemological pluralism has much force in promoting a creative scientific enterprise, he ultimately neglects the objective content of science. That is, theories may in fact be successful (or not) in predicting events or giving rise to powerful technologies.

Unlike Kuhn, Feyerabend has had little impact on social scientists, but has been influential with philosophers of science. On epistemological grounds alone, Feyerabend's position represents a a logically possible form of extreme relativism, and must be taken seriously. His work may best act, however, as a counterbalance to the other highly normative solutions. It provides some counter evidence showing that scientific practice may be as crucial to the growth of science as scientific principle.

Conclusions

Various influential critics in recent years have expressed concern with an over-individual focus in much of Social Psychology. The strongest challenge has emerged from a broadly European perspective which seeks to redefine both the social focus and methodological emphasis of mainstream Social psychology. Champions of the self-styled New Paradigm have been further vociferous in proclaiming a paradigm shift away from orthodoxy. Although there has been considerable dissatisfaction with some of the approaches in Social Psychology this does not appear as yet to amount to a new beginning.

Such dissent may be thought of as a crisis of legitimacy or as indication of a need to continue building the philosophical foundations. Either way the Philosophy of Science is concluded to offer useful insights into the development and evaluation of research; namely a concern with elucidation of the essential nature of the subject, characterization of progress and growth, and a questioning of the basis for its authority.

Despite their considerable differences, the contributions of Popper, Lakatos, Kuhn and Feyerabend to the Philosophy of Science concur in showing that scientific progress can be appraised through critical comparison of the historical and epistemological bases. The research enterprise, moreover, is best characterized in some broad paradigmatic unit of analysis rather than in isolated theories.

The Methodology of Scientific Research Programmes (MSRP) is chosen here as the most appropriate method to critically evaluate the psychological literature on decision making in a *rational reconstruction*. MSRP evolved from sophisticated falsificationism and retains the basis of objectivist epistemology. This has a reflexive advantage insofar as there is an attempt to make explicit the epistemic assumptions of both the subject matter and the methodology. That is, it attempts also to explain itself in terms of the progress of ideas. The Popperian Three World basis also offers a possible solution to the current methodological polarization and impasse often seen between the "Positivist" old paradigm and the "interpretivist" New Paradigm in psychological research work.

Another major advantage built into MSRP is Lakatos's differentiation of internal and external history. This simple but powerful notion helps illuminate differences in the process and content of research. In creating a rational reconstruction, Lakatos (1976) advocates a dialectical approach, confining internal history to the main text and where possible showing external influences through the use of footnotes. As he expresses,

"The real history will chime in the footnotes, most of which are to be taken therefore, as an organic part of the essay."

Footnotes, however, can make for cumbersome reading. In this study matters of internal history will be marked where possible, through the use of present tense, and external history indicated through the past tense. Thus for example: In a BBC talk, Lakatos (1973) *says*,

"The New liberal Establishment of the West also exercises the right to deny freedom of speech to what it regards as pseudoscientific."

The use of present tense here directs attention to the objective (or propositional) content of Lakatos's statement; namely that the institutions of science are hypothesized to impose authoritarian forms of solutions to the generalized demarcation problem. It does not mean that the man, Imre Lakatos, continues to enunciate the same theme. In terms of the external history in this example, it might be said that Lakatos *was concerned* to challenge irrationality wherever he saw it, but especially in powerful institutions. Infact, it is sadly the case that Lakatos died in 1974 leaving much of his work unfinished (also a matter of external history). Appropriately for an objectivist, his ideas (World Three) live on independently of his material existence (World One) or his subjective life (World Two).

STUDY ONE:

SOCIAL JUDGMENTS AND BEHAVIORAL DECISIONS

**A Rational Reconstruction of Empiricist and
Rationalist Research Programmes of Decision Making**

RESEARCH PROGRAMMES IN THE SOCIAL PSYCHOLOGY OF DECISION MAKING.

In creating a rational reconstruction of psychological research in decision making, two rival research programmes will be compared; the Rationalist and Empiricist programmes of decision making. Since MSRP defines research programmes as a larger unit of analysis than theories, two distinct sets of major research work will be reviewed within each programme. In this first study, *Behavioral Decision Theory* (Rationalist) will be compared with *Social Judgment Theory* (Empiricist).

The subject area of decision making is arguably one of the most fundamental topics in contemporary Psychology, epitomizing the prevailing cognitive concerns. For Social Psychology in particular it illustrates the methodological difficulties encountered when attempting to model the individual in the social world. In so doing it exemplifies the dominant paradigm for contemporary Social Psychology. In turn this reflects many of the problematic features inherent to Western cultural values.

The Foundations of Research Programmes in Decision Making

In Psychology's effort after science, much research work has been directed inwards. Theoretical growth has sometimes been neglected in favor of methodological development. Kaplan (1964) wryly comments,

"The work of the behavioral scientist might well become methodologically sounder if only he did not try so hard to be scientific!"

Successful science is also characterized, however, by the growth of technologies which have arisen out of scientific application. From a practical standpoint, science aims at theoretical growth and technological achievement. Technologists, however, are not primarily concerned with applying theories so much as solving concrete problems. To some extent, therefore, scientific application succeeds when technologies become available for user definable problems.

Psychology has given birth to such a possible technology through decision making research (Edwards, Lindman & Phillips 1965).

To be fair, this particular offspring has a number of progenitors. Decision theories and techniques of decision analysis have grown simultaneously in Economics, Managerial Science and various other disciplines. (Raiffa 1969).

The first practical application of decision theories seems to have been with the introduction of Operational Research during the Second World War. This was for specific types of decision which occurred with predictable regularity. Modern decision analysis, by contrast, is best fitted to conditions of risk, outcome uncertainty and great complexity. It is partly for these reasons that decision making is best understood within a psychological framework, and through Psychology that the technologies of decision making can be most fruitfully applied.

Psychology as science may well benefit more than most disciplines, moreover, from the development of decisional research. Potentially it could form the basis of a powerful integrative heuristic for the prevailing cognitive paradigm.

A review of the literature by Slovic and Lichtenstein (1971) makes a useful first landmark for reconstructing research programmes of decision making. The essential merit of their review is in the recognition that single theories do not form the most appropriate units of analysis when appraising scientific progress. Lacking a conventionalist stratagem, however, for comparing rival research programmes, the authors choose to identify different bodies of research effort according to the mathematical components of each programmes heuristic machinery. In their words,

"Much of the recent work has been accomplished within two basic schools of research. We have chosen to call these the 'Regression' and the 'Bayesian' approaches. Each has its characteristic tasks and characteristic information that must be processed to accomplish these tasks."

Describing research programmes according to their main methodological tools does have a number of advantages. Conspicuously, the statistical procedures adopted by each programme will invariably reflect the specific experimental paradigms used. In turn, the experimental procedure will mirror some of the basic assumptions at the core of each programme. A major disadvantage of this analysis, however, lies in the restricted scope of the approach. Generally, the units of analysis are too narrow. Not only might different research programmes attempt to use the same methodological tools inappropriately, but different theoretical bases could be tied with the same methodological brush, and regardless of problem focus. Equally, different data analysis techniques could be used within the same programme.

Labeling research programmes according to their statistical modus operandi may, even so, be quite illuminating as an explanation of external history. One recurrent problem in scientific research seems to be that details of methodology assume ascendancy over theoretical content. Scientists, it appears, are occasionally seduced by their own methodology, so that real theoretical problems can be neglected in favor of methodological border disputes. Perhaps during the phase of Normal Science, scientists become preoccupied with puzzle solving, thereby consolidating

rather than challenging the prevailing paradigm (Kuhn 1970). Meehl (1967) argues that much research on the Social Psychology of the psychology experiment becomes little more than a fruitless search for artifacts where reputations are gained without any substantive original work. (See, however, Miller 1972 for an alternative view). M.B. Smith (1972) in reviewing *Advances in Experimental Social Psychology* reflects that methodological devices, such as the prisoners dilemma game, can become functionally autonomous specialties. The operational obsession of some researchers, though, can reduce scientific progress to marking time. Urbach (1974) reproves scientists on the "I.Q. debate" for this very reason. As he puts it,

"To call the controversy the 'I.Q. debate' is like calling the rivalry between theories of heat the 'thermometer debate'."

More than this, simple minded operationalism also ignores explanations of how any one measuring instrument is more accurate than any other (Zahar 1973).

Number manipulating procedures in particular seem to have a beguiling effect on researchers, distracting them from the original problem focus of the original research. Symptomatic of this tendency is a widespread belief in the heuristic superiority of mathematical models over other types of theoretical formalism. Mathematical models not only appear to permit a more precise testing of parameters, but they also manifest a certain purity and elegance lacking in other approaches. Purity is seen by the devout in the exclusion of ad hoc adjustment to hypotheses, and elegance resides in the neatly guided construction of parsimonious explanations. Unfortunately, this vision can be demonstrated to have little or no foundation in the reality of creating and testing mathematical models. When so overimbued with heuristic power, mathematical models can negate their original utility.

In addition to its ethereal aspects, the worship of mathematical models leads to a research practice which smacks of naive inductivism. In his *Proof and Refutations*, Lakatos (1962, 1976) shows convincingly that definitions in mathematical ideas follow and do not precede proofs. More specifically, proofs can only be challenged once the proof has been formulated in the light of previous working. Contrary to the usual notion about mathematics, then, the procedure of testing mathematical definitions turns out to be an untidy and uncertain process. Poincare, Frechet and Polya amongst others, all fell into the trap of assuming (wrongly) that maths and science share an inductive character. In fact, as Lakatos (1976) points out,

"Mathematical heuristic is very like scientific heuristic - not because both are inductive, but because both are characterized by conjectures, proofs and refutations."

Rationalist and Empiricist Research Programmes

Whilst Slovic and Lichtenstein (1971) may confuse the heuristic properties of research programmes, they are essentially correct in locating the central focus of problems for each school of thought. Psychological research in human decision making is best understood as taking place within two competing research programmes; the Rationalist and the Empiricist Decision Making Research Programmes.

The Rationalist programme depicts decision making as a reasoning process in which the alternatives are subjectively weighed in the balance. For researchers this means attempting to model the decision maker's analysis and appraisal of the options. For the decision maker also this entails an internal audit of values. The Rationalist Research Programme is best seen in the *Behavioral Decision Theory* of Ward Edwards and his colleagues (Becker & McClintock 1967); and in the *Theory of Reasoned Action* by Martin Fishbein and his co-workers (Ajzen & Fishbein 1980).

In contrast, the competing Empiricist programme portrays decision making as based on the recombination of information derived directly from experience rather than reasoning. It is closely identified with studies attempting to model the integration and understanding of pure sense data. More importantly, however, the core heuristic assumes that decision makers themselves understand their world and act through the same (empiricist) principles. Egon Brunswik's psychology in particular exemplifies this approach at its most refined (Hammond 1972). Brunswik himself did not conduct research in decision making. However, Brunswik's followers (particularly Hammond) took up the challenge and systematically applied it in the form of *Social Judgment Theory (SJT)*, mostly through the Lens Model paradigm.

The Empiricist research programme is also powerfully represented in *Attribution Theory*. Heider's (1944, 1958) thinking on phenomenal causality is usually acknowledged as the origin of Attribution Theory. Later research has retained the same strong Empiricist basis (e.g. Kelley 1967), but has mostly not focused on decision making. Weiner's (1980) influential model, however, has allowed Eiser (1982) and others to promote a shift to an attributional or decision making direction.

Rationalism and Empiricism have, of course, been rival methodologies throughout the history of science, shaping both the initial selection of subject matter and the system for acquiring knowledge. The antithesis is well founded historically, and can be traced back to differences expressed in the philosophies of Plato and Aristotle. More directly, it is possible to link the

development of psychological science to the obstinate co-existence of the rival methodologies. Barrett (1971) contends that the history of Psychology is embedded in the history of competition between Rationalist and Empiricist methodologies. In his words,

"The inherited antithesis of methodology persists in the development of psychological thought in a number of dichotomies expressing contrasting emphases: reason versus sense; mind versus body; innate versus acquired; heredity versus environment; phenomenology versus objectivity; molar versus atomistic; qualitative versus quantitative; and certainty versus probability."

Although much of Psychology can be usefully described in this way (e.g. introspection versus behaviorism) Barrett undoubtedly overstates his case. More critically, Robb Farr (1987a) argues that historians of Psychology are blind to the fact that both Empiricism and Rationalism are part of the Cartesian Tradition, and that another, Hegelian paradigm is possible, and indeed, desirable. Nevertheless, rival programmes of decision making research can be seen to closely follow the Rationalist and Empiricist traditions.

From a psychological perspective, the dichotomy of Empiricism and Rationalism is manifested as two distinct approaches towards unlocking the secrets of the human mind. There appear to be two ways of understanding the internal workings; from the outside-in, and from the inside-out. The Empiricist approach is to examine in detail, and principally by statistical procedures, the input and output relations of the organism with the workings of the mind regarded as a black box. The other approach, exemplified by the Rationalist programme is to take the view from the inside and derive an ideal model of basic operating principles. Observations can then be made to check how far the external properties deviate from the ideal standard.

There are inherent problems for both approaches, both in principle and in practice. The Empiricist account offers no rule for the selection of hypotheses to fit the observed data, so unless the scientist adopts some kind of rationalist manoeuvre there will always be irreducible elements and explanations which can only be instrumentalist. Moreover, statistical descriptions do not imply, let alone guarantee statistical laws. That is, discrete processes inside the black box may give rise to probabilistic information outside the box, but knowledge of the latter in no way implies what the underlying data generator consists of. Having described a whole series of such representative correspondences the scientist is in a position of having to infer how the contents might function so as to reflect the observed external properties. Ultimately, therefore, the construction of explanatory mechanisms must rely on the scientists imagination. If this is not realized, or if it is rejected, the scientist is once again open to the charge of naive inductivism. (See Bunge 1964 for a critical discussion of black box theory).

Fisher (1954) suggests that statistics supply a special framework upon which contemporary scientific progress hangs. Whilst Fisher is correct to assume that Twentieth Century science has

made effective use of statistical techniques he is mistaken, however, to imply that statistics could form the structural basis of science. Although phenomena may be treated statistically, knowledge about them remains solidly fallibilist (that is, either true or untrue, not probably true). Naive statistical empiricism which seeks to digest all probabilistic information through a holistic statistical process is also inductivist. (See Popper 1959 and Lakatos 1968 for fuller criticisms of probabilistic knowledge and its inductive character).

Rationalist explanations also will encounter difficulties when accounting for observed disparities with ideal or normative models. The methodology provides no a priori rule for deciding where to locate the origin of the disparity. Nor indeed is there even any guidance for the direction in which to modify hypotheses.

Competing or Completing Research?

Little open discussion has been generated by the two rival programmes under consideration. As Slovic & Lichtenstein (1971) remark,

"For the most part, researchers have tended to work strictly within a single approach, and there has been minimal communication between the resultant subgroups of workers."

In terms of external history then, the most that can be said for rivalry is that the two opponents are not on speaking terms. But does this constitute competition? And may not any differences in the two programmes be due to complementary rather than contradictory content?

In an attempt to provide some basis for integration in the human judgment and decision making fields, twenty five prominent researchers attended a conference in 1978 at Boulder, Colorado. (Hammond, McClelland & Mumpower 1980). Though theory, method and procedure were compared, little integration emerged. The assembly was most productive, however, for identifying diverse major contemporary approaches and tracing the geneology of theories through two distinct research traditions. Although the labels differ, the general picture is in accord with the distinction between Rationalist and Empiricist programmes identified here.

Steinbruner (1974) also makes a similar two fold division of decision theories, but, referring to Kuhn (1962), describes decisional research in terms of competing paradigms. Since each has a historical force affecting more than the research methodology, paradigms are said to offer the best means of understanding the field.

The first paradigm is recognized as having roots in the Rationalist tradition, but is relabelled The Analytic Paradigm by Steinbruner, who claims that "rationality" can be linguistically confusing. He contends that decision theories which embody rational analysis in the economic sense do not mean rational in the wider sense of reasoned or sane. It can be argued, however,

that in the final analysis the distinction cannot be sustained, since rationality (as conforming to reason) ultimately means value integration. For example, if it is rational to carry an umbrella in the rain, then it is so because the positive value of staying dry exceeds the negative value of having to carry the umbrella and the negative value of getting wet. In any case, Steinbruner's definition of the Analytic Paradigm closely follows Rationalist principles. As he portrays it,

"Perhaps the central characteristic of the analytical decision maker is the construction of careful, explicit disgregated calculations of the possible results of his actions."

Steinbruner identifies the second set of decision theories as belonging to the Cybernetic Paradigm. Here the analytical assumption of value integration is replaced by a systems approach where choice is exercised in order to control inherent uncertainty. This is said to be achieved by means of drastically filtering information and matching the available response repertoire. Cognitive information processing as distinct from conscious mental operations form the essential difference between the two paradigms. Cognitive processes are invoked by Steinbruner as necessary for the Cybernetic paradigm to fulfill its promise.

Encumbering psychological research in decision making with labels of Empiricist and Rationalist approaches to methodology does not at first sight add greatly to the division of paradigms made by Steinbruner (1974). The gain so far has been merely to point out a broader historical context to the development of rival accounts of decision making. The hard cores of the two research programmes, however, specify more than a difference in lineage. Not only is a different assumption about the basic functioning of the individual decision maker fundamental to each research programme, but just as importantly, different methodologies are engaged as appropriate means of studying the problem.

The Epistemological Basis of Empiricist Decision Making

At the hard core of the Empiricist programme, like the label suggests, is the assumption that decisions are formulated on the basis of *a posteriori* knowledge. Experience and not reason forms the basis for decision making. At its most radical, choice is ultimately dependent upon direct sense data. Robinson (1981) expressively captures this interpretation describing empiricism as "The Authority of Experience".

Steinbruner makes a similar point in his identification of the Cybernetic Paradigm, which he says makes a central assumption of uncertainty control. Here decision makers are seen as primarily concerned to buffer themselves against chaos in the world by directly avoiding outcome evaluations.

The same assumption is made explicit in the research generated in the Brunswik tradition, which is founded on the tenet that a persons psychology must be understood in probablistic

terms. Since people are seen to operate within an uncertain environment, they are seen to function probabilistically. Brunswik (1955) describes the essence of this formulation thus,

"So long as the organism does not develop, or fails in a given context to utilize completely, the powers of a fully fledged physicist observer and analyst, his environment remains for all practical purposes a semi-erratic medium; it is no more than partially controlled and no more than probabilistically predictable."

Two distinct but related implications follow from this. The first is that the decision maker is wholly dependent upon the information in the environment, and the second is that empiricist methods must be used to study the decision maker. Thus, like radical behaviorism, Brunswik's probabilistic functionalism is tough minded. It asserts that decisions become effective according to the amount of potentially useful feedback gained from the environment. In this theoretical formulation, the facts not only speak for themselves, but also for the decision maker.

The Epistemological Basis of Rationalist Decision Making

In contrast, the hard core of the Rationalist programme has at its centre the principle of *a priori* knowledge, that is, decisions are not dependent upon mere sense perceptions, but are informed by reason. Robinson (1981) aptly summarizes rationalism as, "The Geometry of the Mind".

For decision theorists the concept has its origins in the philosophies of Adam Smith, Jeremy Bentham and John Stuart Mill, which means an essentially economic conception of rationality. Indeed, Economic Man is often cited as the basic model for theories of decision making, particularly in business world applications of decision theory. (Simon 1959). This has been taken to imply two things. The first is that the actor or decision maker is rational and that only the rational survive in economic competition. Note, however, that the model only prescribes a minimum course of action for survival. It does not, as it is sometimes wrongly assumed to, prescribe supremacy. Hence, it could not be reasonably expected to prescribe a "killing" on the stock market.

The model is thus normative, prescribing the appropriate type of action, or minimal course of action for survival. Classically, the conception of rationality reflects the decision makers ability to select available means to reach pre-specified end-states or goals. (Miller & Starr 1967). More recent usage, however, extends the principle to include analysis of the goals to be achieved. To this end the concept of utility is indispensable, so that rationality tends, therefore, to also mean hedonistic.

Workings of the Negative Heuristic in the Empiricist Programme

Lakatos (1970) postulates that the details of a research programmes hard core are protected by the negative heuristic which forbids research questions to be directed at the hard core. Instead, the components of the positive heuristic form a protective belt which bears the brunt of critical tests. With the hard core thus protected, research programmes provide a nurtured environment for the development of the epistemic basis. The Empiricist and Rationalist programmes in decision making are both noteworthy in their attempts to solidify their hard cores, by additionally axiomatizing the basic assumptions of the positive heuristic.

Urbach (1974) raises the question, "Should scientists believe the hard cores of their research programmes?" It is clear from the perspective of Popperian three world epistemology that the private beliefs and other psychological aspects of scientists thinking should not affect the objective content of their theories. Newton, Plank and Maxwell are all examples of eminent scientists who did not, initially at least, believe in their hard cores (Lakatos 1970). What matters for a rational reconstruction of research programmes is the extent to which scientists behave as if they believed in their negative heuristics. In Lakatos's (1971) terms, the personal beliefs are a part of the external history, whereas the internal history is seen in the development of the positive heuristic and auxiliary hypotheses as they relate logically to the hard core.

The Brunswikian faction of the Empiricist programme provide a very clear example of scientists wholly committed to their hard core. It would not be an overstatement to describe them as displaying considerable zeal in conducting their research. They share a profound sense of destiny in their programme, fulfilling, as they see it, the new psychological science and completing Brunswik's unfinished work. Hammond (1966) the chief apostle of this movement, expresses this sentiment well. He states,

"Probablistic Functionalism... is the necessary culmination of psychology and a proper fulfillment of its promise."

Brunswikians also exhibit a marked concern with the elegance of Brunswik's theory. They communicate the importance, as they consider it, of the harmonies and symmetries of the underlying theoretical structure. Concern with elegance is best shown in the diagrams constructed by this group of scientists to schematize the theoretical constructs. Hammond (1966) writes that they,

"possess intrinsic geometric or melodic similarity."

Two things are implied by this concern. The first, relating to external history, is clearly an aesthetic appreciation of the theory work, and it may therefore be an important factor in

motivating the scientists engaged on the research programme. A more important implication, however, and one recognized by researchers in this aspect of the Empiricist programme, is the use of these qualities as a demarcation criterion for evaluating research programmes. Gills and Schneider (1966) attempt to back up such a claim by invoking Kuhn's explanation of scientific revolutions, and proclaim a paradigm shift for the Brunswikian programme. They, like Kuhn, also use the term freely and in different senses. While the lens model can be taken as signifying a new experimental paradigm, it is apparent that the larger gestalt switch has yet to be thrown.

Concern with theoretical elegance is, more generally stated, isomorphic with the criterion of simplicism. Simplicism is the view that greater explanatory and predictive power resides in simpler theories. It has sometimes been advocated as a demarcation criteria for choosing between competing theories, yet it has never been demonstrated to work successfully. Contrary to popular accounts of the history of science, simplicism has not been the hallmark of successful, and progressive research programmes. Newton's theory was not simpler than that of Copernicus, which it replaced, just as Copernican theory was in turn more complex than its Ptolemaic predecessor. (Lakatos & Zahar 1975). The greatest problem lies in specifying why simpler accounts are to be preferred on logical or epistemological grounds. In short, there is a requirement that simplicity criteria should be definite and non-arbitrary. As a principle it should apply to the content of the theory and not just its expression.

The continuing belief in simplicism as a hallmark of theoretical strength may be explained in psychological rather than purely philosophical grounds. Bruner's (1974) exposition of the development of skills, in particular offers pertinent insights. Namely, as we become more competent in acquiring complex behavior, so we gain mastery over it, becoming capable of achieving the same ends through substituting functionally equivalent means. With increased control comes a progressive liberation of cognitive capacity. That is, problems become *psychologically* simpler though *objectively* more difficult. In Popperian terms, simplicism as a World Two phenomenon accurately reflects progress in knowledge, but in World Three as knowledge grows it invariably becomes more complex.

A major implication of the probabilistic psychology described by Brunswik is that all decisions are made under conditions of uncertainty. For Brunswik, psychology is also a description of the environment, or at least as it is defined by relationships between environmental events and psychological processes. Indeed, this is a core assumption of all theories within the Empiricist programme.

Like that other great Empiricist research programme, radical behaviorism, Brunswik proposed that the search for mediating psychological processes should be postponed until the subject-environment relationship is better documented and understood. (Hammond 1966). Skinner, that other stalwart empiricist, has also advocated the adjournment of research into mediational

variables. However, whilst Brunswik wanted the problem to be temporarily shelved, Skinner's (1953) claims to be atheoretical make his postponement an indefinite prorogation. Similar essentially empiricist views of science may be found more widely in Psychology. Cook and Campbell (1979), for example, posit that scientific enterprise (meaning progress) depends upon a body of "stubborn facts".

Workings of the Negative heuristic in the Rationalist Programme.

For the modern decision theorist, the principle of rationality is derived mostly from the work of Von Neuman and Morgenstern (1947), who added to the other classical assumptions the caveat that rational man can completely order probability combinations of states. Ward Edwards elaborated on this and documents a set of principles operationally defining economic man. According to Edwards (1954) economic man meets two additional assumptions over and above the traditional rationality principle. These are complete information and infinite sensitivity. Rationality in this scheme of things consists of a maximization principle (that economic man can maximize choices), and assumption that it is possible to weakly order the states of the world. This latter principle decomposes into another two parts. They are firstly that the decision maker can make a firm choice, and secondly that transitivity holds within the choices. Rationality in decision making thus comes to mean optimality. Coupled with the assumption of utility, it is the choice which maximizes the greatest excess of positive over negative utility.

Edwards (1954) states that the notion of maximization,

"seems to me psychologically unobjectionable",

and further,

"So many different kinds of function can be maximized that almost any point actually available in an experimental situation can be regarded as a maximum of some sort".

We cannot doubt that maximization is mathematically unobjectionable, since it should be possible to specify points in almost any distribution; nor that it may be experimentally convenient, since it should also be feasible to find some range of easily quantifiable, and therefore distributable stimuli, but Edwards conflates this with psychology. Theoretical principles which describe everything usually succeed in explaining nothing. Edwards does point out, however, that the two components of his rationality principle could conflict where holding weakly ordered states means expending considerable effort, and therefore negative utility. In which case, it would be irrational to maximize utilities.

The Rationalist programme specifies that the goal of human action in decision making is the maximization of utility. This simple hedonism can be viewed as a pleasure-pain dimension, and a variant of the psychological hedonism first described by William James (1890). James differentiated psychological hedonism from ethical hedonism.

Within modern Psychology, hedonism has been a widely used explanatory principle. Quite a diversity of theories have assumed that people are basically self-seeking or are motivated in some way to maximize their individual gain. The concept is long overdue for critical appraisal, yet there is very little in the literature to justify the pervasiveness of the concept. One outstanding glance at the idea is the analysis by Insko and Schopler (1972) who differentiate three temporal orientations of hedonism. They define psychological hedonism as,

"The view that individuals act so as to maximize exposure to rewarding, or pleasant circumstances and so as to minimize exposure to unrewarding or unpleasant circumstances".

Learning theory is described as a hedonism of the past since the reward value of past experiences determines future actions and shapes the behavior of the organism accordingly. Hedonism of the present is best seen in Exchange Theory where social encounters are balanced in terms of immediate payoffs or rewards and costs (Blau 1964). Theoretical models which emphasize rationality and choice exemplify, in their view, a hedonism of the future.

Interestingly, Edwards and Tversky (1967) support an at least similar idea by contrasting Rationalist decision theory as ahistorical, with learning theory which invokes historical explanations. Both Insko and Schopler, and Edwards and Tversky take pains to emphasize that an ideal theory should take both orientations into account.

Conclusions

Two distinct research programmes in the Social Psychology of decision making have been identified. Previous reviews of the literature have made similar alignments of the main protagonists but have based their classification on differences in research methodology and research traditions. The *Methodology of Scientific Research Programmes*, however, demands that the epistemic hard cores be recognized as the motive force dictating the form and direction of different research programmes. In this vein, the two rival programmes of decisional research are distinguished as essentially *Empiricist* and *Rationalist*.

Rationalism and Empiricism have long been set as antagonists throughout the history of philosophy, and it may be that the epistemological dichotomy artificially precludes other forms of explanation. Nevertheless, decisional research in Social Psychology is best located within the

Empiricist and Rationalist framework, which explains both the epistemological ancestry of the hard cores and allows the fundamental elements of the subject matter to be appropriately signified for each research programme (i.e. the underlying "models of man" can be specified). The Empiricist decision maker is characterized as dependent on available sense data to directly infer the optimal choice. The Rationalist decision maker, in contrast, comes to a choice through the integration of values imposed upon the available data.

Since the negative heuristics of research programmes give rise to the problem locating and problem solving machinery there is a further implication that decision making should be studied within the corresponding empiricist and rationalist methodologies. How far this can be realized and to what effect is, however, a feature of the positive heuristics.

**THE WEIGHTING AND PROBABILITY OF CUES:
Continuity and growth in the Empiricist Research Programme**

Social Judgment Theorists as Brunswik's disciples now call themselves, have for the most part remained faithful to the basic principles laid down in his psychology (Hammond, Stewart, Brehmer & Steinmann 1975; Arkes & Hammond 1986). Unfortunately, they have also continued Brunswik's practice of jargon cluttered theorizing. Brunswik's writing has the dubious distinction of being some of the most difficult to understand, so much so that it often verges on obscurantism. Social Judgement Theory (or SJT) represents the attempt to conduct a unified theoretical and methodological research programme of decision making based on Brunswik's psychology of Probablistic Functionalism (Hammond & Wascoe 1980).

The methodology has two main complimentary components. They are :

1. The representative design of experiments.
2. The representative sampling of subjects.

This refers to Brunswik's celebrated dictum for establishing ecological validity. The requirement is that experimental stimuli as well as experimental subjects should realistically represent in a sampling sense the environmental situation to which the experimental results will be generalized.

Probablistic Functionalism, like other theories in the Empiricist programme principally employs constructs from the Frequency school of probability. It also represents, though, a variation on Logical probablism, in attempting to understand the environment in terms of probable truths. Certainly Brunswik saw the effort after representative ecological analysis as a prerequisite for theorizing.

Campbell (1966) attempts to defend Probablistic Functionalism against the charge of inductivism by invoking the construct of pattern-matching. He argues that all science progresses through its attempt to pattern-match theory and data, a process fundamentally synonymous with that described by Probablistic Functionalism. In his argument, Campbell recounts Kepler's scientific achievements as a product of the pattern-matching process, fitting the observations of Mars' orbit into an ellipse. Despite his acknowledgement of Popper's criticism of induction, Campbell muddles the issue of deriving the truth content of propositions. He fails to account, for example,

for the choice of one particular pattern over any other. Out of the distribution of observation points describing the orbit of Mars, there are a theoretically infinite number of patterns which adequately describe the data. The ellipse was most likely chosen as the simplest fit, or perhaps as the nearest configuration to the neoclassical obsession with the circle.

The simplicist would object, though, that only one pattern, the simplest, is appropriate. That is, the curve with the smallest deviation from the shortest line intercepting the points. Herman Weyl (1949), however, argues convincingly against the logic of this solution. In any event the ellipse has since proved to be inaccurate not only for Mars, but for all planetary motion. (Lakatos & Zahar 1975; Zahar 1973). Campbell thus commits himself to the inductivist fallacy, and in doing so, fails to defend Probabilistic Functionalism.

The Basic Machinery of the Positive Heuristic: The Lens Model Paradigm

The Lens Model serves as the main structure of the research programmes positive heuristic. Because the Lens Model specifies a strict empiricist methodology, Brunswik's psychology has been criticized as method-bound and atheoretical. (Hochberg 1966; Leeper 1966). Hammond (1966) staunchly defends Brunswik's theorizing on this count, arguing that it is misunderstood because his methodology is criticized in isolation from the aims of the wider psychological theory. Hammond suggests one reason for this lack of insight may be that most of Brunswik's theoretical work was written in German and largely remains untranslated into English. A more plausible explanation, however, is Brunswik's paucity of explanatory concepts for the mediational processes.

The Lens Model paradigm used in research was developed out of Brunswik's original idea by Hammond, Hirsch and Todd (1964). The Lens Model describes two complementary systems; the cognitive system and the environmental system. The basic taxonomy also specifies the possible interactions between the two systems.

This is depicted schematically in Figure 1.

The cognitive system depicts the organized relationship between an individual's judgment and the information, or cues, upon which judgments or decisions are made. The organization of this relationship is expressed as a judge's policy or decision scheme. This amounts to a set of rules for utilizing cues in order to decide in the face of uncertainty.

In the environmental system, events outside the cognitive system are also described in terms of relationships, but no environmental policy is described as such on this side of the lens. Instead, this system represents "the situation itself", which is always considered to be a probabilistic arrangement of events. Unlike the basic taxonomy for the Rationalist programme, the Lens Model judge is always faced with uncertainty.

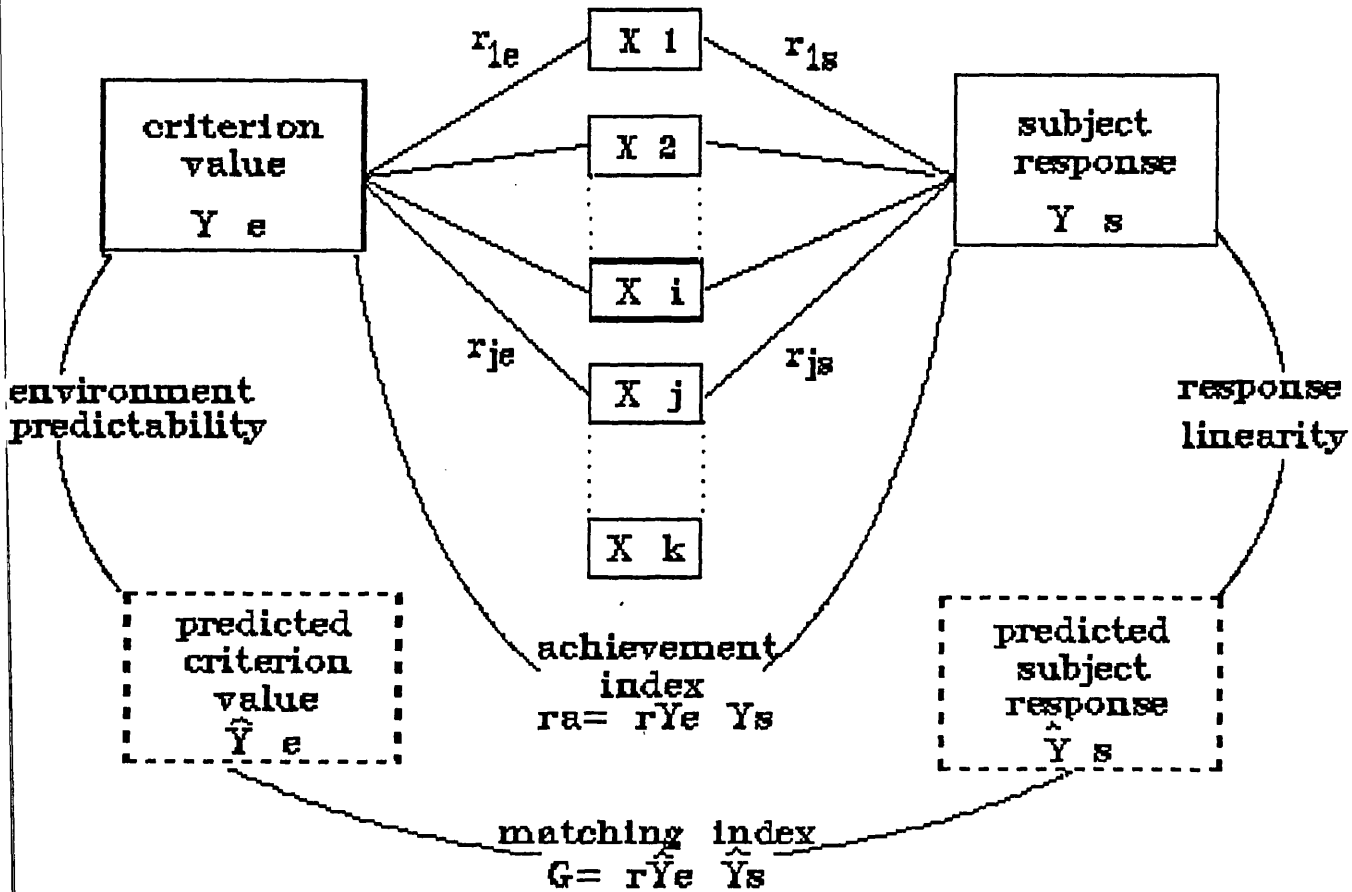
Figure 1

The Lens Model Paradigm
 (after Slovic & Lichtenstein 1971)

Environment
 or distal
 side of lens

Cues
 or stimulus
 dimensions

Judgment
 or proximal
 side of lens



Ecological Validity

The correlation of cue x_i and criterion value (Y_e) gives the ecological validity of the i th cue.

Cue Utilization

The correlation of subjects response (Y_s) with cue x_i gives the cue utilization.

Strongly implicit in the Lens Model is an assumption that stimuli or cues from the environment are sampled by the organism in a representative and salient abstraction of the environment. Information processing limitations would make such an assumption necessary, even if it were not already implied in the basic premise of probabilistic functionalism. Bruner (1956) emphasizes the problems of information sampling thus,

"The point of psychological informational sampling depends upon the strategy of information utilization a person has adopted."

Bruner's message has a direct relevance for probabilistic functionalism. Unfortunately, Brunswik gives no clue as to how this could be achieved and the negative heuristic directs us away from such embarrassing questions.

Propositional and Algorithmic Properties of the Positive Heuristic

Judgment and decision making are explicitly regarded as synonymous, with a focus upon the cognitive processing of information. The emphasis is placed upon the processes and strategies utilized by the decision maker to integrate discrete informational items into single judgments. These processes are considered to be weightings of correlations between various components described by the Lens Model. The basic experimental approach has the judge produce quantitative evaluations of stimuli each corresponding to a cue variable. This results in correlation coefficients between judgments and cues. Similarly, correlations between cues and objective criterion are obtained to give an index of cue relevance to the criterion. The index is said to express the ecological validity. Further, correlations obtained between the judge's prediction and the objective criterion produce an achievement index which expresses the accuracy of the judgment.

The basic working of the Lens Model paradigm requires that each cue dimension be at least nominally quantifiable and have a known specific relevance to the "true state" of the environment (termed the criterion value). Intercorrelations among cues and between the subjects responses or judgments are taken. Criterion and judgment can both be predicted with these basic measurements by use of linear combinations of cues expressed as a regression equation.

A second regression equation gives a predictive model of the subjects decision making strategy or policy.

A multiple correlation coefficient indicates the predictability of judgments from a linear combination of cue-values, and is known as an index of the subjects response linearity. Hirsch et al. (1964) expanded on this basic model to cope with non-linear cues. That is, cue relationships which are non-monotonically related. This is accomplished by the introduction of yet another correlation 'C', between the residual which cannot be predicted in the criterion and in the

judgment. (C is zero when either residual is random). Such an addition to the mathematical model can be strongly criticized, however, on grounds of irrefutability. Any relationship could be predicted by this strategy regardless of its true shape, thus reducing the real predictive utility of the function. By assuming one of the relationships is equal to one, any finding can be explained post hoc. A similar criticism can be made against the more complex equation developed by Tucker (1964).

Tucker's model is intended to show that indices of the Lens Model relationship can be described in a general equation for achievement.

Achievement is here expressed as a function of the statistical properties of the environment as well as the subjects response system, in addition to the match of the linear weightings of both systems and the extent to which non-linear variance of one system correlates with the non-linear variance of the other. In short, the model itself is an achievement in capturing the essence of the Empiricist approach. Tucker's generalized Lens Model equation has come to be the single most important mathematical model used in studies in the Brunswikian mould.

Worral (1975) has proposed a refinement of Lakatos's concept of a research programme's positive heuristic, which is most pertinent in considering Tucker's sophisticated version of the Lens Model. Worral states,

"When I speak of the strength of a heuristic I am referring to its wide applicability, relative unexhausted state and ability to operate independently of facts. There is another sense in which one might want to speak of a heuristics strength namely how near it approaches an algorithm. The heuristic of the Ptolemaic programme was strong in this sense, but weak in mine."

Worral's distinction provides the basis for a powerful refinement to the Methodology of Scientific Research Programmes. It can be argued that all positive heuristics consist of the two fundamental properties; namely a propositional content (meaning the conjectural or theoretical fecundity) and the algorithmic content (meaning the mathematical or other machinery for digesting observations).

The term algorithm has been subject to considerable change in meaning in recent years, principally through the impact of computer science. Kendall and Buckland (1971) offer the following definition,

"It has come to mean an explicit relation which permits the calculation of an assigned quantity by iterative processes converging on the true value; and slightly more generally, any explicit relation which leads to the desired quantity in however protracted a manner."

The latter, more general case is nearer to the usage Worrall has in mind. Runes (1971) offers a similar definition. He says an algorithm is,

"A method or process of calculating with symbols (often but not necessarily, numerical symbols), according to fixed rules which yields effectively the solution of a given problem in some class of problems."

Restated, the algorithmic heuristic of a research programme refers to mathematical or other rule based system used to assimilate patterns of encoded observations.

The distinction between propositional heuristic and algorithmic heuristic also provides the key to understanding the alternative perspectives of different literature reviews of decision making research.

Whilst Slovic and Lichtenstein (1971) pivot their analysis around the algorithmic properties of research programmes, Steinbruner (1974) focuses upon the propositional content of each programme positive heuristic. In keeping with Lakatos's MSRP, the reconstruction attempted here, identifies the rival research programmes in terms of their negative heuristics, or core (epistemological) assumptions.

Tucker's version of the Lens Model can be regarded, like Ptolomy's heuristic, as strong algorithmically, but weak in the sense of increasing theoretical content. Because of this structure, it forces the researcher to wait for anomalies to be presented before they can be assimilated by the heuristic. The Lens Model thus surpasses at "saving" the phenomenon, but does not actually predict much in the way of novel facts.

Auxiliary Hypotheses: Configural judgment and subjective weightings.

Capturing or modelling a judges policy is, according to Slovic and Lichtenstein (1971) the focal topic of research in this programme. This amounts to identifying the idiosyncratic weightings a judge places on proximal and distal cues for a given decision situation. A number of studies on cue-utilization have been conducted, but not all of which employ the Lens Model paradigm. In all studies of this type within the Empiricist programme, however, the basic experimental format is the same. Typically, information is given to subjects concerning traits or the biography of some stimulus person. Subjects are then asked to indicate their subjective probability assessments that the target person also possess some other trait. More realistic paradigms allow the use of multiple stimulus cues, and provide the bonus of examining the subjects inference process by evaluating accuracy against a set of criteria.

The simplest combinatorial rule turns out to be additive and linear, as is the model originally specified in Brunswik's paradigm (Knox and Hoffman 1962; Kohen 1971; Hammond, Hursch and Todd 1964; Einhorn 1971; Newton 1965; Sarbin 1942)

The primary method for supplying a test of the linear model has, like the Lens Model, been a multiple regression approach. This has the advantage of supplying estimates of cue weights in addition to an index of accuracy.

Wiggins and Hoffman (1968) compared the simple linear model with a configural model and found only a slight improvement in predictability with the configural account. Meehl's (1954) classic inquiry into clinical versus actuarial prediction first gave impetus to a search for "configural judges", that is judges who use a non-linear relationship between predictors and criteria. Another way of stating it is that patterns and not linear relationships form the basis of predicting decisions (Goldberg 1965). Goldberg (1970) found that linear regression models gained more accurate and consistent predictions than subjects' own performance. Consequently, Goldberg suggests a strategy known as "bootstrapping". The idea was to obtain appropriate weights from subjects' judgments and then, using a multiple regression equation, apply the formula to the data.

Reviews of the relevant literature (e.g. Slovic and Lichtenstein 1971; Goldberg 1968) generally conclude that the linear model accounts for most of the variance. Fishbein and Ajzen (1974) suggest that although this may be so, it does not provide a valid description of the inference process. A study by Summers, Taliaferro and Fletcher (1970) in which subjects estimated their own weighting strategy supports this claim. (See also Hoffman 1960; Hoepfl and Huber 1970; Oskamp 1962; Pollack 1964). Characteristically, subjects overestimate the importance of a few minor cues with low objective regression weights, and underestimate their reliance on a restricted range of dimensions.

Slovic and Lichtenstein (1971) advance the idea that decisions are made automatically with experience, so that judges are less able to verbalize their cue weighting policies accurately. Even so, subjective reports indicate that subjects strongly believe they utilize cues in a non-linear way. Slovic, Fleissner and Bauman (1972), however, produced evidence to suggest that the difference observed between subjective and objective cue weightings increases as a function of the decision makers experience.

Idiographic approaches to modelling cue weighting policies have revealed, not surprisingly, highly idiosyncratic differences. Wiggins (1973) argues for the utility of an idiographic approach through a "general individual difference model" in which the complexity of both stimuli and individual judges can be determined along a number of dimensions required to

express covariance. Although a number of studies reviewed by Wiggins (e.g. Wiggins, Hoffman and Taber 1969) suggest that weighting policies varied with certain personality characteristics, the research literature as a whole does not suggest the emergence of a fertile new direction in Lens Model studies.

Potential and Growth of the Positive Heuristic

Hammond and Summers (1972) make an interesting distinction between a subjects acquisition of information and the utilization of it. They also demonstrated that the systematic use of weights was an important factor in subjects accuracy. Other factors such as boredom and fatigue have also been highlighted, though the most important influences on accuracy have been non-random variables. In particular, feedback relating to the degree of weighting on appropriate cues has been shown to be significant. Azuma and Cronbach (1966); Lee and Tucker (1962); Summers (1962); and Hammond and Summers (1972) all demonstrated that accuracy feedback enabled subjects to revise cue weightings appropriately.

The whole concept of Probabilistic Functionalism and its algorithmic heuristic, the Lens Model, place considerable emphasis upon the notion of validity, but fail to address its foundation in reliability. As it is operationalized, reliability is essentially a temporal concept, which can be contrasted with the Lens Model representing a slice cut through time. In principle the model could be extended to incorporate temporal features and show concern with reliability, but little has been advanced so far in this direction. Arguments to the effect that the achievement index expresses a reliability coefficient are mistaken since the point is to provide an independent indicator, untethered to the various coefficients of validities.

The effort after representative design, demanded by Brunswik's theory has led to studies being conducted in a variety of field and field-like settings, and across several different cultures. Generally, results have been consistent over most cases, but occasionally demonstrate minor cultural variations in some particular aspect of cognitive functioning as defined by the Lens Model. (See Hammond and Brehmer 1973 for a relevant review).

Problem Shifts in the Algorithmic Heuristic

The experimental approach common to all Lens Model studies has the judge produce quantitative evaluations of stimuli each corresponding probabilistically to a criterion variable. This results in correlation coefficients between judgments and cues, and judgment and criterion variable. The Lens Model focuses upon the adaptive relationship (or accuracy) between the organism and the environment, and is supposed to represent the organisms probabilistic interpretation of environmental variables. How representative can this account be ? The answer very much depends upon how closely the appropriate cue variables mirror the criterion variable. Leaving aside the momentous problem of the inductivist character of representative sampling,

this can be seen as a burdensome problem in the context of experiments, making sizeable practical difficulties. As Wiggins (1973) put it,

"Most studies of cue utilization assume both the experimenter and the subject know and agree upon the relevant stimulus dimensions."

Brunswik (1956) saw representative sampling of cues as a prerequisite for meaningful experimental design, and as a natural process in the individuals adaptation to the environment. The latter he termed a "ratio-morphic" process. Brunswik meant by this that experience of relative frequencies of interrelationships are used as a basis for inductive inference.

Hammond (1966) also argues that Brunswik became the first psychologist to challenge the precepts of orthodox experimental design, particularly through his concept of representative design (Brunswik 1956). Other researchers in the same tradition have claimed that classical experimental designs using single independent variables are not merely unrepresentative but also that they cannot cope with situations such as diagnostic interviews (see for example Gillis and Schneider 1966). How justified are these claims for methodological superiority ?

Shavelson and Stern (1981) reviewed the application of Lens Model methodology in the educational context, and adduce three major criticisms:

1. Artificial tasks in laboratory settings contradict the requirement for representative design.
2. The Lens paradigm should be regarded as an "as if" model, not taken as a literal description of what people actually do in making judgments.
3. Researchers typically aggregate data across subjects, thereby making the false assumption that all subjects utilize the same weighting policy.

Cooksey and Freebody (1985) counter the latter critique by providing a generalized multivariate Lens Model which allows aggregation of data after individual policies have been constructed. Cooksey, Freebody and Davidson (1986) also argue that whilst knowledge structures have been variously described as "knowledge frames" (Minsky 1975), "scripts" (Schank & Ableson 1977) or "schemas" (Bobrow & Norman 1975; Rumelhart & Ostony 1977), only the Lens Model has been able to represent individuals generalized schemas in a concrete form.

The Lens Model paradigm though does not appear to be radically different from univariate paradigms more familiar to orthodox psychological methodology. At least as it is practiced, the Lens Model manipulates only one independent variable, which is the the cue weighting subjects are trained to use or are exposed to. Hammond (1973) also appears to be aware of this problem. As he tentatively admits,

"But it may be reasonably supposed that no research paradigm will in the foreseeable future represent fully or adequately all important features of problems as complex as the one we are addressing."

Indeed, Hammond understates the issue since no experimental paradigm could conceivably represent all the features of any problem situation.

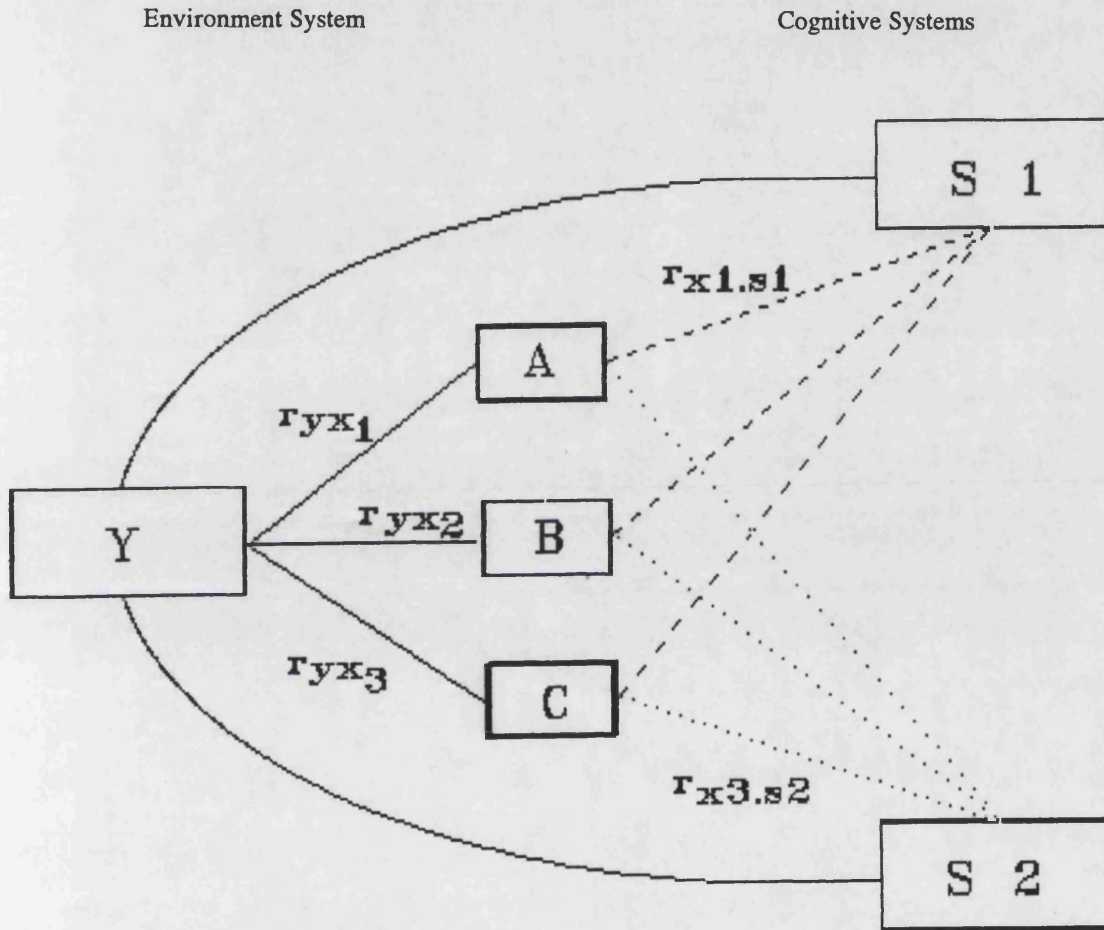
The programme's ability to generate novel facts can be seen in an interesting application of the two system case Lens Model to the area of Clinical Psychology. (Gillis 1969; Davies, Evans and Gillis 1968; Gillis and Davies 1973). Gillis and co-workers explored the effects of psychoactive drugs upon schizophrenic thought disorder by using Lens Model descriptions of the clinical setting. In Brunswikian terms, schizophrenics have failed to adapt to their environment, so experiments using multiple cue probability learning tasks should be an appropriate means of assessing the cognitive focus and adaptation of schizophrenia. The results of the studies showed that the anti-schizophrenic changes brought about through the administration of drugs such as chlorpromazine restricted subjects ability to learn new complex tasks. If readjustment to the environment entails learning new probabilistic relations among proximal and distal cues, it then follows that psychoactive drugs with this effect may actually be counter productive forms of treatment in the long run.

This line of research suggests that the Lens Model has considerable advantages for studying intersystem interaction provided cue validities can be meaningfully sampled and controlled.

Hammond (1965) established the basis for a progression in this aspect of the Empiricist programme with the introduction of the Cognitive Conflict paradigm, which is said to be analogous to conflict created by the clash of ideological differences. It requires two or more confronting cognitive systems in addition to a problem capable of no perfect solution. See Figure 2.

Figure 2

The Cognitive Conflict Paradigm
(after Hammond 1973)



Two or more judges (S_1, S_2 etc) share the same set of cues (A,B,C etc) about the criterion value (Y). Extensions of the Lens Model equation measure statistical association between the separate systems (i.e. The environment system, the cognitive system of judge 1, the cognitive system of judge 2).

The experimental method involves two stages, a training stage and a conflict stage. During the training stage subjects are presented with sets of cues having known correlations with a criterion variable. Typical experimental procedures present cues on cards, or through interactive computer displays.

The task most used in research practice has been the political decision task, which requires subjects to judge the level of democratic institution in given countries. This is taken to be the criterion variable. Predictor cue variables used have been the extent of free elections and the extent of state control. Statements pertaining to such cue variables are presented, but each subject in the experimental conflict is trained to weigh the cues differently.

The introduction of computer graphics to display judges' weighting policies has facilitated the development of Lens Model technology as a cognitive aid for improving judgments (Hammond, Stewart, Brehmer and Steinmann 1975). Its purveyors argue it to be a superior form of learning to traditional methods relying on feedback of outcome, since learners acquire knowledge of their judgment processes rather than content. Hammond et al say that a unique contribution of Social Judgment Theory is,

"Separating knowledge from cognitive control."

Though SJT is not discussed by Steinbruner (1974) this property is perfectly in accord with that for the Cybernetic paradigm. Steinbruner says,

"The learning process is not causal, but, rather, instrumental."

Drawing on Ross Ashby's (1952) explanation of "non-purposive adaptation", Steinbruner argues that organisms maintain a set of "critical variables" rather than a preference ordering. Indeed, a novel fact generated by a cybernetic approach is that it is able to describe decisions as ubiquitous in nature, from the dance of bees to human politics. [See also Ross Ashby's (1952) *Design for a Brain*; and Stafford Beer's (1959) *Cybernetics in Management*].

Problem Shifts in the Propositional Heuristic

Hammond and Brehmer (1973) reviewed twenty five studies based on the Cognitive Conflict paradigm, and conclude,

"Subjects do, in fact, reduce the differences in their policies- the differences in their cue-weighting systems approach zero. At the same time, however, they decrease their consistency ; they become more erratic, and their judgments, the overt product of their policies continue to differ."

Consistency emerged as a new focus of research in the Cognitive Conflict paradigm. Generally, judges were found to be inconsistent or at least consistency varies with the nature of the judgment problem, especially task uncertainty and task complexity. (Brehmer 1976, 1978).

Furthermore, subjects appear to be unaware of this discrepancy in their internal policy and their overt behavior. As Brehmer (1984) reflects,

"People simply do not know that they have to use statistical rules, rather than deterministic rules, when faced with probabilistic cues."

The result thus presents a sizeable anomaly to the thesis of Probabilistic Functionalism.

The result is anomalous not only because it flouts the continuity hypothesized between thinking and behavior, but more importantly because it flies in the face of the Empiricist hard core. In Brunswikian terms the problem is that the Lens Model does not appear to cope with individual behavior. It allows no feedback from the organism itself.

In the Empiricist programme judgments are held to be a functional aspect of thinking, equipping the organism with a means of coping with an uncertain environment. The Empiricist basis of individual behavior is clearly centred on this particular concept. As Rappoport and Summers (1973) expound,

"It provides the psychological means of going beyond perceptual and cognitive 'givens', while maintaining organization and continuity of behavior."

The Empiricist programme has been saved from this potential refutation by the invocation of a *ceteris paribus* clause. Hammond and Brehmer (1973) boldly attempted a theoretical rescue. The extra hypothesis of "quasi-rationality" allows the recalcitrant test result to be explained *post hoc* without damaging the basic Lens Model.

According to Hammond and Brehmer (1973) cognitive processes underlying policy formation (that is decision making schemas) should now be understood in terms of an analytical-intuitive dimension. They emphasize the dimensionality of the construct, and also the convenient fact that most instances of thinking will fall somewhere along the central range (i.e. have both sets of features). Since most thinking has both components the resultant composite is termed quasi-rational thought. The analytical pole is said to be characterized by explicit, sequential and

recoverable properties, making for a rule generating end of the dimension. In contrast, the intuitive pole is characteristically implicit, nonsequential and nonrecoverable.

The original Empiricist conception contained in Brunswik's Probabilistic Functionalism strongly linked experience and cognition. The one was said to shape the other, so that cognitive rules grew directly out of experience. The quasi-rationality construct, however, does not specify how experience comes to shape the rule formation process, or in what way. Instead it is left in the vagueries of idiosyncratic differences. Consequently, this theoretical manoeuvre must be considered a degenerating problem shift. Brehmer (1984) grants of quasi-rationality,

"Although this is an attractive explanation for inconsistency, it is admittedly ad hoc."

The Cognitive Conflict paradigm has, however, provided a more fertile field of research in the form of interpersonal learning. Consistency may be restored to problematic theories if some suitable premise can be found and tagged onto it, as if it had momentarily slipped the scientist's mind. As Lakatos (1970) points out, the *ceteris paribus* clause need not be regarded as an independent premise.

In interpersonal learning, judgment is reinterpreted as a skill. Lack of skill may then be used to explain judges anomalous behavior (not following the judgment rules they intended to). The definition is entirely congruous with the Empiricist basis when the hypothesized mechanism of cognitive learning does not rely on preference ordering. Hammond (1973) claimed this to be a new topic for psychology, and one destined to have a major impact. The task used experimentally in studies of interpersonal learning is fundamentally the same as other Cognitive Conflict procedures. The difference is that after a number of trials subjects are asked to predict the response of their counterpart. (Hammond, Wilkins and Todd 1973). Miller (1973) studied interpersonal learning in a field setting, between police officers and minority youth. Using a novel tape-exchange procedure in which one party records a message which is played to the other, Miller claimed both groups significantly increased their predictive accuracy.

Social Judgment Theory has the major advantage of general social applicability according to its adherents. Hammond and Adelman (1976) see SJT as a scientific method for integrating scientific knowledge with social values through the technology of the Lens Model, which may be used to "externalize" the judgement processes of different factions. Unlike other conflict theories which focus in on the underlying motives of the parties involved, SJT only examines the process of judgment.

Applications of the Conflict paradigm include:

- * A dispute over police handgun ammunition (Hammond, Stewart, Adelman & Wescoe 1975)
- * The cognitive sets of couples in marital distress (Markman, Jamieson & Floyd 1983; Dhir & Markman 1984)
- * Water resource planning (Flack & Summers 1971)
- * Citizen participation in local planning (Stewart & Gelberg 1972)
- * Labour-management negotiations (Balke, Hammond & Meyer 1973)
- * Evaluation of Nuclear safety policy (Brady & Rappoport 1975)
- * Investment analysis (Smith 1973)
- * Community goals (Steinmann & Stewart 1973)
- * Corporate policy negotiations (Adelman, Stewart & Hammond 1975)
- * Public land acquisition (Steinmann, Smith, Jurden & Hammond 1975)
- * Clinicians view of cancer risk (Hammond & Marvin 1981)

Finally, Brehmer (1984) argues that the "shallow psychology" of Social Judgment Theory (meaning its Empiricist basis, free of "deep motivations") forms a more appropriate framework for understanding and aiding decision making. From this perspective he gives a rare critique of the "rational actor paradigm" as being unable to account for anything but the simplest of decisions. He contends that, although the rational principle is commonplace, in reality the decision maker cannot always rely on previous experience or there are information processing limitations. Consequently, motives cannot be reliably inferred as the basis for decision making.

Conclusions

Brunswik's Probabilistic Functionalism has not produced the theoretical and methodological revolution in Social Psychology that Kenneth Hammond and other keen advocates had originally hoped for if not anticipated. By the middle of the 1980's the Social Judgment Theory appears to have reached a zenith, with few new ideas emerging and research effort mostly constricted to the University of Colorado. The research has nevertheless found worthy success as an applied decision technology. It has proved especially useful for integrating human judgments with data and policy derived from scientific and technological sources.

Although claimed to be uniquely capable of "externalizing" individuals judgmental processes, it does not provide intuitively compelling representations for decision makers. Indeed, its greatest advantage may be in showing that actuarial judgmental performance does not necessarily subjective evaluation of decision making skills. Consequently, the Cognitive Conflict paradigm has great potential for training decision makers to achieve levels of consistency, especially where the decision task remains constant but the information flow varies unpredictably. In this sense, the SJT research enterprise has achieved marked progress for the Empiricist research programme.

In this rational reconstruction of the Empiricist research programme, the fortunes of Social Judgment Theory have been signally useful in helping formulate a notable addition to the Methodology of Scientific Research Programmes. The historical development of SJT has illustrated that the positive heuristic consists of separate propositional and algorithmic elements. Rates of progress in research may be explained through the different heuristic features. For Social Judgment Theory at least, the Lens Model has been worked into a sophisticated algorithm capable of generating and assimilating forms of data unavailable to rivals. The empirical handling of novel data, however, is not alone equivalent to the prediction of novel facts, which must also have a propositional or explanatory component.

Over-investment in the algorithmic heuristic to the neglect of theoretical expansion has, for SJT, resulted in a slide towards degenerating problem shifts. The originally robust empiricist base has become weakened in an attempt to explain the mismatch of data with the subjective policies of decision makers.

Although Social Judgment Theory exemplifies the Empiricist approach to decision making, it is not the sole embodiment of the research programme (see for example, Steinbruner 1974). In any event, as Lakatos (1970) points out, there is nothing to prevent research programmes re-emerging in a renewed and progressive form at a later stage.

**THE SUBJECTIVE EXPECTATION OF UTILITIES:
Consistency and growth in the Rationalist research programme**

The distinction between normative and descriptive models is often reiterated in Rationalist studies of decision making, and it is a distinction often conflated with other issues. If, as is often asserted, a normative model, forms the basic heuristic machinery of the Rationalist programme, is it not inappropriate for describing human decision making processes? The answer to this depends upon how the normative prescriptions are interpreted, and the psychological "depth" attributed to the explanatory model. Clearly there is a sense in which normative prescriptions use descriptive terms, but this only adds confusion to the issue.

Edwards and Tversky (1967) admit that,

"The distinction between what an organism should do and what it does do, is slippery."

They reconcile the dilemma by stating that when the stakes are high we usually do what we think we ought to do. The problem is, of course, that the stakes are not always high in decision situations. Theoretical progress, moreover, can be retarded by confusion over where to locate the origins of anomalous test results. If subjects perform suboptimally, as they usually do, do we say the normative model is only normative after all, or the subjects normal, and the model sub-optimal in the sense of not adequately reflecting the decision process?

Researchers in the Rationalist programme tend to use the idea of normative models in two different ways, though not always distinctly. The issue may be clarified by discussing these under two separate headings. viz :

Normative Model One (The Gambler's Model)

Mathematical and Economic decision theory within the Rationalist programme epitomize this variant. Prescriptions are here analogous to the strategies worked out by the (rational) professional gambler. The course of action prescribed aims to give the maximum return, or the best possible chance in the known circumstances. Once the data is available it can be slotted into a mathematical machine and made to optimize appropriately.

Normative Model Two (The Bookmaker's Model)

Continuing the analogy, and in contrast to Normative Model One, this version is paralleled by the prediction made by the bookmaker about the behavior of the gambler. In order to retain the economic advantage, it is necessary to predict the behavior of a human being. Not knowing the gambler in Model One has a machine, optimal predictions must be made on a general model of how all, or most people make their (gambling) decisions. This may be seen in the shortened odds bookmakers give for the "favourite". Normative Model Two thus provides a normative basis for a descriptive account of how decisions are made. Audley (1967) neatly portrays this version thus,

"Rational schemes may provide a template with which the actual performance of animals and men can be compared."

Normative Model Two is, or should be, the appropriate version for psychological theories of decision making. Even so, this model could give rise to confusion, depending upon the strength of interpretation. Again, two forms are possible, a strong and a weak version.

The strong version of Model Two asserts that all decisions are made according to the rational principles embodied in the model. Any observed differences in observational outcomes must, therefore, be attributable to extraneous factors such as misperception of data, or artifacts created by the testing procedure, such as order effects in data presentation.

The weak version of Model Two specifies only that decisions are made *as if* according to the rational principles contained in the model. Anomalous test results may, therefore, reflect departures from the basic optimal process. Hence in this version, subjects may be regarded as deviating from rational principles.

As a cautionary note, however, a series of studies by George Wright and Larry Phillips have unambiguously demonstrated that probabilistic thinking is not the universal phenomenon it is frequently assumed to be in the decision making research literature. Different "fate orientations" of cultures appear to strongly determine how probabilities are cognitively processed, or even whether they are given any psychological significance. Some cultures appear to have no concept of likelihood at all. That is, events are given only categorical status, to occur or not as the case may be. (Phillips & Wright 1977; Wright, Phillips, Whally, Choo, Ng, Tan & Wisudha 1978; Wright & Phillips 1979; Wright & Phillips 1980).

The Basic Machinery of the Positive Heuristic: Subjective Expected Utility (SEU) Paradigm

The Reverend Thomas Bayes (1763) gave his name to a theorem consisting of a mathematically trivial consequence derived from the product laws of probability. It takes into account all the available and relevant data at a particular time and expresses the probability of an event occurring. The theorem also provides for the revision of this probability given new, relevant information.

Von Neumann and Morgenstern (1947) gave rebirth to Bayes theorem with the principle of maximizing expected utility. Davidson (1980) claims that Von Neumann and Morgenstern rediscovered Ramsey's (1931) theory and cultivated a less interesting form of it which became Decision Theory.

In the eulogized work *The Foundations of Statistics*, Savage (1954) injected more life into Bayes Theorem by axiomatizing the basic principles. The main impetus for psychological research, however, came from Ward Edwards, who strongly argues that although opinion revision is interesting as a unique phenomenon, it is most significant when it leads to decision making and subsequent action. (Edwards 1962, 1968; Edwards, Lindman and Savage 1963).

Criticism against Bayes theorem, has, however, been quite vociferous, especially from classical statisticians who object to Bayesians regarding parameters as random variables with prior probabilities. On philosophical grounds, Popper (1972) has also objected that Bayes theorem amounts to a calculus of certain subjective knowledge. Hence it is also a subjectivist epistemology.

The main problem consists of defining and determining prior probabilities in a meaningful way. For example, Bayes theorem encounters difficulties with zeros as datum. Where prior probabilities equal zero, Bayes theorem resolves only into zero posterior probabilities. Against this problem, Bayesians create the fundamental postulate that unless data to the contrary appears, all prior probabilities are assumed to be equal. There is, however, also dissent over the fact that Bayesian analysis predicts a distribution of probabilities rather than a single point estimate of some hypothesized state of nature. Bayesians counter the critique by asserting that many situations do not lend themselves to straightforward assessment by reference to relative frequencies. Bayes, however, would have the advantage of having probabilities available for combination with payoff information, and so makes fewer demands than the underlying assumptions of classical statistics.

Bayes theorem may not make the same assumptions as classical statistical versions of probability, but it does make strong assumptions unique to Bayes.

Since the environment is assessed on the basis of subjective probabilities, and new information is revised according to an optimal solution, Bayes theorem forms the basis of a prescriptive or normative model.

Research into the utility component, in contrast, has not on the whole been as energetic as that afforded the probability component of the Rationalist programme.

The measurement of utility has its origins in the history of economics, with the move to make Nineteenth Century economics founded on the study of individual consumer preferences. The economists Bentham, Gossen and Fisher in turn all suggested the direct measurement of utility by comparison of pleasure given by two or more commodities.

Von Neuman and Morgenstern (1947) revived interest in cardinal utility in relation to gambling choices, such that the gamble with the highest utility should be preferred. This is postulated to hold true up to a positive linear transformation with any new set of numbers. Originally, Pareto (1906) argued that if differences in values are comparable subjectively, then utility is measurable on a cardinal scale. Pareto, however, doubts the ability of subjects to make such comparisons reliably.

Since the early and influential studies of utility measurement a number of so-called utility paradoxes have been discovered which show that under some (usually extreme) circumstances the underlying assumptions of utility functions break down. (Allais, 1953; Bernoulli, 1964; Ellsberg, 1961). The St. Petersburg Paradox, for example, demonstrates that people do not always choose the gamble with the highest expected utility, nor would it always be rational to do so. (Bernoulli 1964). The problem with the classical conception of utility theory is that unrealistic assumptions have to be made regarding unidimensionality and independence such that utilities are not *psychologically meaningful*. Typically, subjects do not perform with the consistency expected by the earlier research such as Von Neumann and Morgenstern (1947). Instead, the particular values used by subjects in locating their utility functions seems to depend very much upon temporal and context effects, rendering this form of utility theory relatively impotent as a predictive account.

Unless rational decision schemes are to be taken as purely static affairs, decision theories would need to be extended into a wider behavioral context. Particularly important in this respect are the effects of habit strength, available knowledge and the concreteness of foreseeable outcomes for subjective utilities. Since rationality is measured in Behavioral Decision Theory by single attribute utility functions, and not a behavioral history, any decision can only be taken as part of a larger set of possible decisions. As Lee (1971) aptly expresses,

"One rational decision does not make a rational man".

Bohnert (1954) criticizes utility theory for having posed the wrong theoretical questions. Rather than conceiving of utilities as attached to entities, he argues we should ask what circumstances pleasure depends upon. That is, the value we give to something varies according to the broader social situation which establishes a frame of reference for utilities. A person may, for example, be generous with their money showing largesse to family and friends, but be penny-pinching and miserly to others. The problem thus lies in the context of choice, and there has been a sparsity of psychological research on this issue. Jeremy Bentham (1876) thought pleasure or pain to be determined by intensity, duration, certainty and propinquity (delay). Regarded as dimensions for experimental manipulation they might usefully be employed in psychological research in this area.

Utility measurement has, in fact, been comparatively neglected in empirical research. Instead, analysis proceeds on the basis of objective values, usually small amounts of money in experimental manipulations. Lee (1971) speculates the reason remains the difficulty of resolving validities when measuring utilities, and what is more, it would make no real difference to the interpretation of results. The history of utility theory taken this far represents a serious anomaly for the Rationalist programme. In defence of the utility concept it can be argued that whenever some decision situation implies a course of action in which one outcome is more preferable to another, then some form of utility function is implied. Subsequent theory though has not succeeded in developing either a convincing theoretical explanation (propositional heuristic) or an adequate means of operationalizing the concept (algorithmic heuristic).

Rationalist decision theories came of age with the development of a basic paradigm for integrating expectancy and value considerations. Early studies using various measures of objective probability and objective values gave way to studies founded on the paradigm of Subjective Expected Utility (SEU). Research studies typically involved the use of bookbag and pokerchips, urns and balls or some similar arrangement of stimuli whereby subjects could be exposed to a direct sampling of discrete events from a limited and statistically defined population. Usually, two separate populations were compared (Phillips and Edwards 1966). The subjects task typically consisted of giving direct estimates of probabilities for a real or hypothetical population of events. Conventionally, this involved two discrete populations so that there was an equal likelihood of sampling from either set. The subject was then presented with new information pertinent to the composition of a sample drawn from one of the populations, and then required to revise the probability estimate in the light of the new data.

Auxiliary Hypotheses: Conservatism and Misaggregation

The consistent finding has been that although subjects revise their estimates of posterior probability in the same direction predicted by Bayes optimal solution, the extent of revision is

too small. Edwards and Phillips (1964) term this aspect of sub-optimal performance the conservatism effect. (See Edwards 1968; Slovic and Lichtenstein 1971; and Rappoport and Walsten 1972 for the mass of research on this particular area).

Because the model employed by the Rationalist programme sets a template against which to compare subjects performance levels, it would be indeed surprising if sub-optimal performance were not the central feature of research findings. For the programme to be considered progressive, however, other auxiliary hypotheses must be specified which predict novel facts, and do not merely save the phenomena. Thus, unless research attention goes beyond the relatively trivial hypothesis of conservatism, this aspect of the programme must be considered a degenerating problem shift.

More progressive aspects of research in the Rationalist Programme have focused attention on finding causal factors for the observed conservatism effect (Peterson, Schneider & Miller 1965; Phillips & Edwards 1966). The findings are in accord with those of previous research which demonstrated that subjects generally underestimate probabilities where larger values of objective probability obtain. Likewise, they overestimate probabilities for very low values of objective likelihoods. (Attneave 1953; Cohen 1960; Cohen, Deamaley & Hansel 1956; Howard 1963; Preston & Baratta 1948; Sprowls 1953; Mosteller & Noguee 1951; Griffith 1949).

On the basis of these and other similar results, Edwards (1968) and others (Phillips and Edwards 1966; Peterson and Miller 1965) have suggest that misaggregation of information by the subject is the locus of causality for sub-optimal performance. The misaggregation hypothesis holds that subjects may have correct priors, but do not make inference according to the normative model. Thus the weak interpretation of Normative model Two is the appropriate basis for the misaggregation hypothesis.

Peterson and Miller (1965) and Phillips (1965) obtained results showing that subjects appear to misaggregate information even when they themselves provide the subjective probabilities. Misaggregation has therefore been attributed to a reluctance by subjects to indicate extreme positions before all the relevant data are known. Presumably, the reasoning is that the limits of the probability scale may be approached too quickly. This effect is seen to disappear, however, accompanied by a reduction in conservatism, when subjects give estimates of odds and not direct probabilities. (DuCharme 1970; Phillips and Edwards 1966).

Edwards (1968) proposed that man-machine systems could be developed which would provide a testing platform to separate out the different explanations for sub-optimal revision. An experimental paradigm was created in which the person makes the likelihood estimate, but the machine revises (or aggregates) data in line with Bayes theorem. Accordingly, Probablistic Information Processing (P.I.P.) research flourished in the late 1960's and early 1970's (Edwards, Phillips, Hayes & Goodman 1968).

Despite the innovation of P.I.P. techniques, conservatism research continued to sustain severe criticism. Bayes Theorem especially was seen as too complex a task for humans unaided, with the result that subjects invariably sought to simplify their experimental problems to manageable proportions. Winkler & Murphy (1973) and Navron (1978), amongst others argue that laboratory experiments on probability assessment and conservatism have a misleading structure, with unrealistic problems and misleading data.

Fertility in the Positive Heuristic

More recent studies have used a different approach to the revision of opinion method. This focuses on a subjective evaluation of available evidence to infer backwards to the parent population. Typically, subjects are asked to give estimates of the posterior probability that some particular sample is drawn from a known population; for example, that a shy, introverted man is a librarian rather than a farmer, given a knowledge of the proportions of the parent populations. Tversky and Kahneman (1974) and Kahneman (1974) used this type of problem to demonstrate the supposed fallaciousness of human intuitions concerning uncertainty. The usual result reported from this line of research is that the shy introverted man is seen by subjects as a librarian. Since farmers considerably outnumber librarians, however, Bayes predicts farmer as the correct choice in the experiment. Thus the researchers claim that people are sub-optimal information processors. The method is riddled with artifacts, however, and demonstrates no such thing. Most importantly, subjects undoubtedly attend to the labels of "librarian" and "farmer" and inevitably draw upon their own stock of knowledge concerning stereotypes for these groups. Thus they discount the experimentally supplied (trivial) numerical population parameters in favour of their own trusted (meaningful) data base.

A review of the literature by Peterson and Beach (1967) concludes that the revision of opinion tends to be internally consistent, and that Bayes Theorem has proved to be an acceptable predictor of human information processing. Other researchers, however, have taken the view that many Bayesian studies seek to measure subjective probabilities to the exclusion of any attempt to come to terms with the underlying process. Consequently, a loosely knit set of theoretical models has arisen portraying man as an intuitive statistician.

Kahneman and Tversky (1972) have been particularly critical of interpretations placed on Bayesian studies of conservatism. They contend that revision of opinion is a sequential process, and because the estimates are always in the predicted direction there results a monotonic relationship between subjective probability estimates and objective posterior probabilities. One implication of this relationship is that subjects responses are taken to be qualitatively inconsistent with the normative model, whereas a more parsimonious interpretation would be that the conservatism bias is merely a quantitative discrepancy.

The theme of this research has been to demonstrate that judgments made under uncertainty are subject to a limited number of operations, such that man does not function as a perfect intuitive statistician, as the normative model predicts. The outcome of this line of enquiry has been the clear demonstration of a number of systematic errors or biases in normal information processing. The findings have only been taken to hit at the Rationalist programme, showing that the normative account of decision making cannot be upheld. Indeed, a study by Slovic, Fischhoff and Lichtenstein (1976) revived interest in Simon's (1957) theory of Bounded Rationality, as an attempt to embrace the anomalous findings. The thesis is that cognitive limitations force the decision maker to construct simplified models of the world. Thus, the principle of Rationality is retained in attenuated form, rescuing the programme from a degenerating problem shift.

If studies of man as an intuitive statistician threaten parts of the Rationality programme, then they do so even more for the Empiricist programme. The Brunswikian school has all but ignored, however, the implications of the results which show that probabilistic information is processed imperfectly. Hammond (1966) has made one quick reference to the early studies by Peterson and Miller (1964) and obliquely suggested that Brunswik's "ratio-morphic" process is synonymous with the concept of "man as an intuitive statistician". To support the idea Hammond cites Brunswik's (1955) use of the term "intuitive statistician" as an alternative phrase for the ratio-morphic process. Hammond's linguistic ploy is insufficient, however, to turn the recalcitrant findings into a victory for the Empiricist programme. Infact, of course, the studies of "man as an intuitive statistician" clearly refute the construct. Kahneman and Tversky (1973), for example, showed that subjects have a poor conceptual understanding of statistical regression and the Lens Model is founded upon such principles. In detail, an operational understanding of regression requires the following three concepts:

1. Variance of predictions should be sensitive to the validity of data.
2. Regression should increase as validity decreases.
3. Accuracy of prediction decreases as informational redundancy increases.

Kahneman and Tversky (1973) found that subjects exhibited incomplete or totally misguided understandings of these principles. Regressions were not anticipated by subjects in contexts where it is likely, or else gave spurious causal explanations.

Other studies have demonstrated different kinds of systematic bias in probability judgments. Tversky and Kahneman (1973) postulated the effect of "availability" upon facilitating the processing of probabilistic information. Availability refers to the ease with which appropriate instances can be imagined or retrieved from memory. Likely occurrences are deemed more available than unlikely ones, and since recency and emotional saliency will affect this, availability is seen as a source of potential error. (Slovic, Fischhoff and Lichtenstein 1976)

Other findings have shown the existence of "anchoring" and "hindsight" biases. (Tversky and Kahneman 1974; Slovic 1972; Fischhoff and Beyth 1975). During the 1970's Kahneman, Tversky and colleagues continued to generate research which catalogued an increasing number of such sub-optimal decisional strategies. The "biases" were relabelled as "cognitive heuristics" and became the basis of a fertile new research area. Since then Kahneman & Tversky (1979) have developed Prospect Theory which attempts to show that decisions are based on the relative evaluation of outcomes combined with the relative weighting of subjective probabilities. In this form the theory only entails a minor problem shift for the algorithms of the Rationalist programme. Later work in this area has added the concept of "framing" decision problems (Tversky & Kahneman 1981; Fischhoff 1983). This offers a more direct threat to the propositional heuristic by suggesting that outcomes are judged against a frame of reference. This amounts to a watering down of the rationality principle.

Problem Shifts in the Propositional Heuristic

Edwards and von Winterfeldt (1986) have attempted to subsume the anomalies produced by the Kahneman-Tversky programme, along with the recalcitrant findings from earlier SEU work in a massive problem shift, redefining the research field as "Cognitive Illusions", rather than human judgment. They contend that Cognitive Illusions have a 100 year old research history, though intensively only since 1968. As they vindicate it,

"The focus on human error is a folkway of psychology."

For their newly defined research paradigm Edwards & von Winterfeldt (1986) catalogue the following cognitive illusions:

- * Probability inference (Edwards, Lindman & Savage 1963)
- * Conservatism (Beach, Wise & Barclay 1970)
- * Ignoring Base Rules (Barr-Hillel (1980)
- * Ignoring sample size (Tversky & Kahneman 1974)
- * Overconfidence (Lichtenstein, Fischhoff & Phillips 1982)
- * Hindsight (Fischhoff 1980)
- * Debiasing (Fischhoff 1982)
- * Anchoring (Slovic, Fischhoff & Lichtenstein 1977)
- * Retrieval and Scenario based Availability (Kahneman & Tversky 1973)
- * Statistical Intuitions (Nisbett, Krantz, Jepson & Kunda 1983)
- * Non Regressive Predictions (Jennings, Amabile & Ross 1982)

Edwards & von Winterfeldt (1986) wish to broaden the research base into a more general study of human intuitive performance, including mental arithmetic, logic and other forms of reasoning. Whilst the redefinition rescues anomalous findings from the scrapheap of research effort for the Rationalist Decision programme the manoeuvre must be regarded as a degenerating problem shift.

Problem Shifts in the Algorithmic Heuristic

A number of other weaker or attenuated rationality principles have also been proposed. Most influential amongst these has been Simon's (1959) principle of Bounded Rationality. Instead of searching for an optimum solution to decision problems people are held to delimit a strict catalogue of available options with "good enough" outcomes. To this end, Simon introduced the concept of satisficing rather than satisfying choices.

Attenuated rationality principles of necessity entail a weakening of the hard core of the Rationalist research programme. Rather than succumb in this fashion, the main body of the programme has been directed away by the negative heuristic towards a problem shift. Multi Attribute Utility Theory (MAUT) became a progressive replacement for the earlier SEU theory and method.

MAUT starts from the assumption that most real world decisions involve a choice amongst several outcomes, each with multiple attributes. With multiple alternatives, some evaluative component is required to decide between them, and MAUT has risen to the demand with its multi dimensional approach. The essence of MAUT lies in a procedure of localization whereby each outcome is evaluated on each dimension. (Huber 1974).

One of the most influential MAUT models was developed by Raiffa (1969) which was derived from Fishburn's (1967) additivity theorem in addition to considerations based on the notion of indifference lotteries. In this, as with psychophysical judgments, regions of indifference between alternative outcomes come to be defined in statistical terms such that one alternative is preferred to the other over 50% of the time. Raiffa's technique demands that choices be dimensionable through a number of independent dimensions, though he gives no guidance on how they should be selected.

Edwards (1971) developed a simple rating technique for the measurement of multi attributed alternatives, and Keeney (1972) produced a multiplicative aggregation model. Independence assumptions are strong for all models of MAUT, demanding also the possibility of making choices along continuously scaled dimensions. Violations of the independence assumption result in overestimates.

Huber (1974) documents two primary methods used in MAUT methodology for obtaining subjects utilities. These he terms Client Explicated and Observer Explicated techniques. In the Client Explicated method, the subject estimates utilities for various levels of given attributes. In the Observer Explicated version, the subject is asked for an overall utility judgment associated with each item. The judgments are then employed as variables in a mathematical model, with the attributes as independent variables. The distinction in the two techniques exactly mirrors that described earlier for the direct and indirect methods of estimating subjective probabilities. With the MAUT model, a large number of observations relative to the number of estimated parameters is required if the model is to be predictive. To this end, most studies have used some form of questionnaire approach.

Validating the MAUT model is problematic since this can only be achieved if it can be compared with independent measurements of judged preferences. Further, the relative judgments between differing attribute levels must be consistent. Altogether, assumptions of probability independence, utility independence, and attribute independence are made, but seldom justified empirically.

Humphreys and Humphreys (1973), however, presented a paper which compared a variety of models for accuracy of prediction. Their study also made an interesting attempt to use Kelly's (1955) elicitation technique (derived from repertory grid studies) to fill the gap left by Raiffa for selecting salient attributes. Their results show that multidimensional analytical techniques fare better than models not taking such utilities into account. The use of Kelly grid technique to elicit relevant dimensions of utility attributes is also arguably a more methodologically solid and psychologically meaningful procedure than other non-systematic practices.

Gardiner & Edwards (1975) endeavoured to extend the MAUT model into the social arena. In studies of interpersonal and intergroup disagreements MAUT has been found to supply a means of turning low key discordance into firm agreement. Gardiner & Edwards differentiate two types of disagreement which recall the cognitive conflict paradigm studies. The distinction concerns disagreements made at the stage of measure location (where each entity is evaluated on each dimension), and disagreements made at the stage of rank ordering dimensions in terms of importance. The authors say that disagreements made at the first stage,

"Seem to us to be essentially like disagreements among thermometers measuring the same temperature,"

whereas disagreements at the other stage,

"seem to us the essence of conflicting values."

Stated differently, a distinction is made between ratings on a given attribute, and the weighting given to that attribute. For the cognitive conflict paradigm of the Empiricist Programme, a

similar distinction has also been made. The distinction, though, as we have seen has been made as a post hoc explanation for an anomalous test result. The distinction between analytical and intuitive thought can be viewed as mirroring the types of disagreements differentiated by Gardiner and Edwards. In a more recent application of MAUT, Edwards & Newman (1982) say they have little to add to the discussion from 1975 (Edwards, Guttentag & Snapper 1975).

Like The Lens Model paradigm, MAUT has found favour as an applied technology. It has been used to evaluate a wide variety of social issues, including the following:

- * community anti-crime programmes
- * dispute resolution
- * school desegregation alternatives
- * siting of dams and nuclear power stations
- * choice of military hardware
- * international negotiations
- * combat readiness of marines
- * land use management

(Edwards 1980; Edwards & Newman 1982)

Like the Cognitive Conflict paradigm of the Empiricist programme, MAUT offers particular advantages for conflict resolution. MAUT is said to produce an "audit trail" on which skeptics can at any point substitute other judgments and compare the consequences. As Gardiner and Edwards (1975) commend,

"Multi-attribute-utility measurement allows value conflicts bearing on social decisions to be fought out and resolved at the level of decision rules rather than at the level of individual decisions."

Berkeley & Humphreys (1982) in contrast are critical of the use of decision making research which reduces genuine group differences to artifacts. They posit instead that social decision making research should focus on ways of achieving common understanding which means an implied recognition and acceptance of differences. The research work undertaken by Patrick Humphreys and his colleagues represents a strangely neglected avenue in the Rationalist programme. In its philosophical basis rationalism also means a characterization by reasoning. Stated differently, Rationalist models of decision making have pursued value auditing algorithms to the neglect of whatever internal representations subjects themselves make use of. The work of Humphreys et al is an attempt to restore the balance in this direction and is an argument to "naturalize" decision making research.

Humphreys and McFadden (1980) report an extensive programme of work with Multi Attribute Decomposition (MAUD). This computer based technique is alleged to be superior to Edwards' SMART and other MAUT techniques by shifting the research focus. Instead of contrasting the theoretical model of decision making with subjects' actuarial model of decision making the research theme switches to the convergence of the two. In contrast to the bootstrapping and P.I.P. approaches, MAUD provides feedback to subjects. It is said to have a general effect in aiding decisions rather than specific problem solving. Most interestingly, however, Humphreys & McFadden reveal that some subjects felt betrayed and exposed by the technique.

The unease which decision makers feel at having their decision analysed is used as a starting point for Larry Phillips' (1984) theory of Requisite Decision Models. In this scheme the elucidation of "small world" models by decision analysis is considered to facilitate the reflexive mirroring of the wider models of social reality. A new creative role is argued for decision techniques beyond simple optimal choice solutions. A combination of "sensitivity analysis" and evaluative feedback supplied through flexible computer aids generates new insights so that decision makers modify the model in either form or content (Phillips & Wisniewski 1983). Phillips sees the change of concept as sweeping aside critics' objections to decision techniques based on the normative model. Phillips thus shares with with Humphreys an attempt to converge normative and descriptive models. This could provide the basis of a progressive problem shift rescuing this part of the Rationalist programme from the burgeoning catalogue of empirical anomalies.

Himmelweit, Humphreys and Jaeger (1985) utilize Multi Attribute Utility Theory as part of a wider model of consumer choice. In taking account of previous habits, value systems, environmental influences and interaction with information resources in the social context, Himmelweit et al claim their model is more psychologically inclusive than the familiar Rationalist model. Although it most clearly belongs to the Rationalist programme, their usage of MAUT marks a definite problem shift in its Social Psychological implications. That is, decision making processes are depicted as part of a more general cognitive mediation of social variables.

In their study of voting choice, Himmelweit et al used the model to derive an impressive 91% correct classification of choices. The MAUT based predictions showed clear superiority to discriminant analyses based on all available attitude data. The authors say that the MAUT based model has in addition to simplicity of calculation, the singular advantage of idiographic application.

Helmut Jungerman (1983) contends that the Rationality programme has split in recent years into camps of pessimists and optimists. The pessimistic rationalists interpret judgmental errors as evidence of limitations in human cognitive processing. The optimistic rationalists, in contrast, regard such observed anomalies as due to inadequate theory and/or research methodology.

As already noted, Berkeley and Humphreys (1982) raise the important point that research paradigms typically neglect the subjects internal representation of the decision problem. The decision task is often a crude normative representation which may be entirely contradicted by the subjects own internal representation. Berkeley & Humphreys are especially critical of Tversky & Kahneman (1981) for ignoring such factors. Sub-optimal decisions may be seen as rational, once the internal structural representation is understood.

Experimental manipulation has typically isolated a single moment of decision making from the continuous process of sequential decisions. In this sense, the experimental tasks are highly artificial, as it were, freezing time. In reality decisions form part of a longer continuous stream of choices. Hogarth (1981) argues that in the total context, isolated decisions seen as sub-optimal may be seen as rational.

Developments in the Propositional Heuristic

Other researchers have approached the Rationalist theme anew. Janis & Mann's (1977) conflict theory of decision making shows that all consequential decisions evoke some stress in the decision maker. Since all decisions involve a choice between competing courses of action, the decision maker is said to experience concern over the possibility of making a wrong choice and experiencing a negative outcome. Consequently, conflict is generated within the decision making process, resulting in the net effect of people being reluctant decision makers. Janis and Mann specify five modes of coping behavior from vigilant (searching all possible options) through to defensive (avoiding the issues) and detail the psychological operations necessary for decision making in any one context.

Beach & Mitchell (1987) and Montgomery (1987) have developed descriptive decision making models based on Image Theory which attempts to incorporate the concept of script based imaginings with a profitability criterion for decision making. Other schema based models have emerged which posit a "dominance search" strategy suggesting a new form of Rationalist algorithm (Montgomery & Svenson 1989). At this stage, however, the new theories are little more than collections of working models and do not as yet pose a significant threat to the dominant paradigm. As Vlek (1987) comments, they require,

"further elaboration and specification."

The part of Rationalist programme originating in SEU theory now shows a distinctive shift towards more descriptive models of decision making. Berkeley & Humphreys (1982) and Phillips (1984) from different angles have managed to achieve a better correspondence of the somewhat neglected propositional heuristic with the sophisticated but remorseless Multi Attribute algorithms. The progressive problem shift not only prolongs the life of this form of Rationalist programme but raises other challenges about the basic nature and purpose of social research.

Conclusions

The history of Behavioral Decision Theory like its Empiricist rival, Social Judgment Theory, is inter-twined with the development of powerful algorithmic components. This form of decision theory has also continued to develop in other discipline areas (such as Business Studies and Economics). The sophisticated algorithmic heuristic has even expanded to become a form of independent sub-discipline where the procedures of decision analysis are axiomatized into distinct mathematical theorems (French 1988). In this sense the algorithmic development has become more remote from Social Psychological theory. Problem shifts in the propositional heuristic have paralleled this trend and led to other changes in the growth of the research programme.

Early research in the Rationalist programme was dominated by the Bayesian normative model. This led to an inwardly spiraling search for further manifestations of decisional sub-optimality. Not only was this of limited theoretical interest, but it did little to advance the Rationality principle. If anything it presented a continuing anomaly for the major thrust of the research programme and thus sustained a degenerating problem shift.

Redefining the rational decision maker as an intuitive statistician helped rescue the situation and led to a search for biases and stratagems. This research continues to be quoted more widely in the literature of Social Psychology, but has not progressed significantly within the Rationalist research programme.

The SEU model continues to appear occasionally in Social Psychology generally, though mainstream decision making research work has experienced a problem shift to the MAUT formulation. This not only gave a more progressive form of algorithm but also redirected theoretical attention. By extending the decision tree, Multi Attribute Utility Theory also changed the view of the basic decision operation away from sub-optimality to the capture of complexity.

In its new guise, Behavioral Decision Theory has made a creditable contribution as an applied technology. It is best suited to decisions of great complexity where uncertainty and risk mean a trade off in values attached to outcomes.

More recently, a seminal form of a progressive problem shift has emerged. This amounts to an attempt to "naturalize" the algorithm to model the internal representations of decision processes whilst retaining the Rationalist basis.

RESUME AND CRITIQUE OF STUDY ONE

This literature review of Social Judgment Theory and Behavioral Decision Theory is presented as part of a rational reconstruction of Empiricist and Rationalist research programmes of decision making. From the Philosophy of Science, the Methodology of Scientific Research Programmes has been chosen to appraise scientific growth in this particular area of Social Psychology. The methodology directs attention to a historiographical account of research progress and elucidation of the epistemological basis.

Methodological Considerations

Other reviewers of the same literature area might well disagree with the selection presented here. Why some research papers and not others are singled out as influential remains a matter of critical judgment as does the evaluation of what constitutes a problem shift. The Methodology of Scientific Research Programmes gives no guidance on which aspects of the research enterprise to include. More than this, as Lakatos (1970) points out, there is also no predetermined means of showing how or why researchers make their choice of what to include in the protective belt of auxiliary hypotheses in the first place. Some aspects of a research programme will be exposed to potential falsification early on, and others will remain protected for as long as possible.

A Citation Index could be employed to show, by statistical frequency, which research contributions are most often referred to. This might reflect theoretical influence, though how much of this apparent popularity in the scientific community is internal history and how much aspects of external history remains uncertain.

The distinction between internal and external history has proved especially useful in directing attention at how scientists in practice operate with the two forms of heuristic machinery. It also shows, however, that the MSRP needs to be extended further in order to accommodate the effects of differences in scientific practice.

External history includes the economic, social and psychological influences on scientists thinking. Internal history focuses on the truth content or "unpsychological" aspects of

knowledge. The explanatory relationship between internal and external history needs, however, further elaboration. Lakatos suggests adopting a dialectical approach in creating a rational reconstruction, and poetically adds that the truth will "chime" in-between. For a rational appraisal of scientific growth, however, it is clearly necessary to go beyond the expression of the methodology and discover how the two strands interact as sources of influence.

There is at least scope for the Social Psychology of scientific research. Though not able to provide a complete explanation, the thinking and action of scientists should be of interest to cognitive Social Psychologists.

Perhaps the greatest drawback of MSRP is that it depends on hindsight for appraising progress. Since it does not enable direct predictions of the direction of problem shifts it makes just about any aspect of research development to be reconstructed as significant. As Hacking (1983) remarks,

"We cannot tell whether a research programme is progressive until after the fact"

Hacking adds that if MSRP is to be a worthy methodology then it should also distinguish how the rationality of science leads to the growth of science. Both Hacking and Feyerabend argue that MSRP is of little use for advising current research interest. It cannot, for example, be readily used to show which is the more viable option to invest in. Hacking sees this as the most pressing practical problem for the Philosophy of Science and a failure of MSRP.

In this rational reconstruction, MSRP has nevertheless been demonstrated as a useful framework for tracing the historical development of two rival research programmes. The methodological structure has been particularly suitable for assimilating the complex features of decision making research. Once the components of Hard Core, Negative Heuristic and Positive Heuristic are established, the methodology furnishes the basis for an efficient analysis. Differentiating the structures of research programmes according to Lakatos's scheme has been shown to be internally consistent for Empiricist and Rationalist programmes at least. Identifying the two contending research programmes in terms of their epistemological hard cores was also useful for contrasting other reviews of the same literature and showing the broader historical location of the research traditions.

This rational reconstruction portrays Social Judgment Theory and Behavioral Decision Theory as respectively manifestations of the Empiricist and Rationalist research programmes in human decision making. The 30 or so years of case histories in research development illustrate part of the larger story of Social Psychology after the Second World War. This is significant for the boost in technological development. It would have been possible, and perhaps illuminating, to trace how both research programmes have successfully exploited developments in information

technology, performing new forms of experimental research with the aid of interactive computer systems. Most of this study, however, restricts the analysis to the theoretical growth of the research programmes. MSRP could, however, be usefully extended to include the form and conduct of scientific practice as an element of internal history.

In theoretical evolution and application both research programmes evince a series of problem shifts.

Progress and Degeneration in Empiricist Research

Social Judgment Theory appears overall to have invested in algorithmic development to the neglect of fundamental theoretical progress. Whilst the Lens Model paradigm has matured into a workable formula to capture the actuarial policies of decision makers, little has advanced in the propositional heuristic since Brunswik's original conjectures on Probabilistic Functionalism.

The search for configural judges (those who use non-linear rules to combine information) showed variations in the statistical representation of judgment processes, but added little to the knowledge base of the Empiricist programme. The Lens Model algorithm has been shown to efficiently portray the input-output relationships of stimulus cues and judgments policies. The statistical representation, however, does not "externalize" the subjective processes in an intuitively compelling manner.

The Cognitive Conflict paradigm, however, has formed the basis of a progressive problem shift with a change of direction to interpersonal learning. This has been successfully applied in a range of practice areas and is particularly suited to capturing differences in policy between individual decision makers and decisions based on scientific and technical data sources. The most progressive research focus examines the consistency and adaptation of judges making decisions in the face of an uncertain stimulus environment.

Researchers in Social Judgment Theory are also notable for their commitment to the ideals of Probabilistic Functionalism which remains one of the best paragons of the Empiricist model. Decision makers are seen to be wholly dependent on the arrangement of cues available to them. Experimentally, an assumption is made that both researcher and subject can sample cues in a statistically representative fashion. How this inductive process is achieved, however, is trapped in the hard core by the Negative heuristic, and thus protected from further investigation.

After a quarter century of operation in the Empiricist research programme, Brunswik's Probabilistic Functionalism has not generated the paradigm shift in Psychology which SJT researchers had hoped for. Indeed, the research effort now appears to be increasingly centred around just one institution. Nonetheless, SJT has provided some powerful research tools and has

been a conceptual counterbalance to the widely accepted, and often unquestioned, Rationalist model of decision making.

Progress and Degeneration in Rationalist Research

Behavioral Decision Theory has also invested heavily in the algorithmic heuristic to create a workable technology of decision analysis. The algorithm has even matured to become a semi-autonomous and quasi mathematical discipline. In part this has been a consequence of a number of unconnected disciplines sharing the same basic model. Although applied in a wide range of practice areas, decision analysis using the Rationalist model remains a mostly specialist activity, no doubt due in part to the level of mathematical sophistication required. It is best suited to applications of where risk estimations are entered into part of the decision makers value audit.

The detachment of algorithm from proposition in this way has, however, allowed the basic Social Psychological theory to progress differently from SJT which remained strictly tethered to the algorithm of the Lens model.

Early research effort was dominated by the strong template supplied by the Bayesian normative model. The consequent search for manifestations of sub-optimal decisions resulted, however, in something of a theoretical cul-de-sac. Studies of the decision maker as an intuitive statistician gave a more descriptive focus to the Rationalist model. Subsequently sub-optimality has been re-appraised with a change of definition from *biases* to *cognitive heuristics*.

The change from Subjective Expected Utility to Multi Attribute Utility gave another progressive problem shift. In addition to augmenting the basic algorithm, this altered the basic research focus to modelling complexity rather than sub-optimality. It also facilitated study of the internal representation of decision making. The most progressive form of research within the Rationalist programme has subsequently been the attempt to "naturalize" the modelling process such that decision makers appreciate it as intuitively plausible.

In the Rationalist model the decision maker is assumed to take an internal audit of the values subjectively attached to likely outcomes. How the subjective values are arrived at is retained by the Negative heuristic as part of the Hard Core. The underlying principle of hedonism is taken as given and not exposed to potential falsification.

Since the Second World War Behavioral Decision Theory has evolved into a workable technology and has provided a steady stream of theoretical insights into the information processing of human decision makers. Behavioral Decision Theory remains important to the Rationalist programme of decision making, but is perhaps being superseded by other Social Psychological

models having wider appeals within the Rationalist framework (e.g. Ajzen & Fishbein 1980; Janis & Mann 1977).

Conclusions

Thus far it has been possible to identify two rival research programmes in decision making: the Rationalist and Empiricist. These have been shown to have a long and powerful influence in the development of psychological decision theories where patterns of progressive and degenerating problem shifts are visible in the research literature. For the most part, however, the two programmes appear to coexist more or less independently. Very few attempts have been made to either contest the two approaches or to reconcile the differences.

As predicted by the Methodology of Scientific Research Programmes (MSRP) the negative heuristics condense over time to form a hard core of assumptions which remain protected from direct refutation. The positive heuristics, however, function as the medium of empirical research. Most significantly, it has been possible to extend Worrall's (1975) observation and further differentiate the nature of the positive heuristic. Research programmes, it is argued, contain both propositional and algorithmic properties which may develop at different rates. The propositional heuristic acts to generate conceptual issues, further elaborating or defending the theoretical basis. The algorithmic heuristic generates forms of data and data analysis which are also derived from the epistemological basis

STUDY TWO:

REASONED ACTION AND ATTRIBUTIONAL CHOICES

**A Reconstruction of Problem and Practice Shifts
in the Rationalist and Empiricist Research Programmes of Decision Making.**

**THE PHILOSOPHY OF SCIENTIFIC PRACTICE:
Revisions to the Methodology of Scientific Research Programmes**

Frederick Suppe (1977) sees a new movement of historical realism (so called because of the central importance of the history of science in its methodology) as the dominant force in contemporary Philosophy of Science which starts with the basic tenet of examining what scientists actually do. This also retains an epistemic focus on rationality and growth in science, which means maintaining a distinction between external and internal history. Suppe says it is characterized by :

"a strong commitment to both a metaphysical realism
and an epistemological realism."

The concept of scientific practice parallels scientific principle for understanding the growth of science. Putnam (1981), for example, is critical of Popperian theory for its failure to see that practice is crucial to scientific growth. One consequence has been a too sharp distinction between Science and its social context. Putnam argues that although scientific ideas guide practice in Science, it is also true that the nature of practice has a formative influence. As Putnam expresses:

"Practice is primary: ideas are not just an end in
themselves."

Lakatos's methodology is also criticized by Suppe on the grounds that his version of scientific growth assumes the positive and negative heuristics as given. Nowhere does Lakatos identify how we might rationally decide what to include in either. For Lakatos the positive heuristic may even be formulated as a metaphysical principle. Indeed, Hacking (1983) claims that Lakatos is important for addressing a metaphysical and not an epistemological principle in appraising science. He argues that Lakatos actually holds a Hegelian outlook which does not seek a correspondence of science with truth, only a commitment to rational action. Newton-Smith (1981) also criticizes Popper and Lakatos not linking the realistic goal of science with its methodology.

Scientific Practice as Domains of Applied Reasoning.

Suppe champions the work of Shapere which he claims to be superior to Lakatos's methodology. Dudley Shapere (1977) sees his work as occupying a middle ground between the relativism in Kuhn and Feyerabend, and the excesses of positivism, especially the idea of theory-neutral observation language. For Shapere, the fundamental analysis of scientific practice should focus on reasoning patterns actually employed by the scientists. Although Shapere maintains his position makes "socio-psychological" views of scientific knowledge unnecessary (referring to Kuhn), his emphasis on reasoning patterns is highly reminiscent of much attributional work in contemporary cognitive social psychology.

Central to Shapere's analysis is the concept of *domain*. this is characterized by items of information (putative facts, laws theories etc) which in turn form a body of information. The linkage between them reveals what is problematic and whether science is "ready" to deal with it. Suppe defends the concept of domain against the charge that it is ultimately a sociological definition, arguing that the concept is intended to replace the observation-theory distinction and that items of information are ultimately linked by grounding in reason. For Shapere, objectivity is equivalent to the degree of delineation of a scientific domain. The epistemic implications still remain, however, imprecise.

According to Shapere, in scientific practice it is rational for scientists at various stages of development of a theory to continue pursuing and fostering it even though they may explicitly be aware that it is literally false. Indeed, it may be that all young theories go through such a primitive stage and it would be nonsense to attempt refutations or other observationally linked testing. Theory may be put forward initially not as *true*, but as some idealization or as a model or even a useful fiction. In the development of a theory it becomes pertinent to ask at any particular stage whether it purports to provide a realistic explanation or else is offered as a conceptual device.

In providing an adequate account of scientific practice Shapere insists that we must accommodate the actual uses to which theory is put. Science, moreover, is said to be influenced by its content. That is, the content may "feedback" and impose constraints upon the concepts of science. For Shapere, as science develops the constraints grow ever tighter and the alternatives stranger. One manifestation of this effect is the production of "weird" views of the world provided by modern physics such as quantum mechanics and relativity theory. (They are weird in the sense that they portray the reality of nature at odds with our everyday understanding of space and time.)

Scientific Practice as Enterprise in Problem Solving.

Larry Laudan (1977) is recognized to have provided one of the more influential contributions to the Philosophy of Science since Popper, Lakatos, Kuhn and Feyerabend. Like Shapere, Laudan focuses on scientific practice and defines scientific rationality in cognitive terms. Laudan argues that most extant philosophical accounts of rationality have been shown to be inapplicable to science and so must be redefined to be synonymous with scientific progress. Nothing short of a cognitive evaluation of science is proposed by Laudan, in which science is viewed fundamentally as a problem-solving system. Theories are regarded as cognitively important in facilitating solutions to scientific problems. The main question to be asked is whether theories are *adequate* in solving problems, of which there are two types; empirical problems and conceptual problems.

Empirical Problems.

Empirical problems are so called because we treat them as if they were real world problems. They constitute the domain of a given science.

The content of empirical problems may change, according to Laudan, so that some issues cease to be problems. Solving problems is not synonymous with explaining facts, however. The solution is not defined by the truth or falsity of a theory, or by degree of corroboration. It is rather, relative and impermanent according to its empirical status. This may be either; unsolved, solved or anomaly.

Laudan argues that it is the cognitive importance of anomalies in science, and not the sheer number (as Kuhn would have it) which gives anomalies a role in shaping the direction of scientific enterprise. It is the degree of epistemic threat they pose, and this is only conceivable by comparing competing theories together. Competition between rival theories will effectively force anomalies up in empirical price resulting in problem inflation as rivals see solutions as premium.

Conceptual Problems.

Although as important as empirical problems this area has been largely ignored by philosophers of science, according to Laudan, but not by the scientist themselves. Laudan criticizes Popper, Lakatos, and Feyerabend together for all imagining theory choice to be governed solely by empirical issues. In practice, Laudan states, theories are often criticized for their conceptual credentials independently of any empirical considerations.

Research Traditions in scientific practice.

The aim of science in Laudan's thesis is to maximize solved empirical problems whilst minimizing anomalies and reducing conceptual problems. It is in effect a mini-max strategy. Replacement of one theory system by another is regarded as progressive, and therefore rational, if and only if it has a better mini-max ratio of solved problems.

Generally, Laudan's methodology offers a very full descriptive account, illustrating how research traditions might be evaluated through adequacy in problem setting and solving. Ultimately, however, the methodology relies on a sociological appraisal of science and contains, like Kuhn, a consensual view of adequacy and acceptability. Lacking a normatively epistemological basis, it remains empty and offers no rational appraisal. Indeed, just about any aspect of the history of science could be accommodated somewhere within it. A generous interpretation may be able to show that "rational persuasibility" of problems is linked epistemologically to increasing theoretical content. Laudan's thesis is, in any case, instrumentalist and consensual. The main advantage is that he directs us to examine scientific practice as an independent element in the puzzle.

Laudan denies that circumventing epistemic issues means his model is without normative appraisal. He says,

"I am suggesting that we can have a theory of rationality without presupposing anything about the veracity or verisimilitude of the theories we judge to be rational or irrational."

Laudan's methodology relies, though, on the notion of problem solving and the ratio of solutions. In turn this implies some form of verisimilitude. How do we know problems are in fact solved if not by some form of observation statement? Laudan, however, criticizes the Lakatosian idea of progressive truth, on the grounds that it can never be shown to be progressive. He argues that the Popper-Tarski theme relating empirical and logical content ignores critiques by Grunbaum (1976) and others, which have shown it to be impossible. Laudan's argument is mistaken, however. His notions of progress strongly imply the efficient replacement of theories by newer, better ones, which ultimately converges on problem solutions. In turn, this is inextricably linked with empirical testing and some form of correspondence theory of truth.

Science as Autonomous Social Practice

Adrian Chalmers (1978) advocates a "Radical Instrumentalism or Pluralistic Realism" which stresses the character of scientific practice. He sees in it a means of reconciling the problem of induction by extending the distinction between the real world and the content of theories. Although Chalmers explicitly rejects Popper's Three world thesis, he maintains that all

observation statements are theory dependent, and that a separate reality must be attributed to the real world and the content of theories. As he describes it, we need a pluralistic realism in which,

"The external world and the world of theories are both real, but they are distinct. They are linked by a third real, scientific practice."

For the Radical Instrumentalist, Chalmers contends real scientific theories are inextricably bound with a separate real scientific practice. Theories, however, are not assumed to explain the real world. What matters is that people behave *as if* the explanations are true. In this sense, scientific practice provides the necessary link for scientific progress.

Chalmers also draws on the work of the French Marxist, Louis Althusser (1969; 1970), who's epistemology in turn owes much to Gaston Bachelard. Althusser gives a materialist interpretation of science, in which all aspects of social practice function to serve the interests of social groups. Above all, social groups are portrayed as striving to survive and use their relative autonomy to progress their interests. This version of social Darwinism does not rely on the intentions, or indeed the insights, of the groups members. Thus it is that scientific practice is said to function independently of other related practices (such as technology or the educational system).

Popper and Lakatos are thus viewed as half-hearted objectivists. In attempting to establish science as a rational activity they are seen as being forced to adopt an idealist position, which in turn means an unwitting acceptance of subjectivist doctrine.

Althusserian analysis, however, precludes the possibility of rational growth in Science, however, and does not sit easily with Chalmer's Radical Instrumentalism.

Applied Science and the Theory-Practice Gap

Donald Schön (1983) argues that a model of technical rationality dominates the practice of science through its influence on the thinking of professionals who apply scientific findings. Practitioners can be seen to act instrumentally, applying the tools of science to solve immediate problems but seldom initiating new scientific contributions themselves. With the technical rationality of applied science, practical knowledge is entirely used as a means to an end. An assumption is made, moreover, that the ends are unambiguous and agreed upon.

Such a technical application of science in this way leads to a separation of research and practice. In turn this division of labour further polarises the theory-practice gap, with practitioners becoming more doers than thinkers.

Since applied science is based on some scientific discipline it follows that problems are defined by the relevant scientific theory as much as the needs of the practitioners. The importation of models from research based disciplines in this way redefines the practice subject, not as an emerging discipline growing out of the fruits of others, but as a practice ground for others. That is, it constitutes a victory of hegemony for the exporting discipline as it takes over further empirical ground (Laudan 1977).

Schön (1983) argues instead for a new epistemology of practice in which subject based practitioners reconstruct their own knowledge base from their tacit knowledge-in-action to become reflective practitioners. To articulate and codify practical knowledge, scholarly discourse must take the form of theory construction. de Castell (1989) warns, however, that institutional factors impose severe limits upon reflections about action and the the literate opportunities of practitioners. Practitioners are typically given neither the time nor the encouragement to engage in theory construction.

Schön's model of the reflective practitioner cannot, moreover, be grafted onto practice in yet another exercise of technical rationality. It does, though, provide a important challenge to our view of how disciplines emerge, and the effect of progress in scientific research programmes as they establish new empires of influence in practice.

The Autonomous World of Action

In seminal, but unpublished works, Aubrey Baillie (1978,1980) provides the basis for solving the epistemological shortcomings of the preceding analyses. His contribution has the potential to furnish the Methodology of Scientific Research Programmes with the means of appraising scientific practice.

Baillie argues for extending Popper's epistemic triad with the addition of just one more conceptually independent world. In the World Four thesis, Baillie posits an "autonomous world of action." The Fourth World, that is, is said to contain the objective nature of practice independently of knowledge or the intentions of practitioners.

Popper would undoubtedly say that Baillie's World Four is nothing more than a misrepresentation of World One, or else a misunderstanding of World Three. Baillie, however, argues forcefully that World Four can best be described according to states of relationships in any one context at any one time; between an outcome, a behavior and a "prespecification". Taken together, the relationships add up to an "autonomous world of action". That is, all actions contain objective consequences, regardless of intentions. It is the principle of "materially fixed behavior-consequence connections". World Four (states of relationships) is a direct analogy to Popper's World Two (states of consciousness) and World Three (states of arguments).

The World Four thesis has profound implications, not only for Popperian Philosophy of Science, but also for the reflexive analysis of Social Psychology. Whatever knowledge basis our actions are founded upon they have a verisimilitude all of their own. The problem is to discover and improve the extent of correspondence between knowledge, action and consequences.

According to Baillie, all worlds are represented as decision structures which include both a specification (or decision point) of transition and operators (or factors) to bring about a change of state in the world. The mind is thus best understood as pluralistic decision structures. In Baillie's words,

"All major psychological theories (and all cosmologies) are, in a sense, concerned with the origin of pattern and order of the mind."

Two questions, however, need to be addressed:

1. Why one action is chosen over another initially?
2. Why one course of action is sustained over a competing alternative?

Stated differently, there is a need not only to describe, but also to appraise a course of action.

Baillie indicates a similar thinking in stating that the psychological nature of effort consists of arranging the appropriate initial conditions and establishing that the World Two prespecification is valid.

Although Baillie focuses the problem in terms of the medium of articulation (that is the processes by which events are transformed into the world of knowledge), his analysis does not yet have the advantage of an applicable methodology. (In itself a singular irony).

Fortunately, a suitable methodology of Action Programmes can be generated by extending Lakatos's Methodology of Scientific Research Programmes to include considerations of World Four (practice components). This may be used both for the normative appraisal of Science and as a means of understanding individual action.

Practice Shifts and the Methodology of Scientific Research Programmes

In addition to predicting novel facts (World Three), successful science must also be founded in successful practice (World Four). Research programmes must thus be characterized by practice shifts in addition to problem shifts. That is, the objective epistemological content contained in the actions of scientists must add to the growth of knowledge in addition to their theoretical contributions. Of particular relevance, is the application of their research work and the dissemination and acceptance of their findings in practice domains.

Domains of practice are delineated by coherent bodies of information addressing particular sets of problems (Shapere 1977), and following Laudan (1977) will differ in the social value. Practice domains could exist entirely within erudite discipline boundaries as in "pure" physics, or be more widely accessible and debated by non-specialists. All that matters is that the problem area is recognized as coherent and be highly valued. Within practice domains, moreover, the agenda of problems could change as society and nature imposes new demands.

In the practice domain of health education, for example, H.I.V infection and the A.I.D.S problem has taken on a high social value in recent years, demoting other health concerns lower down the agenda. The premium attached to this problem may, moreover, raise the practice area of health relative to other social concerns. In terms of external history, funding is more likely to be invested in such high priority areas, research findings will attract greater publicity and increased kudos will fall on research programmes claiming the practice domain as their own.

World Four, however, concerns the internal history of scientific practice. This will be seen in the research programmes ability to give form and content to the practice domain. In particular, an effective programme might be expected to equip practitioners with adequate tools to augment their activities and to translate theoretical insights into practical consequences. Stated differently, research programmes should find a ready application in given domains of practice. More progressive programmes would be expected to address a broader variety of domains.

Most significantly, however, there should also be a verisimilitude of action. Progressive research programmes will generate new instances of practice, in effect providing novel opportunities to exploit theory. A progressive practice shift is one which not only covers the same ground (domain of practice) as its rival, but also uncovers and exploits new opportunities. (For example, by extending research practice across disciplines- perhaps by exporting the algorithmic heuristic).

Degenerative practice shifts, in contrast, are characterized by missed opportunities, by the post hoc development of a practice base.

Recognizing the importance of practice shifts to the progress of science helps recast the operational and methodological obsessions of scientists in a new light. For a research programme to progress (or perhaps, more poignantly, to survive in the face of competition), the practice basis must be demonstrated to be fertile as well as the theoretical content.

Correspondence in Problem and Practice Shifts

The combination of problem and practice shifts can be usefully depicted in a 2 X 2 matrix of possibilities. Viz:

Figure 3

The Combination of Problem and Practice Shifts

		PROBLEM SHIFTS	
		progressive	degenerative
PRACTICE SHIFTS	progressive	sustained programme	detached programme
	degenerative	programme in crisis	abandoned programme

When progressive problem shifts correspond with progressive practice shifts a fairly obvious direction can be predicted for the research programme. Scientists who are successful in practice and also find their theoretical developments progressing will likely as not sustain their line of work. Equally obviously, scientists who find only failure in their practice efforts and who also see their theory work degenerating will quickly seek more productive directions elsewhere (that is, in effect they will seek a paradigm shift).

More interesting, however, are the two remaining cells of the matrix. Each has far-reaching implications for the appraisal of scientific progress:

Progressive Practice Shift combined with Degenerating Problem Shift

Although apparently successful in their work, scientists in this cell will feel constrained by it, or worse, that they are forced to practice what they do not preach. The self-diagnosed hypocrisy of their actions will most likely result in either continued but uncommitted work, or, at best, the adoption of radical action, attempting to change the course of practice. Both coping strategies are likely to sow discord within the community of scientists, not least because the very success

of their practice makes this group highly credible to colleagues. The first by the apparent cynicism and detachment of good role models and the second through direct "political" challenges to the system.

Progressive Problem Shifts combined with Degenerating Practice Shifts

Scientists caught in this circumstance might be thought to make up for in enthusiasm what they lack in practice. This is only likely in the short term, however. Repeated failure in practice will bring about two kinds of difficulty. First, a crisis of credibility can be induced by having scientists unable to practice their theoretical insights. Second, a crisis of confidence is likely for the group and inevitable for the individual. Crises of confidence in Social Psychology (Westland 1978; Parker 1989) may now be reinterpreted in this light.

Scientific growth is thus to be characterized by the nature of problem and practice shifts. Progressive research is that which shows growth in both arenas. True science will also generate problem and practice shifts which correspond in their epistemological basis.

Conclusions

With a call for "historical realism" Philosophers of Science have most recently given greater prominence to scientific practice. Hacking (1983), for example, agrees with Feyerabend that science should be evaluated in terms of what scientists actually do, rather than relying on the normative ideal. That is, the quality of their speculations and experimentations should be seen as embodying the true nature of science.

The lack of a suitable epistemological basis, however, has left such solutions resorting ultimately to socio-psychological discourse. Though not inappropriate, this level of explanation is insufficient to account for scientific growth. Lakatos's distinction of external history partly addresses the call for realist accounts by directing attention to the extraneous influences on scientists activities, but finally gives no means of integrating the two strands.

The World four thesis outlined here provides an epistemological way forward. By extending Popper's epistemology to include the objective content of action it may equip MSRP with a basis for the rational appraisal of scientific practice. In reconstructing the growth of research programmes, the question of what scientists actually do should be extended to what use they make of their research. This revision of MSRP specifies that practice shifts in addition to problem shifts should characterize the progress of research programmes. Rational reconstructions are then directed towards the critical evaluation of rival research programmes competing within shared domains of practice.

**FROM ATTITUDES TO REASONED ACTION :
Redefinitions in the Rationalist Tradition**

One of the major attractions in studying decision making for the social researcher is the possibility of creating some kind of universal and basic unit of analysis. Decisions just might turn out to be the primary operating characteristics of many social phenomena, providing a means of codifying and understanding the relationship between cognitive structures and voluntary action.

Within Social Psychology at least, the concept of attitudes has traditionally filled this position, and has often been cited as defining the field of study par excellence. Gordon Allport (1954), one of the discipline's respected ancestors expresses it thus,

"...the attitude unit has been the primary building stone in the edifice of Social Psychology
....Without some such concept, Social Psychologists could not characterize the mental organization of social man. The term itself may not be indispensable, but what it stands for is."

As Allport implies, attitudes are central to the research tradition of Social Psychology. In Laudan's (1977) sense attitude research authenticates the domain of Social Psychology.

The importance attached to the concept of attitudes is also historically intertwined with the rise of large scale social research. Although the term had been in use by psychologists for over a hundred years (usually attributed to Herbert Spencer in 1862) and since 1918 by sociologists (introduced in Thomas and Znaniecki's classic, *The Polish Peasant*), attitudes only became a prominent concept during the 1930s. Around this time researchers in the social field began to spread their investigations wider and consequently devoted much effort towards creating technologies of attitude measurement. Thurstone (1928) and Likert (1932) are the better known forms of attitude scale created in that era, though the concern with operationalizing the concept has also remained a constant feature of much social research ever since.

Guttman's (1944) work investigating the American soldier during the Second World War, and Osgood, Suci & Tannenbaum's (1955) exploration of language and meaning both led to influential techniques of attitude measurement. In the post-war years effort switched to more

cognitive versions of the attitude concept with the rapid growth of consistency theories, especially celebrated in dissonance research (Brown 1965).

Around the mid 1960s, studies of the attitude-behavior problem came to the fore. Liska (1984) describes the expansion of work as a "mushrooming" of empirically based studies to the neglect of theory and definitions. Each new study led to the identification of more influencing variables, resulting in a generally confused picture.

More recently, a number of integrated attitude-behavior models have been developed (e.g. Fishbein & Ajzen 1975; Triandis 1977; Acock & Defleur 1972). These have at least had the effect of consolidating the spiraling search for new attitude variables. Most influential of all has been the work of Martin Fishbein and his colleagues (but generally known as the Fishbein model), which has had a dramatic influence in the development of attitude research (Fishbein 1967, Fishbein & Ajzen 1975; Ajzen & Fishbein 1980).

McGuire's (1986) review of the attitude field also attests to a developing series of problem shifts. Though making no reference to the Philosophy of Science, McGuire shows a distinct understanding of the need to differentiate internal and external history in accounting for the popularity and decline of research topics. Lacking an explicit epistemological basis and a conventionalist stratagem for appraising research trends, McGuire reconstructs the changes in terms of 20 year cycles. The "measurement of mind" is identified as dominating the 1920s-30s (a time in which research focused upon delineating attitudes). "Action-attitude correspondence" (a period devoted to attitude change) is said to characterize the the 1950s-60s. Finally, McGuire identifies the 1980s-90s as a phase of "structuralist" research effort attempting to deal with the social organization of attitudes. Most insightfully, though, McGuire (1986) argues that over the 3 periods attitude research has,

"Exercised hegemony over the disciplines imagination"

Conceptual Problems of Attitude Definition

Several definitions have currency and most retain the connotation of "stance" or "posture" from the latin origin of "aptus", meaning fitness or readiness. The main debate over a viable working definition revolves around the so-called three component model. In this, attitudes are said to have cognitive, affective and behavioral components with measurement usually taken from the cognitive area. Controversy exists over the composition and relatedness of the multi-dimensional structure of attitudes.

The affective dimension, Fishbein argues is the essential location of an attitude, and must be clearly differentiated from cognitive and conative factors. Moreover, most standard

measurement instruments can be shown to ultimately combine the several components into a single score along a dimension of favourableness---unfavourableness. Fishbein considers Thurstone's (1931) definition of attitude to be the most succinct and accurate, as:

"the amount of affect for or against a psychological object"

DeFleur and Westie (1963), however, contend that the debate has crystallized into two broad paradigms with attitudes being defined either as:

- * A latent process which acts to mediate behavior, or;
- * As a response potential which gives the likelihood of a particular behavior occurring in a known set of circumstances.

They also argue that the latter form of definition is more consistent with the bulk of empirical research. Indeed it may be more telling to say that definitions given to attitudes have tended to follow attempts to operationalize the concept rather than being based on first principles of theoretical argument.

The effort after solving empirical problems appears to have fed-back to make changes in conceptual problems. This, of course, is the exact reversal of Laudan's (1977) thesis, which has new (conceptual) discoveries forcing changes in method. To repeat Putnam's (1981) phrase, practice is primary.

Empirical Problems: The Attitude-Behavior Relationship

The crucial testing arena for attitude research has come to be in attempts to predict behavior from attitudes. Generally stated such research has been singularly unsuccessful or at least replete with contradictions. Wicker (1969) concludes from a careful review of the literature that attitudes only account for about 10% of the explained variation in behavior. Deutscher (1966, 1973) maintains that there is no reason to assume a direct link between attitudes and behavior, and Turner (1968) adopting a more radical if not nihilistic position, even argues that in this context the whole concept is redundant. Given that most reviews of the literature inevitably conclude pessimistically for not predicting behavior from attitudes, it is difficult to account for the sustained popularity of the concept and the massive investment of wide-scale social research in attitude measurement. As Gaskell & Fraser (1990) remark,

"Attitudes have been asked to do a great deal of work in Social Psychology, perhaps rather too much."

Whilst attitude theory has generally shown little progress in predicting behavior, the research work has been sustained by an upward change in the practice base. That is, the investment in and furtherance of attitude research methodology has been something of a growth industry. In turn this has led to changes in the focus of attitude research and the development of newer, better conceptual models.

From within the mainstream research tradition Fishbein (1967) has also reviewed the vast amount of contradictory attitude literature and contends that two reasons have perpetuated this state of affairs. First, the attitude measured is typically toward an inappropriate stimulus object, and secondly, the particular behavior being studied may be partially or completely irrelevant. The theoretical weakness of most attitude studies lies, according to Fishbein, in a failure to understand the complex relationship between beliefs, attitudes, intentions and behavior.

Failures to predict behavior have traditionally been blamed on difficulties of measuring all three components of cognition, affect and conation (behavior) in a meaningful way, or that only one component is measured in isolation from the others. Gaskell & Fraser (1990) observe, though, that despite the limited operationalization of the concept, the three component model is still extant.

Fishbein, however, has located the problem elsewhere and has argued convincingly that the definition given to attitudes is invariably incommensurate with what attitude measures are expected to achieve. Most studies, that is, attempt to predict *specific* behavior consistently towards *specific* objects, from a knowledge of *general* attitudes. Typically too, cognition, conation and affect are taken to mean different things by different investigators, and the term "attitude" is employed as a blanket concept to cover a diversity of single item measures which demonstrate little consistency. Indeed, Fishbein and Ajzen (1972) identified over 500 different measurement procedures for operationalizing attitudes. Again, the sheer magnitude of this research effort attests to the importance of practice considerations in appraising scientific growth.

Problem Solving Capacity in the Emergence of Fishbein Theory

Theories, according to Laudan (1977) are never self-justifying and can only exist within the fabric of research traditions. These function to authenticate theories, and also to act heuristically. In Laudan's sense, Fishbein's theory of attitude change was shaped through the great importance attached to the attitude-behavior problem. The propositional heuristic developed in order to fit the model's powerful algorithm as much as the need to reduce conceptual problems. Indeed, the model originated when Fishbein (1967) adapted Dulany's (1961, 1964) theory of propositional control, or more accurately adopted the workings of Dulany's algorithm.

Dulany's model was developed in the context of verbal learning and concept attainment studies. Perhaps more significantly, it was developed in order to test whether insight was a necessary precondition in the operant learning of human subjects. Fishbein's adaptation retained the basic expressions in Dulany's model including the use of multiple regression procedures to determine beta weights for the model's main components. (See figure 4)

The first formulation included separate components of personal and social norms. Since then the model has been amended slightly. In particular, the normative component, has been reduced to the single formulation which covers the normative beliefs for both the individual's reference group and the individual's own private prescriptions (Fishbein and Ajzen 1975).

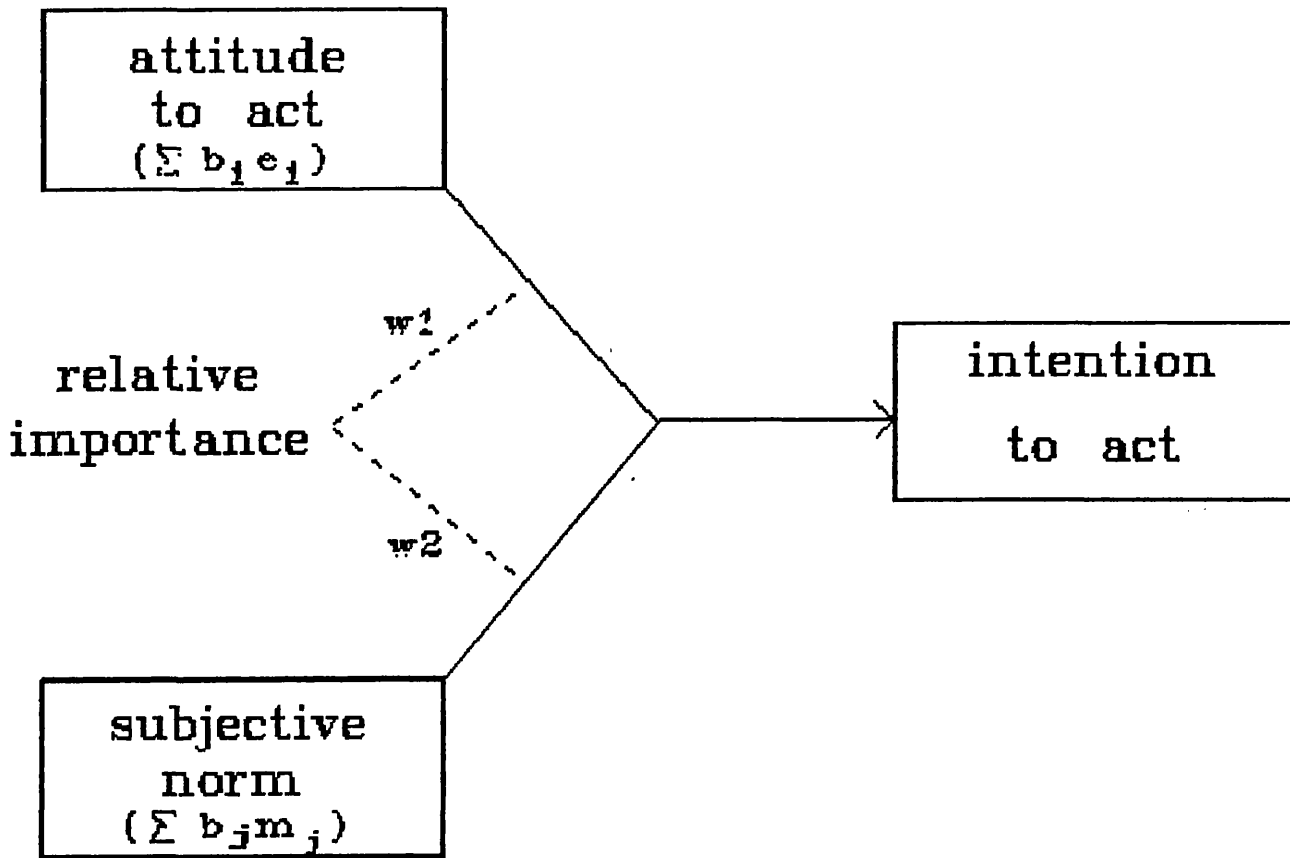
Both sets of variables in the model (that is the attitudinal and normative components) are composed from the set of salient beliefs multiplied by the evaluation of those beliefs. Fishbein has drawn implications from these considerations for a practical research perspective, namely that weightings must be known. The weighting parameters are determined through multiple regression techniques in a post hoc empirical procedure.

Figure 4

The Fishbein Model

(The Theory of Reasoned Action)

(After Ajzen & Fishbein 1980)



b_i : beliefs about the act
 e_i : evaluation of beliefs

b_j : beliefs about what significant others think of the act
 m_j : Motivation to comply

Intention, according to Fishbein's theory can be viewed as a special case of belief. It is the perceived relationship between self and some behavior with respect to the attitude object. Predictability of the intention-behavior relationship is also said to be susceptible to a number of major influences. Generally, the greater number or magnitude of variables intervening between measuring the intention and the onset of the behavior, the lower will be the predictability. Thus time interval, new information, size and sequence of steps are all potential disruptions of predictive accuracy.

Problem Shifts in the Propositional Heuristic: Attitudes as Reasoned Action

A progressive form of problem shift is demonstrable in the propositional content of Fishbein's theory which has undergone a significant redefinition. Instead of concerning attitudes and behavior (Fishbein and Ajzen 1975), the work is now said to concern reasons and actions (Ajzen and Fishbein 1980). The transition marks a major progressive problem shift with Fishbein's work becoming redefined as a Social Psychological theory of decision making within the Rationalist programme.

A broader influence helping to redefine Fishbein's theory stems from a more general paradigm shift within contemporary Social Psychology (and indeed with much of Social Science). The growth of cognitive theories has and continues to have a widespread effect in rethinking a number of basic psychological concepts including the most fundamental of all; behavior. This is being increasingly replaced with the concept of action. As Rosenberg (1988) argues, social science should aim at explaining human action, not simply "mere behavior". Though there are different and even rival schools of thought as to how the new concept should be defined, they seem to share a dissatisfaction with the old behaviorist notion of human performance in passive and mechanistic terms (compare, for example, Beach 1985; Frese & Sabini 1985; Atkinson 1982; von Cranach & Harré 1982).

In his presidential address to the American Psychological Association, Kelman (1974) argues that attitudes remain a distinctive and indispensable concept. Most significantly, though, he locates attitudes within action rather than behavior.

Most eloquently, Atkinson has expressed the need for a conceptual change in a "new dynamics of action". Social Psychological analysis in terms of a stream of action has profoundly different implications than descriptions of singular behaviors. As Atkinson (1982) cogently states,

"We break out of the traditional mode of thought that has always considered behavioral episodes as isolated events and begin viewing the behavioral life of an individual as a continual stream characterized by change from one activity to another even in a constant environment."

Feather (1982) emphasizes that several writers have made the same basic point, namely that individuals must be seen in the context of longer term behavior, not just immediate situations. In particular, past, present and future perspectives on behavior all form part of an individual's active construction of themselves and their world.

For Fishbein theory the change of emphasis has far reaching conceptual and empirical consequences. Most significantly, is the recognition that any one behavior may be shared by diverse actions. Different intentions give different meanings (or more correctly sets of reasons) to the same behavior. For example, the exact same tooth brushing behavior may simultaneously entail actions of dental prevention, personal hygiene or grooming (Bateman 1985). The revised Fishbein model (Ajzen & Fishbein 1980) directs research to the prediction of specific actions rather than behaviors.

The Rationalist basis to Fishbein's work is also clearly visible in the algorithm, where individuals are asked to perform an internal audit on their beliefs and evaluations. It is also made explicit in the propositional content which describes action as following reasoning. As Ajzen and Fishbein (1980) succinctly express,

"....we argue that people consider the implications of their action before they decide to engage or not engage in a given behavior."

Reasoned Action as Decision Making

Part of the momentum transforming Fishbein's theory of attitudes into a theory of reasoned action came from the progressive practice shift brought about through attempts to make the model into a workable technology (Fishbein 1982; Fishbein & Jaccard 1973; Jaccard & Davidson 1972). Fishbeinian researchers working in the applied field, such as Mary Tuck have long regarded the model as best fitted to problems of choice behavior (Tuck 1976).

As Tuck (1976) points out, Fishbein's theoretical model is aimed at complete generality and is,

"essentially a theory of behavior under volitional control."

Stated differently, attitude theories for Fishbein are, or should be, considered as theories of choice.

Other rival consumer theories are criticized by Ajzen and Fishbein (1980) as being highly eclectic, cumbersome and being over-complex in trying to incorporate the whole gamut of social and psychological variables. In seeking to explain everything they are said to actually succeed in explaining nothing.

In the effort to make the Fishbein model testable and specific in this domain, the conceptual shift from attitudes to decisions was perhaps inevitable. The impetus is well illustrated by Ajzen and Fishbein (1980) who make a number of cutting comparisons with the model of rivals Howard and Sheth (1969). They illustrate the explanatory power and parsimony of their own model (progressive problem shift) applied over a diverse range of consumer problems (progressive practice shift), clearly revealing the new focus on decision making.

Problem Shifts in the Algorithmic Heuristic: Pathways of Reasons

As it is operationalized, Fishbein's model is based upon a multiple value-expectancy algorithm. (Ajzen & Fishbein 1980). Eiser (1986) too says of it that it is an example of expectancy-value models in decision making.

The algorithm is indeed structurally similar to some Multi-Attribute Utility Theory (MAUT) formulations of decision making. Himmelweit, Humphreys & Jaeger (1985) also observe that the Fishbein model is akin to MAUT in its *mathematical* form, but argue,

"The Fishbein procedure is not, in the final analysis, comparable "

Their caution, however, is too strict. Fishbein's model shares not only the linear-additive model for combining expectancy-value scores, but more importantly, the same Rationalist basis. Both represent an attempt to derive the internal audit for a choice problem based upon multivariate considerations. In turn, both make strong assumptions that the complete (or salient) set of contributing dimensions can be made manifest. Both models explicitly recognize that dimensional salience varies across individuals. Finally, both locate the decision horizon (the point at which the decision maker takes the internal audit and ceases to search for further information) as the moment of choice. The Fishbein formulation differs from MAUT primarily in not giving a *relative* weighting to the evaluation (or importance weighting scores). Instead, Fishbein retains evaluative ratings as absolute and employs Multiple Regression procedures to give relative weighting to the resultant attitudinal and normative components of the model. In

fact then, Fishbein and MAUT are generally closer propositionally, than they are algorithmically.

It is important to note, however, that Fishbein emphasizes properties not considered in MAUT studies. In predicting behavioral intentions, Fishbein prescribes that the expectancy-value must be of behavior and not objects. So, for example, instead of researching attitudes *towards* a political party in trying to predict voting patterns, the researcher should study attitudes *towards voting for* a political party. This and other insights from Fishbein's analysis of attitude research provide pertinent criticisms for research work in Behavioral Decision Theory.

Like attitude theories, Behavioral Decision Theories have, on the whole, been unsuccessful in predicting behavior. Following the course of Fishbein's analysis, it is revealing to ask whether the definition given to decisions is consistent with what decision measures are expected to achieve. Regarded as a purely algorithmic abstraction the concept of a decision becomes psychologically empty. Thus it is that the decisions modelled in SEU studies bear little relevance to or even contradict the subsequent behavior of the decision maker (Becker & McClintock 1967).

Decisions as defined in SEU theories can only be seen, by and large, as misleading reifications; phantoms created by the programmes algorithmic heuristic, devoid of psychological substance. For the Rationalist programme, there is much to be gained from a better psychological analysis of the relation between cognition and behavior, since decisions only meaningfully exist when considered with or preceding some behavioral act. And like behavioral intentions, as Fishbein has argued, accurate behavioral predictions are only possible from a knowledge of all the relevant factors. The problem shift from SEU to MAUT in the Rationalist programme can be seen to illustrate this point exactly. The real advantage of Multi Attribute Utility models over earlier formulations of Subjective-Expected Utility lies precisely in the tapping of the larger salient set of items. In effect then the gain to the programmes positive heuristic is as much propositional as it is algorithmic.

Both Fishbein's model and the MAUT models of decision theory share two problems of matching method (or more accurately, algorithm) with theory. These are:

1. The selection of appropriate dimensions, and
2. the determining of weightings for the dimensions.

With few exceptions (such as the innovative work of Humphreys and the more recent work of Phillips, referred to earlier) there has been little attempt within Behavioral Decision Theory to systematize the elicitation of dimensions in a psychologically meaningful way. (Humphreys & Humphreys 1975, Humphreys & McFadden 1980; Phillips 1984).

In Fishbein methodology the saliency of dimensions (beliefs) is determined through a free selection procedure in which subjects express the beliefs uppermost in their minds. Saliency in Fishbein's sense is thus equivalent (operationally at least) to the availability heuristic put forward by Tversky and Kahneman (1973) complete with all the implied problems of informational bias. No theoretical limits are imposed by Fishbein on the number or construction of salient beliefs. Instead, he refers somewhat weakly to Miller (1956), suggesting that a set of seven, plus or minus two beliefs "usually" account for most of the variance. (Kaplan & Fishbein 1969, Thomas & Tuck 1975).

Sheth has criticized the operationalization of saliency in Fishbein's model, asserting that it disregards the importance of beliefs for the individual, and has suggested the addition of an importance measure for the evaluation component (Sheth & Park 1973, Tuncalp & Sheth 1974). Fishbein maintains this criticism is fundamentally wrong headed in that the salience determines the importance of beliefs (that is, if some belief is important to the individual than it will occur within the set elicited). Against this, however, there is no way of assessing the relative importance of beliefs within the salient set. Further, Fishbein assumes that the first handful of elicited beliefs will be in his terms "inferential". There is, however, no theoretical justification for why this should be so. Falling into Laudan's category of unsolved empirical problems, the location of salience and salience shifts should be considered the crucial topic for investigation.

Hackman and Anderson (1968) first questioned Fishbein's method of defining salience in terms of frequency of occurrence in a given population. They argue that the theory should predict Individual Salient Beliefs (ISB) to be a superior predictor to Fishbein's use of Modal Salient Beliefs (MSB). Most studies, however, have shown that the method of MSB is at least as good, and often better than ISB. Kaplan and Fishbein (1969) reply that the ISB used by Hackman and Anderson probably contained non-salient beliefs generated through the forced elicitation procedure they employed.

In an early empirical test of the problem, Thomas and Tuck (1975) show that although both methods produced significant correlations, the trend remains,

"Strikingly in the wrong direction."

Thomas and Tuck (1975) suggest the superiority of MSB is due to items acting as *indicants* of attitude rather than *determinants*. That is, MSB appears to be superior where behavior is to be predicted from attitude. Stated differently, the model works best where beliefs are inferred (through affective consistency) rather than recalled as valid products of experience. Thomas and Tuck (1975) conclude their careful analysis by calling for a criterion of salience which is

independent of the operational definition. As they understate, the problem of salience is the concept least well operationalized and remains theoretically unsatisfactory.

More recently, Eiser (1986) distinguishes the uses of Fishbein theory for studying attitude formation/decision making, from studies of attitude change. As Eiser points out, the emphasis to date has been very much on predicting the average response of a subject population to broad attitude changes. Not surprisingly, therefore, the method of Modal Salient Beliefs, recommended by Fishbein and Ajzen (1975) has become the mainstay of empirical work. For individual decisions, the problem is that some dimensions salient to the wider group, may not be utilized at the individual level.

A second source of contention has been the path analysis of the Fishbein model (see Figure 4). Liska (1984) classifies this as a,

"recursive chain causal structure".

More expressively Eiser (1986) criticizes the model as being,

"relentlessly unidirectional in its causal assumptions."

A number of researchers working in this area have advocated revisions, and particularly extensions to Fishbein's basic model. Bentler & Speckart (1979) challenge the sole mediating function of Behavioral Intentions, and claim that other exogenous variables may be better predictors of behavior. A number of field studies suggest that attitudes have a greater direct influence upon behavior (Schwartz & Tessler 1972; Albrecht & Carpenter 1976; Bentler & Speckart 1979; Fredricks & Dossett 1983). Songer-Nocks (1976) argues that situational factors limit the generalisability of Fishbein's model, and offers instead an amended version with 70 product terms !

Liska (1984) maintains that the basic Fishbein model is both too simplistic and mis-specified. By marshalling evidence from the research literature to show that there are also reciprocal effects of behavior influencing attitudes and behavioral intentions, Liska puts forward an "Accumulative Revision" of the Fishbein model.

The continuing proliferation of pathways and products into Fishbein's basic model, however, strongly resembles the addition of epicycles into the Ptolemaic astronomical system (Worral 1975) That is, each addition may iteratively solve empirical problems, but represents a serious accumulation of conceptual anomalies for the underlying theory.

The structural properties of the model have also been the subject of considerable research interest. The independent contribution of attitudes and subjective norms in predicting behavioral intentions has been questioned but remains a statistical quandary (Warner & DeFleur

1969; Acock & DeFleur 1972; Liska 1974; Andrews & Kandel 1979; Susmilch, Elliot & Schwartz 1975; Schuman & Johnson 1976).

Researchers further disagree about the predictive usefulness of particular components of the model. The Motivation to Comply variable, for example, is used by Bowman & Fishbein (1978) as a unipolar construct, whereas Davidson & Jaccard (1979) employ the concept in bipolar form. Schlegel, Crawford & Sanborn (1977) and Saltzer (1981) contend that model is better served without it. Moreover, Fishbein originally incorporated a Personal Normative Belief term (what subjects themselves think they should do). The component was dispensed with because Ajzen & Fishbein (1969; 1970) came to see it as an alternative form of behavioral intention. Pagel & Davidson (1984), however, argue for its reinstatement. Miniard & Cohen (1983) make a case for personal *versus* normative factors. Budd & Spencer (1984) say it predicts ideal behavioral intentions, but that much depends upon whether the components are regarded as consequences or antecedents of behavior.

As the keystone in Fishbein's expression of the Rationalist research programme, *Intention* is defined only by the negative heuristic. Warshaw & Davies (1985) say that most Fishbeinian research "surprisingly" does not define intention but instead regards it as self-evident. Warshaw & Davies call for further measures and investigation of intentions. Consequently they have attempted to disentangle *Behavioral Intentions* per se from *Behavioral Expectations*. They argue that researchers in the Fishbein framework have confounded the two distinct interpretations of Intentions.

In their analysis *Behavioral Intention* involves behavioral commitment whereas *Behavioral Expectation* is independent. They argue it parallels the distinction made by Einhorn & Hogarth (1981) between choice and judgment. Choice is said to involve psychological conflict (as in Janis & Mann 1977).

Warshaw & Davies, however, see themselves as challenging Fishbein's claim that all behavior is reasoned (eg Fishbein & Ajzen 1975; Ajzen & Fishbein 1980). They argue instead that researchers are now moving to a view that many behaviors are not in fact under volitional control (eg Bagozzi 1981; Triandis 1977; Abelson 1976).

In their own study Warshaw & Davies found *Behavioral Expectations* to be a better predictor over 18 common self report behaviors. They claim *Behavioral Expectations* are more accurate since external factors rather than intentions determine behavior. The "mindless" interpretation, however, more fittingly belongs to the Empiricist programme, and thus constitutes a strong criticism of Fishbein's Rationalism.

Liska (1984) is critical of Fishbein and Ajzen for disregarding such conceptual problems as mere "methodological nuisance". He protests,

"Anomalous research has been either explained away or just ignored."

Despite the critiques and ostensible revisions Fishbeinian work has remained mostly faithful to the original algorithm. Eiser (1986) reflects, somewhat pessimistically, that on the whole, no other single causal model,

"is likely to prove superior in all behavioral domains."

Eiser goes on to question the generality of Fishbeinian assumptions, however, particularly the models power to go beyond "the decision moment". Like the MAUT model of decision making, Fishbein's formulation succeeds best at dealing with new behavioral decisions, but is severely limited in dealing with any longer term perspective.

Conclusions

Attitude theory retains a central place in the development of Social Psychology. Over time, new research demands have changed the focus from broad social surveys, through attitude change investigations and then decision making studies. A fresh research interest in the nature of widespread beliefs (e.g. Gaskell & Fraser 1990) may yet see the concept reformed again on a broader social basis.

Fishbein's influential review of the attitude literature called into question the purposes of attitude definitions and the attempts to operationalize the concept. His own model, based on a simple, but powerful algorithm, generated a new search for attitude structure. Subsequently, Fishbeinian researchers have refined the model into a theory of choice. The Theory of Reasoned Action marked a problem shift into a Rationalist decision making model in Social Psychology.

The algorithmic heuristic shares structural similarities with other Multi Attribute models of decision making. Empirically, however, it continues to generate recalcitrant findings when applied at the individual level. Against theory, Modal Salient Beliefs are usually found to be better predictors of intentions and behavior than Individual Salient Beliefs. Although some revisions have been put forward, there appear to be as yet no major contenders to replace the basic model.

The short history of research work in the Fishbein tradition makes a compelling illustration of a research programme continuing to progress despite acquiring a catalogue of empirical anomalies. As Lakatos (1970) points out, however, so long as the hard core remains protected by the fertility of the positive heuristic and so long as the theory continues to predict novel facts (relative to rivals), the programme can be expected to continue to thrive.

ATTRIBUTIONAL JUDGMENTS :
Redirections in the Empiricist Research Tradition

McGuire (1972) has commented on the popularity of the attribution approach with researchers who once followed the fashion of dissonance research. He says that like dissonance theory,

"...it represents Heider's common sense approach to perceived causation."

Attribution Theory is not a unified theory at all, however, but rather a set of loosely tied theoretical models sharing the same Empiricist hard core. The Empiricist parentage is also shown in the fact that Heider originally based his theory on Brunswik's Lens Model paradigm. He proposed that causal analysis shares with the perceptual process the problem of differentiating the objective properties of distal stimuli, from the psychologically real proximal stimuli.

Hewstone (1983) adds,

"For social perception, Heider suggests that the important distal stimuli, dispositional properties linked to the proximal act, often refer to psychological states."

Attribution processes refer generally to the inferences individuals make in their attempts to understand and predict their environment. For the most part, attribution processes have been used in low level theories of social perception and attitude change, on the assumption that the individual attributes causation when demanded by the external context.

Recent interest has also included the investigation of perceived causality associated with decisions preceding acts, and this may represent the best conceptual focus for attribution theory. Even so, the central theme of all attribution research, remains the location of causal meaning attributed by the perceiver to action embedded in a social context. From this emphasis an assumption is made that judgments are made from a rich information base in which the perceiver has opportunity to sample behavior (or at least a description of it) in a defined social environment. The sampling of behavior, moreover, also refers to the self so that self-perceptions are subject to the same attributional processes as are judgments about others.

Extending this notion, Totman (1982) interprets attribution theory as reflecting a movement to relativist logic in philosophy. Consistent with Totman's theme, Harvey (1981), a mainstream

attribution theorist, argues that no special claim is made for understanding reality. What counts is how perceivers themselves attribute reality.

As Eiser (1986) remarks, however, little research effort has so far been invested in discovering how people construe their own attributions. With similar thinking, Wong and Weiner (1981) developed a "self-probe methodology" in which attributions could be made amongst 5 attributional dimension supplied by the researchers, viz: locus, control, intention, stability, and generality.

In their studies, Locus and control are given the highest loadings. Eiser is critical of this, however, for not really allowing "spontaneous" attributional analysis.

Attribution theory shares with Fishbein theory the variable of intentionality as a central explanatory concept (Heider 1958; Jones & Davis 1965; Eiser 1986). Interestingly too, Fishbein's current emphasis upon Target, Time and Place (Ajzen & Fishbein 1980), is reminiscent of Kelley's consistency over target person, time and modality.

Shotter (1981) criticizes attribution theory for replacing intentionality with impersonal causes. He objects that human agency is misrepresented in so far as we look for meaning rather than causes to define the contexts of our actions.

More recently, Parker (1989) muses that attribution theory has become one of the most enduring and widely influential areas of Social Psychology, and that influential writers from both the old and new paradigms have claimed attribution principles as their own (e.g. Kelley 1967 ; Harré 1981a). Parker also claims that attribution theory carries the conceptual residue of scientific rationalism and humanism. His usage, however, accords with Empiricism. As he elaborates, it has,

"Concern with truth, science and the power of situations"

Conceptual Problems: Diversity and Integration of Attribution Theories

Fiske and Taylor (1984) identify six theoretical traditions which they contend, form the backbone of attribution theory:

- * Common sense Psychology (Heider 1958)
- * Correspondent Inference Theory (Jones and Davis 1965)
- * Covariation and Causal Schemata Models of Attribution Processes (Kelley 1967, 1972)
- * Self-Perception Theory (Bem 1967, 1972)
- * Emotional Lability Theory (Schachter 1964, 1971; Schachter & Singer 1962)
- * Locus of Control Theory (Rotter 1966)

The first three are explicitly focused upon attribution processes and form a direct lineage in attribution theory. The latter three have different theoretical origins but are regarded as particularly influential in attribution research. It is arguably more apposite to say that Attribution theory has provided a theoretical umbrella for a range of cognitive theories (Harvey and Smith 1977). To the list of diverse integrations should also be added other various manifestations of Social Learning Theory. Most notably are, Self-Efficacy Theory (Bandura 1977), Reactance Theory (Brehm 1966) and the Theory of Learned Helplessness (Seligman 1975). Against this, Semin (1980) is critical of Attribution research for its "hegemony", overincluding and oversimplifying research in social cognition. Semin's claim, however, is strongly rejected by Harvey (1981), who sees the subsuming of diverse research efforts as evidence of theoretical power. Clearly the assimilation of such diverse theoretical domains constitutes a progressive problem shift.

To the list of core theoretical influences should be added Weiner's reworking of Atkinson's (1957) concept of Achievement Motivation (Weiner 1979; Weiner & Kukla 1970). Arguably this has been the most influential of all attribution theories and the most pertinent for a redirection of the positive heuristic into the realm of anticipatory decision making.

Empirical Problems: The Partitioning of Attributional Categories

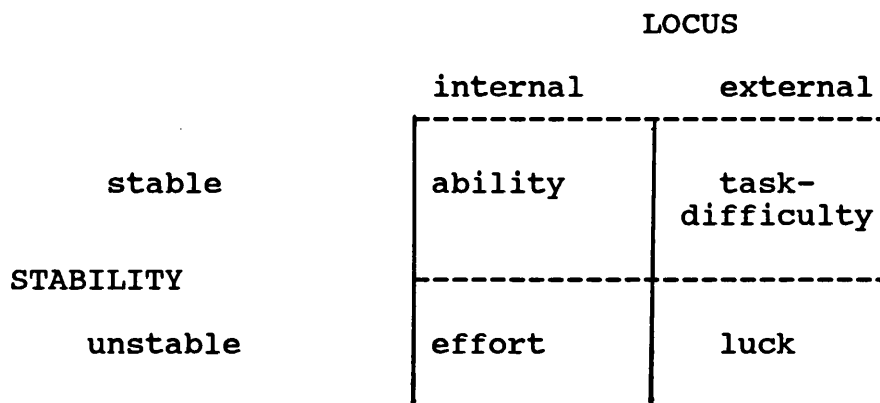
Whereas Atkinson defines achievement in terms of pride in goal accomplishment, Weiner differentiates affective and expectancy components. Expectancy is said to be determined by Stable versus Unstable causes. The Internal-External dimension is considered to influence affect. By combining the Internal-External with the Stable-Unstable distinction, Weiner generated a simple 2 X 2 matrix of causal categories. Success or failure is consequently attributable to ability, effort, task-difficulty or luck. (see figure 5)

In Weiner's revision of Achievement Motivation high Need Achievers choose tasks of intermediate difficulty which give the best possibility of feedback about personal causation. They attribute failure to lack of effort rather than ability. Low Need Achievers, however,

attribute success externally and select tasks which are either extremely difficult or extremely easy thereby escaping fear of failure. (Meyer 1970; Weiner, Heckhausen, Meyer & Cook 1972; McMahan 1973).

Figure 5

Weiner's Basic Attributional Model



Weiner has continued to add attributional dimensions to the basic model, and differentiates *Locus* from *Control* (Weiner 1979). The addition of *Generality* and *Intentionality* to *Stability* amount to a five dimensional scheme, though most of the empirical research work to date has concerned the original 2 x 2 partitioning of attributional categories. Some researchers, however, have questioned whether the extra dimensions improve the basic model (Abramson, Seligman & Teasdale 1978; Ickes & Kidd 1976; Phares 1976). Measurement difficulties have caused some research concern (Elig & Frieze 1979; Russell 1982). Critics have also questioned the independence of variables (McFarland & Ross 1982) and the temporal sequence (Covington & Omelich 1979).

Overall, however, Weiner's model has received solid empirical support in a wide variety of applications. viz:

- * Parole decision making (Carroll & Payne 1976)
- * Sex stereotyping (Deaux 1976)
- * Helping (Ickes & Kidd 1976)
- * Depression (Abramson, Seligman & Teasdale 1978)
- * Reactions to medication (Henker & Whalen 1980)
- * Loneliness (Michela, Peplau & Weeks 1983)

Hewstone (1983) complains, though, that applications of attribution theory have in the past been overly preoccupied with Weiner's theory, often at the expense of other possible developments.

Problem Shifts in the Algorithmic Heuristic: Situations and Dispositions

Attributing success or failure along an internal-external dimension is also fundamental to Social Learning Theory (Rotter, Chance & Phares 1972). Rotter (1966) argues that individuals differ in their expectancy of reinforcements as a function of their own behavior (an internal locus of control) or agencies outside themselves (an external locus of control).

The major factor in generating Locus of Control research has undoubtedly been the easy applicability of Rotter's (1966) scale (The Social Reaction Inventory). This has in turn spawned a range of similar Locus of Control instruments (for example: Norwicki & Strickland 1973; Reid & Ware 1974; Mischel, Zeiss & Zeiss 1974; Wallston, Wallston, Kaplan & Maides 1976). The construct has been explored across cultures (Hui 1982) and has had a considerable impact upon mainstream attribution research (Krovetz 1974; Lefcourt et al 1975).

Locus of Control research has typically used college students as subjects and attempted to find significant differences between internals and externals (Lefcourt 1972). Consequently, research effort has largely focused upon the two outlying groups whilst ignoring the bulk of the distribution. This line of criticism recalls an earlier dispute in a different area of psychological research, in which Christie (1956a,b) severely attacked Eysenck's work on the Intraversion-Extraversion dimension for using very small samples of extreme groups and then drawing extreme conclusions about them.

Much of the Locus of Control research has also signified Internality to be a more desirable attribute than Externality. As Bains (1983) summarizes,

"Almost without exception, this work has contained an implicit positive evaluation of the 'internal' and a tendency to portray the 'external' as someone with disordered and maladaptive cognitions."

Although the Locus of Control Scale has been widely employed (see Lefcourt 1976 and Phares 1976 for general reviews), the validity of the instrument has been strongly questioned. Gurin et al (1969) criticize the scale as reflecting a narrow range of white middle class values. Mirels (1970) conducted a factor analytic study which distinguishes sub-scales of personal and political control, and Collins (1974) further argues that the Locus of Control Scale conflates a number of separate control related variables.

At around the same time Locus of Control research developed, de Charms (1968) made a similar theoretical distinction between Origins and Pawns. (Origins are said to have a strong notion of personal causation, whilst Pawns feel determined by external forces.) Unlike the Locus of Control theme, however, de Charms' theory received little empirical investigation, and did not develop into a fertile research area. In the absence of a readily usable research instrument to supply the algorithmic heuristic, the propositional content of the theory was insufficient to retain the research momentum.

Locus of Control, in contrast has continued to flourish in research practice, even though its central tenets are directly contradicted by much of the attribution literature. Whilst Rotter's conception of stable individual differences in Locus of Control amount to a classification of attributional personality, the thrust of most attribution work has been to emphasize situational determinants. Perhaps most strikingly, Weiner's influential work specifically denies that the internal-external distinction directly influences expectancy. As Fiske and Taylor (1984) aptly summarize,

"Empirical justification for the theoretical centrality of the dimension is, frankly, weak."

Problem Shifts in the Propositional Heuristic:

From Motivation to Cognition

Laljee & Abelson (1983) describe the Person-Situation distinction as "enshrined" in attribution theory. Certainly much research effort has been addressed to the fundamental attribution error (Jones & Nisbett 1971) in which actors are thought to over-attribute to situations while observers over-attribute to personal dispositions. Billig (1982), however, criticizes attribution theory for being ambivalent between the person and the situation.

The Internal-External distinction is of greatest consequence in the area of Defensive Attributions. That is, the issue of whether motivational drives or purely cognitive factors account for our understanding of human actions. In the attribution literature this is seen in research into self-serving biases. This important auxiliary hypothesis brings to the fore the Empiricist basis of Attribution Theory.

To be consistent with the hard core, attributions of responsibility should not be deflected by self-serving biases. Although a number of researchers postulated such a tendency, most research effort within the programme has been designed to show that attributions are made entirely on the basis of information processing. Jones and Nisbett (1971) argue that differences in

attribution of responsibility between actors and observers must be due to divergent perspectives. Subsequent research has focused upon the differential availability of information (Storms 1973), and upon the misperception of consensus information. Miller and Ross (1975) distinguish "self-protection" from "self-enhancement" attributions, and conclude that there is little evidence for a self-protective function. In an extensive critique of the research work in this area van der Pligt (1981, 1984) explains actor observer differences in terms of methodological errors, whereby dispositional or situational choice tends to be conflated with evaluation.

Nisbett and Ross (1980) call this fundamental issue of human inference the "hearts and minds" problem. In a stimulating and lucid review of the problem, they come down firmly against the "hearts" interpretation. In their analysis, three important points are underlined:

1. Evidence for a motivational interpretation of self-serving bias in attribution processes is very weak, at least as far as laboratory studies go.
2. Self-serving biases are probably more concerned with behavior rather than interpretations or attributions about behavior.
3. Unconscious processes are better regarded as problems of interpretation or reconstruction rather than psychodynamically repressed memories.

Although the Internal-External distinction has generated anomalous findings and has underlying conceptual problems, it continues to be extensively employed, and is still regarded as a fundamental feature of attribution work (Taylor & Koivumaki 1976; Miller, Smith & Uleman 1981).

One of the most interesting challenges within Attribution Theory has been put forward by Kruglanski (1975) who differentiates *actions* (which are voluntary and always Internal) from *occurrences* (which are not completely voluntary and may be either Internal or External. Actions, moreover, are further sub-divided into endogenous acts (ends in themselves) and exogenous acts (means to ends). At its most fundamental, Kruglanski distinguishes between causal and teleological explanations, criticizing attribution research for dealing mostly with "what" rather than "why". With this understanding, Kruglanski's analysis has much in common with Anthony Kenny's (1963) philosophical analysis of action and will, which differentiates between intentions and voluntary actions. Buss (1978), however, urges for more caution in distinguishing reasons and causes, which he says, may involve diverse kinds of attributions. Attribution theorists, according to Buss, have been too naive in their use of causal explanations, but not naive enough, in the sense of modelling lay explanations.

Arie Kruglanski offers a "lay-epistemic process" as an alternative explanation for attribution theory. He maintains his work provides an overarching rationale which integrates otherwise

conflicting issues, such as motivationally based concepts and those based upon pure information processing. Research in attribution theory is characterized, according to Kruglanski by a content-process confusion. He argues that although researchers intend their models to explain processes by which people generally ascribe causality, the models in fact focus upon specific problems and therefore become ungeneralizable. Moreover, whilst principles of covariation may be true they also become circumscribed according to specific questions. Instead, Kruglanski's theory of Lay-epistemology puts forward deducibility as the main principle for causal inference. In this scheme, people are said to continually engage in a knowledge seeking process, but are constrained by their capacity and motivation.

Whether or not a knower will analyze in terms of effort, ability, task difficulty or luck depends, according to Kruglanski, upon whether the problem was seen in terms of success or failure in the first place, and this is situationally determined.

The dominance of a self-esteem need is said to account for the literature stressing defensive attributions. In Kruglanski's perspective there is argued to be no rivalry between motivational and information processing models. Rather, both represent different instances of the attributional process. Provided deducibility is adapted as the central theme, Kruglanski argues, the debate between a hot, motivational model and a cold, cognitive one can be reconciled.

Kruglanski's operational definition of epistemic processes is extremely simplistic, however, and does not address the central problems of how truth is first discovered and then sustained. The lay-epistemic process Kruglanski describes appears to be confined to singular beliefs or propositions rather than with any higher order processes for integrating new knowledge. Without some such mechanism, cognitive capacity limitations would stunt the growth of knowledge to a very few unconnected associations (for the same reasons as Chomsky's 1959 celebrated critique effectively refutes Skinner's 1957 account of Language Acquisition).

An Attributional Basis to Decision Making

The Empiricist basis to Attribution theory is clearly evident in the work of all the major theoretical influences, but is revealed most explicitly in the writings of Harold H. Kelley (1967) who suggested attribution research be based upon a model of man as "naive scientist". More specifically, Kelley argues people use a naive version of J.S. Mill's *Method of Differences* (a truly inductivist method). In Kelley's version, people are said to explain behavior (make attributions) by establishing covariation between cause and effect, rather than assigning positive or negative values to behavior.

Kelley (1972) later amended the model of man slightly by proposing that attribution theory be grounded upon a model of the layman as an *applied* scientist. Despite the implied instrumentality, Attribution research has not yet fully established itself in the decision field, though Eiser (1983;1986) has made a number of explicit references in this direction. He also calls attention to the distinction made by Kelley and Michela (1980) between attribution processes and attributional processes. *Attribution* processes focus upon antecedents of judgments and are thus retrospective. *Attributional* processes, however, concern the consequences of judgments. The latter refocuses attribution theory as a decision theory, emphasizing the prediction rather than the explanation of action.

Kukla (1978) proposes an attributional theory of choice which attempts to integrate Attribution Theory with Behavioral Decision Theory. By re-interpreting "can" and "try" as subjective probability and utility, Kukla seeks to meld the SEU algorithm with both Weiner's model of attributing responsibility and Atkinson's model of achievement motivation. Although sophisticated in argument and mathematical form, the analysis is fundamentally mistaken in failing to recognize the rival epistemological bases. Utilities, for example, are hypothesized to be an increasing function of task difficulty. The synthesis does not explain, however, how such values (utilities) are derived, if not through the attribution of task difficulty. That is, expectancy and utility are conflated in a circular argument which ultimately must reduce to the Empiricist basis; namely, that attributions of utility are inferred from expectancy based on experience. The analysis also fails to predict how the meta-choice of selecting attributional categories (e.g. internal or external locus) would influence the revision of information. In any event, Kukla's theory has not given rise to a fertile new area of decisional research.

Richard Eiser (1983), though, makes a convincing argument for reorienting attribution work with a decisional direction, saying,

"It is not just that attributions can have behavioral consequences: rather, it is that behavior itself provides actors with information that may confirm or disconfirm their attributions."

More generally, he argues that the attention of attribution theorists has been directed almost exclusively towards diagnostic inferences (essentially a reflective process) to the neglect of predictive (anticipatory) attributions. One important consequence of this single sided emphasis has been that attribution research has come to regard social cognition as divorced from behavioral processes. Eiser sees the two approaches as complementary, however, and argues for their integration. He also criticizes attribution work for effectively disregarding affective and emotional processes, or at best giving them the status of biasing factors.

Eiser posits that a major challenge for attribution theory is the location of applications and the discovery of when and how people do make attributional inferences. Indeed, it is conceivable

that just as with the Fishbein's work the impetus for this side of attribution theory to mature is likely to arise from attempts to apply it in practice. Eiser's own work on the attribution of addiction forms an important step in this regard.

There have also been interesting developments in attribution (or more correctly misattribution) therapies, particularly the work of Storms and his associates (Storms & Nisbett 1970, Storms and McCaul 1976; Valins & Ray 1967; Frieze, Bar-tal & Carroll 1979). Shapere (1977) argues that developing theories may become "weird" as constraints grow on concepts of science. One of the attractions of attribution theory to researchers is undoubtedly that it generates counter-intuitive, not to say "weird" accounts of human behavior (e.g. the work of Storms & Nisbett 1970, reformulating "placebo" effects). This is particularly noteworthy given McGuire's observation that attribution theory is attractive precisely for its relevance to common sense.

Conclusions

Attribution theory remains one of the most influential study areas in current Social Psychology. Within the Anglo-Saxon faction, at least, it might be described as *normal science* by virtue of its status in the discipline's body politic. Despite this, the theory is work is not integrated into a single paradigm. The research practice, however, is almost entirely based upon the Analysis of Variance algorithm which not only form the methodological framework for empirical investigations, but also forms the explanatory model attributional processes. This may set limits upon the evolution of the theory.

A substantial amount of research effort has been sustained through applications of Weiner's model in particular. This has consistently shown that locus of control should be understood as a situationally determined rather than dispositional variable. Despite the weight of evidence in this direction, and the subsequent theoretical reorientation of most researchers, the *Locus of Control* concept continues to thrive. This illustrates a progressive practice shift despite a clear degenerating problem shift. The easy usability of the Locus of Control algorithm undoubtedly contributes to this state of affairs.

Weiner's model continues to expand quantitatively within the ANOVA framework as new dichotomous attributional categories are accumulated. Most research applications, however, retain the original 2X2 formulation, and expand the auxiliary belt of empirical findings.

The Empiricist basis to Attribution Theory is readily apparent in both the propositional and algorithmic heuristics. People are held to make judgments (attributions) entirely on the basis of data available to them, and to employ inductive procedures to infer causality in their explanations. An important auxiliary hypothesis examines the "hearts and minds" problem, which asks whether people are "self-serving" in their attributions. Most research work has

demonstrated support for a purely cognitive interpretation of attributional errors, which corroborates the Empiricist basis.

Kruglanski questions some of the fundamental propositions of attribution theory, however, and calls for refinements in the understanding of naive causal analysis, distinguishing actions from occurrences. The conceptual critique has important implications for attribution theory, by challenging the Empiricist basis, and pointing to a content-process confusion. Kruglanski's own model of Lay Epistemology, however, makes similar inductive errors in accounting for the accumulation of lay knowledge.

A progressive form of problem shift is possible for attribution theory with a change of direction to anticipatory decision making. Eiser amongst others calls for a theoretical reorientation from *attribution* to *attributional* theory, meaning a change from retrospective to prospective judgments. It may be, however, that the dominance of the ANOVA paradigm could impose constraints on the development of a new conceptual framework for attributional decision making.

**A SHARED PRACTICE DOMAIN :
Health Education and Cigarette Smoking**

Scientific knowledge interchanges with the real world. The evolving social world constantly places new demands on the scientific enterprise, sometimes making use of it, sometimes ignoring or refuting it, but always affecting it and being affected by it. In particular, there is the growth of practice areas, where specialists represent scientific knowledge through the ostensible applications of theory and methodology. Practice domains, however, do not necessarily grow directly out of the products of scientific research. They may exist prior to the availability of scientific knowledge and technology, or even evolve in reaction against it.

Practitioners, though, have tended either to search other disciplines for a scientific basis to their work or else have concentrated on expounding the ideological basis of their work. Compare, for example, Tones, Tilford & Robinson (1990) with Rodmell & Watts (1986), in the case of Health Education. Neither approach, however, leads directly to the creation of a corpus of knowledge particular to the practice area or to a coherent set of methods worthy of discipline status. That is, practice domains are defined as much by the contributing research discipline as by internal demands.

Indeed, practice domains are not only testing grounds for the application of science, but also territorial acquisitions to be defended against rival research programmes. Research based disciplines, that is, have a vested interest in expanding their domain of influence, creating an empire of application which further protects the hard core and simultaneously authenticates it.

Practice shifts, however, are more than the tussles of rival programmes for social recognition and resourcing. Practice shifts have an intrinsic epistemological status. As the World Four thesis postulates, action has a verisimilitude of its own. For scientific research programmes this means appraising the effectiveness and efficiency of research in practice. As much as theoretical growth, research programmes need to demonstrate the growth of practice. Where problem shifts indicate a research programme's ability to explain and predict, practice shifts show a research

programme's ability to assimilate action and to create novel opportunities for the exploitation of theoretical and methodological progress.

For the rational reconstruction of decisional research in Social Psychology, the practice domain delineated by Health Education has a special relevance. The problem of health interventions in cigarette smoking, in particular, has proved a thorny problem to solve in practice and thus poses epistemic threat to research programmes contending for the honours. In Laudan's terms, the problem of persuading cigarette smokers to abandon their habit has been given a high premium.

Health Education has generally drawn on a broad range of research based disciplines to provide explanations (propositional heuristic) and tools of analysis (algorithmic heuristic). Social Psychology, perhaps more than most, has been turned to in order to explain and then influence individual behavior in the social context. Holund (1991) reviews the Models most often cited as basis for health behavior interventions as:

- * The Health Belief model (Rosenstock 1966, 1974, 1986)
- * The Theory of Reasoned Action (Fishbein & Ajzen 1975; Ajzen & Fishbein 1980)
- * Social Learning Theory (Bandura 1977, 1986)
- * The Theory of Social Behavior (Triandis 1977)
- * Problem Behavior Theory (Jessor & Jessor 1977)

Health interventions in tobacco smoking behavior have, on the whole, had limited success. The decisional basis to the problem has been most effectively addressed, however, by the Theory of Reasoned Action in the Rationalist programme, and Social Learning Theory in the Empiricist programme. As part of the rational reconstruction of decision making research, the practice domain generated by Health Education concern with cigarette smoking can be shown to throw the Rationalist and Empiricist research programmes into sharp relief.

The Smoking Problem

Smoking cessation continues as a major topic on the social agenda, at one point being labelled the number one health problem (Godber 1983). Despite receiving massive attention from health educators, however, the evidence for a widespread change to non-smoking is far from encouraging for the anti-smoking lobby. The 1974 Gallup report on smoking, for instance, concludes that there was only a 5% increase in non-smokers over a 10 year period.

The most dramatic illustration comes from a study reported by Raw and Van der Pligt (1981). Following a Granada Television programme, *Reports Action*, 20,000 people wrote for a free "Anti-Smoking Kit". The kit was sent to one third of these and followed up by questionnaire one

year later. Out of 1752 usable replies, 1602 expressed their intention to stop smoking. Of these, 747 actually tried to stop, but only 14 were still abstinent after one year.

Broad social surveys typically reveal marked demographic differences in quitting rates especially between gender, age and occupational groupings. Generally, males (especially older males) appear more likely to quit than females. This trend becomes more pronounced for the more affluent and higher educated. Data from the 1984 Household Survey portrays a marked social class gradient in smoking habits. Although recent years have shown some decline in smoking, this is mostly restricted to the higher social classes. In particular, there has been very little reduction in the rate of smoking amongst women in manual groups (Whitehead 1987).

The usual explanation proffered by the anti-smoking lobby to account for smokers staying with their hazardous habit is that they somehow remain insufficiently motivated. Either the smoker doesn't really understand the personal relevance of the health messages or else makes a Faustian bargain, trading off immediate worldly pleasures against the vaguely imagined and remote consequences of illness in the long term. Ashton (1979), for example, concerned with the apparent lack of change in smoking behavior, found no differences with regard to knowledge of smoking hazards in smoking and non-smoking groups. They did differ with respect to health education, however. Whilst non-smokers thought there was too little, smokers felt the level was about right. Ashton concludes that smokers are as well informed of health risks as non-smokers but that differences in behavior are due to smokers denying the validity of arguments about health hazards or else repressing the evidence. Janis and Mann (1977) similarly conclude that heavy smokers given a serious challenge to their habits,

"Assert that they ought to stop smoking entirely but that it is too difficult to do so. At this point their rationalizations about being hopelessly addicted or somehow invulnerable to the threat emerge with full force, and the upshot is that they resume their behavior as heavy smokers."

Anti-smoking campaigners have tackled such resistance through intensified propaganda, often resorting to fear appeal messages, with the intention of showing smokers the folly of their blasé attitude, and attempting to bring home the personal risks attached to their smoking habit.

Health professionals and others concerned to create a smoke free world have also been concerned to assist smokers follow the healthier path by offering a wide variety of remedies, therapies and other strategies for making the transition. Though well intentioned the resulting advice is crudely eclectic insofar as smokers are urged to give up by whatever method will work. The withdrawal strategy is seen only as a means to an end and in any case as no more than an adjunct to the only true method which is sustained determination and will power. Most anti-smoking literature catalogues "tried and trusted" methods for giving up smoking, but offer

the smoker no advice as to which method is most suitable, or why (see, for example, the current HEA leaflet *A Smokers Guide to Giving Up*; Catalogue Number AS 39). Indeed, the general message appears only to be, "if at first you don't succeed - try another strategy." The net results are disappointingly low success rates for stopping, and high rates of relapse.

Whilst many smokers do give up smoking, about 75% appear to relapse within one year (Hunt & Matarazzo 1973; Marlatt & Gordon 1980). Hunt & Bespalec (1974) have also drawn attention to the similarity of relapse rates for smoking, alcohol and heroin addiction.

Models of Smoking Behavior: Applied Scientific Reasoning

The domain of smoking withdrawal has drawn on a wide diversity of research traditions, most of which result in degenerating forms of practice shifts. Generally, smoking has been couched within the broader frameworks of psychological theory. Subsequent intervention and treatment programmes have, however, met with little success. Lichtenstein and Danaher (1976) aptly criticize the bulk of this effort for being,

"long on theory and short on heuristic value".

They paint a degenerating picture with repeated patterns of high initial success rates, high subsequent relapse rates, and failures of replication.

In their review of smoking intervention work Pachaceck and Danaher (1979) point to the differential success of research in understanding the long term health consequences of smoking, and the difficulties of understanding how and why smokers manage to quit. Much work in the past has also assumed that if smokers can be convinced to give up (why) then they will as a direct consequence be able to (how).

Most early work viewed smoking in terms of needs and drives (Bernstein 1969). During the 1970s learning theory formulations gained popularity, at least in the United States. Pachaceck and Danaher (1979) argue that learning theory offered the advantages of precise definition and workable treatment procedures, and in this sense still offers the most complete heuristic framework to guide theory and practice.

Tomkins (1968) proposes that smoking is used to manage affect (in promoting pleasure and reducing negative affect), resulting in a dependence mechanism. Horn used Tomkins' basic model to develop a smoking typology questionnaire (Ikard, Green & Horn 1969). 6 scales were classified. viz:

- * habitual
- * addictive
- * negative affect
- * pleasurable
- * stimulation
- * sensory motor

The classification and the questionnaire have been widely employed and adapted, mostly in self-help guides to stopping smoking (see, for example, Gillie 1977; Harris 1978). Russell et al (1974) have since refined and extended the measure, though no new principles have emerged to aid smokers change their habits. This has also been employed as a diagnostic aid in popular self-help guides in the same way as Tomkins original version (e.g. The Addison Group 1981).

Horn's (1976) more recent and broader based model covers acquisition and maintenance of the habit using psychosocial variables. Again, however, little is spelled out for specific forms of intervention.

Meanwhile, interest in pharmacologically based models grew apace, especially in Great Britain (Dunn 1973, Russell 1976). Though the mechanism of biochemical dependency has not been unravelled (Jarvick 1977), nicotine is widely believed to be the best candidate as the active agent for addiction. It has been argued that smokers will modify their intake rates to maintain a constant (satisfactory) level of nicotine in their bloodstream (Russell 1977). Russell (1976) gave the strongest exhortation for a pharmacologically based model arguing that nicotine is,

"probably the most addictive and dependence producing form of object specific self-administered gratification known to man."

Russell (1977) has estimated that a pack-a-day smoker averaging 10 puffs to a cigarette will have taken 70,000 shots of nicotine and tar within a year. The frequency of self-administered drug dosage is thus significantly greater than with any other comparable psychoactive substance, including alcohol and heroin.

Russell (1971, 1974) produced what appears to be a comprehensive theory with behavioral, pharmacological and social psychological components. Ultimately, however, Russell's factors combine into a medical version of addiction.

The medical model has come to overshadow other forms of explanation. In consequence, most intervention strategies prescribe a course of externally administered treatments, be it nicotine

chewing gum, acupuncture or hypnosis. Not only are research efforts dominated by the medical model, but more importantly smokers themselves have their expectations of interventions and treatment couched in a medical framework. Another way of stating this might be to say that the medical model of smoking is also a social representation of smoking.

Within Health Education in recent years, however, there has been considerable debate as to the appropriate form and focus of effective health intervention. This has resulted in challenges to the medical model and the development of health education models drawing upon different health theoretical and epistemological assumptions (Rawson & Grigg 1988).

From another perspective, Gossop (1979, 1982) has questioned the blanket use of the addiction concept and argues persuasively that there are in fact 4 different possible versions.

The underlying theories of drug dependency are:

- * Personality Theories - where drug abuse is a function of intrinsic personality disorder.
- * Social / Epidemiological Theories - in which social structure (especially disadvantage) determines dependency.
- * Conditioning Theory - where behavior is controlled by pharmacological reinforcers.
- * Biochemical & Physiological Theories - in which continued drug use leads to underlying metabolic change and consequent need for homeostasis by the drug.

Gossop further postulates that each version acts as a procrustean bed, providing at best only partial explanations of some effects which can be observed in drug dependency. Instead, Gossop argues that theories of dependency should take account of the meaning the drug has for the addict. Furthermore, since a number of recent findings have shown that drug users appear to exercise control over their use of drugs, Gossop recommends Cognitive Theory as the best way forward.

In recent years two Cognitive social psychological models of smoking have emerged which attempt to incorporate the addiction concept. (Rawson 1982). The Strong Version of the Addiction Model has been spelled out best by Schachter (1978), who maintains that once addicted, smokers continue the habit to avoid the unpleasant effects of nicotine withdrawal. As evidence for this view, Schachter demonstrates that smokers regulate their intake of nicotine according to the acidity of their urine. Urinary pH significantly reflects the body's ability to absorb nicotine, and stress results in higher urine acidity. Consequently, Schachter argues smoking increases under stress in an attempt to replenish the diminishing level of nicotine, and not to reduce stress as such.

The Weak Version of the Addiction Model has been advanced by Stepney (1979; Ashton & Stepney 1982), where smoking is seen as a psychological tool. It seems that nicotine has either a stimulating or a depressing effect on the nervous system according to how, and how much nicotine is delivered. Small doses stimulate and large doses depress. Stepney theorizes that by varying their strength and frequency of inhalation, smokers can effectively control their own arousal level. In addition to suggesting possible mediating mechanisms between cognition and behavior, the model is important in alerting us to the fact that smoking has real advantages in addition to the well known dangers. Clearly, if smoking can produce such effects it is not realistic to ask smokers simply to abandon their habits.

Effective smoking withdrawal programmes would need to take account of the gap left by smoking, and try to help would-be non-smokers find suitable alternatives. This would seem to be most pertinent for smokers in high stress occupations, where control of arousal through smoking forms part of their overall coping strategy. Ironically, it may be healthier for smokers in such situations to continue to smoke rather than risk stress induced illness. From a sociological perspective, Graham (1976,1984) has concluded similarly. She posits that for some young mothers who feel trapped in the same constricting environment as their offspring, smoking functions as a necessary stress reducing mechanism. From a sympathetic perspective, Jacobson (1981) argues that for women, smoking is a feminist issue rather than an addiction. Like slimming, smoking is said to be a medium through which women can exercise independence and control over their own lives in an otherwise restrictive society.

Other theorists have paid attention to attitudinal components. Leventhal (1971,1973) describes the earlier work in this sphere and articulates a chain of events bringing about change from smoking to non-smoking, namely; exposure to new information, comprehension and yielding to messages, attitude change and behavior change. Mettlin (1973) and Rogers (1975) have similarly sought to apply basic social psychological concepts. Unfortunately this work has tended to generate more questions than answers and highlights the old dilemma of attitude research in accounting for the gap between what people say and what they do.

Rationalist Approaches to the Decision to Stop Smoking

Studies of decisions to stop smoking have been located almost entirely within the domain of health issues. Early health choice models were limited, by being overly homeomorphic and lacking in cognitive integrating mechanisms. Suchman (1967) for example draws variables from epidemiological analyses. Preventive health behavior is then construed in terms of:

- * "Host" factors (personal readiness- including attitudes, concerns, knowledge)
- * "Agent" factors (comprising positive and negative aspects of the relevant protective measure).
- * "Environmental" factors (including mass media influences and the social world).

The most enduring, if not influential treatment, however, has been through the Health Belief Model (HBM). This has its conceptual origins in Lewin's work, but draws on SEU literature for its algorithmic content (Becker 1979; Rosenstock 1966, 1974, 1986). Using a loose expectancy-value methodology, health behavior is predicted where beliefs about disease likelihood and importance combine into personal health threat (Becker & Mainman 1975). More specifically, the individual's decision to engage in health actions is considered to be determined by beliefs about:

- * Perceived vulnerability to disease
- * Perceived severity of illness
- * Perceived costs and benefits of the health behavior
- * Various external influences (socio- economic status etc)

Although it has been widely used in the health field and subjected to an accumulating series of revisions it has not met with notable success. Empirical research (e.g. Becker et al 1977) has tended in practice to generate significant correlations but generally has been found to be better at predicting actual behavioral outcomes (such as weight loss) rather than applications of health interventions (such as dieting). Haefner (1974) argues that HBM has been accepted uncritically. One consequence has been an exponential growth in the number of contributing variables. Current reformulations have generated 11 readiness and 23 enabling factors in each health decision. Wallston & Wallston (1984) add that the unwieldy theory now includes more causal factors than any one study could reasonably accommodate. They might also have said that the decision model incorporates more sources of variance than any one individual decision maker could reason with.

The more parsimonious Subjective Expected Utility paradigm has been applied with some success to smoking related decisions. Mautner & Platt (1971) and Eiser & Sutton (1977) have both shown that SEU values for giving up smoking are more positive than for continuing to smoke. Eiser & Sutton (1977) have also shown that the crucial decision for smokers is whether or not to *try* to stop rather than the absolute decision to quit. In a postal survey comparing the beliefs of Smokers, Ex-Smokers and Never-Smokers, Eiser, Sutton & Wober (1979) showed that smokers hold less negative beliefs about the consequences of smoking than do non-smokers. Smokers, moreover, were more likely than ex-smokers to believe that there was little point in stopping since the damage had already been done.

Practice Shifts in the Rationalist Programme: The Theory of Reasoned Action Applied to the Decision to Stop Smoking

Fishbein (1982) points out that there have been over 10,000 studies investigating psychological and sociological determinants of individual smoking decisions. Fishbein (1977) reviews a substantial part of this literature and concludes that very little is known of the factors underlying any given smoking decision. Despite the massive research effort on smoking no systematic theory has arisen to adequately explain how the different factors contribute to smoking choices. Some consensus does exist, however, that:

- * Factors concerning the onset, maintenance and cessation of smoking are distinct
- * Any single decision is likely to be multivariate in nature
- * People differ with respect to factors influencing their decisions.

The enormous plethora of factors identified seems to suggest that no general rules of interpretation are possible, however, leaving the issue of smoking decisions in the netherworld of individual differences.

Fishbein does not sustain a pessimistic outlook, though, and argues that the Theory of Reasoned Action is able to incorporate these problems. This can be seen as a clear expression of Fishbein's readiness to assimilate a new domain of practice (Shapere) and an intimation of the power of the programme at solving empirical problems (Laudan).

At the methodological level, Fishbein (1982) criticizes previous studies which attempt to measure smoking decisions within highly homogeneous groups (e.g. smokers), since this leads to highly skewed distributions which attenuate correlations. Fishbein found relative differences in the importance of attitudinal and normative components for smoking behaviors with different populations. With young women, Fishbein contends that normative pressures will be ineffective in trying to persuade them to take up smoking, but effective in increasing their intentions to stop smoking. Quoting evidence from a study of 63 young women (Chung and Fishbein 1979) Fishbein argues there is "strong" support for predicting smoking and non-smoking behaviors from a knowledge of the target groups attitudinal and normative components.

Perhaps the most significant finding concerns the detailed analysis of differences in behavioral beliefs between those who intended to smoke and those who did not. All the young women in the sample believed that smoking would lead to negative consequences. The two groups differed widely, however, with respect to positive behaviors. Here, the intended smokers believed that smoking was more likely to result in positive outcomes, while non-intenders believed the same

would occur through not smoking. The two groups, moreover, differed significantly in the magnitude of all beliefs, whether positive or negative.

Health beliefs made a significantly greater negative impact on the differential attitudes of non-intenders, than intended smokers. Fishbein cautions, though, that health beliefs are only a small subset of the total pattern of salient beliefs underlying the smoking decisions of young women.

In the normative component, non-intenders were found to have stronger motives to comply with significant others (especially doctors and mothers). Fishbein concludes that the decision to smoke can be seen as reasonable in that,

"the decision maker believes that the net effects of smoking are more positive than the net effects of not smoking."

This finding distinctly reveals the rationalist basis to Fishbein's model, and also marks a victory for the research programme in Laudan's terms by successfully solving empirical problems whilst digesting anomalies and reducing conceptual problems.

Eiser (1986) challenges that people may sometimes act in a justifying (that is rationalizing rather than rational) way. He argues that, contrary to Fishbeinian principles, people may form an overall impression first and then implement an accounting system which provides the right answer in terms of costs and benefits. However this may be, the Theory of Reasoned Action continues to show a progressive practice shift by offering a readily applicable model. The approach is particularly attractive to health educators and other change agents who depict lifestyle changes in terms of health risks and benefits.

This approach is best seen in Marsh and Matheson (1983) who undertook a major study in Great Britain applying Fishbein's theory of Reasoned Action to smoking attitudes and behavior. Attitudes were described as smokers' beliefs and value expectations regarding outcomes of behavior. This further decomposed into six main dimensions.

Marsh and Matheson highlight the independence of an affect control dimension noting that it contains items of short term difficulty for would-be non smokers (e.g. feeling ill at ease without a cigarette). Other dimensions such as health threat, however, were salient with respect to medium and long term expectations. They conclude that smokers expected losses of affect control to be offset by gains from other areas.

Subjective norms also fell into six dimensions. In identifying the relative importance of the normative dimensions the authors interpret a modelling role (e.g. "setting a good example to children") as more salient than social desirability considerations (e.g. "my behavior will offend other people").

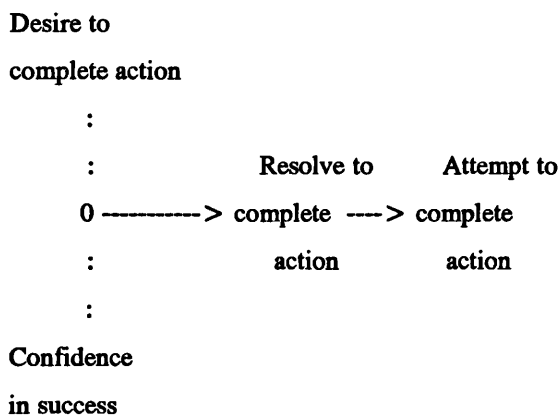
Behavioral intentions were defined by subdivision into desire, resolve and confidence. Marsh and Matheson portray the three components of intention as related, with resolve given a central place. They say,

"This component represents behavioral intentions in the sense that Fishbein's Theory would most readily acknowledge."

Operationally, the concept is treated as a measure of determination and portrayed as a resultant force (or at least as an averaging out) of the other two intentional components. viz:

Figure 6

Marsh & Matheson's Model of Intentional Structure



Where Desire and Confidence are in potential conflict, resolution is said to be necessary for the action to go ahead.

In the Fishbein model *intention* is equivalent to *decision*. Marsh & Matheson (1983) refer to "undecided" respondents as those,

"...having neutral intentions and/or neutral confidence scores."

In the earlier formulation, however, (Fishbein & Ajzen 1975), it was pointed out that behavioral intentions and beliefs have both separate strength and content components. Just as attitudes towards an act can be understood from the entire set of salient beliefs, so the pattern of behavioral intentions was identified as a much better predictor of a specific behavior than any one behavioral intention.

The major implication is that the total set of intentions must be known in order to make good point predictions of behavior. Knowledge of a single intention only allows prediction of a multiple act, that is the larger pattern, but not specific single acts (Fishbein & Ajzen 1974).

This formulation appears to have been abandoned, however, in favour of single intention criteria. In this sense, Marsh & Matheson's multi component version may well be more true to the original thinking.

If Fishbeinian research has mostly disregarded the definition of intention, its location in the cognition-behavior relationship, makes it synonymous with the decision moment. The Marsh & Matheson study reaffirms smokers decisions as rational. Failures to quit, for example, are explained by the balance of perceived costs and benefits. As they express,

"People who still smoke have their own reasons for doing it."

By successfully explaining the anomalous action of smokers, the Theory of Reasoned Action sustains a progressive problem shift for the Rationalist programme.

In a subsequent reworking of the Marsh & Matheson (1983) data, however, Sutton, Marsh & Matheson (1987) suggest that confidence (defined as expectancy of success) is a major factor in predicating intentions to stop smoking. Sutton et al extend the basic SEU model to predict intentions, using confidence, perceived costs / benefits and prior experience of attempting to stop smoking. Intentions to stop smoking are said to be strengthened by shifting the balance in the perceived rewards and costs of stopping smoking and increasing the smokers confidence in successful quitting. Significantly, Sutton et al draw attention to the prevailing health education work which emphasizes the costs of smoking and the rewards of stopping, but reinforces smokers negative expectations of success by underlining the addictive nature of smoking. Eiser & van der Pligt (1988) regard the incorporation of the confidence variable as clear evidence that behavior is "beyond volitional control" and of the limitations of the Fishbein model. In other words, it constitutes a degenerating problem shift. The theme of confidence is given centre stage in a different form (as self-efficacy expectations) within the Empiricist programme.

Empiricist Approaches to the Decision to Stop Smoking

The Locus of Control concept was taken up with great enthusiasm by a number of change agents, but particularly those in the health field. This is perhaps because as Beattie (1984) observes, the concept of personal causation is fundamental to the popular self-empowerment models of health education (see, for example, Tones 1986). Further than this, Fiske and Taylor (1984) contend that health is the *only* specific research area to have emerged from the Locus of Control concept.

Research on the Locus of Control dimension has generally shown, or has attempted to show, that Internals are more adaptive to changes and exhibit more positive health behaviors than Externals (Lefcourt 1976; Phares 1971; McDonald 1973).

Wallston & Wallston (1978) developed a specific Health Locus of Control Scale (HLOCS). They also review a range of studies showing the relevance of the locus of control construct to health behaviors, but are at pains to point out that the HLOCS does not measure health beliefs per se. Generally, Internals are believed to exhibit more positive behaviors, though there is some contradictory evidence. In an earlier review of the literature, Strickland (1978) suggests the evidence is in favour of Internals being more likely to take up preventive measures for their health. Straits & Sechrest (1963) and James, Woodruff & Werner (1965) found that non-smokers were more likely to be Internals. Kaplan & Cowlet (1978) found that Internals who valued their health were more likely to be successful in giving up smoking and remaining stopped. Other studies, however, have not always corroborated this theme (e.g. Best & Steffy 1971; Lichtenstein & Keutzer 1967).

King (1983) attempts a synthesis of attribution theory and the health belief model. The study tries to fit patients "natural explanations" of health and illness to attributional themes. King's analysis is eclectic to say the least, however, and offers a series of ad hoc categories. Indeed, Harvey & Harris (1983) in the same volume question King's understanding of attributional analysis and roundly criticize her for,

"inferring a causal relationship without sufficient proof."

King's work at least points to a difficulty of extending attribution theory to account for the content as well as the structure of lay beliefs. Charitably, it might be seen as an attempt to go beyond the tabula rasa assumed by attribution theory.

The greatest difficulty for a shift to an attributional or decisional focus is likely to be in the algorithmic heuristic. So far, most research work has involved the retrospective attribution to categories supplied by the researcher. To this end, analysis of variance models have proved adequate and formed the basic research paradigm. For a prospective attributional focus, however, where categories are supplied by research respondents, a different algorithm would seem to be required.

Practice Shifts in the Empiricist Programme: Attributional Theory Applied to the Decision to Stop Smoking

Eiser (1982) comments that one of the difficulties of applied research is the way the problem is initially defined in the practice field. For smoking in particular, regardless of whatever health risks are attendant on it, smoking itself has now come to be labelled as a disorder. It is seen mostly as an addiction or dependence (Russell 1976), or even as a "mental disorder" (Jaffe 1977). Over half of all smokers labelled themselves as addicted in a study by Eiser, Sutton & Wober (1978).

Eiser (1982, 1983) argues persuasively against the prevailing overemphasis on the medical (addiction) model. He is also critical of the usual health education which continues to reinforce messages about the negative effects of smoking. Instead, Eiser urges that the emphasis should shift towards demystifying the concept of addiction. More attention should be paid to the positive effects produced by drugs, which should be relabelled for their hedonistic qualities rather than need satisfaction.

In championing an attributional approach, Eiser draws attention to the work of Robbins et al (1974) who showed that the rate of spontaneous recovery was extremely high for ex-Vietnam war veterans who had previously been "addicted" to heroin. Eiser points out that, as with alcoholism, the self-labelling of addiction and perception of the problem as a disease has major implications both for the addicts expectancy of recovery, and the view of treatment agencies. In particular, it follows that the addiction syndrome comes to be seen as incurable without the intervention of intensive treatment. (Eiser 1983).

At the individual level there is a major problem with the externalized attribution of responsibility. Once the concept of addiction is used to explain behavior, the individual is left with a ready made justification for subsequent lack of success in attempting to change, and a reason for discontinuing the investment of effort.

One of Eiser's major contributions has been to tie up this form of attributional mechanism with the sick role concept. An important observation to be derived from Parsons (1951) sick role theory is that the sick role may be adopted to avoid moral censure. The label of sickness is regarded, that is, as more socially acceptable than that of deviance or marginality. Eiser (1983) argues that adoption of the sick role functions to reduce dissonance for smokers who explain away the inconsistency in their desire to quit and failure to stop smoking. On this basis, Eiser has also called into question the validity of the notion of the dissonant smoker.

In an influential Government survey of smokers, McKennell and Thomas (1967) divide the target group into consonant and dissonant types. Consonant smokers are those who maintain a harmonious link between their beliefs, feelings and actions. In order to remain smokers and stay

consonant they must discount the anti-smoking propaganda, for example, by rationalizing "It will never happen to me," or by denying the statistical evidence, perhaps by recalling cases of people who have smoked all their lives and lived to a ripe old age. Dissonant smokers, however, are said to be convinced of the health hazard entailed by their habit, and wish it were otherwise. Nonetheless, they continue to smoke, as it were, guiltily.

Originally, Eiser (1978) applied the divergent perspectives hypothesis to smokers, arguing that smokers (actors) tend to make situational attributions for smoking whilst observers (non-smokers) view it in terms of dispositions (the smoker's habit). Further, Eiser posits that dissonance may be functional in allowing smokers to believe they are incapable of quitting through a self-serving attribution of addiction. (Eiser, Sutton and Wober 1978). Since then the hypothesis been modified to one of smokers protecting themselves by wanting to give up if it is perceived as easy, but not if it is seen as difficult.

Eiser (1982) reports data which shows that smokers expressing feeling "hooked" have lower expectations of success in trying to quit smoking and express less inclination to try. The work of Weiner and Kukla (1970) is regarded by Eiser as particularly important in this regard. Weiner (1979) now maintains that stability/instability is a major predictor of expectancy, but that internal/external is not, though it may influence emotions.

Eiser concludes that smokers motivations to quit are,

" undermined by perceptions of task difficulty and personal inability, two concepts which feature prominently in Weiner's (1979) attributional approach to achievement motivation."

Eiser (1982) concludes that his own work in this area also supports Weiner's position. Similarly, Wright (1980) showed that smokers and ex-smokers attribute failure to quit smoking as largely due to task difficulty and effort, whereas never-smokers emphasize ability.

This line of thinking was pursued further in an innovative study by Eiser, van der Pligt, Raw and Sutton (1985), who made use of a television programme to test attributions about smoking cessation using Weiner's framework. Generally, the findings show substantial support for Weiner's model. As predicted, Internality turns out not to be correlated with confidence (or expectancy of success). Confidence does predict intention, however, which in turn predicts behavior.

Eiser's derivation of Weiner's model makes it similar to Bandura's (1977) model of self-efficacy, an observation not unnoticed by Eiser, who says,

"The notion of confidence as an intervening variable between cognitions and behavior is much the same as Bandura's (1977) concept of self-efficacy, and may be critical in predicting the effectiveness of interventions."

Bandura's (1977) Self-Efficacy model is championed by Pechaceck and Danaher (1979) as the most powerful framework for understanding smoking behavior and problems of quitting. They argue that a cognitive-behavioral perspective offers the best framework for integrating the diverse smoking models. Most promisingly, the inconsistencies of the previous pharmacological models are said to be given clarity by attributional analysis. The approach evolved out of social-learning theory and includes a major cognitive element. (Now relabelled *Social Cognitive Theory*; Bandura 1986)

According to Bandura's model, behavior change is mediated by two factors of expectation, which the individual sees separately:

* *Outcome expectancy*, that the new behavior will bring about particular consequences (e.g. quitting smoking results in better health prospects)

* *Personal efficacy*, that personal ability and resources will enable the behavioral goal to be reached (e.g. managing to quit and remain a non-smoker).

The expectations form major determinants of effort expended and the degree of persistence over time. This application also lucidly illustrates how cognitive concepts replace explanations based upon motivation. The central problem is said to be perceived control. High levels of outcome expectancy combined with low levels of efficacy expectancy result in learned helplessness.

The two sets of dimensions may be usefully recast into a 2 X 2 matrix, and compared with the Weiner model. It is apparent that when applied to this domain, the two models share interesting structural similarities.

Compare figures 7 and 8.

The attributional themes generate a powerful set of explanatory mechanisms offering compelling insights into the the failure of would-be non-smokers to translate their intentions into successful actions. They are attractive to health educators and change agents who emphasize the longitudinal development of health careers. The research work, however, suffers from lack of a suitable algorithm to efficiently model attributional choices.

Figure 7

Pechaceck & Danaher's reworking of the
Bandura Model

		Personal Efficacy	
		high	low
Outcome Expectancy	high	self-confidence	learned helplessness
	low	persistence	fatalistic orientation?

Figure 8

Eiser's reworking of the
Weiner Model

		Locus	
		internal	external
Stability	stable	personal ability	addiction syndrome
	unstable	try hard	bad luck

Pechaceck and Danaher (1979) incorporate Bandura's model into a detailed cognitive-behavioral analysis of smoking, with stages of adoption, the decision to quit, and actual quitting clearly differentiated.

Adoption

Initially, psychosocial factors are said to be important. Smoking, especially for the adolescent becomes a part of trying out adult roles or else is used to express deviance or rebelliousness. In the early stages, smoking may even be experienced as unpleasurable. Other pressures, however,

lead to persistence with the habit and skill is acquired in using cigarettes to bring about pharmacological effects.

Decision to Quit

Pechacek and Danaher further Bandura's Model by arguing that the decision to quit is made by appraisal of two kinds of expectancy :

1. Response (or Outcome) Efficacy, where probabilistic estimates are made that change will in fact bring about the outcome.
2. Personal Efficacy, where probabilistic beliefs are made of personal ability to reach the goal, resulting in confidence appraisal. Factors influencing confidence include:

- * Fear of withdrawal symptoms
- * Generalized expectations from other similar experiences of mastering self-control
- * Perceived emotional or psychological stability
- * Expectations of environmental support.

Quitting

Consistent with the model, quitting is seen as an opportunity for self-control. Most quitters are successful without formal help. Indeed, high expectations of self efficacy run counter to perceived need for outside help. Only about one third of smokers seem willing to participate in organized programmes to quit (Gallup 1974), and most seek self-help aids (Schwartz and Dubitzky 1967). When smokers choose formal treatment methods, then the perceived efficacy of treatment is said to become important.

According to Bandura (1977) the critical elements in achieving enhanced self-control are:

- * Expectation of mastery based on previous accomplishments
- * Vicarious experiences
- * Verbal persuasion
- * Physiological feedback

Relapse occurs where personal efficacy reappraisals or response outcome appraisals become less than the initial expectations. Here relapse is focused mostly in terms of failing coping strategies, typically resorting to cigarettes to cope with unexpected negative affect (anxiety etc). To be effective, withdrawal strategies would have to provide more than a mechanism for making the break. As Pechacek and Danaher (1979) note it must,

"provide personally relevant information and skills regarding the participants ability to cope."

They also predict that heavier smokers (with over learned patterns of behavior) would need greater persistence and effort. Hence lower levels of perceived self efficacy would be predicted.

Pechaceck and Danaher further observe the phenomena of a single cigarette causing total relapse. Interestingly, the same type of effect is well known for reformed alcoholics who are said to revert to their former ways after the first drop of drink touches their lips. (Marlatt 1978, Wilson 1978). Marlatt (1985) describes this attributional mechanism as an "abstinence violation effect".

Wilson (1979) argues forcefully that it is the meaning given to relapse rather than the onset of physiologically based addictive processes which results in loss of control. Given that addiction mechanisms are the most prevalent forms of explanation and that most treatment programmes are geared to regimes of total abstinence the alcoholic becomes trapped in a self-defeating spiral. Each subsequent attempt to quit and each ensuing relapse only adds to the sense of hopelessness. Each transgression is interpreted by both drinker and observer as further proof of lack of control. In Bandura's terms efficacy expectations sum to zero.

Strong parallels may be drawn with alcohol dependence, and Eiser's account of the attribution of addiction to smoking. Would be non-smokers who construe smoking as a physiologically based addiction are most likely to believe that total abstinence is the only workable therapeutic goal. Relapses to smoking are also likely to result in a lowering of perceived control, in turn self-fulfilling the implied prophecy of incurable addiction.

Shiffman (1982) directly extended Bandura's and Marlatt's work with self-efficacy and self-control to the problem of smoking cessation and relapse. Self-efficacy was found to be significantly related to success in abstinence. Bower & Grunberg (1987) say of Bandura's self-efficacy concept that it has,

"generated more successful treatment of appetitive behaviors than any other social psychological theory."

The impact of efficacy-type expectations on smokers decision making constitutes a novel fact predicted by the Empiricist programme. The progressive problem shift is all the more significant since attempts to incorporate the self-efficacy variable into the Rationalist programme have not met with particular success (Ajzen & Madden 1986; de Vries, Kok & Dijkstra 1989).

To date, most health education programmes and other interventions have focused only upon considerations of outcome evaluation and hence outcome efficacy. By neglecting self-efficacy they create a decision-action impasse for smokers.

Conclusions

The Theory of Reasoned Action has had a sizeable impact in mainstream Social Psychology and has promoted a rethinking of attitudes as decision structures. This has proved popular in a range of practice domains, but especially in health education. The simple recursive structure of the Fishbein model lends itself readily to user defined problems. It is particularly suited to health education work which results from mass media applications, and has been found efficient in explaining the decisional concerns of health education target groups. Empirically, however, it also creates its own internal anomalies. Against theory, Modal Salient Beliefs are usually found to be better predictors of action than are Individual Salient Beliefs. There is also evidence to show that external variables often predict at least as well as the main attitudinal and normative components of the theoretical model. The research programme continues, nevertheless, to experience a progressive practice shift. Within the domain of health education about cigarette smoking the model has not only highlighted areas for the targetting of new health promotion interventions, it has also saved the Rationalist programme from a major refutation by explaining that smokers who continue with their habit retain their own reasons for continuing to smoke.

Attribution theory has developed to become a new cornerstone in mainstream Social Psychology. Although it contains a diversity of theories, they all share the same epistemological hard core, that judgmental processes are based on inferences derived from perceptions. They are not based on values assigned to outcomes, as is the case with the rival Rationalist model of decision making. Mostly the attributional process has been taken to be an inductive mechanism, achieving uncertainty reduction through an Analysis of Variance paradigm. This has set the basic task for experimental puzzle solving and also supplied the conceptual framework for theoretical development. Weiner's influential model, for example, continues to proliferate yet more dichotomous attributional categories without any serious development in theoretical explanation. Nevertheless, Weiner's work has generated a wealth of research studies in a variety of applications.

More progressively, Eiser has advocated a reorientation of attribution theory to a prospective direction. His reworking of Weiner's model shows it to have significant structural similarities with Bandura's theme of self-efficacy. This not only identifies important features of attributional judgments but also helps bring Social Learning (now Social Cognitive) Theory into the attributional fold. Perhaps of greatest consequence, the synthesis points to perceived ability as a major factor in decision making. For the practice domain of health education, it has significance in explaining why smokers so often fail in their attempts to implement their decision to stop smoking, and in predicting their choice of withdrawal strategy.

This acts as a challenge to decision models based on Rationalist principles. In particular, it highlights that internal audits of values are insufficient to explain the selection of outcomes. Rather, confidence or some similar variable must be engaged in the judgmental process before decisions can be activated. In all, the theme constitutes a novel fact for the Empiricist programme and a conceptual victory over its rival. Against this, however, the attributional work remains tied to the ANOVA paradigm. This limits judgments to discrete categories with assumptions of independence, homogeneity of variance estimates and normality of sampling. The expansion of attribution theory into a prospective (decisional) direction may thus be constricted. It would certainly restrict the form of any new decision technology in practice.

RESUME AND CRITIQUE OF STUDY TWO

Programmes of research rather than single theories are specified as the appropriate units of analysis by the Methodology of Scientific Research Programmes. This second literature based review continues the rational reconstruction therefore, with a comparison of two additional sets of theory work in the Social Psychology of decision making.

As in the earlier analysis of Behavioral Decision Theory and Social Judgment Theory, it has been possible to divide the theories of Reasoned Action and Attribution according to their underlying core heuristics. There are, moreover, strong parallels to be drawn in the separate coexistence of the two lines of research work.

Methodological Considerations

Recent influential contributions to the Philosophy of Science have highlighted the need to include practice considerations in reconstructions of scientific progress. These have been disadvantaged, however, through the lack of a suitable epistemological basis to explain the concept of action. The World four thesis briefly outlined here gives practice such a basis. Using an extension to Popper's Epistemology without a knowing subject, it is argued that action constitutes an independent world with its own correspondence to material consequences (outcomes) and to other knowledge structures (such as intentions or theories). On this basis, it is possible to revise the Methodology of Scientific Research Programmes to include practice shifts. These are akin to problem shifts but comprise the nature of scientific action. Progressive research programmes should not only accomplish all that rivals do in a practice domain (in providing concepts, theories, methods, technologies and expertise to sustain practice) but also create novel opportunities (a concept parallel to the creation of novel facts in problem shifts).

The addition of practice considerations to the Methodology of Scientific Research Programmes arguably marks a step forward in the appraisal of scientific growth. The analysis presented here shows theory work to be intricately tied to practice by way of shared epistemic assumptions. This consists of what asking what scientists actually do as distinct from what they claim to do or think. Practice also includes, though, the working context in which research findings are applied to solve practical problems. Such *domains* of practice could be marked by professional boundaries or be areas of interest open to broader public involvement. The social value which

marks it and the premium given to the solution of practical problems set the stage for rivalry by research programmes.

The significance of practice for the appraisal of scientific growth, however, goes beyond the social value it is accorded. Scientific action also has an epistemic value which measures scientific progress along with problem shifts. Practice shifts are an indication of theoretical verisimilitude as much as problem shifts.

Differentiating practice and problem shifts can become difficult, however, since progress in either may prompt new solutions in the other. New theoretical insights, for example, may give rise to new technologies which in turn augment forms of practice. Equally, new practice developments may promote the search for newer, better, forms of theoretical model. Clearly, this is an aspect requiring further clarification. Nonetheless, the distinction is useful. It helps explain differential progress in theory work and application, and it refines the concept of external history.

Even broader social and economic influences of external history, it seems, should be evaluated for their correspondence with the negative heuristic. That is, they may facilitate the programme where the epistemic value of the external influence is consistent with the hard core, or they may retard progress where there is a contradiction.

The revision of MSRP to include implications of the World Four thesis also requires further specification and development. In particular, there is the problem of explaining how the two form of progress (problem and practice shifts) interact, and at what point differential progress becomes unworkable. For example, how long will progressive practice shifts in the *Locus of Control* theory be sustained in the face of a degenerating problem shift?

The relationship of scientists' individual practice (meaning their actual reasoning patterns and research behavior) and Scientific Practice (meaning domains of applied reasoning and research enterprise) requires further elaboration and criticism. Does the practice basis of a research programme have a problem solving machinery similar to the positive heuristic, or indeed does this require another extension to the concept of heuristics? Whilst the revised MSRP proposed here offers a way forward to incorporate practice considerations in the appraisal of scientific growth, it also poses many new methodological and epistemological problems.

Nevertheless, consistent with the scheme outlined earlier for extending MSRP, it has been possible to locate practice shifts as well as problem shifts in rational reconstructions of research programmes of decision making. These have been demonstrated to be significant features in the progress of research programmes and in the rival status of programmes.

The Theory of Reasoned Action fits comfortably within the definition of Rationalist research. The basic model makes clear that decision makers operate on the basis of an internal audit of values assigned to outcomes. Despite a series of anomalous findings, however, the momentum of the research programme has been sustained. Equally, the developing Attributional Theories conform with the designation of Empiricist research, where decision makers infer their choice by reducing uncertainty. There too, problem and practice have progressed at different rates.

Rationalist Decisional Research in Practice

Researchers working with the Fishbein model continue to work with (or despite) a constant set of empirical anomalies. The simple recursive model continues to attract empirical difficulties but somehow sustains propositional strength. Although revisions have been put forward, none appear as yet to have grabbed the imagination of practitioners in the same way that the basic Fishbein model has. The Theory of Reasoned Action offers not only a clear conceptual basis for understanding and predicting action within the Rationalist framework, but also comes with an accessible algorithm, readily adaptable to user defined problems. Compare for example, its use in predicting a diverse range of health actions, (Bateman 1985; Chassin et al 1984; Freeman 1984; Hoogstraten et al 1985; Høglund 1991).

Most health education campaigns and other anti-smoking propaganda have focused upon the values of smoking and not smoking (Cohen & Cohen 1978; Gatherer, Parfit, Porter & Vessey 1979; Hallett & Sutton 1986). The arguments have thus implicitly been couched within a Rationalist framework. In effect, health education work which emphasizes lifestyle outcomes has provided an opportunity for exploitation by the Rationalist research programme of decision making. In the absence of adequately competing alternatives the demands of practice have helped facilitate a progressive practice shift for the Theory of Reasoned Action. Most propaganda work in this domain, however, has tended to perpetuate the myth of addiction and to relegate the transition to non-smoking to the netherworld of personal will power. In so doing it has also neglected the important issue of how people choose appropriate instrumental actions, leaving would-be non-smokers with a practical gap and consequent failure to fulfill their intentions.

Empiricist Decisional Research in Practice

In contrast, change agents more interested in the therapeutic implications of stopping smoking have mostly looked to research within the Empiricist framework. The main force of the Empiricist studies in the domain of smoking decisions has been to direct attention to the problem of choosing successful transitional behaviors.

Attribution theory continues to swell the propositional heuristic in this arena. It is most suitable, or at least most attractive to researchers who are concerned with the problem of making the transition between thought and action.

Within the Empiricist programme a decision direction to theory work has begun to emerge in this practice domain. Eiser particularly has revised Weiner's basic model such that it shares important structural similarities with Bandura's work. This emphasizes the importance of perceived ability (or self efficacy) to implement action in making choices. Where considerations of ability override other elements of choice there is a risk of failure resulting in a self defeating attributional spiral. This has significance for health education programmes which focus on individual responsibility for health. The attributional mechanism explains one of the psychological manifestations of "victim blaming" in health promotion work. It also offers the possibility of intervention strategies which go beyond the practical gap associated with Rationalist based programmes. These themes at least are important for drawing the attention of health educators and other change agents to fact that there is no royal road to implementing successful action and achieving goals.

The Empiricist programme thus generates a significant novel fact with the self-efficacy construct. It seems likely to assume increasing influence, not only for decision theories but self-empowerment models of health education.

Despite this theoretical progress, the research programme has been slow to generate workable decision theories. Much of this difficulty can be ascribed to the lack of a suitable algorithm with which to capture prospectively oriented attributions whilst maintaining the Empiricist core assumptions.

Conclusions

Rational reconstructions of scientific growth require considerations of scientific practice. A revision to the Methodology of Scientific Research Programmes attempts to do this through the identification of practice shifts. This adds to the explanatory power of the normative methodology but still does little to move it out of an entirely retrospective analysis.

The Rationalist programme of decision making continues to experience a progressive practice shift in the domain of health education about cigarette smoking. In addition to an accumulated research history investigating the topic, the programme has supplied a new, powerful explanation and methodology with the Theory of Reasoned Action. Fishbein's model has been most useful for rescuing the programme from the damaging anomaly of smokers remaining in the practical gap (that is smokers continuing to smoke "dissonantly"). It does this by showing

that smoker's do in fact retain rational (but hidden) reasons for their continued habit despite acknowledging the damaging effects of smoking.

The Fishbein model developed out of attitude change research but was also shaped by the demands of practice in the field of consumer behavior. This background makes it ideally suited to health intervention strategies based on manipulation of information with the aim of influencing rational choice. That is, health education work which presents messages containing positive inducements to change specific behaviors along a single continuum (such as anti-smoking propaganda) also fits the same Rationalist mould and is easily and readily assimilated by the Theory of Reasoned Action.

Attribution theories of choice are also making an increasing impact upon the practice domain of health education about cigarette smoking. Research developments have grown out of studies in social judgments but have also matured in the domains of therapeutic practice. This history lends itself to reorientations in health education having a self-empowerment focus. Unlike the rival Rationalist programme, however, it does not have a readily adaptable algorithm with which to capture and predict choices.

The Empiricist programme, however, does offer a novel fact to better explain the difficulties smokers have in deciding to quit but then remaining with their habit. This progressive problem shift should change the emphasis of anti-smoking interventions away from yet further inducements to alter the outcome (smoking or not smoking) to ways of increasing smokers' confidence in their attempts to try to quit.

In sum, advice to smokers comes from two opposing philosophies of decision making. One (Rationalist approach) focuses upon the costs and benefits of outcomes, but does not address the issue of how the outcome may be obtained. The other (Empiricist approach) explores the realization of actions but neglects to show how old and new values may be reconciled. Exposed to anti-smoking messages based upon contradictory models of decision making, and in the absence of any clear guidance it should hardly be surprising that so many smokers fail in their efforts to stop smoking.

STUDY THREE :

RELATIVE REASONS AND PERSONAL EFFICACY IN STOPPING SMOKING

**An Empirical Investigation of Rationalist and Empiricist
Decision Theories Applied to Smoking Withdrawal.**

EXPERIMENTAL METHODOLOGY AND APPLICATION OF THEORY

An assumption is often made in much empirical research that the empirical method (particularly the classic experiment) is epistemologically neutral. This creates a paradox for falsificationist methodologies having pretensions to objectivist epistemology. Since all observations are acknowledged to be theory dependent, there can be no neutral ground which gives equal favour to rival explanations. Each research programme will contain its own algorithmic heuristic which will generate its own form of data, and its own preferred mode of analysis. Powerful algorithms can be expected to surpass at saving or assimilating relevant data and at the same time generating forms of data not available to rivals. As the preceding two literature based studies have shown, this is not always the same as theoretical growth. Research programmes, it appears, may have differential growth rates in propositional and algorithmic properties, and in theoretical development and application to practice.

The empirical method is usually understood as an opportunity to directly test the truth content of theories. An alternative view is that it tests the efficiency of linkages between conceptual and empirical problems. Another way of stating this is to regard empirical methodology as a critical exposition of propositional and algorithmic heuristics.

Empirical methodologies become crucial for testing theories in the sense that they create a set of measurement opportunities which allow, as far as possible, each contending research programme to give full operation to the algorithmic machinery. In turn this means allowing different empirical methods, different forms of data and different forms of data analysis. Of course, this still cannot guarantee impartial conditions, but it should allow the imbalances to be aired. More than this though, the generation of empirical data should be seen as an opportunity to compare the relative efficiency rather than truth content of each form of scientific practice. This does not necessarily imply a relativist or instrumentalist solution since ultimately (over many such opportunities) the research programme with the more progressive problem and practice shifts would be expected to prevail.

Algorithmic Transfer

If the preceding theoretical arguments made here are correct, algorithms generated by the same negative heuristic should in principle be transferable between different theories within the same research programme. Since the algorithmic heuristic embodies the same epistemological foundation, it should generate comparable data and operate within the same overall logic. Rationalist algorithms, for example, should ultimately reduce to the decision maker's internal audit of values attached to outcomes. Moreover, the principle that more powerful algorithms should be capable of collecting and digesting new data, not easily assimilated by weaker rivals, should also apply *within* research programmes. That is, algorithms may be exposed to critical testing as much as the propositional content of theories. Algorithmic transfer may thus be added to the array of critical methodology as a means of appraising the growth of research programmes.

Methodology

An empirical platform is required here to facilitate critical comparison of the two rival research programmes in practice (Rationalist and Empiricist approaches to decisions about smoking withdrawal).

To this end an experimentally based strategy was devised to explore the workings of each programme's positive heuristic. In particular, such study exposes the effectiveness of the propositional heuristic in dealing with empirical problems generated by the algorithmic heuristic. That is, each rival explanation may be appraised for its capacity to digest anomalies and predict novel facts. In no less a manner the machinery of each algorithmic heuristic is also exposed to critical scrutiny.

Aims and Objectives of the Empirical Study

The empirical phase of this study was devised to test the algorithmic workings of Rationalist and Empiricist research programmes and to balance the preceding theoretical analysis by providing an opportunity to demonstrate the rival research programmes in practice.

In particular, the empirical investigation was based on the following considerations:

Aims:

1. To further explore the interdependent relationships of epistemological basis, propositional heuristic and algorithmic heuristic in describing scientific research programmes.
2. To contrast the application of Rationalist and Empiricist decision theories in a shared domain, thereby further illuminating problem and practice shifts.
3. To further understanding of smoking withdrawal problems through the application of social psychological decision theories.

Objectives:

1. Demonstrate that algorithmic heuristics sharing the same epistemological basis may be successfully and usefully transposed across theoretical models.
2. On this basis provide an effective reworking of Fishbein's formula using MAUT techniques.
3. Similarly help equip the Attributional model of decision making with an effective algorithm by transposing the Lens model paradigm.
4. Critically compare the efficiency of Rationalist and Empiricist approaches in describing and explaining smoking withdrawal problems.
5. Illuminate the decision making bases to smoking withdrawal problems.
6. Identify features of the decision making process to support an alternative model based on World Four epistemology.

The Social Context of the Empirical Research

The empirical opportunity was provided by patients' choice of therapeutic treatments in a smoking cessation clinic.

In addition to being a major practice domain for the rival decision theories, problems of smoking withdrawal offer interesting advantages for research design.

Primarily, the subject matter can be made into meaningful choices for research respondents. Janis and Mann (1977) have criticized mainstream research in decision making for dealing only with "cold" issues, having no real salience for experimental subjects. Much of the research work in decision making, however, which involves bookbag and poker chips or other artificial gambles can only be described as conspicuously cold. The trivial or abstract choices typically lack personal meaning for experimental subjects, who must inevitably remain emotionally detached from the decision making process.

The smoking issue in contrast, provides a hot topic for empirical research. It is a widely debated issue, and continues to receive ample media coverage. As part of the increasing social value attached to public health, tobacco smoking has become a major focus of contention. For smokers themselves, the decision to stop smoking is a matter of immense psychological immediacy. It appears to be seen as the threshold to a major life transition similar to other important changes such as career moves, deciding to get married or to stop eating meat.

A second advantage to focusing upon problems of smoking withdrawal is the opportunity it provides for staging experimental work. Any study aiming to test the validity of decision theories must take seriously Brunswik's call for representative design. For broad ecological validity the experimental context would need to go beyond the usual confines of the laboratory setting. Staging an experimental manipulation within a clinic context allows for an optimal compromise; the relevance of a field type setting whilst retaining control of near laboratory conditions.

Martin Raw (1979) complains, however, that too many Psychology dissertations are based upon projects of anti-smoking clinics, with superficial trials of various treatment programmes, all resulting in the same dismal success rate.

One student's research project which created an anti-smoking clinic to test the relative effectiveness of two treatment procedures was based at the London School of Economics (Hayes 1977). Whether or not Raw's scathing critique is justified Hayes' smoking clinic provided a workable experimental scenario for this study. With an established history and local credibility, the LSE Smoking Clinic presented a ready made opportunity for ecological design. Hayes' therapeutic format was retained almost exactly, but experimental subjects were offered a free

choice between two therapeutic treatment procedures rather than being randomly assigned. The purpose of the new smoking clinic was thus the capture of decision making processes and the measurement of action consequences, rather than testing the particular merits of anti-smoking therapies.

At the outset it was assumed that both anti-smoking treatments would be equally effective options. In the earlier L.S.E. Smoking Clinic, employing the same therapeutic procedures, Hayes (1977) found an equal success rate after a 3 months follow up study. It is revealing to note though, that Hayes concluded,

"Better outcomes could be obtained by assigning subjects to treatments according to their suitability."

The Clinic Setting

The Smoking Research Clinic was administered through the Department of Social Psychology at the LSE from 1979-1981. The premises consisted of a modest office and treatment room within a quiet annexe of the University. Situated in the shadow of St. Phillip's hospital its location may also have implied a quasi-medical establishment and thus added to the representation of smoking as an addiction.

Care was taken to create a suitably therapeutic atmosphere in the Clinic setting with attention to detail in furnishings and equipment. Every effort was made to make the Clinic a working concern, not simply for theatrical effect (in support of the experimental manipulation), but also to provide subject "patients" with the best possible resources in their efforts to quit smoking.

Rationalist Hypotheses

From the Theory of Reasoned Action:

The decision to stop smoking is likely to be influenced by normative considerations, particularly where health beliefs are salient. Those who are successful in stopping are likely to show overall a positive appraisal of the benefits of stopping smoking. Equally, those who fail to quit are likely to retain a balance of negative considerations for changing to life as a non-smoker.

Intention to stop smoking will be a better predictor of action outcomes than external variables. In turn, intention will be predicted from the attitudinal and normative components.

The choice of treatment options is unlikely to be strongly influenced by normative consideration. Choice of treatment options will not be materially affected by attributional

variables unless these become part of the salient beliefs. In which case, they will have values attached to them which mirror the perceived costs and benefits of the options. This is most likely to be seen in the attitudinal component.

From Multi Attribute Utility Theory:

The decision to become a non-smoker will result in a net Multi Attribute Utility in favour of quitting for those who manage to stop. Those who remain smokers, however, will show a net Multi Attribute Utility against changing to life as a non-smoker.

The choice of treatment options will be reflected in the differential utilities attached to the options, so that the treatment with the highest overall Multi Attribute Utility will be selected.

Empiricist Hypotheses

From Eiser's reworking of the Weiner attributional model:

Smokers who perceive their habit as an addiction are less likely overall to be successful in their attempts to quit. They are more likely, however, to choose treatments demanding an external locus of control, where power is invested in the form of expert treatment.

Generally, would-be non-smokers will choose treatments seen as offering an easy success. Attributions of stability in the treatment option are likely to be the best predictor of expectancy, however. Treatment choices will therefore most likely follow the combination of perceived easy treatment (in the form of external control) with stability.

Success in stopping smoking, however, is predicted with the combination of internal locus and stability.

From Bandura's Self-efficacy theory:

Success in stopping smoking is likely where there are positive gains to both outcome expectancy and personal efficacy expectancy (probabilistic estimates that stopping smoking will lead to the anticipated outcomes, and probabilistic estimates that stopping smoking can be achieved).

Choice of treatment options is most likely to follow the treatment perceived as enhancing or substituting for personal efficacy.

Sampling Considerations

Schachter (1982) has argued convincingly that would be non-smokers who attend smoking clinics are a very different group from those who manage to quit through their own methods. As he expresses,

"People who cure themselves do not go to therapists."

One consequence has been misleading statistics about the success rates of smoking withdrawal. Schachter maintains that the notoriously low success rates reported in the literature are only true for therapy programmes (such as anti-smoking clinics offer). The success rates for self-cure, however, are considerably higher. In interviews with successful ex-smokers, Schachter found that two thirds said their only technique was "deciding to stop" (Gerrin 1982). Similarly, the United States Public Health Services (1977) estimate that 95% of smokers who quit, do so unaided.

Raw (1978) also comments that clinics typically add to this situation by attracting heavier smokers. Schwartz (1969) reviewing smoking control methods nevertheless finds a worthwhile niche for anti-smoking clinics. As he describes,

"Smoking is a difficult habit to break. The results....indicate that many smokers try several times before they can quit. For them, the smoking clinic is one step closer to success."

Ecological Validity for a study based upon a clinic setting must hence be bounded by the self-selecting nature of the group seeking treatment. Even so, the study may embody representative design for that particular group, offering psychological veracity through real choices with real consequences.

Whilst the relatively small scale of the study limited scope for wider representative sampling, as broad a spread of subjects as possible was sought through three forms of recruitment:

- * Leafleting the windscreens of parked cars within a one mile radius of the clinic premises (in central London)
- * Sending a poster/leaflet and recruiting letter to all libraries and other public offices within the Clinic's postal district.
- * Contacting the local radio *Helpline* service, and inviting them to give details of the clinic to interested callers.

(See *Appendix 1-2* for the Smoking Clinic recruiting materials).

Clinic Treatment Subjects (n=40)

The recruiting operation was closed after the first 100 applications were received.

Within this frame 40 applicants were randomly selected for clinic treatment and offered up to four therapy sessions in return for their cooperation as research subjects. (See *Appendix 3* for details of the research contract).

10 potential subjects were eliminated because:

- * They did not return (or return in time) the preliminary questionnaire (n=5)
- * They failed to keep the appointment for the preliminary interview (n=2)
- * They knew other patients already attending the clinic (n=3)

The remaining 50 were assigned to a waitlist as treatment controls.

Clinic patients formed the principal subject group for the experimental design. On the basis of experimentally manipulated choice information, clinic subjects selected a therapy programme to help implement their decision to stop smoking.

Waitlist (No treatment) Controls (n=50)

Clinic applicants who were waitlisted received an apology letter, wishing them success in quitting. (See *Appendix 4*). They were also sent the pamphlet *How to Stop Smoking* (HEC leaflet AS3). This offers three detailed plans of action to help stop smoking and ways of cutting down plus a scorecard to mark daily savings in expenditure by phasing out cigarettes over a three week programme.

It was originally hoped to offer waitlisted subjects a later opportunity to join the Clinic's treatment programme. Unfortunately, this option was precluded by resource limitations, and remains an unsatisfactory aspect of the research strategy.

Experimental Choice Controls (n=40)

A set of comparisons was also sought for the actual decision (choice of therapeutic treatments), and to test the face validity of the experimental manipulation. This was achieved by running the experimental manipulation of choice information (a tape/slide presentation) to a non-clinic group and asking them to make a cold choice "as if" they were deciding which therapy option to take.

Three distinct sub-samples were selected to comprise the experimental control group. These were:

Committed-smokers (not intending to quit smoking) (n=12)

Ex-smokers (not intending to return to smoking) (n=12)

Never-smokers (not intending to start smoking) (n=16)

Within these constraints, as wide a spectrum of demographic differences were sought to match the Clinic sample. This was achieved through a chain sampling procedure in which 12 different acquaintances of the Experimenter acted as recruiting agents to contact potential subjects in each category. (See *Appendix 5-6* for detailed criteria used in recruiting experimental control subjects).

Pilot Subjects (n=10)

Additionally, a group of pilot subjects were recruited to go through a whole course of experimental and therapeutic procedures prior to the actual study. Their data is excluded from subsequent analysis, but was used to modify the procedures and measuring instruments.

Procedure

Empirical work was organized into four phases:

1. Preliminary data gathering
2. Experimental manipulation and measurement
3. Clinic treatment
4. Follow-up and Control Group data gathering

1. Preliminary data gathering

All clinic applicants (Clinic and Waitlist subjects) were sent a preliminary postal questionnaire, seeking information on their:

- * demographic details
- * smoking history
- * health history
- * treatment preferences

(See *Appendix 7*).

95% (of the 100) questionnaires sent were returned completed

Initial Interviews

Clinic subjects were given an extensive initial interview during which a range of measures were taken and the main experimental manipulation of information was administered. They were also encouraged to explore in depth the ramifications of attempting to stop smoking. This was recorded by the interviewer as case notes.

Decision Capture: The Balance Sheet Procedure

An adapted Balance Sheet Procedure (Janis & Mann 1977) was employed as the elicitation procedure for subjects' dimensions of choice, much as Humphreys & Humphreys (1973) had earlier used a version of Repertory Grid technique to elicit dimensions in an application of Multi Attribute Utility Theory.

The Balance Sheet procedure has several distinct advantages in this respect. By asking subjects to complete a detailed inventory of their choice dimensions in terms of positive and negative considerations, it ambiguously allows subjects to focus on decision outcomes, decision processes or both. It also gives advantage to the Rationalist decision models, however, by directly eliciting evaluative loadings and making explicit the principle of weighing issues in the balance (a paragon of Rationalist thinking and ultimately reducible to the maximization of utility). More than this, though, the Janis & Mann Balance Sheet procedure also supplies subjects with useful categories and a visual framework which help subjects unpack relevant attributes for each choice option.

In *Balance Sheet One* (BS1), subjects were asked to list all their personal beliefs about their stopping smoking. In the form adapted for this study the procedure had two stages:

(i). The Balance Sheet Grid (See *Appendix 8*).

The Grid provided a framework for listing positive and negative considerations of choice options. These were further categorized in terms of:

- * the self
- * others
- * self approval/disapproval
- * social approval/disapproval.

This part of the procedure is directly analogous to the *identification of relevant dimensions* in MAUT techniques and to eliciting the *individual set of salient beliefs* (ISB) in Fishbein methodology.

2. Experimental Manipulation and Measurement

Subjects were given a tape-slide presentation, illustrating the choice of treatment options offered by the Smoking Clinic.

Photographic slides and a linked taped commentary described in detail the two therapies on offer (Hypnosis or Rapid Smoking). The slides showed the Clinic therapist in session with the same smoking patient acting the described procedures and effects. (See the illustrations in *Appendix 12-14*).

Hypnosis and Rapid Smoking treatments were described as having equal chances of overall success, but that much depended upon the correct choice being made; that is matching the most suitable treatment to each individual patient. Choice information was arranged in a two way analysis of variance design, partitioning the effects predicted by the attributional model (EXTERNAL/INTERNAL and UNSTABLE/STABLE).

The design of the experimental manipulation was intended to give maximum opportunity for testing Eiser's thesis that decisional outcomes are influenced primarily through considerations of expectancy (stability) rather than locus.

Although no false information was given about the Hypnosis and Rapid Smoking options, selected attributes of each treatment option were emphasized to fit the ANOVA framework. These are described in general terms in Figure 9, and given in detail in *Appendix 15-19*. Descriptions of Hypnosis and Rapid Smoking were further counterbalanced through the ANOVA design so that each was equally represented at all levels.

Subjects were randomly allocated to the 4 cells of the ANOVA design (n = 10 per cell). To balance presentation, four different research assistants presented all four experimental conditions across the range of subjects. The order of presentation was also counterbalanced across the subject group.

Figure 9

EXPERIMENTAL MANIPULATION OF CHOICE INFORMATION

locus

EXTERNAL

INTERNAL

skill of therapist
at administering
treatment procedure

patients ability
to concentrate or
learn quickly

strength of
hypnotizing or
conditioning techniques

patients willingness
to cooperate
with instructions

Expectancy

UNSTABLE

STABLE

(short term advantage but
long term risk)

(long term advantage but
short term risk)

pleasant and/or
interesting experience

discomfort during
treatment procedure

immediate results
but
effect wears off giving
symptom substitution

accumulative results
with
lasting effect giving
fewer/milder
withdrawal symptoms

Following the tape-slide description of the treatments on offer, subjects were urged to carefully consider the alternatives before arriving at a firm decision. This was expressed by signing a *Treatment Consent Form*, which also contained a second measure of *Intention* (ii) for quitting smoking with the treatment chosen. (See *Appendix 20*).

Once subjects had chosen a treatment, a second set of *Balance Sheets* (BS2) were taken for each of the options.

Experimental Control Conditions

Experimental Choice Controls were administered the same slide show manipulation by the Experimenter at a later stage, but asked to choose treatment options "as if" making a real choice. They were also asked to complete a Balance Sheet for each option, and to express an "as if" intention, operationalized in terms of how likely they thought the chosen option would be to succeed as a means of quitting. (See *Appendix 21*).

The Locus of Control Scale (Social Reaction Inventory) was similarly administered to all experimental choice controls along with interview schedules which sought basic demographic data. Ex-smokers and Committed-smokers in the control group received an additional questionnaire which sought information on their own smoking and treatment histories plus perceptions of smoking futures. (See *Appendix 22-23*).

3. Clinic Treatment

Clinic subjects or patients received a maximum of four treatment sessions with their chosen therapy. In addition, they were encouraged to seek more general advice and counselling from the Therapist in their efforts to quit smoking. To help assess the impact of treatment and the wider context of action, detailed case notes on the progress of each patient were recorded by the Therapist.

In support of the Therapist, a debriefing with the Experimenter was held after each treatment session. Experimental manipulation and data gathering were, however, run independently of the therapeutic treatments, maintaining a strict blind procedure throughout the study.

Hypnosis Therapy

In their extensive appraisal of smoking intervention strategies, Pechacek and Danaher (1979) argue that although hypnosis is widely employed, and accompanied by outstanding claims of success, there is little in the way of empirical testing. Hypnosis has been a mainstay of anti-smoking treatments for over 30 years, but most of the available data takes the form of clinical reports lacking adequate control procedures. (Johnson & Donaghue 1971; Orne 1977; Schwartz & Rister 1977).

As far as possible the hypnotic treatment employed in this study followed the Barber Hypnotic Induction Procedure (Barber 1969). It was recognized, however, that the essential art of hypnosis consists of tailoring suggestions to meet subjects' expectations (Spiegel 1959; Barber, Spanos & Chaves 1974) and of giving positive feedback to convince subjects that they can in fact achieve the suggested behaviors (Rawson 1975).

A different set of therapeutic suggestions was devised for each of the treatment sessions, covering four common problem areas of giving up smoking. Gillie (1977) lists 18 "most common occasions" when people want to light up a cigarette. Stoppard (1982) identifies 12 "most important" cigarettes of the day and Jacobson (1981) catalogues 9 "cigarette cues". Pilot work in this study, however, generated the following shortlist (interestingly, also common to the other three sets of lists). Viz:

1. Being offered a cigarette as part of socializing.
2. Smoking a cigarette to relieve boredom.
3. Wanting a cigarette to aid digestion after a meal.
4. Using a cigarette to aid concentration in problem solving.

The details of the suggestions were modified in practice to fit the expectations and circumstances of each individual patient. (See *Appendix 24* for the basic set of protocols).

Hypnosis Treatment Responsiveness Measure

For each treatment session a different hypnotic test was administered, derived from the Barber Suggestibility Scale (Barber 1965). This has a claimed reliability of .80 and above for both the objective and subjective scores for test items. Generally, the tests consist of suggesting to the subject that they are powerless to engage in a simple action, such as opening their eyes, and then challenging them to try. As part of the hypnotic procedure the tests powerfully add to subjects perceptions of being hypnotized.

On each successive treatment session a more difficult challenge was administered. The test results were recorded in strict categories by the Therapist and later independently scored to give a measure of treatment responsiveness. (See *Appendix 25*).

Rapid Smoking Therapy

Based on learning theory principles, Rapid Smoking is an aversion treatment which uses the smokers own habit as the only source of noxious stimulus. Earlier versions which also involved warm stale smoke being blown into the faces of subjects met with mixed success. This was later refined by Lichtenstein and his co-workers who discovered the optimum means of turning cigarette smoke inhalation into aversive consequences (Lichtenstein et al 1973; Danaher & Lichtenstein 1978). It is generally recognized in the literature as a very successful therapy, at least in the short term, but with high relapse rates in the longer term (Danaher 1977; Hall, Rugg, Tunstall & Jones 1984). Reviewing over 30 studies, Danaher (1977) found Rapid Smoking to be a

"relatively superior" form of treatment. Pechacek and Danaher (1979), take pains to point out, however, that as with other procedures, a warm, supportive interpersonal context is equally important during treatment.

In the LSE Clinic, the procedure adapted by Hayes (1977) was closely followed. (See *Appendix 26*). For each trial of Rapid Smoking, subjects were instructed to take a "good draw" from their own cigarette in a normal way, but in time to an electronic signal which was relayed every 7 seconds. When no longer able to tolerate further inhalation of their cigarette smoke they were briefed to stub out the cigarette and declare, "I don't want to smoke any more". A one minute pause was held between each trials. A session was completed when subjects were no longer able to continue with such trials. A plastic bowl, hygienic wipes and glass of water were kept discreetly accessible in anticipation of some subjects feeling nauseous as a result of the Rapid Smoking treatment.

Rapid Smoking Treatment Responsiveness Measure

The number of inhalations and trials taken were recorded by the Therapist, along with detailed observations of the subjects immediate reactions to the treatment. (See *Appendix 27*). This information was later independently scored into a Treatment Responsiveness Scale. The scale categories were made as comparable as possible to the Barber Suggestibility Scale employed in the hypnosis treatment. That is, in each session subjects responses to treatment were scored on an objective scale (behavior and appearance of aversion to smoking) and a subjective scale (reports of aversion experienced). Scoring categories followed the Negative Sensation Checklist for Aversive Smoking (Danaher & Lichtenstein 1978).

4. Follow-Up Procedures

Clinic and Waitlist subjects were sent a postal follow-up questionnaire 18 months after their first contact with the Smoking Clinic.

The *follow-up* questionnaires sought information on:

- * Subjects current smoking rates
- * Reflections on the methods used to help subjects attempt to quit smoking
- * Perceptions of smoking futures (including likelihood estimates of future success in non-smoking)

As a follow-on to issues raised in a preliminary analysis of Balance Sheet data, a *Treatment Preference* measure was created. This brief questionnaire item listed 5 different kinds of anti-smoking strategy which respondents were asked to rank order in terms of suitability.

(See Appendix 28-29).

Conclusions

This empirical study was designed in the form of a negative crucial experiment to critically test two opposing research programmes of decision making. As the Duhem-Quine thesis shows, however, no empirical test, or even series of such tests, could crucially refute one rival and prove the other. The experimental format is rightly seen as a powerful tool in scientific enquiry but it cannot be used to directly infer the truth content of theories. Rather, its role is more subtle and complex. Experimental work remains crucial in the sense of providing empirical opportunity for research programmes to demonstrate the effectiveness and efficiency of their heuristic machinery. In particular, a well designed experimental study should facilitate demonstration of the workings of algorithmic heuristics and propositional heuristics in a contended practice domain. Such study should expose the strengths and weaknesses of the rivals, thereby not only assisting in the appraisal of scientific growth, but also pointing usefully to parts of research programmes structures which function most profitably or else are in need of additional investment.

Algorithmic transfer has been identified here as a potential condition of progressive research programmes. The argument is that since the form of algorithmic heuristic is generated by core epistemological properties, it ought to be transposable across theories belonging to the same research programme. Superior (more powerful) algorithms, moreover should be able to assimilate the work of weaker ones, thereby effecting competition and accumulated growth *within* research programmes.

In this study, rival Rationalist and Empiricist approaches to decision making were exposed to empirical scrutiny through the operation of an experimentally based anti-smoking clinic. Forty would-be non-smokers were offered a choice between two different methods of treatment thought to be equally effective; Hypnosis and Rapid Smoking. Attributes of choice information, however, were manipulated in a audio-visual presentation. Using a two way Analysis of Variance design, the treatments were variously described as having properties of External/Internal control and Unstable/Stable expectancies.

Subjects were also exposed to an intensive battery of questionnaires and rating scales designed to capture and measure the features of their decision making processes. Adapted Balance Sheet procedures were employed to generate dimensions of both the decision to stop smoking and the

choice of treatment options. These were subsequently rated as expectancy and value scales. Intention scales and Locus of Control Scales were also obtained. A Waitlist control group and experimental control group were carefully matched to the Clinic group. The latter also consisted of 3 sub-groups of interest; Committed-smokers, Ex-smokers and Never-smokers. Waitlist and Clinic subjects were followed up 18 months later and asked for further data related to their decision making. Experimental controls made a cold choice of the options "as if" they were to about to receive treatment.

In all 140 subjects were studied intensively for their decision making processes. The experiment was meant to provide real choices of consequence to the experimental group and to supply appropriate comparison and control data. The methodology employed a battery of qualitative and quantitative instruments which give maximum working opportunity for the models of decision making in the Rationalist and Empiricist research programmes. It was intended that this should not only facilitate the testing of hypotheses derived from the two rival approaches, but should also allow for the possibility of algorithmic transfer within models from the same research programme.

RESULTS AND ANALYSIS (1)

Sample Composition and Treatment Evaluation

Sampling Characteristics: Demographic Profile

The 3 sub samples (Clinic patients, Waitlist and Experimental Controls) share a similar demographic composition (see Table 1).

An almost identical gender ratio was maintained throughout (3 females: 2 males). Jacobson (1981) reports that in a survey of 21 local health authority clinics 2/3 replied that the majority of clientele were women. Evidently the Clinic sample in this study reflects the same trend.

Levels of Socio Economic Grouping (SEG) also show no significant differences ($t = .52$; $p = .61$), though the variances are unequal ($F = 2.17$; $p = .007$).

Age distribution shows a similar standard deviation (sd), though the Waitlist group was older on average than the other 2 groups ($t = -2.04$; $p = .04$). Close inspection of the data shows the mean age for the Waitlist group to be offset by a single outlying case (a 72 years old respondent). The next oldest respondents were 60 years in the Waitlist group, and 62 years in the Clinic group. If nothing else, this attests to the wide social appeal of the smoking problem. Otherwise the sub-samples show remarkably similar matching, allowing for some initial confidence in drawing comparisons.

Sampling Characteristics: Smoking History

Clinic and Waitlist subjects were also closely matched in their personal history of cigarette smoking. Both groups commenced regular smoking around 17 years old. Waitlisted subjects being from a slightly older group average 17 years of smoking, compared to 11.5 years for the Clinic group. In other respects, the profiles of smoking histories show general agreement, both averaging around 2 serious previous attempts to stop smoking, and both groups smoking on average 1 or 2 packs (between 27-30 cigarettes) per day, with similar strength cigarettes (nicotine yields).

No significant differences in fact were found in the mean levels of any of the smoking history variables. The period of longest abstinence, however, shows large inequality of variance ($F= 14.87$; $p= .0001$). Close inspection of the data again reveals a single outlying case to be the cause of the discrepancy (a 13 year gap in smoking for one of the Clinic group, compared to a longest gap of 3 years for the Waitlist group). (See *Appendix 30*)

Table 1

Basic Demography of Sampling Frame

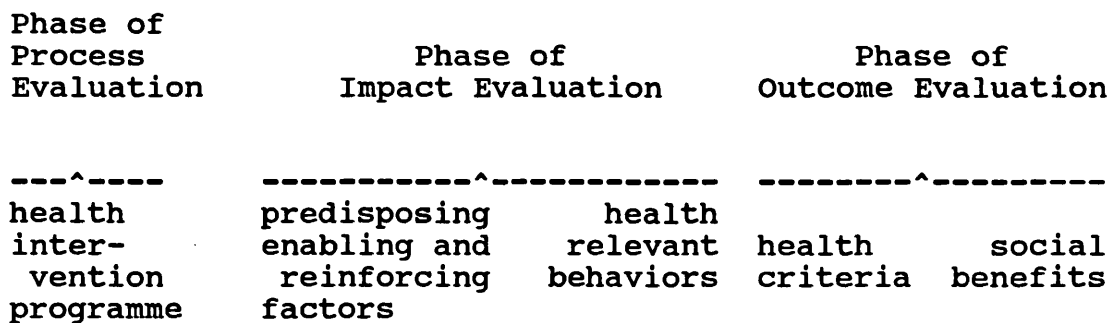
sub-sample	n	AGE		SEG		SEX	
		\bar{x}	(sd)	\bar{x}	(sd)	F%	M%
Clinic treatment group	40	32.17	(10.96)	3.43	(1.43)	60	40
Waitlist control group	50	37.38	(13.19)	3.29	(0.97)	62	38
Experimental choice controls	40	33.50	(7.17)	3.28	(1.13)	62	38
(i) never-smokers	[16]	32.38	(5.19)	3.125	(1.03)	69	31
(ii) ex-smokers	[12]	35.50	(9.11)	3.17	(1.40)	58	42
(iii) committed-smokers	[12]	33	(7.51)	3.58	(0.99)	58	42
Grand Total	130						
Grand Mean		34.50		3.33		61	39

Evaluation of the Clinic Treatment Programme

Although the anti-smoking Clinic was designed primarily to be a means of exploring decision processes, evaluation of the treatment programme gives a useful indication of its face validity as well as the ecological validity of the experimental study. Borrowing from Green et al's (1980) framework for planning health intervention programmes, it is useful to consider that three distinct forms of evaluation are possible. Each focuses upon a different phase of the programme and each draws upon different criteria of measurement. The model can be depicted schematically:

Figure 10.

Green's Multiphase Model of Evaluation



The 3 major phases are:

1. Process Evaluation : measuring the programme in its own terms; the immediate effects
2. Impact Evaluation : measuring the direct behavioral antecedents and consequences; short term effects
3. Outcome Evaluation : measuring the direct and indirect benefits from a long term perspective

Each phase is said to generate its own legitimate form of criteria for assessment. Much difficulty between contributing specialist groups in the health field can be avoided by recognizing that each may have a particular focus of interest in any one phase. Each phase, however, can be seen to have an independent and equal importance to the overall shape of the programme.

Process Evaluation of Clinic Treatment

Most treatment programmes face two problems; Drop out rate and relapse rate. Rates of attendance (or drop out rate) provide a simple but direct first measure of process evaluation. On average Clinic subjects attended at least 3 of the 4 sessions. In all, 25 (63%) opted for the full course of 4 treatments. Only 3 (7%) chose not to return after the first treatment session. The remaining 12 (30%) received 2 or 3 sessions.

Most of the subjects opted to receive most of their chosen treatment. Comments expressed in the Follow-Up questionnaire also attest to the credibility of the Clinic operation (even if subjects found their treatment lacking in efficacy).

Patients immediate responsiveness to treatment gives a further indication of process. Both forms of therapy were associated with substantial levels of responding, again suggesting that the final choice of options had meaningful consequences for Clinic subjects. (See *Appendix 31*).

Impact Evaluation of Clinic Treatment

Changes in smoking rate during the course of treatment provide the most direct means of measuring treatment impact.

During the course of clinic treatment, most subjects managed to achieve a substantial reduction in their smoking rates. Only 2 showed no reduction at all. 19 (45%) of the sample cut out smoking completely whilst attending the Clinic. At the end of treatment, smoking rates had on average been reduced by 2/3 of subjects' base rate. Overall, the clinic treatment resulted in a creditable level of immediate impact. (See *Appendix 32*).

Outcome Evaluation of Clinic Treatment

The final phase of evaluation provides the longest term measurement opportunity.

In the Follow-Up Questionnaire Clinic and Waitlist subjects were asked to recount the longest period they had subsequently stayed as non-smokers (see Table 2). Clinic subjects averaged only a few days (\bar{x} = 4.63; sd = 2.98). Waitlist subjects averaged a little better (\bar{x} = 6.00; sd = 2.62).

This finding is consistent with the general picture for smoking clinics. In their report *Smoking or Health*, the Royal College of Physicians (1977) found that smoking-withdrawal clinics rarely achieve a success rate more than 30%. Whatever intervention or treatment programme is used, only 15-25% remain ex-smokers after a 1 year follow up (Breglund 1969; Schwartz 1969; Bernstein 1970; Hunt & Bepalec 1974;)

Table 2.

**Changes in smoking rate over
18 months follow-up period**

sub sample	base rate			follow-up rate			median percent reduction
	\bar{x}	sd	medn	\bar{x}	sd	medn	
Clinic	30.22	12.73	27	23.08	15.94	20	74
Waitlist	28.97	11.29	30	18.67	10.75	18.75	62.5

Note: Follow-up data is based on the following return rates:

Clinic Subjects	n= 27 (67.5%)	} Overall n= 47 (52.2%)
Waitlist subjects	n= 20 (40.0%)	

Clinic treatment thus receives a relatively poor outcome evaluation compared to the non-treatment controls.

In the original LSE Smoking Clinic study, employing essentially identical therapeutic treatments, Hayes (1977) found a mean reduction in smoking to 30% of the base rate for both treatments after a 3 months follow up.

On a broader basis, it has been generally found that only 14 % of smokers remain stopped 2 years after quitting, and that 3 out of 4 smokers have tried but failed (Eisinger 1972). As McKennell & Thomas (1967) so aptly conclude, smoking is a habit easy to acquire but difficult to abandon.

Conclusions

Three sub-groups, Clinic patients (n= 40), Waitlist Controls (n=50) and Experimental Controls (n=40) were sampled and carefully matched for socio-demographic characteristics. This was based on a ratio of 3 females to 2 males across the sub-groups, which also appears to reflect the proportions generally attending anti-smoking clinics. On average, subjects are in the mid thirties age range and come from middle class backgrounds. A broader range of characteristics was sampled, however, and within the size limitations form a generally more representative profile. Clinic applicants exhibit a smoking history with typical start smoking ages around 17 years old and smoke between 1-2 packs of cigarettes per day.

Green's Multiphase model directs attention at aspects of process, impact and outcome evaluation. Though not designed as a test of treatment efficacy, such evaluation tests the face validity of the Clinic operation and further establishes the context of choice for the subject group.

Most clinic patients opted to receive most of their treatment sessions and responded quite vigorously to the therapeutic interventions which shows a credible level of process evaluation. Impact evaluation is seen in the changes of smoking rate during the course of treatment. Nearly half of the subjects managed to stop completely during treatment and by the end of the sessions, most had reduced smoking to at least 2/3 of their base rate. Longer term follow up reveals the outcome evaluation. This was less encouraging, but similar to findings from other researches on Clinic treatments. Few actually stayed stopped smoking altogether, though a median reduction to 74% of base rate was obtained. This result, however, is less than that for Waitlist control subjects who did not receive Clinic treatment.

RESULTS AND ANALYSIS (2)**ANALYSIS THROUGH RATIONALIST ALGORITHMS:****Reasoned Action for the Decision to Stop Smoking.***The Set of Salient Beliefs.*

Content analysis of the first Balance Sheet (BS1) for the Clinic subjects yields a total of 23 separate dimensions or salient beliefs (see Table 3). On average, however, individual subjects volunteered around 8 or 9 dimensions ($\bar{x} = 8.88$; $sd = 1.9$; range = 4-13).

Table 3.

**Salient Beliefs for Stopping Smoking:
Balance Sheet 1**

	Positive considerations	Negative considerations
1. Gains + and Losses- for SELF	improve/increase: health breathing & fitness finances lifestyle options nicer breath smell on clothes cleaner environment better atmosphere (less pollution) reduce risk of cancer	loss of: relaxation social confidence prop (handling) concentration pleasure gain weight become irritable
2. Gains + and Losses- for OTHERS	assist others to stop assist family welfare (modelling role)	
3. SELF approval+ or SELF disapproval-	increase autonomy	reactance (against pressure to stop smoking)
4. SOCIAL approval+ or SOCIAL disapproval-	social acceptance (as non-smoker) social approval (for quitting)	feel an outsider (with smoking friends)

The Modality of Salient Beliefs.

Scharsre (1966) says that the most common reason for stopping the use of drugs is the "addicts" realization that they are physically addicted, that is the perception of dependency. 90% of the Clinic subjects appear to share this view in their most salient belief (see table 4).

Table 4.

**Relative frequency (Modality) of Salient Beliefs.
Balance Sheet 1: Outcomes for Stopping Smoking**

Dimension	Outcome	Modality (%)
1	increase autonomy	90
2	improve health	85
3	improve finances	83
4	social acceptance	73
5	loss of relaxation	55
6	have nicer breath	53
7	social approval	45
8	gain weight	43
9	loss of pleasure	40
10	create better atmosphere	38
11	loss of prop	35
12	feel an outsider	33
13	create cleaner environment	30
14	reactance	28
15	nicer smell on clothes	28
16	increase lifestyle options	25
17	become irritable	25
18	better breathing	23
19	loss of social confidence	20
20	assist others to stop	15
21	assist family welfare	10
22	reduce risk of cancer	10
23	loss of concentration	5

The salient set of beliefs compared with other studies.

16 of the 23 dimensions are directly comparable with Fishbein (1982). The first 6 dimensions also correspond directly with the 6 broad "attitude areas" identified by Marsh & Matheson (1983). (see Table 5). Further, only the first 6 dimensions elicited in the present study had a modal frequency greater than 50% . The remaining dimensions elicited in Balance Sheet 1 correspond quite closely with the modal set of salient beliefs elicited by Marsh & Matheson or could possibly be subsumed under similar headings.

Table 5.

**Comparison of salient beliefs for
smoking/not smoking outcomes**

Balance Sheet 1 (present study)	Fishbein (1982)	Marsh & Matheson (1983)
increase autonomy	increase dependency	self-esteem
improve health	harmful to health	health threat
improve finances	expensive	financial outcome
social acceptance	} acceptance	social reaction
feel an outsider	} by peers	
nicer breath	bad breath	aesthetic gains
loss of relaxation	relaxing	affect control
social approval		
gain weight	keep weight down	
loss of pleasure	pleasant taste experience	
loss of prop	something to do with hands	
loss of social- confidence	helps interaction	
become irritable	relieves tension	
better breathing	breathing problems	
nicer smell on clothes	bad odor on clothes	
reduce cancer risk	increase cancer risk	
loss of concentration	helps concentration	
better atmosphere	offensive to others	
clean environment		
family welfare		
assist others		
increase life- style options		
reactance		

The first 6 dimensions in Balance Sheet 1 also correspond closely with the 6 "motivating factors" identified in the Royal College of Physicians report (1977)

Weight gain, however, is not easy to categorize. It does not appear as a salient dimension in Marsh & Matheson's (1983) study. They say,

"Only 6% bemoaned an increase in weight as a result [of quitting]- either the others did not gain weight or did not care about it."

Weight gain emerged as a salient consideration, however in the study by Fishbein (1982).

More generally, it is particularly noteworthy that Marsh & Matheson (1983) found few negative factors in their study for giving up smoking. As they express it,

"One good thing or bad thing follows from another."

In the present study 9 of the 23 outcome dimensions are negatively evaluated, mostly concerning some form of loss. Dimension 17 (Reactance) relates reflexively to the decision process. For some Clinic volunteers the decision to quit smoking meant self-disapproval and a possible resistance to be successful. For example, one subject resented that he felt:

"dominated by someone else's decision."

Another contemplated:

"The thought of giving up makes me want to smoke more."

Yet others revealed an interesting paradox in their verdict, reflecting:

"Deep down I don't want to give up."

According to Brehm's (1966) Reactance Theory, people react in proportion to the importance of the perceived freedom that is threatened (or the number of freedoms). Reactance results in attitude change away from the position of the source of the threat and increased attractiveness of the alternative (Brehm & Sensenig 1966; Worchel & Brehm 1971).

Quantification of the Fishbein Model

The basic expression of the Fishbein algorithm is given by:

$$B \sim I = f[w_1 A_B + w_2 SN]$$

where:

- B = the target Behavior
- I = the Intention to perform the behavior
- A_B = Attitude to performing the Behavior
- SN = Subjective Norm concerning performing the behavior

w_1 and w_2 are relative weighting parameters determined through standard multiple regression techniques (Beta weights).

The Attitude component consists of the sum of all salient beliefs (b_i) multiplied by the evaluation of those beliefs (e_i). viz:

$$A_B = f[\sum b_i e_i]$$

The Subjective Norm component is given by the the sum of all salient normative beliefs (b_j) multiplied by the Motivation to Comply with those considerations (M_j). viz:

$$SN = f[\sum b_j M_j]$$

Intention not to smoke [Intention (i)]

All clinic applicants were asked to express their immediate intentions to stop smoking (as a likelihood scaled from 0 to 100%). Table 6 summarizes the ratings given to the first measure of intention.

Table 6.

Intention to stop smoking (i)

sub sample	\bar{x}	sd	median	min	max
Clinic	48.68	18.93	48.5	25	100
Waitlist	43.17	20.68	43.5	0	100

No significant differences were found between the 2 groups ($t= 1.27$; $p= .20$). By inspection of the data, however, Clinic subjects do appear at this stage to be marginally more confident than the Waitlist group. At the time the measure was taken, it should be noted, assignment to either group had not been made.

Analysis based on Individual Salient Beliefs.

Of the 23 outcomes in Balance Sheet 1, there are 5 which may be considered as Normative components (dimensions 4,7,12,20,21). The remaining 18 are attitudinal. The distinction is operationalized here in terms of where subjects themselves categorized their beliefs in the Balance Sheet procedure (considerations relative to SELF were regarded as ATTITUDINAL, considerations relative to OTHERS as NORMATIVE). Tables 7 and 8 give the average ratings of of all 23 dimensions, located as attitudinal and normative components.

Table 7.

**Average attitudinal beliefs, outcome evaluations
and products for stopping smoking.**

outcomes	b_i	e_i	$b_i \cdot e_i$
increase autonomy	7.44	6.89	51.31
improve health	6.96	7.32	50.98
improve finances	7.28	5.13	37.28
loss of relaxation	4.08	-3.73	-15.22
nicer breath	4.49	3.76	16.86
gain weight	3.18	-3.38	-10.72
loss of pleasure	2.74	-2.01	- 5.49
better atmosphere	2.30	2.35	5.41
loss of prop	2.80	-2.29	-6.41
cleaner environment	2.41	1.69	4.07
reactance	1.68	-1.49	-2.49
nicer smell on clothes	2.06	1.99	4.10
increase lifestyle	1.86	1.83	3.40
become irritable	1.84	-1.56	-2.86
better breathing	1.68	1.70	2.86
lose social confidence	1.40	-1.31	-1.84
reduce cancer risk	0.60	0.70	0.42
lose concentration	0.36	-0.37	-0.14

Table 8.

**Average normative beliefs, motivations to
comply and products for stopping smoking.**

Referents	b_j	m_j	$b_j \cdot m_j$
social acceptance	5.17	3.91	20.21
social approval	3.87	3.51	13.58
feel an outsider	1.95	-1.04	-2.02
assist others	1.04	1.04	1.08
assist family welfare	0.68	0.78	0.52

Most noticeably, there is a substantial decrease in average products ($b_i \cdot e_i$ scores) after the first few (most modally frequent) dimensions, particularly the first 3 attitude items and first one normative item.

Predicting Intentions from Individual Salient Beliefs

As Thomas (1975) notes,

"Strict adherence to Fishbein Methodology requires using each individuals own salient beliefs, that is, the beliefs that determine the attitude."

Regressing Attitude and Subjective Norms based on all 23 dimensions of Individual Salient Beliefs (ISB) yields a disappointingly poor prediction of intention. ($R^2 = .01$; $F = .23$; $p = .87$). (See figure 11).

The Fishbein formula, however, shows itself to be a superior predictor than a simple SEU formulation based on the overall expectancy-value scores of the same 23 dimensions (Overall SEU regression equation: $R^2 = .0004$; $F = .001$; $p = .98$).

A better though still non-significant regression model is obtained with the expectancy-value scores summated into the 4 categories formed by the Balance Sheet procedure ($R^2 = .08$; $F = .08$; $p = .58$). (See figure 12).

Gains and losses for Self receive the highest mean score and also have the largest number of contributing dimensions. Each component is also associated with a high standard deviation, however, indicating that for many subjects the gains are balanced by the losses. Only Gains and Losses for Others has no negative considerations (compare Table 3).

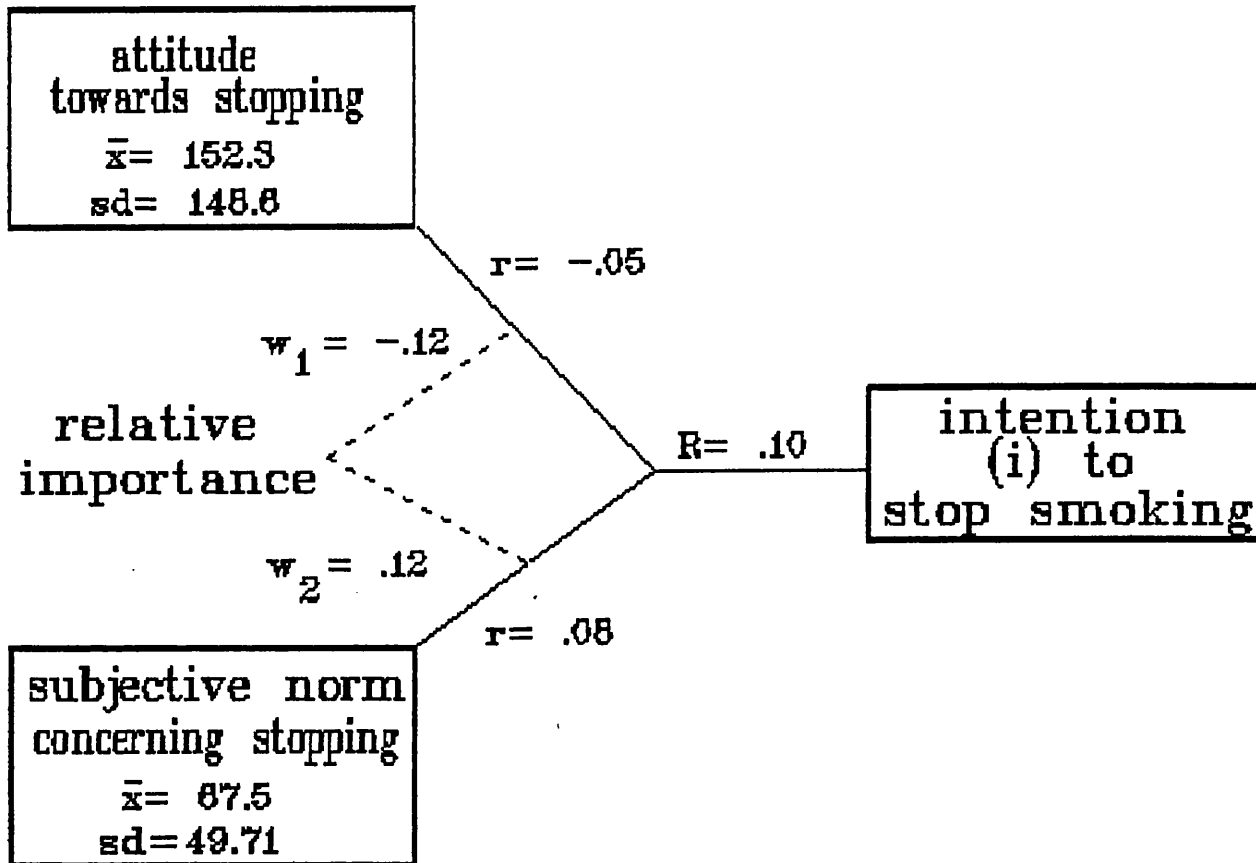
Predicting Intentions from Modal Salient Beliefs

Further improved predictions are obtained by restricting the composition of attitudinal and subjective norm components to Modal Salient Beliefs (MSB) with a frequency $> 50\%$ (see figure 13). Though still non-significant, the resulting regression equation is substantially improved from the previous analyses based on all 23 ISB ($R^2 = .09$; $F = 1.67$; $p = .19$). Most noteworthy is the conspicuously higher weighting given to the Subjective Norm component.

Figure 11

Multiple Regression Analysis of
Attitude and Subjective Norm Components
on intention to Stop Smoking

(From all 23 Individual Salient Beliefs; Balance Sheet 1)



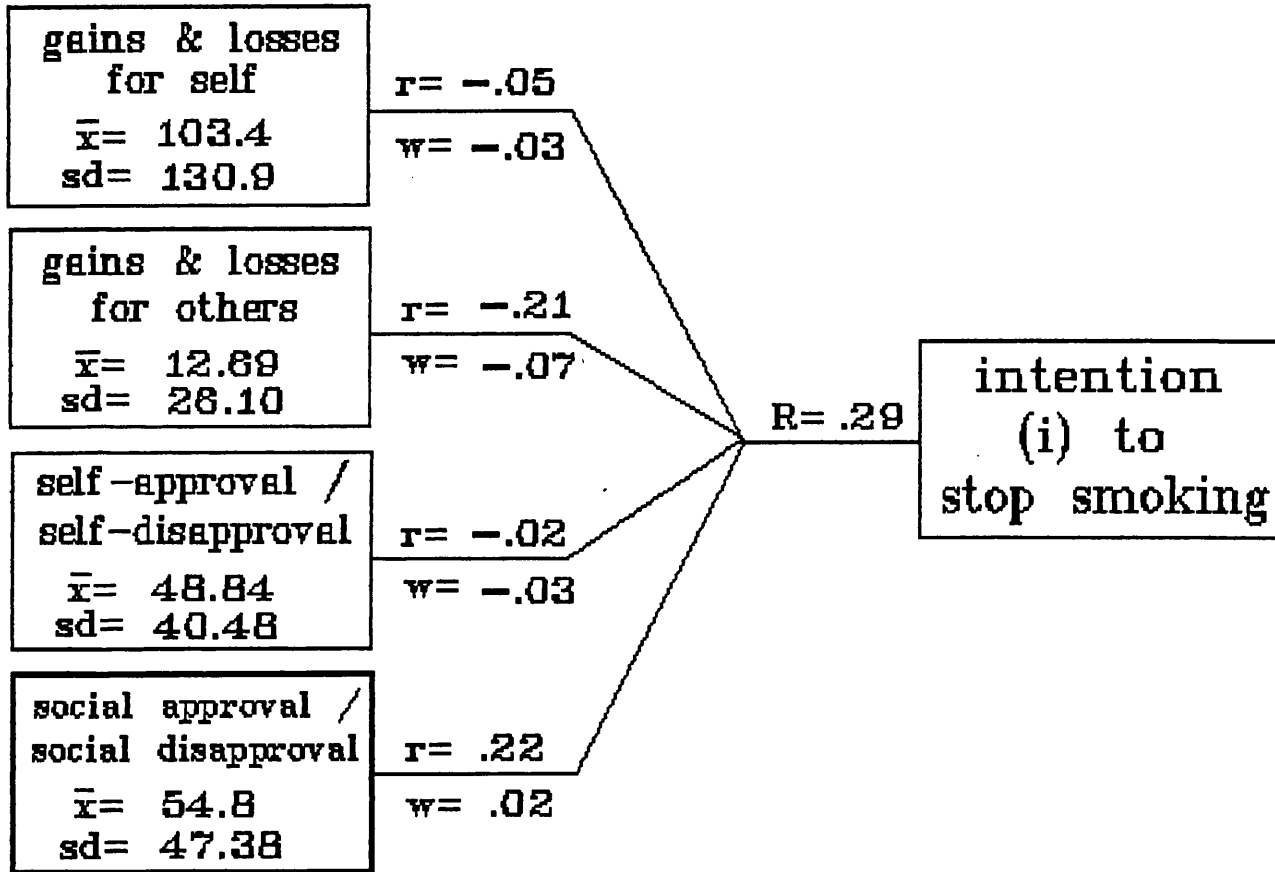
Overall regression equation:

$$R^2 = .01; F = 2.32; p = .87$$

Figure 12

**Multiple Regression Analysis of
Balance Sheet Components on
Intention to Stop Smoking**

(From all 23 Individual Salient Beliefs; Balance Sheet 1)



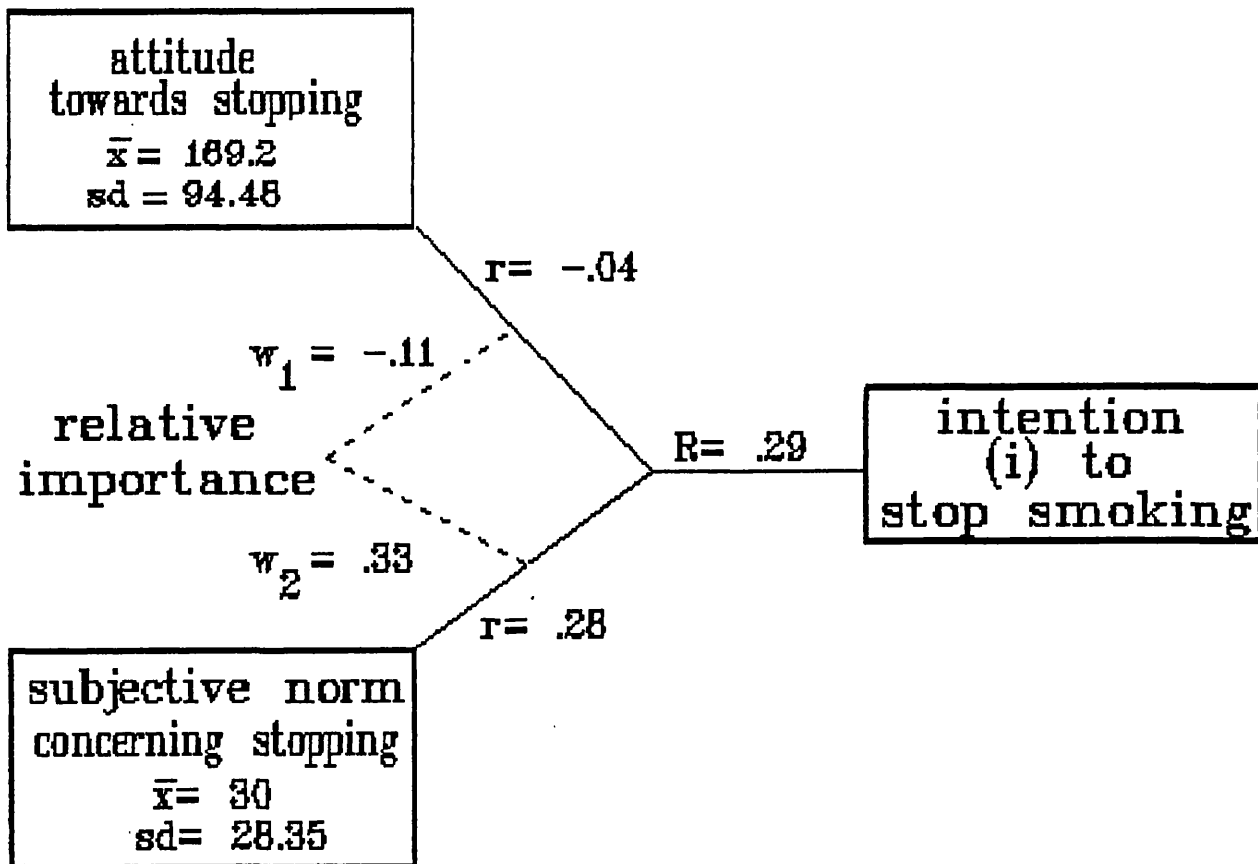
Overall regression equation:

$$R^2 = .08; F = .76; p = .58$$

Figure 13

**Multiple Regression Analysis of
Attitude and Subjective Norm Components on
Intention to Stop Smoking**

(From Modal Salient Beliefs; Balance Sheet 1)



Overall regression equation:

$$R^2 = .08; F = 1.67; p = .19$$

Modal salient Beliefs consist of all elicited beliefs with a shared frequency > 50%

As noted earlier, the first 6 dimensions elicited in Balance Sheet 1 are directly comparable with the 6 broad attitude areas identified by Mash & Matheson (1983). A separate regression of the first 6 MSB (treated as independent variables) yields a multiple correlation of $R = .44$, but a weaker overall regression ($R^2 = .19$; $F = .11$; $p = .39$).

Recombining all 23 ISB into Marsh & Matheson's 6 broad attitude areas and performing a separate regression results in a still weaker prediction ($R^2 = .16$; $F = .95$; $p = .48$).

The Contribution of External Variables.

In the theory of Reasoned Action, behavior is shaped by intention which is determined by attitudes and subjective norms. The influence of external variables is said to be mediated via salient beliefs which make up the attitudinal and normative components.

For Clinic subjects, however, external variables (demography, smoking history and treatment history) provide a better direct prediction of action. (See figure 14).

When not mediated through the recursive chain of intentions, attitude and subjective norm components, the set of external variables correlate significantly with Least Amount Smoked ($R = .59$; $p = .05$). In comparison, Intention not to smoke shows only a modest correlation with ensuing action ($r = .30$).

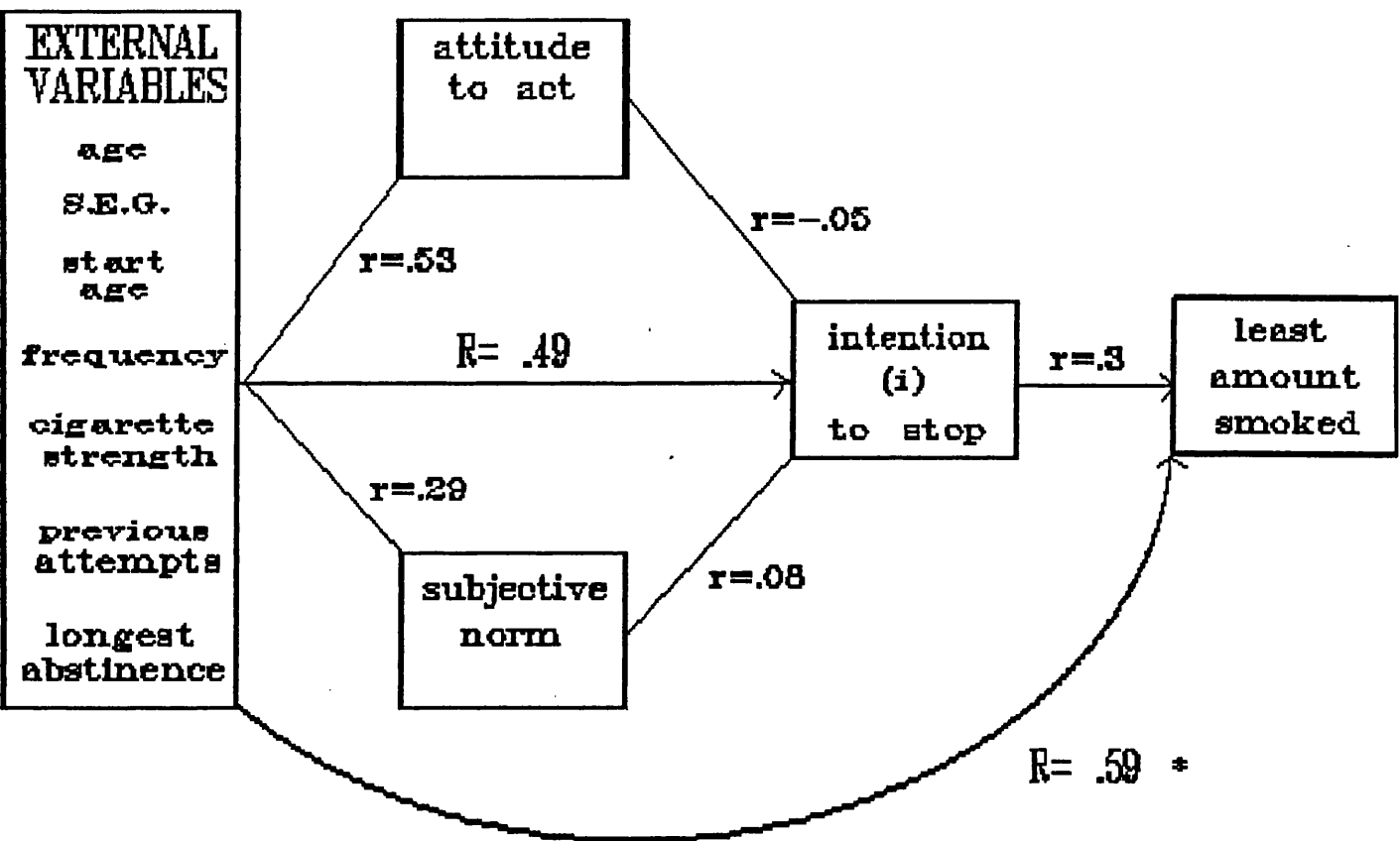
External variables have a substantial statistical association with intention ($R = .49$) but also with attitude ($R = .54$) and subjective norm ($R = .29$). Most noteworthy, the number of previous attempts to stop smoking shows the largest influence with Intention to stop ($\beta = .54$).

Attitude and subjective norm, moreover, produce a better direct prediction of behavior ($R = .45$; $p = .05$).

Figure 14

Contribution of External variables on
Fishbein Model

(From Balance Sheet 1)



* significant at $p < .05$

Sex differences.

Jacobson (1981) reviews evidence showing that women generally find it harder than men to stop smoking. They are less successful in their attempts to quit, moreover, regardless of age and occupational group.

Since sex was classified categorically it was not included in the general regression of external variables.

Instead, a separate series of statistical comparisons was conducted for differences between the two gender groups. Viz:

Table 9.

Sex Differences in Stopping Smoking

sex	intention to stop (i)		Least amount smoked		attitude		subjective norm	
	\bar{x}	s.d.	\bar{x}	s.d.	\bar{x}	s.d.	\bar{x}	s.d.
males	51.93	18.20	83.08	25.66	165	143.7	39.17	24.51
females	45.52	19.49	81.22	31.63	143	154.2	86.38	53.55

The only statistical differences found between the sexes were for Subjective Norm scores, which proved to be highly significant ($t= 3.29$ for 36 df ; $p= .002$). This reaffirms the findings of Chung & Fishbein (1979), that women are more sensitive than men to normative considerations in their decision to stop smoking.

The analysis thus far reveals a number of empirical anomalies for the Fishbein model.

Whilst external variables show a number of statistically interesting and theoretically significant relationships with mediational variables, they also exhibit substantial direct correlations with behavior.

The key Intention variable has received at best an ambiguous showing in the data.

The smaller Modal set of salient beliefs results in substantially better predictions than the larger Individual set of salient beliefs.

Factor Analysis of Beliefs for Stopping Smoking (Balance Sheet 1).

Marsh & Matheson (1983) employed factor analysis in a radical revision of Fishbein's original algorithm. Marsh & Matheson's questionnaire contained 32 items with belief and value ratings. These were factor analyzed to give 6 broad "attitudinal" scales. The resultant algorithm departs from Fishbein's original formulation in two critical respects. Firstly, the distinction between attitudinal and normative influences was blurred. Instead, the normative considerations were subsumed under the "attitude area" of *social aspects*. Secondly, the original additive rule was replaced by an averaging model in which each of the basic scale scores was constructed from the various contributing items identified by factor analysis.

Factor analytic technique could be added to the original Fishbein formula for two related reasons:

1. As a numerical sieve to shake out responses into categories of similar strength (descriptive emphasis)
2. As an attempt to order the meaning of beliefs into attitudinal areas (causal emphasis).

Marsh & Matheson (1983) make it clear that their accent is on the latter. As they explain their findings,

"What is happening is that an undertone of feeling about giving up smoking is shaping at a very basic level, smokers beliefs about giving up."

This represents a clear departure from Fishbein's originally strong Rationalist principles (in which the internal audit is manifestly available to the decision maker). That is, the key *empirical problem* of belief salience is solved in the Marsh & Matheson study through principles more appropriately belonging to the Empiricist programme of decision making. Of greatest consequence is the implied change from Fishbein's original additive model to one of weighted values attached to relative gains.

According to Laudan (1977), however, empirical problems may be solved in either rival domain of science. What matters is the degree of epistemic threat posed by the solution. Although Marsh & Matheson's solution represents a triumph for the Empiricist algorithm, it is not equivalent to an explanation, so may be safely accommodated by the mainstream Rationalist theory. It remains, however, a potential form of degenerating problem shift.

Categories of salience cannot, in any case, be inductively arrived at, though Fishbein's method strongly assumes they are self-evident and unproblematic. In fact, of course, the modal categorization of subjects salient beliefs takes considerable interpretation, which in turn is theory dependent. For example, in the present study, the distinction between dimension 6 (nicer

breath) and dimension 15 (nicer smell on clothes) could arguably be subsumed under a single "nice to be near" category.

Three Clinic subjects volunteered *combined* outcome beliefs in this area (as belonging to a single dimension), such as "my breath/clothes will not offend". Others made reference *only* to niceness in terms of their "cleaner breath" *or* their "hair not smelling of smoke". In turn the whole "nice to be near" category may form part of an "aesthetics" dimension as Marsh & Matheson (1983) suggest.

Whatever factor structure emerges, the final denotation of meaning cannot be inferred from statistical frequencies alone.

Following Marsh & Matheson (1983), Varimax rotation was employed to analyze the 23 dimensions of Balance Sheet 1 in the present study. This resulted in 9 principal components accounting for 74.6% of the variance. Table 10 gives the factor loadings and offers tentative labels for the resulting factors.

Where possible, the emergent factors are labelled the same as Marsh & Matheson's study. Some factors reveal a close correspondence. Others, however, are difficult to interpret and given somewhat arbitrary titles. The variables making up Factor 4 (social image), for example are difficult to resolve into a single over-arching theme.

Table 10.

Principal Components Analysis of Balance Sheet 1

Factor	Cumulative % Variance	Contributing variables	Factor loading
1. life- enhancement	12.48	increase autonomy increase lifestyle improve health social approval lose social confidence reduce cancer risk	(.71) (.71) (.61) (.53) (.52) (.52)
2. affect control	21.42	loss of relaxation become irritable	(.79) (.71)
3. aesthetic gain	30.05	have nicer breath	(.71)
4. social image	37.68	assist family welfare gain weight nicer smell on clothes	(-.68) (.64) (-.54)
5. social acceptance	45.65	social acceptance	(.82)
6. loss of prop	53.43	loss of prop (handling)	(.85)
7. material gain	61.01	cleaner environment improve finances	(-.78) (-.51)
8. better atmosphere	68.74	better atmosphere (less pollution)	(.80)
9. assist others	74.54	assist others to stop	(.71)

To make interpretation easier, only variables contributing ± 0.5 to the factor loadings are included (rather than the figure of ± 0.3 conventionally employed).

Multi Attribute Utility Algorithms

Algorithms developed from Multi Attribute Utility Theory (MAUT) may offer a partial solution to the problems of modality and saliency in the Fishbein model. In effect MAUT algorithms give a relative weighting to dimensional salience. One way to do this is to equate salience with relative frequency at the group level.

Gardiner & Edwards (1975) created a Simple Multi Attribute Rating Technique (SMART) which covers the basic principles of MAUT in 10 steps.

The first few steps concern the appropriate identification of people, issues, entities and relevant dimensions.

Gardiner & Edwards urge that the number of dimensions be kept down, which they say can be achieved through recombining and moving up through the goal hierarchy, or even by leaving out less important goals. Raiffa (1969), however, argues that goals are not ordinarily set in hierarchies. Gardiner & Edwards suggest 8 dimensions as a rule of thumb, with 15 being too many. As they emphasize:

"The less important dimensions will have non-trivial weights only if there are not too many of them."

The critical selection of dimensions is, of course, identical to the saliency problem facing Fishbein. Neither approach gives a satisfactory solution to this major conceptual and empirical problem, though both interestingly, use a similar number as a rule of thumb.

The MAUT algorithm may help partially solve the empirical problem, however, by giving relative weighting to modality. It differs most from Fishbein's model in the next few steps which accrue the ratings into mathematical indicators of decision making. In the SMART version dimensions are rated in importance whilst preserving the ratio for salience. Once the importance weights are summated, dimensions are effectively weighted by their relative frequency in the salient set.

Subsequent steps give a location measure of each entity on each dimension. Where the dimension is subjective, this means in effect obtaining likelihood estimates, a procedure identical to Fishbein technique. Edwards (1971) and Raiffa (1968) disagree about this phase of the operation, however. Raiffa advocates a dimension by dimension utility curve. Edwards in contrast (like Fishbein) treats maximum and minimum values as linearly related. Edwards & Gardiner say that a straight line relationship is best when the underlying dimension is conditionally monotonic (that is where more is always preferred to less throughout the plausible range of values). Nonetheless, they do acknowledge that people sometimes are concerned that their preferences may be curvilinear.

The resultant Utility for entities is calculated by the expression:

$$U_i = \sum_j w_j \cdot u_{ij}$$

where

$$\sum_j w_j = 100$$

u_i = the aggregate utility for the i th entity

w_j = the normalized importance weight of the j th dimension

u_{ij} = the rescaled position of the i th entity on the j th dimension

The final step is to decide. For a single act the decision rule is to maximize U_i . The general case is expressed by Gardiner & Edwards as,

"benefit - minus - cost difference, not benefit - over cost difference."

That is, cost is treated as simply another value dimension but given a minus rating.

The ratings of dimensions elicited from the Balance sheets (and indeed from any expectancy-value exercise) can be readily transformed into a MAUT analysis using the SMART algorithm. Expectancy ratings directly provide the location measures and the value ratings are easily transposed into the importance weights, provided the relative frequency of occurrence is known.

Multi Attribute Utilities for Stopping Smoking

The 2 columns of the balance Sheet (positive and negative considerations) may be used to generate a SMART analysis for the decision to stop smoking (see Table 11). Folding back the MAUT transformed scores of all 23 salient beliefs results in an average Utility score in favour of stopping smoking ($\bar{x} = 3.78$; $sd = 2.52$).

Table 11.

MAUT analysis of Balance Sheet 1 (Stopping Smoking)

Positive dimension	\bar{x}	importance weight	final weight	location measure	aggregate utility
1	6.89	0.16	0.11	7.44	0.85
2	7.32	0.17	0.12	6.96	0.84
3	5.13	0.12	0.09	7.28	0.65
4	3.91	0.09	0.06	5.17	0.31
6	3.76	0.09	0.06	4.49	0.27
7	3.51	0.08	0.06	3.87	0.23
10	2.35	0.06	0.04	2.30	0.09
13	1.69	0.04	0.03	2.41	0.07
15	1.99	0.05	0.04	2.06	0.08
16	1.83	0.04	0.03	1.86	0.06
18	1.70	0.04	0.03	1.68	0.05
20	1.04	0.02	0.01	1.04	0.01
21	0.78	0.02	0.01	0.68	0.01
22	0.75	0.02	0.01	0.60	0.01
					3.53
					42.63

Branch weight: .71

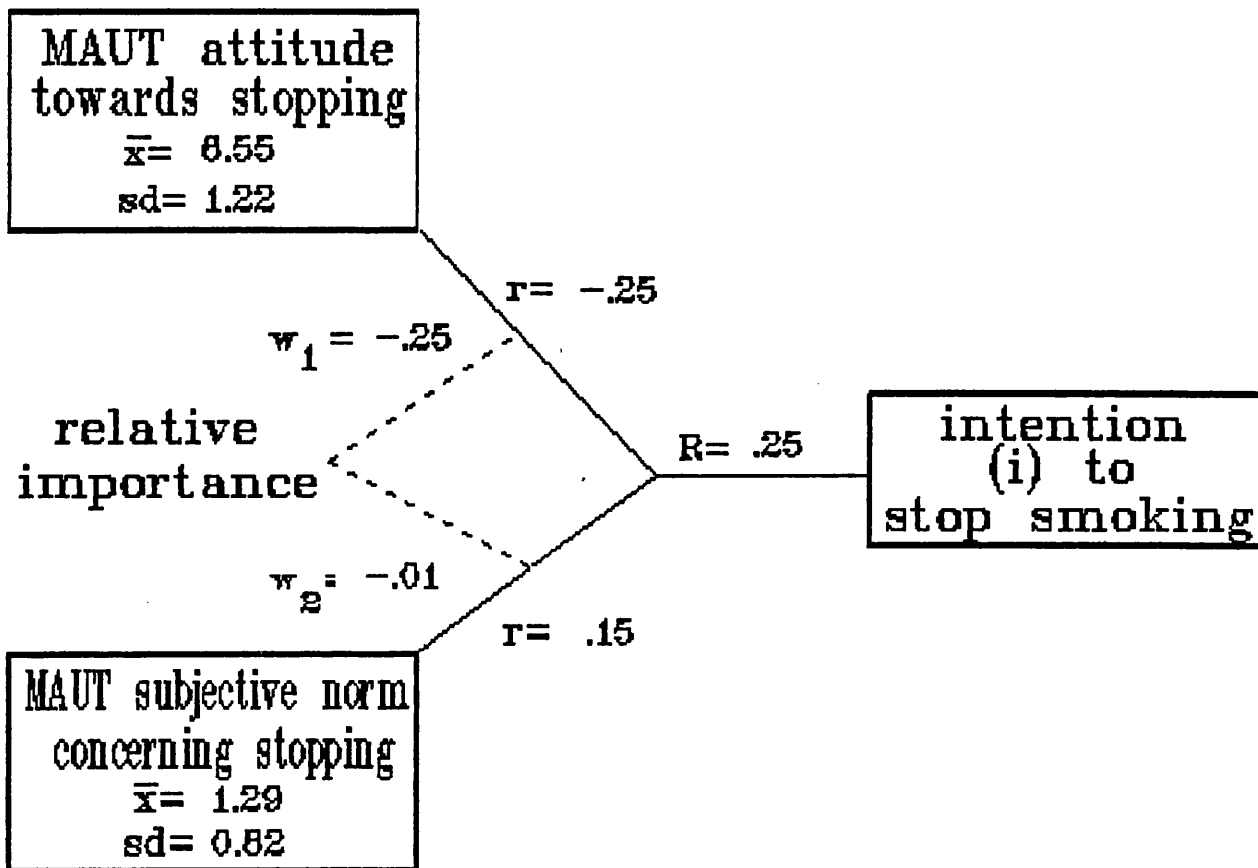
negative dimension	\bar{x}	importance weight	final weight	location measure	aggregate utility
5	3.73	0.22	0.06	4.08	0.24
8	3.38	0.20	0.04	3.18	0.13
9	2.01	0.12	0.03	2.74	0.08
11	2.29	0.13	0.04	2.80	0.11
12	1.04	0.06	0.02	1.95	0.04
14	1.49	0.09	0.03	1.68	0.05
17	1.56	0.09	0.03	1.84	0.06
19	1.31	0.08	0.02	1.40	0.03
23	0.34	0.02	0.01	0.36	0.004
					0.74
					17.13

Branch weight: .29

Figure 16

Multiple Regression Analysis of
MAUT Transformed Fishbein Components on
Intention to Stop Smoking

(From all 23 Individual Salient Beliefs; Balance Sheet 1)



Overall regression equation:

$$R^2 = .06; F = 1.16; p = .34$$

The Multi Attributed Utility score correlates only weakly, however, with Intention to stop smoking ($r = .08$). Treating the positive and negative MAUT scores as separate regression components results in an improved, though still non-significant, equation ($R^2 = .03$; $F = .50$; $p = .68$). (See figure 15).

Separate MAUT Analysis of the Fishbein Components

The same basic SMART technique may be extended to analyze the Fishbein model, treating the attitudinal and normative components as the branches of the decision tree (see Table 12). This formulation does not add significantly to the predictive power of either the straightforward MAUT analysis or the original Fishbein analysis. Regressing the MAUT score of Attitude and the MAUT score of Subjective Norm on Intention gives a weak regression equation ($R^2 = .01$; $F = .02$; $p = .87$).

MAUT Transformation of the Fishbein Model

MAUT analysis may be combined with the Fishbein model in a different way, however, retaining the most useful features of each approach. Performing a normal MAUT type analysis of the 23 Individual Salient Beliefs (Table 11) and then accumulating the Utility scores within each of the Fishbein components results in a substantially improved prediction of Intention. ($R^2 = .06$; $F = 1.16$; $p = .34$).

With this transformation, the positive and negative considerations are retained as the initial branches of the decision tree (retaining the sign, so that the scores reflect the differences in positive and negative utility). The values of aggregate utility for each dimension are summated, however, according to attitudinal or normative categories (see Figure 16). The transformed algorithm arguably forms a more accurate empirical representation of the psychological processes portrayed in Fishbein's Rationalist model.

Table 12.

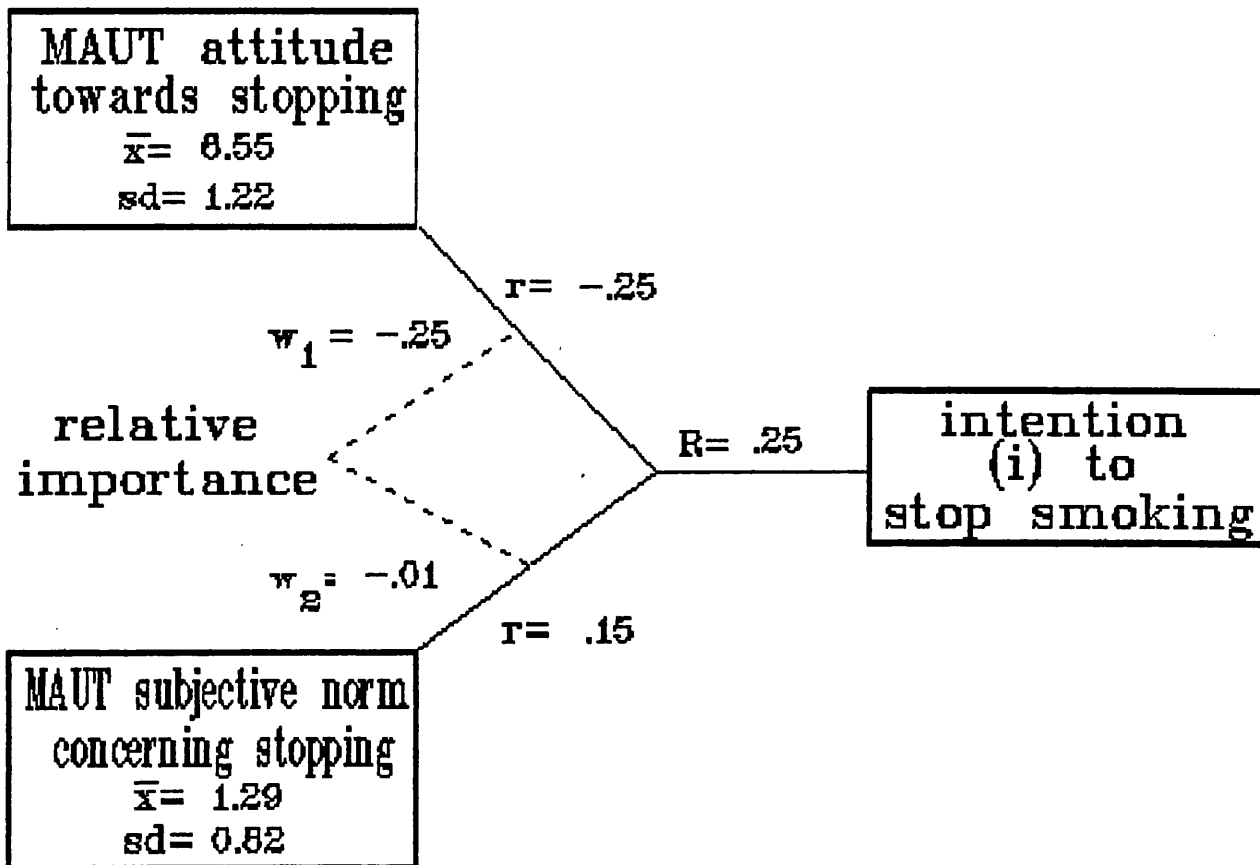
MAUT analysis of Fishbein components

dimension	\bar{x}	importance weight	final weight	location measure	aggregate utility
1	6.89	0.21	0.14	7.44	1.04
2	7.32	0.22	0.15	6.96	1.04
3	5.13	0.15	0.10	7.28	0.73
6	3.76	0.11	0.07	4.49	0.31
18	1.70	0.05	0.03	1.68	0.05
10	2.35	0.07	0.10	2.30	0.23
13	1.69	0.05	0.03	2.41	0.07
16	1.83	0.05	0.03	1.86	0.06
22	0.75	0.02	0.01	0.60	0.01
15	1.99	0.06	0.04	2.06	0.08
total 33.40					3.62
<i>Positive Attitude Component; Branch weight : .67</i>					
5	3.73	0.23	0.08	4.08	0.33
8	3.38	0.21	0.07	3.18	0.22
9	2.01	0.12	0.04	2.74	0.11
11	2.29	0.14	0.05	2.80	0.14
19	1.31	0.08	0.03	1.40	0.04
23	0.38	0.02	0.01	0.36	0.004
14	1.49	0.09	0.03	1.68	0.05
17	1.56	0.10	0.03	1.84	0.06
total 16.09					0.95
<i>Negative Attitude Component; Branch weight : .33</i>					
4	3.91	0.42	0.38	5.17	1.96
7	3.51	0.38	0.34	3.87	1.32
21	0.78	0.08	0.07	0.68	0.05
20	1.04	0.11	0.10	1.04	0.10
total 9.23					3.43
<i>Positive Subjective Norm Component; Branch weight : .90</i>					
12	1.04	1.0	0.10	1.95	0.2
total 1.04					0.2
<i>Negative Subjective Norm Component; Branch weight : .10</i>					

Figure 16

**Multiple Regression Analysis of
MAUT Transformed Fishbein Components on
Intention to Stop Smoking**

(From all 23 Individual Salient Beliefs; Balance Sheet 1)



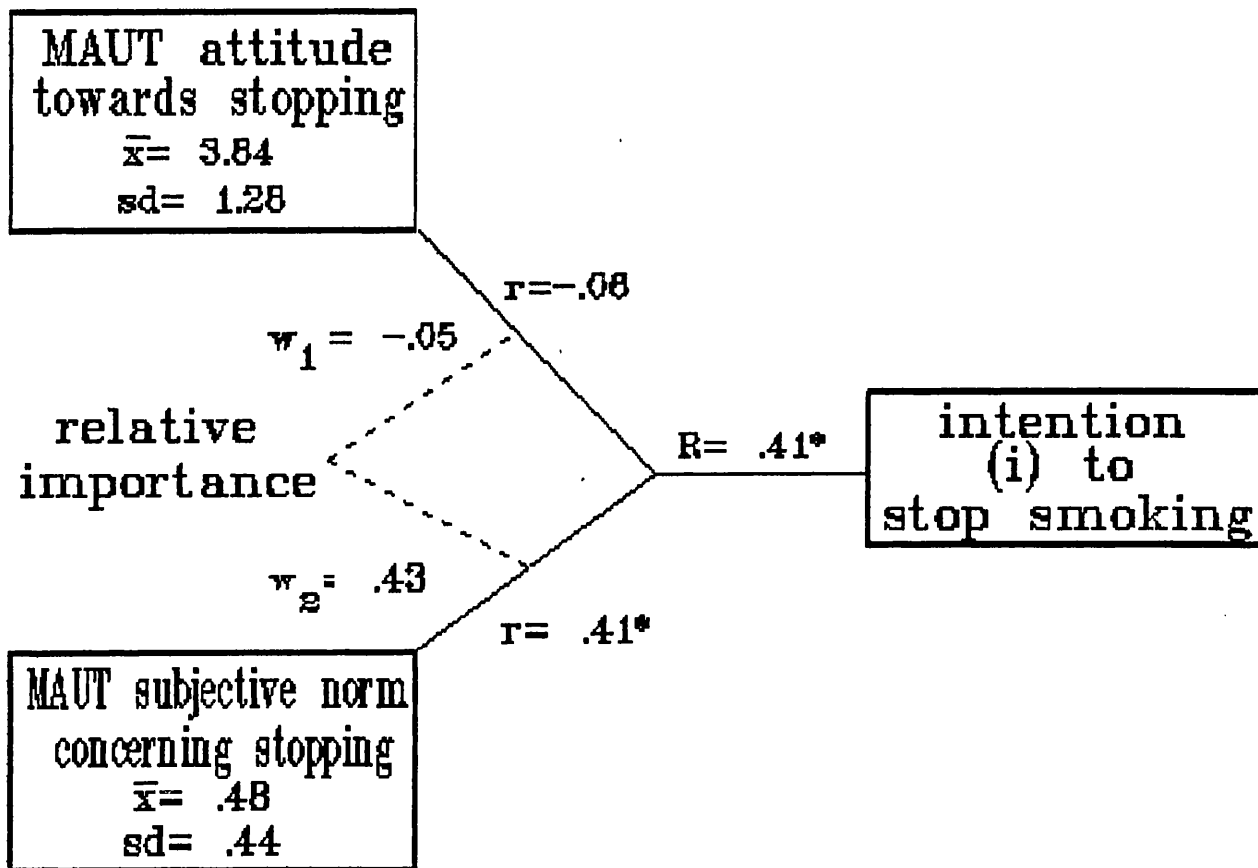
Overall regression equation:

$$R^2 = .06; F = 1.16; p = .34$$

Figure 17

Multiple Regression Analysis of
MAUT Transformed Fishbein Components on
Intention to Stop Smoking

(From Modal Salient Beliefs; Balance Sheet 1)



Overall regression equation:

$$R^2 = .17; F = 3.64; p = .02 *$$

* significant at $p < .05$

Yet better predictions are obtained using the same procedure but restricting the analysis to the first few Modal Salient Beliefs (with a frequency > 50%). This results in a significant regression equation ($R^2 = .17$; $F = 3.64$; $p = .02$). (See figure 17)

As argued earlier, one of the major differences between the MAUT algorithm and Fishbein's model lies in the relative weighting of the evaluative (importance) scores. At a practical level it means that subjects who utilize few dimensions may be given a higher final product score than subjects who employ many dimensions. The reverse holds true for Fishbein's original formulation.

Reasoned Action for the Choice of Treatment (Balance Sheet 2).

Far fewer dimensions were elicited for the choice of treatment options (Balance Sheet 2) than for the option of stopping smoking (Balance Sheet 1).

Both Clinic and Experimental Control subjects produced on average around 3-4 dimensions each for the treatment options. (Substantially less than the 8 or so dimensions for "stopping smoking" in Balance Sheet 1).

Table 13 shows that Experimental Control subjects generally have a higher frequency of elicited dimensions than do Clinic subjects (on average 15 as against 13). The difference was found to be non significant, however. Closer inspection of the table shows the distribution to be markedly different with Control subjects giving higher endorsements to fewer dimensions. Clinic subjects, in contrast are more evenly spread in their use of the salient set of beliefs ($F = 5.17$; $p = .004$).

Table 13.

**Overall Frequency of Salient Beliefs
in Balance Sheet 2.**

Dimension	Clinic sample		Control sample		Combined samples	
	n	%	n	%	n	%
A	19	48	33	83	52	65
B	19	48	25	63	44	55
C	17	43	30	75	47	59
D	14	35	21	53	35	44
E	20	50	29	73	49	61
F	10	25	18	45	28	35
G	12	30	11	28	23	29
H	18	45	15	38	33	41
I	9	23	12	30	21	26
J	9	23	1	3	10	13
K	7	18	2	5	9	11
L	5	13	0	0	5	6
M	10	25	4	10	14	18
	total	169	201			
	\bar{x}	13	33	15.5	39	36

Treatment sensation refers to the perceived intrinsic gentleness - nastiness of the treatment experience.

Treatment onset refers to the immediacy or time delay in treatment effects.

Treatment durability refers to the length of time positive treatment effects are perceived to last for.

Although Clinic and Experimental Control subjects generated similar sets of salient beliefs, none of the Control group volunteered dimension 12 (assist others). Either Clinic subjects were more altruistic than Controls, or, more likely, assisting others is instrumental in helping subjects sustain their chosen action through belief bolstering or dissonance reduction. As Janis & Mann (1977) note:

"Post decisional bolstering raises threshold for responsiveness to challenges."

Disaggregating the data further shows that Hypnosis treatment is generally given more salient beliefs. Clinic subjects do not consider Rapid smoking in terms of treatment interest (see Table 14).

Table 14.

**Clinic Subjects Salient Beliefs
for the 2 treatment options.**

Dimension	Hypnosis		Rapid Smoking	
	n	%	n	%
A treatment sensation	12	30	13	33
B treatment durability	10	33	15	38
C personal suitability	11	28	9	23
D treatment onset	9	23	9	23
E treatment power	16	40	13	33
F locus of control	6	15	7	18
G effortlessness	12	30	1	3
H fear of treatment	12	30	15	38
I withdrawal symptoms	7	18	4	10
J self-approval	9	23	5	13
K treatment interest	7	18	0	0
L assist others	5	13	1	3
M social approval	8	20	6	15
total	124		98	
\bar{x}	9.5	24	7.5	19

Table 15.

**Control Subjects Salient Beliefs
for the 2 treatment options.**

Dimension	Hypnosis		Rapid Smoking	
	n	%	n	%
A treatment sensation	23	58	24	60
B treatment durability	18	45	20	50
C personal suitability	22	55	17	43
D treatment onset	13	33	13	33
E treatment power	13	33	25	63
F locus of control	16	40	7	18
G effortlessness	11	28	0	0
H fear of treatment	11	28	6	15
I withdrawal symptoms	8	20	8	20
J self-approval	1	3	0	0
K treatment interest	2	5	0	0
L assist others	0	0	0	0
M social approval	2	5	2	5
total	140		122	
\bar{x}	10.7	27	9.4	23

Control subjects in particular do not employ dimensions G (effortlessness), J (self-approval), or K (treatment interest) for Rapid Smoking (see Table 15).

Thomas (1975) reaffirms that Fishbein theory differs from other attitude theories most of all in concerning determinants and not indicant beliefs of attitudes. She is also critical of other studies for using the Fishbein model with insufficient care and for not justifying the selection and salience of belief items. As Thomas remarks,

"The onus is on the user of the equation to show that the attributes used are salient for most of the subjects or to attempt some degree of scale purification."

With this caution it is pertinent to explore the nature of the beliefs contained in the salient set. In Balance Sheet 2 (considerations of treatment choice), 5 of the 13 belief dimensions were explicitly contained in the experimental manipulation of information (treatment power, treatment durability, treatment onset, locus of control and withdrawal symptoms). Fear of treatment, treatment sensation, personal suitability, effortlessness and treatment interest are all likely subjective experiences which would be easy to infer from the content. This is, perhaps, a difference in indicant as opposed to determinant beliefs (c.f. Thomas & Tuck 1975). Beliefs about self-approval, social approval, and assist others, however, are clearly normatively oriented.

Strength and Composition of Underlying Beliefs (Clinic Subjects)

Clinic subjects appear to perceive Hypnosis as a powerful treatment. They also give a high expected-value to associations of effortlessness and pleasant sensation. These strong positive considerations are to some extent offset, however, by a fairly strong fear of the treatment. Perhaps most surprisingly it is rated on average as personally unsuitable (see table 16). Normative beliefs are given only a nominal expression.

Rapid Smoking treatment is perceived by Clinic subjects more negatively overall than Hypnosis. Strongest of all is fear of treatment closely followed by unpleasant treatment sensation. It is also seen as personally unsuitable. In contrast to Hypnosis, the most positive attribute is locus of control (see table 17). Again, normative considerations receive almost neutral weighting.

Table 16.

Clinic Subjects Beliefs about Hypnosis Treatment.

*Average attitudinal beliefs,
outcome evaluations and products.*

Outcome	b_i	e_i	$b_i \cdot e_i$
treatment sensation	2.94	2.53	7.44
treatment durability	1.92	-0.63	-1.20
personal suitability	2.36	-0.63	-1.47
treatment effects onset	1.85	1.89	3.5
treatment power	3.85	2.86	11.01
locus of control	1.38	-1.34	-1.85
effortlessness	2.83	2.67	7.56
fear of treatment	2.07	-2.05	-4.23
less withdrawal symptoms	1.22	0.22	0.27
self-approval	1.95	-1.07	-2.08
treatment interest	1.64	1.43	2.35

*Average normative beliefs,
motivation to comply and products.*

referents	b_j	m_j	$b_j \cdot m_j$
assist others	1.09	-0.89	-0.97
social approval	1.84	-0.17	-0.32

Overall mean products score: 20.01

In contrast to Balance Sheet 1 the beliefs elicited for the treatment options (Balance Sheet 2) show a much smaller correspondence between modality and belief strength. That is, the first few (most modally frequent) items are not necessarily those with the highest product scores.

Table 17.

Clinic Subjects Beliefs about Rapid Smoking Treatment.

*Average attitudinal beliefs,
outcome evaluations and products.*

Outcomes	b_i	e_i	$b_i \cdot e_i$
treatment sensation	3.56	-3.11	-11.08
treatment durability	3.11	0.36	1.12
personal suitability	1.98	-1.78	-3.53
treatment effects onset	1.86	-0.01	-0.01
treatment power	3.16	0.55	1.75
locus of control	1.74	1.47	2.56
effortlessness	0.28	-0.28	-0.08
fear of treatment	3.89	-4.06	-15.78
less withdrawal symptoms	0.72	0.47	0.34
self-approval	1.02	-0.19	-0.19
treatment interest	0	0	0

*Average normative beliefs,
motivation to comply and products.*

Referents	b_j	m_j	$b_j \cdot m_j$
assist others	0.31	0.31	0.10
social approval	1.25	-0.06	-0.08
----- Overall mean products score:			-24.88

Overall, Hypnosis receives a moderately positive outcome evaluation (20.01). The average rating for Rapid Smoking is marginally stronger, but negative (-24.88). This would suggest that on average, Clinic subjects are repelled away from the Rapid Smoking treatment as much as (or slightly more than) they are attracted towards the Hypnosis option.

**Strength and Composition of Underlying Beliefs
(Control Subjects)**

The pattern of beliefs underlying choice of treatment options for Control subjects shows interesting differences to that elicited from Clinic subjects.

Hypnosis scores best in terms of pleasant treatment sensation, and also rates quite strongly for its perceived quality of effortlessness. The main negative features are its lack of personal suitability and external locus of control. Viz:

Table 18.

Control Subjects Beliefs about Hypnosis Treatment.

*Average attitudinal beliefs,
outcome evaluations and products.*

Outcomes	b_i	e_i	$b_i \cdot e_i$
treatment sensation	4.2	3.67	15.41
treatment durability	2.81	-0.93	-2.60
personal suitability	3.66	-2.39	8.74
treatment effects onset	2.34	1.16	2.72
treatment power	1.98	1.95	3.85
locus of control	2.86	-2.06	-5.90
effortlessness	2.00	2.14	4.29
fear of treatment	1.35	-0.99	-1.33
less withdrawal symptoms	1.46	-0.35	-0.52
self-approval	0.18	-0.25	-0.04
treatment interest	0.39	0.50	0.19

*Average normative beliefs,
motivations to comply and products.*

Referents	b_j	m_j	$b_j \cdot m_j$
assist others	0	0	0
social approval	0.40	0.36	0.15

Overall mean products score: 24.96

Control subjects see Rapid Smoking to be the more powerful treatment with a useful treatment onset. This is counterbalanced, though by stronger negative associations, especially for treatment sensation. Viz:

Table 19.

Control Subjects Beliefs about Rapid Smoking Treatment.

*Average attitudinal beliefs,
outcome evaluations and products.*

Outcomes	b_i	e_i	$b_i \cdot e_i$
treatment sensation	5.05	-3.31	-16.69
treatment durability	3.61	-1.5	-5.42
personal suitability	3.13	0.11	0.35
treatment effects onset	2.33	1.95	4.53
treatment power	4.3	3.29	14.13
locus of control	1.48	0.81	1.21
effortlessness	0	0	0
fear of treatment	1.25	-1.05	-1.31
less withdrawal symptoms	1.23	0.03	0.03
self-approval	0	0	0
treatment interest	0	0	0

*Average normative beliefs,
motivation to comply and products.*

Referents	b_j	m_j	$b_j \cdot m_j$
assist others	0	0	0
social approval	0.38	-0.15	-0.06

Overall mean products score: -3.23

Overall, Control subjects rate both treatment options more positively than Clinic subjects. Hypnosis receives the highest average outcome evaluation (24.96), and Rapid Smoking is accorded a small negative loading (-3.23). Clinic subjects produce highly polarized differences resulting in a slightly stronger emphasis on the negative features of Rapid Smoking. Control subjects, however, are more persuaded by the positive considerations of the Hypnosis treatment.

It is most noteworthy that for both Clinic and Control subjects the beliefs underlying the subjective norms are given a mostly nominal or neutral outcome evaluation.

Table 20 compares average product scores based on differential beliefs. Significant differences are found in 6 of the 13 dimensions. Perceptions of treatment durability and fear of treatment show the largest differences. Clinic subjects, that is, differ from Controls most in rating the treatments as generally less durable and more fear inducing.

Table 20

Comparison of Clinic and Control Group Outcome evaluations.

*Mean Differential scores for
Attitude to Act ($b_i.e_j$)*

Outcome dimension	Clinic Subjects		Control Subjects
A treatment sensation	46.12	*	9.64
B treatment durability	-3.08	**	41.59
C personal suitability	10.09		24.75
D treatment onset	19.87	*	-7.35
E treatment power	36.32		23.47
F locus of control	-8.81		10.24
G effortlessness	21.48		13.52
H fear of treatment	27.20	**	1.73
I withdrawal symptoms	2.68		6.50
J self-approval	-10.89	*	1.75
K treatment interest	11.40	*	-0.13

*Mean differential scores for
Subjective Norm ($b_j.m_j$)*

Outcome dimension	Clinic Subjects		Control Subjects
L assist others	3.26		not used
M social approval	0.08		1.21

* differences significant at .05 level
 ** differences significant at .01 level (2 sample t-test)

**Intention to Stop Smoking with Chosen Treatment
(Intention ii)**

After they had made a decision to take one of the 2 treatment procedures, Clinic subjects rated a second measure of intention to stop smoking. (Also expressed as a likelihood scaled from 0 to 100%). Experimental Controls rated a similar scale, expressing their likely intention "as if" taking the treatment.

Table 21 compares the various sets of intention scores.

Experimental Controls appear to have a greater confidence in the treatment procedure, with significantly higher intention (ii) scores than Clinic patients. ($p < .05$).

More interestingly, though, Clinic subjects exhibit a much wider variation in their intention (ii) scores than Experimental Controls, despite being a more homogeneous group. Viz:

Table 21.

sub sample	Intention (i)		Intention (ii)	
	\bar{x}	sd	\bar{x}	sd
Clinic	48.66	18.93	45.39	39.17
Experimental Controls			59.35	18.57

Clinic subjects also show a massive increase in variation between intention (i) and intention (ii), with a doubling of the standard deviation. Although there is a small downward shift in Clinic subjects' intentions, this is non-significant ($t = 0.22$; $p = .83$).

The two sets of intention scores for Clinic subjects correlate at only $r = .21$ (non-significant).

Fishbein Modelling of the Decision to Stop Smoking Following Treatment Choice.

In contrast to the previous analysis (of Balance Sheet 1), the Fishbein model based on all 13 Individual Salient Beliefs (in Balance Sheet 2), results in a number of significant terms (see Figure 18). This is undoubtedly a reflection of the smaller number of dimensions, and thus reduced variance in the number of salient beliefs. Indeed, regressions based on Modal Salient Beliefs (with a frequency greater than 20%) hardly changes the picture at all (compare Figure 19).

[With the data set from Balance Sheet 2 a frequency of 20% is the highest possible threshold for including beliefs in the salient set whilst retaining the basic structure of the Fishbein model. Below this level there would be no belief dimensions to include in the normative component] .

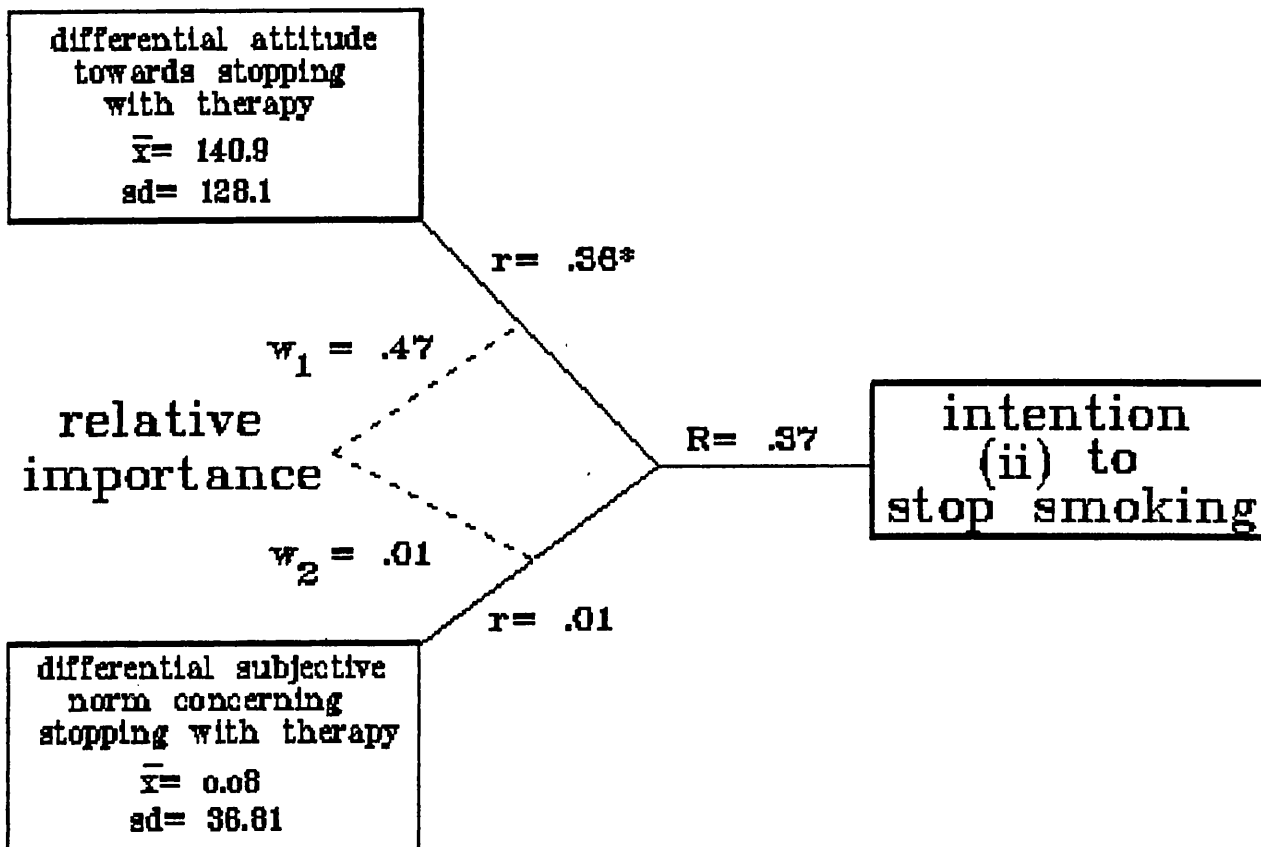
Not surprisingly, perhaps, for Control subjects the Fishbein equation results in substantially lower levels of prediction. For Control subjects too, the Normative component has little impact on treatment choice.

Figure 18

**Multiple Regression Analysis of
Attitude and Subjective Norm Components on
Intention to Stop Smoking with Chosen Therapy**

(From all Independent Salient Beliefs; Balance Sheet 2)

[Clinic subjects]



Overall regression equation:

$$R^2 = .13; F = 2.16; p = .11$$

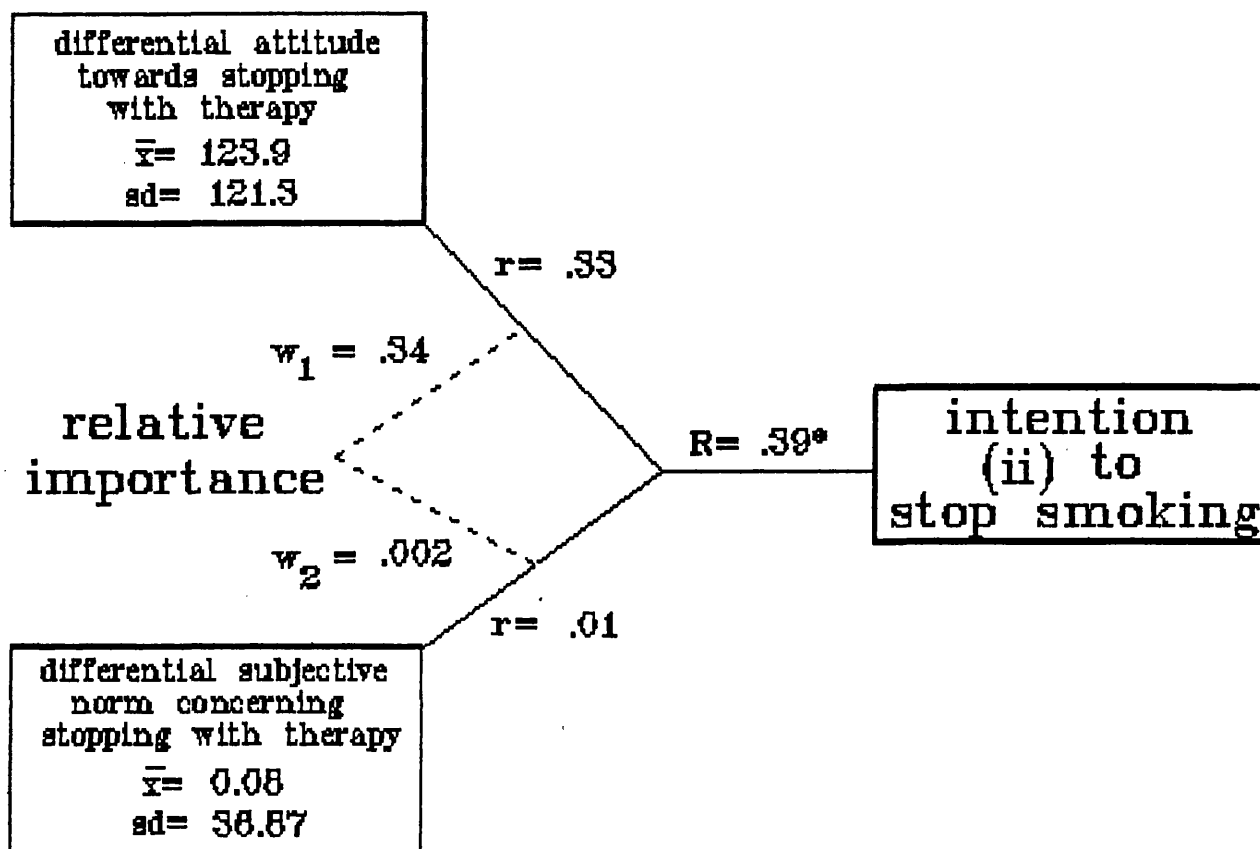
* significant at $p < .05$

Figure 19

**Multiple Regression Analysis of
Attitude and Subjective Norm Components on
Intention to Stop Smoking with Chosen Therapy**

(From Modal Salient Beliefs; Balance Sheet 2)

[Clinic subjects]



Overall regression equation:

$$R^2 = .11; F = 1.74; p = .18$$

* significant at $p < .05$

The Contribution of External Variables.

Figure 20 shows that for Clinic subjects external variables are also strongly associated with intentions to quit and treatment choice. In contrast to the earlier analysis (of Balance Sheet 1), external variables are more correlated with Subjective Norm than with Attitudinal considerations.

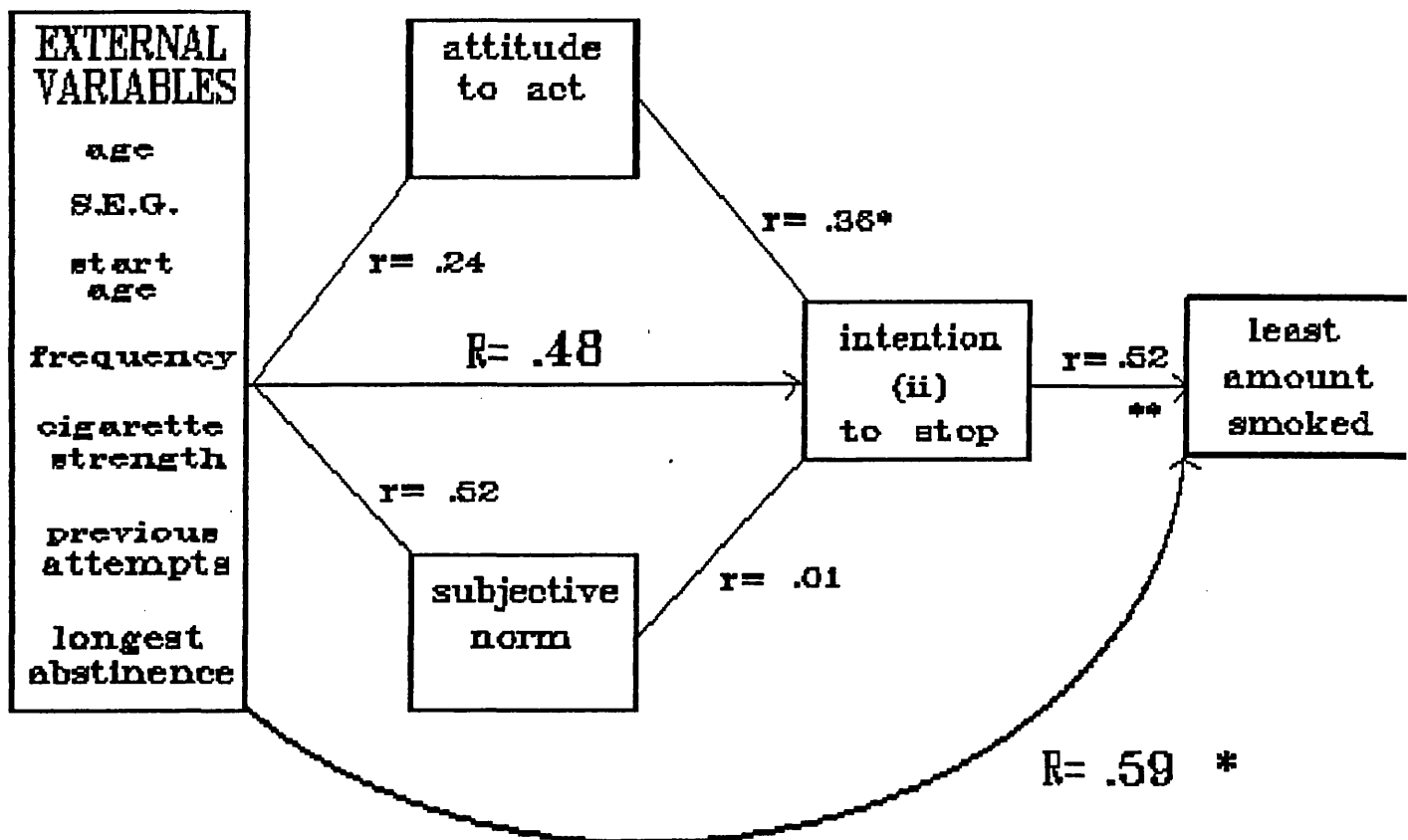
The external variables also exhibit some interesting differences in association between themselves. The highest correlations were obtained for the number of *previous attempts* to quit and the *longest abstinence* ($r = .45$; $p < .05$). The number of *previous attempts* to quit further showed further substantial associations with *frequency* of cigarettes smoked per day ($r = .41$; $p < .05$) and with *age* ($r = .37$; $p < .05$). This suggests that subjects' personal smoking history constitutes a sound basis for predicting future success in stopping smoking. In turn this lends support for self-efficacy based explanations advanced by the rival Empiricist programme.

A significant negative correlation was found between the *start age* for smoking and *cigarette strength* ($r = -.37$; $p < .05$). That is, those who have been smoking longer, smoke stronger cigarettes. This would appear to give credence to pharmacological interpretations of the smoking habit. Against this, however, the *start age* for smoking shows hardly any association with the *frequency* of cigarettes smoked per day ($r = .08$).

Figure 20

Contribution of External Variables on
Fishbein Model

(From Balance Sheet 2)



* significant at $p < .05$

** significant at $p < .01$

Sex Differences: Choice of treatments

Men and women show no difference in their choice of treatment method. Table 22 shows Hypnosis to be clearly the most popular option for both.

Table 22.

Sex Differences in Choice of Treatment			
		Women	Men
Treatment	Rapid Smoking	3 (13%)	3 (19%)
	Hypnosis	21 (88%)	13 (81%)

The 2x2 contingency table gives a non-significant Chi-Square of .29

Sex Differences: Components of the Fishbein Model

Unlike the earlier analysis, no differences emerge between men and women in the strength of Normative considerations. Women, however, are significantly more positive and more uniform in their Attitudes towards stopping smoking through treatment than men are ($t= 2.19$; $p= .03$). Viz:

Table 23.

Sex Differences in Fishbein Model					
		Attitude		Subjective Norm	
		\bar{x}	sd	\bar{x}	sd
Women		167.20	109.30	-7.19	43.98
Men		57.25	173.6	8.00	23.68

Analysis of Treatment Choices using SMART

Gardiner & Edwards (1975) Simple Multi Attribute Rating Technique is readily applicable to the choice of treatment options. Tables 24 and 25 reveal the decomposition of Balance Sheet 2 dimensions treated as multi attribute utilities for both Clinic and Experimental Control subjects.

Folding back the aggregate utility scores from the decision tree shows that Clinic subjects appear to be more polarized in their ratings of the two treatment options than are Control subjects. This is consistent with the previous analysis of the strength and composition of underlying beliefs. Generally, Clinic subjects appear to be more directed away from rapid smoking than they are towards Hypnosis (even though the overall utility for Hypnosis was positive). Control subjects, in contrast are more persuaded by the relative positive utility attached to the Hypnosis option.

Detailed inspection of the aggregate utilities adds further definition to the picture revealing that the two sets of subjects differ in their relative use (final weighting) of salient dimensions as well as their ratings along the dimensions (location measures). In particular, Clinic subjects give substantially higher weighting to dimensions :

A (treatment sensation)
H (fear of treatment)

Control subjects attach their greatest weightings to dimensions:

A (treatment sensation)
E (treatment power)

The MAUT analysis thus reveals that Clinic subjects appear to be relatively most concerned with *affective* factors in assessing their options. Control subjects, however, show a relatively strong concern with both *affective* and *instrumental* factors in appraising the options.

Table 24.

MAUT Analysis of Treatment Options
[Clinic Subjects]

dimension	\bar{x}	importance weight	location measure	final weight	aggregate utility
A	2.53	.20	2.94	.14	.41
E	2.86	.23	3.85	.16	.62
D	1.89	.15	1.85	.10	.19
G	2.67	.21	2.83	.14	.40
I	0.22	.02	1.22	.01	.01
K	1.43	.11	1.64	.07	.11
L	0.89	.07	1.09	.05	.05
12.50					1.79
<i>Positive Hypnosis Dimensions; Branch weight: .68</i>					
B	-0.63	.11	1.92	.04	.08
C	-0.63	.11	2.36	.04	.09
F	-1.34	.23	1.38	.07	.10
H	-2.05	.35	2.07	.11	.23
J	-1.07	.18	1.95	.06	.12
M	-0.17	.03	1.84	.01	.02
-5.88					.64
<i>Negative Hypnosis Dimensions; Branch weight: .32</i>					
B	0.36	.13	3.12	.03	.09
E	0.53	.20	3.16	.04	.13
F	1.47	.54	1.74	.12	.21
I	0.05	.02	0.72	.004	.003
L	0.31	.11	0.31	.02	.01
2.72					.44
<i>Positive Rapid Smoking Dimensions; Branch weight: .22</i>					
A	-3.11	.33	3.56	.26	.93
C	-1.78	.19	1.98	.15	.30
D	-0.006	.0007	1.86	.0005	.0009
G	-0.28	.03	0.28	.02	.01
H	-4.06	.43	3.89	.34	1.32
J	-0.19	.02	1.02	.02	.02
M	-0.63	.01	1.25	.01	.01
-9.48					2.59
<i>Negative Rapid Smoking Dimensions; Branch weight: .78</i>					

Table 25.

MAUT Analysis of Treatment Options
[Control subjects]

dimension	\bar{x}	importance weight	final weight	location measure	aggregate utility
A	3.67	.45	.23	4.20	.97
D	1.16	.14	.07	2.34	.16
E	1.95	.24	.12	1.98	.24
G	2.14	.26	.13	2.00	.26

8.17					1.63
<i>Positive Hypnosis Dimensions; Branch weight: .51</i>					

B	-0.93	.12	.06	2.81	.17
C	-2.39	.31	.15	3.66	.55
F	-2.06	.26	.13	2.86	.37
H	-0.99	.13	.06	1.35	.08
I	-0.35	.04	.02	1.48	.03
J	-0.25	.03	.01	0.18	.002
K	-0.50	.06	.03	0.39	.01
M	-0.36	.05	.02	0.40	.01

-7.82					1.22
<i>Negative Hypnosis Dimensions; Branch weight: .49</i>					

C	0.11	.02	.01	3.12	.03
D	1.95	.32	.16	2.33	.37
E	3.29	.53	.27	4.30	1.16
F	0.81	.13	.07	1.49	.10
I	0.03	.004	.002	1.23	.003

6.19					1.66
<i>Positive Rapid Smoking Dimensions; Branch weight: .51</i>					

A	-3.31	.55	.27	5.05	1.36
B	-1.50	.25	.12	3.61	.43
H	-1.50	.17	.08	1.25	.10
M	-0.15	.02	.01	0.38	.004

-6.01					1.89
<i>Negative Rapid Smoking Dimensions; Branch weight: .49</i>					

This form of analysis usefully extends the statistical picture obtained by the simple additive algorithm employed in the Fishbein model. In particular the MAUT algorithm illuminates something of how the underlying patterns of beliefs are organized. On this basis, MAUT analyses could be usefully extended into the Fishbein model to give an indication of how decision makers select beliefs into salient sets. With a similar aim Judd & Krosnick (1982) call for measures of attitude centrality (relative intensity of values underlying attitudes). Budd & Spencer (1984) also argue that attitudes and norms are moderated by the degree of attitude organization and urge that measures of latitude of rejection be incorporated into the basic model.

Overall, the MAUT analysis shows Clinic subjects to be strongly influenced in their decision by the affectively related dimensions. Since Rapid Smoking receives the highest (and negative) scoring on these dimensions, the choice appears to be largely a function of negative affect. This lends support to Eiser's (1983) suggestion that smokers want to give up provided the task is seen as easy (or perhaps more tellingly, if it is perceived to be painless).

Conclusions

The Balance Sheet procedure yields a set of salient beliefs for stopping smoking broadly similar to those found in other studies. In particular, *autonomy* emerges as the dominant dimension over and above health beliefs, financial considerations, social acceptance and management of affect.

Data derived from the Balance Sheet procedure is readily placed in the algorithm from The Theory of Reasoned Action. The Fishbein model, however, produces only weak predictions of intention to stop smoking with Individual Salient Beliefs. Improved, though still non-significant, predictions are obtained by limiting the data set to Modal Salient Beliefs. This shows greater weighting to be given to the Subjective Norm component. Women in particular, appear to be more sensitive to Subjective Norms in their decision to stop smoking. External variables are found to give better, and statistically significant, associations with behavior (least amount smoked) than intention to stop smoking.

Factor analysis can be used to explore the relationships and composition of salient beliefs. Although some of the principal components accord with the Marsh & Matheson (1983) study, others have no obvious meaning and add little to the basic model.

Multi Attribute Utility algorithms can be superimposed on the Fishbein analysis to good effect, with utility scores accumulated according to Attitude and Subjective Norm designations. The analysis proves superior to both the original MAUT algorithm and the basic Fishbein formula. When applied to the set of Modal Salient Beliefs, the transposed algorithm significantly predicts

intention to stop smoking. By giving relative weighting to salient items, the MAUT transformation reduces unwanted variance in the group audit and thus improves regressions.

Balance Sheets for the choice of treatment options generate far fewer salient beliefs than for the decision to stop smoking (Balance Sheet 1). Clinic and Control samples produce almost identical sets of salient beliefs, though the strength and composition of underlying beliefs differ significantly. Clinic subjects appear to be persuaded away from the Rapid Smoking option slightly more than they are attracted to the Hypnosis therapy. Control subjects, however, are more attracted by the positive associations of Hypnosis.

Analysis based on Modal Salient Beliefs make little improvement to that based on Individual Salient Beliefs. The smaller number of dimensions also reflects reduced variance in the number of salient beliefs in the final regression equation. The Fishbein model yields significant terms for differential attitude components, giving good predictions of intention to stop smoking. Women in particular appear to be more consistent in their attitude to treatment. Subjective Norms have virtually no showing in the data, however. Amongst external variables, the personal smoking history and especially the number of previous attempts to stop smoking form good predictors of future smoking behavior.

MAUT analysis demonstrates that clinic subjects give greater weighting to affective factors in their choice of treatments. Control subjects, in contrast, show equal concern with affective and instrumental considerations. MAUT techniques may have advantages for the Theory of Reasoned Action, augmenting the basic algorithm and directing theoretical attention at the organization of underlying beliefs.

RESULTS AND ANALYSIS (3)**ANALYSIS THROUGH EMPIRICIST ALGORITHMS:****Attributional Judgment in the Decision to Stop Smoking***Preferences for Treatment Options*

The picture is compounded by the initial treatment preference of subjects before attending the Clinic. That is, many Clinic subjects may have volunteered for treatment only in anticipation of receiving hypnosis.

Before being offered the choice between Hypnosis and Rapid Smoking, Clinic applicants were asked (in an open ended item of the Preliminary Questionnaire) what form of treatment they considered would be most helpful.

Hypnosis was given as the immediate preference by 26 of the 40 Clinic subjects (65%). Only 1 person specified Rapid Smoking as first choice, and one stated *either* Hypnosis or Rapid Smoking. Additionally, 1 specified acupuncture and 5 (13%) responded with a "Don't Know".

Clinic subjects had experience of a variety of methods to help them stop smoking. Only 16% of such attempts, however, involved expert treatment in their attempts to quit. Of these, 3 used hypnosis. (See *Appendix 33*).

As a follow-on to these themes, an additional questionnaire measure was generated which asked respondents to rank order their preferences for 5 different treatment strategies. Consistent with their actions, Clinic applicants placed expert treatment as their most preferred strategy. Jacobson (1981) contends that expert help will be sought only by those having low self-confidence. She argues, in line with Feminist critique, that the best form of support is self-help groups. In contrast to Clinic applicants, Controls are more inclined towards strategies with a client centred locus of control (methods of discovery and support groups). (See *Appendix 34*).

Actual Distribution of Choices

Clinic and Control subjects differ significantly in their actual selection of anti-smoking therapies on offer in this study (see table 26). The differences may be used to explore attributional variations in judgment.

Whilst Control subjects show an almost even choice for the two therapeutic treatment options (reflecting the experimental manipulation of choice information), Clinic subjects exhibit an overwhelming preference for the hypnosis treatment. One plausible interpretation would be that commitment to action alters the payoff matrix.

Table 26.

Distribution of Therapies Chosen

	Hypnosis	Rapid Smoking
Clinic subjects	34 (85%)	6 (15%)
Control subjects	24 (60%)	16 (40%)

The contingency table shows the two groups to be significantly different in their overall choice of treatments (Chi-Square= 6.27; $p = .012$).

Overall, Control subjects express a preference for
Hypnosis in the order of 1.5 : 1.

Clinic subjects, in comparison, choose
Hypnosis in a ratio of 5.7 : 1.

Disaggregating the Control sample into sub-groups generates further a picture of increasing preference for hypnosis treatment with greater involvement in smoking (See *Appendix 35*).

Never-Smokers are even in their choice between
Hypnosis and Rapid Smoking (1 : 1).

Ex-Smokers are more favourable towards Hypnosis
increasing the ratio to (1.4 : 1).

Committed-Smokers extend the ratio further selecting the
Hypnosis option in a ratio (3 : 1).

Choice pattern expected through attributional principles.

If subjects were to make their decisions solely on the basis of information contained in the slide show manipulation, Hypnosis and Rapid Smoking treatments ought, on average, to have been chosen with equal frequency. The following choice pattern, moreover, would be predicted (See Table 27):

Table 27.

Predicted Pattern of Therapy Choices

experimental	level 1 LOCUS	level 2 STABILITY	expected choice
A	internal both treatments	stable long term risk to Rapid Smoking	Hypnosis
B	internal both treatments	unstable long term risk to Hypnosis	Rapid Smoking
C	external both treatments	stable long term risk to Rapid Smoking	Hypnosis
D	external both treatments	unstable long term risk to Hypnosis	Rapid Smoking

Hypnosis and Rapid Smoking treatments should, on average, be chosen with equal frequency. In fact Clinic subjects showed a clear preference for the Hypnosis treatment regardless of experimental condition. (See Table 28) Viz:

Table 28.

Clinic Subjects Actual Pattern of Therapy choices

EXPERIMENTAL CONDITION

chosen treatment	internal		external	
	A	B	C	D
Hypnosis	stable 8 (20%)	unstable 9 (22.5%)	stable 8 (20%)	unstable 9 (22.5%)
Rapid Smoking	unstable 2 (5%)	stable 1 (2.5%)	unstable 2 (5%)	stable 1 (2.5%)

No significant differences were found for the cells of this contingency table (Chi-Square = .78 ; p= .85)

Control subjects show a choice pattern generally consistent with the predicted model. Though there is also an overall preference for Hypnosis treatment, the Rapid Smoking option receives predictably more endorsements in experimental conditions B and D (where it is described as the stable option). See Table 29.

Table 29.

Control Subjects Actual Pattern of Therapy Choices

chosen treatment	EXPERIMENTAL CONDITION			
	internal		external	
	A	B	C	D
	stable	unstable	stable	unstable
Hypnosis	8 (20%)	5 (12.5%)	7 (17.5%)	4 (10%)
	unstable	stable	unstable	stable
Rapid Smoking	2 (5%)	5 (12.5%)	3 (7.5%)	6 (15%)

No significant differences were found for the cells of this contingency table, with a Chi-Square of 4.17 ($p = .24$)

Analysis through the ANOVA Algorithm

In a strict statistical sense Analysis Of Variance (ANOVA) is actually analysis of sums of squares (Kendall & Buckland 1971). It is mostly employed as an algorithm by researchers who find advantage in experimental studies which manipulate orthogonally related sets of variables or factors (Edwards 1968; Hays 1973). The algorithm efficiently partitions and expresses variation in a dependent variable as a function of other independent variables. In so doing it epitomizes classic experimental design.

Kerlinger (1973), however, argues that researchers in social science treat independent variables in two distinct ways, as *active* variables and as *attribute* variables. Active variables are typically manipulated in studies, often because they cannot be measured directly. Attribute variables are typically measured and not available to manipulation, often because they are strongly correlated. Analysis Of Variance is therefore suitable only for active types of variables.

Kerlinger & Pedhazur (1973) add that ANOVA and Multiple Regression techniques ultimately share the same statistical basis in sums of squares. They also show convincingly that Multiple Regression can achieve all forms of analysis open to ANOVA techniques.

The ANOVA paradigm, moreover, can be restrictive in making strong assumptions of independence of variance estimates, normality of sampling and homogeneity of variances.

The wide acceptance of the ANOVA algorithm in psychological research goes beyond its technical proficiency as a statistical tool. Because the analysis isolates sources of variance it allows active variables to be treated as causal variables. More than this, by reducing wide patterns of data to a few explanatory factors it effectively mirrors the basic heuristic in the Empiricist research programme. It thus can be used as a statistical analogy of the empiricist decision making model. This can be seen clearly in Fisher's (1954) original formulation. As he expresses,

"It is convenient ... because it brings to the eyes and to the mind a summary of a mass of statistical data in which the logical content of the whole is readily appreciated."

The ANOVA paradigm finds favour in attribution research partly because it supplies a suitable statistical framework to recast the (often dichotomised) active variables. Principally, however, it endures because it provides an algorithm that is consistent with the positive heuristic of Empiricist research programme.

Kelley's (1967) seminal work in conceptualising attribution processes in ANOVA terms continues to influence much thinking in this area (Jaspers, Hewstone & Fincham 1983). Kruglanski et al (1978) say that ANOVA is a special case of the lay epistemic process. Bandura's (1977) Self-efficacy model is effectively a 2X2 ANOVA design. Weiner's (1985, 1986) influential model of attribution processes also continues to expand through further nesting of orthogonally related variables.

In the present study, the ANOVA based manipulation furnishes a means of testing reworkings of Weiner's model of attributional judgments. Specifically, Eiser & van der Pligt (1986, 1988) state that intention will be dependent upon confidence (meaning expectation of success). Confidence, in turn will be influenced by considerations of stability rather than locus. To this end an ANOVA analysis is conducted with both intention scores (see Tables 30 and 31) and mean expectancy scores (see Tables 32 and 33).

[Data from Balance Sheet 2].

Table 30.

**Two Way Analysis of variance
Clinic Subjects Intention (ii) scores**

ANOVA Table				
Source	df	SS	MS	F
rows (locus)	1	367.5	367.5	0.2
columns (stability)	1	498.8	498.8	0.3
rows X cols (interaction)	1	414.4	414.4	0.3
error	36	55690.1	1546.9	
total	39	56970.8		

No significant differences were found for any of the ANOVA terms, or for row or column contrasts.

Table 31.

**Two Way Analysis of Variance
Control Subjects Intention (ii) scores**

ANOVA table				
Source	Df	SS	MS	F
rows (locus)	1	748.2	748.2	2.4
columns (stability)	1	319.2	319.2	1.0
rows X cols (interaction)	1	1071.2	1071.2	3.4
error	36	11322.1	314.5	
total	39	13460.8		

No significant differences were found for any of the ANOVA terms or for row or column contrasts.

Table 32.

**Two Way Analysis of Variance
Clinic Subjects differential
expectancy scores**

ANOVA table				
Source	df	SS	MS	f
rows (locus)	1	0.4	0.4	0.1
columns (stability)	1	19.9	19.9	8.2 *
rows X cols (interaction)	1	0.5	0.5	0.2
error	32	87.7	2.4	
total	35	108.5		

* significant at $p < .05$

Table 33.

**Two Way Analysis of Variance
Control Subjects differential
expectancy scores**

ANOVA table				
Source	df	SS	MS	F
rows (locus)	1	3.9	3.9	1.7
columns (stability)	1	1.1	1.1	0.5
rows X cols (interaction)	1	1.1	1.1	0.5
error	36	83.2	2.3	
total	39	89.2		

No significant differences were found for any of the ANOVA terms, or for row or column contrasts.

The resulting analysis shows a main effect for *stability* with expectancy scores. This is only true, however, for Clinic subjects. Experimental Controls appear not to be influenced in their expectancy by either *stability* or *locus*. This finding presents a paradox for interpretation. In their actual choice of treatments, Clinic subjects appear to be completely oblivious to the experimental manipulation. Control subjects choice of treatments, however, is in the predicted direction (that is influenced by considerations of *stability*). Thus it appears in this study at least, that the actual choice of treatments is not directly influenced by expectations, though expectations are influenced by *stability* factors. Intention scores, moreover, for both samples do not appear to be influenced by either set of attributional variables.

Although the finding of a main effect for *stability* offers some corroboration for Eiser's thesis, the overall picture remains a perplexing anomaly.

The ANOVA algorithm may well set limits on what can be unpacked about people's judgment processes. Although the experimental manipulation presented descriptions of the choice options in terms of Weiner's categories, there is no way of knowing whether these correspond with subjects' own inherent attributional categories (a point often made by Eiser). The ANOVA paradigm also reduces explanatory variables to independent categories. Real life decisions may well combine attributes which are intrinsically correlated and distributed in non dichotomous form. It is unlikely, that is, that many attributes underlying real life decisions will meet assumptions of independence and homogeneity of variance.

Dispositional Locus of Control

Rotter's (1966) scale, (the Social Reaction Inventory) was used to measure subjects general level of locus of control. No differences were found between Clinic and Control groups (see Table 34).

Both groups also exhibit a similar modest negative correlation between externality and Intention (ii). (Clinic subjects $r = -.12$; Control subjects $r = -.13$)

That is, there is a slight tendency for internals to have stronger intentions to stop smoking. Correlations of externality with the actual reduction in rate of smoking, however, are near to zero. These findings concur with the general attributional theme of the internal-external distinction having force primarily as a situational rather than dispositional variable.

Table 34.

Summary table : Locus of Control Scale

group	x	s.d.	median
Clinic subjects	9.75	4.40	11
All Experimental Control subjects	10.30	4.23	11

No significant differences were found between the two groups ($t= 0.57$; $p= .57$). The variances were also found to be equal ($F= 1.08$; $p= .40$)

Disaggregating the Control sample data into sub groups of never-smoker, ex-smokers and committed-smokers does not reveal any interesting differences. (See *Appendix 36*).

Perceived Symptomology of Smoking

Eiser (1983) hypothesizes that many smokers attribute a "sickness" label to their habit as a means of reducing dissonance. Eiser & Gossop (1979) studied groups of outpatient drug users who responded to descriptive statements about their drug related problem. Principal components analysis resulted in 2 factors which were labelled "hooked" and "sick". Self-attributions of being sick were found to be independent of perceived lack of control. Subsequently, Eiser & van der Plight (1986) report similar findings for smokers.

To examine the relationship of smoking with sickness attributions, all clinic applicants were asked if smoking had in any way affected their health. (Open ended item on the Preliminary questionnaire). The descriptions were content analyzed into categories of symptoms which Miller (1978) suggests people use as independent scales to infer illness. Viz:

Table 35.

**Smoking as Illness
Clinic Subjects Perceptions**

symptom type	n	%
alarm	12	30
disability	13	33
nastiness	8	20
embarrassment	0	0
none	5	13
don't know	1	3
other	1	3
total	40	99

Table 35 clearly illustrates that most of the sample pathologize their smoking habit in some form. There appears to be no difference in any of Miller's categories except for Embarrassment which has virtually no showing in the data. Thus, however diseased the habit is perceived to be, smokers nonetheless appear to regard it as a socially acceptable form of sickness. This finding offers some incidental corroboration for Eiser's (1983) hypothesis.

Smoking Typology

The classifications of psycho-social motivations contained in the smoking typologies of Ikard, Green & Horn (1969) and Russell et al (1974) were derived from factor analytic studies of smokers explanations of their habits. Consequently, they may be best regarded as general attributional frameworks of smoking causation. Standardized typology instruments, however, have a number of serious methodological disadvantages. Most importantly for this study was the possibility of suggesting to subjects additional attributional categories (not normally occurring as part of their "naive" explanations).

Eiser (1983) criticizes attribution research for too readily imposing categories of attribution on people and not giving them the freedom to choose to do so. As he expresses:

"When descriptions of real life events are used - subjects responses may bear little resemblance to the standard categories of causal explanation."

Smoking typology scales were not administered during the study. Instead, Clinic subjects' comments (recorded in the Preliminary Interview and Therapist's case notes) were content analyzed, and then independently scored according to the 7 categories of smoking Type (Russell et al 1974). Table 36 summarizes the results.

Table 36.

Clinic Subjects Attributions of Smoking Type

	Smoking Type	\bar{x}	s.d.
1.	SOCIAL	.87	.93
2.	AUTOMATIC	.58	.95
3.	ADDICT	.82	.98
4.	STIMULANT	1.03	1.17
5.	SEDATIVE	1.36	1.33
6.	INDULGENT	.69	.84
7.	HANDLING	.29	.65

The SEDATIVE function of smoking has the highest mean score. This result is consistent with the earlier observation that, for Clinic subjects, loss of relaxation was associated with the highest negative loading (or simply, was seen as the greatest drawback to stopping smoking).

Low order correlations between the scores of smoking type generally attest to the independence of the dimensions (see Table 37). The only remarkable associations are between STIMULANT and SOCIAL types ($r = -.32$); and between STIMULANT and SEDATIVE types ($r = -.33$).

Table 37.

**Correlation Matrix
Attributions of Smoking Type**

	s m o k i n g t y p e						
smoking type	1	2	3	4	5	6	7
1. SOCIAL		-.03	-.26	-.32	-.005	.01	-.16
2. AUTOMATIC			.002	-.16	-.17	-.27	.07
3. ADDICT				.004	-.12	-.04	-.13
4. STIMULANT					-.33	-.18	-.08
5. SEDATIVE						-.19	.003
6. INDULGENT							.12
7. HANDLING							
Least amount smoked	.06	-.27	-.25	.18	-.11	.31	.08

Attributions of smoking type should also be reflected in the dimensions of belief for stopping smoking (Balance Sheet 1). Indeed, the highest expected correlations occur between SEDATIVE type and salient beliefs of *become irritable* ($r = -.39$) and *relaxation* ($r = -.27$).

Even higher correlations, however, are obtained where not predicted (e.g. between HANDLING type and salient beliefs of *pleasure loss* $r = -.61$; INDULGENT type and *loss of prop* $r = .41$).

Correlations of smoking type with dimensions from Balance Sheet 2 (considerations of treatment options) do not generate any striking comparisons, the highest being between INDULGENT type and *fear of treatment* ($r = .42$).

Regressing the 7 sets of typological scores on Least amount smoked gives an R-squared of only .13 ($F = .62$; $p = .75$).

Of the 7 dimensions INDULGENT type has the largest association with actual reduction in smoking rate ($r = .31$). Exploratory regressions on the other main dependent variables also results in poor levels of prediction.

Similarly, a discriminant analysis of the 7 types onto actual choice of treatments results in an R-squared value of only .15 ($F = .69$; $p = .69$).

Lens Model Algorithms

If Attribution theory is to succeed in an attributional (i.e. decision making) domain, then it will need to be equipped with a suitably powerful algorithm. Previously, attributional work has been limited in the practice field, mostly adapting Analysis of Variance procedures, such as explicated in Kelley's (1967) model or implied in Weiner's (1979). Because the statistical model demands the sources of variance be partitioned as independent factors, the algorithm may well have set limits upon the attributional development of the programme. Kerlinger and Pedhazur (1973) argue convincingly that there are structural equivalences between ANOVA and the more usable regression techniques (as used extensively in MAUT and the Fishbein model). As Hoffman, Slovic & Rorer (1968) point out, moreover,

"In the real world situation, where signs are likely to become available one at a time, the process may be more obviously sequential than in the experimental situation."

The Lens Model, might just fit this need and equip attributional theories with a suitably powerful and refined algorithm, true to the Empiricist basis.

Various versions of the Lens model algorithm have been developed (e.g. Hirsch et al 1964; Tucker 1964). Generally the algorithm locates a central set of cue variables which are shared by both proximal (judgment) and distal (environmental) considerations. (see Figure 1). Each side of the "lens" converges into two sets of statistical models. Mostly these have been formulated in terms of Multiple Linear Regressions.

Tucker's (1964) equation appears to have the greatest currency for the Lens Model. This is expressed as:

$$r_a = G \cdot R_1 R_2 + C \sqrt{1 - R_1^2} \sqrt{1 - R_2^2}$$

- where: G = the correlation based on the prediction derived from both models. It is taken as an expression of the extent of policy similarity. That is it measures the degree of consistency of application across the two sides of the lens. In a learning task this would be seen as the extent of task achievement or "knowledge".
- R₁ = the multiple correlation measuring the fit of the model on the proximal side of the lens. That is the predictability of individual judgment from the set of cues. In effect it indicates the level of consistency. This is taken to be the degree of cognitive control.
- R₂ = the corresponding multiple correlation on the distal side of the lens. It expresses the predictability of the environment from the set of cues. In effect it measures the degree of consistency. This is considered to represent the level of task control.
- C = the correlation of residuals. A high value in this variable indicates non-linear variation between the two systems. A low "C" value, however, shows only an absence of shared non-linear variation.
- r_a : resolves into a multiple correlation between the two systems. Hammond, Stewart, Brehmer & Steinman (1975) take this further, extending its application to the cognitive conflict paradigm. They argue that since G and R variables are statistically independent it is possible to disentangle effects due to differences in the two models and the effects of control.

The central equation:

$$r_a = G \cdot R_1 \cdot R_2$$

may thus be interpreted as:

Performance = Knowledge X cognitive control X task control

Lens Model Analysis of the Decision to Stop Smoking

In the Balance Sheet procedure elicited dimensions were given separate expectancy (likelihood) and value (importance) ratings. This same data set which supplied raw material for analyses through Rationalist algorithms (such as the Fishbein model), may also conveniently and appropriately be fed into Empiricist workings.

For the Lens Model paradigm the likelihood ratings may be regarded as *cues* or stimulus dimensions. Figure 21 shows the same cue ratings expressed as beta weightings on both proximal and distal sides of the lens equation. In this analysis *intention (i) to stop smoking* was taken as the subjects response or judgment value (Ys). A measure of the *least amount smoked* supplies the environment or criterion value (Ye).

It is apparent that greatest weighting is given on both sides of the lens to dimension 8 (gain weight). There is, however, considerable mismatch on dimension 6 (have nice breath) which is under utilized by subjects' judgement systems.

Figure 21.

**Lens Model Analysis: Clinic Subjects
Judgment for Stopping Smoking (Balance Sheet 1)**

	β	cue	β	

Ye	-0.25	1	-0.38	Ys
	-0.25	2	-0.49	
	-0.47	3	-0.45	
	0.27	4	0.30	
	0.22	5	-0.16	
	0.52	6	0.06	
	0.05	7	-0.33	
	-0.52	8	-0.68	
	0.05	9	0.06	
	-0.01	10	-0.10	
	-0.02	11	0.13	
	0.32	12	0.51	
	-0.11	13	-0.29	
	0.19	14	0.49	
	-0.04	15	-0.44	
	0.11	16	0.22	
	0.10	17	0.20	
	0.02	18	0.24	
	0.26	19	0.12	
	0.46	20	0.15	
	0.20	21	-0.22	
	0.16	22	0.05	
	-0.06	23	-0.04	

Ye = Criterion value (Least Amount Smoked)
Ys = Judgment value (Intention i for stopping smoking)

Tucker's (1964) Lens equation :

$$r_a = G \cdot R_1 R_2 + C \sqrt{1 - R_1^2} \sqrt{1 - R_2^2}$$

Applied to the judgment to stop smoking (employing the set of 23 c from Balance Sheet 1):

G = 0.36 (a relatively modest correspondence between the 2 systems, or a somewhat weak level of knowledge).

R₁ = 0.82 } both sides of the Lens model show quite high
 } levels of prediction for the main dependent
 R₂ = 0.84 } variables.

C = 0.28 (a minor level of non-linear variation)

$$r_a = 0.36 \times 0.82 \times 0.84 + 0.28 \sqrt{1 - 0.67} \sqrt{1 - 0.70}$$

$$r_a = 0.34$$

Following Hammond et al (1975) the equation may be interpreted as showing:

Relatively modest performance level	=	Modest degree knowledge	X	High level cognitive control	X	High level task control	X	Relatively minor non-linear variation
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The resulting model indicates that the greatest improvement could be gained through an increase in knowledge (a better matching of the 2 systems). Whilst the set of 23 cues from Balance Sheet 1 strongly predict both intentions (R₁) and behavior (R₂), the two models are incongruous. That is, whilst Clinic subjects appear to be accurate in relating their intentions to the set of cues (salient beliefs), and the same set of issues do indeed accurately predict subsequent behavior, the Clinic subjects do not make the correct inferences about how their pattern of cues influence their behavior. This conclusion is reinforced by comparing Clinic subjects importance ratings with their likelihood estimates.

Dhir and Markman (1984) argue that judgment inaccuracy is largely caused by judges being unaware of the specific weight and function forms they actually employ. In their extension of the cognitive conflict paradigm, they recommend comparing the actual relative weights (determined through application of the lens model formula) with apriori subjective estimates of cue weightings. Following their methodology, importance ratings (from the Balance Sheets) may be conveniently transposed into subjective estimates of cue weights. This is achieved by simply converting the importance ratings into proportionate scores (adding the importance ratings for each subject, dividing each rating by the total score).

Generally, the two sets of weightings show only a modest association (see Table 38). Whilst subjects appear to regard *increase autonomy* as their highest priority, the empirical Lens analysis shows *gain weight* to be the actual foremost consideration.

Table 38.

**Weights Assigned to Cue Variables
for Stopping Smoking (Balance Sheet 1)**

Dimension	averaged a priori subjective estimates of cue weights	averaged relative weights determined by LENS analysis	
1	increase autonomy	.11	.06
2	improve health	.08	.08
3	improve finances	.03	.07
4	social acceptance	.04	.05
5	lose relaxation	.03	.03
6	nicer breath	.02	.01
7	social approval	.05	.05
8	gain weight	.08	.11
9	lose pleasure	.09	.01
10	better atmosphere	.06	.02
11	lose prop	.08	.02
12	feel outsider	.02	.08
13	cleaner environment	.01	.05
14	reactance	.07	.08
15	clothes smell nicer	.08	.07
16	increase lifestyle	.01	.04
17	become irritable	.01	.03
18	better breathing	.01	.04
19	lose confidence	.03	.02
20	assist others	.004	.02
21	family welfare	.06	.04
22	reduce cancer risk	.002	.01
23	lose concentration	.03	.01

correlation $r = .36$

Interestingly too, if the weightings are accumulated separately for the "attitudinal" and "subjective norm" components identified in the previous Fishbeinian analysis, substantial disparity exists for the actual and subjective weightings. The a priori estimates sum to .83 (attitude) and .17 (subjective norm). The actual weights derived from the Lens model, however, accumulate to .76 (attitude) and .24 (subjective norm), showing a substantially larger effect of the subjective norm. That is, it looks as if subjects considerably underestimate the influence of normative considerations in their decision making for stopping smoking.

Lens Model Analysis of the Choice of Treatment

Differential likelihood ratings from Balance Sheet 2 may similarly be exploited in the Lens Model paradigm to determine cue utilization and ecological validities associated with choice of therapeutic treatment.

Figure 22 expresses cue ratings from Balance Sheet 2 as beta weightings on the two sides of the lens equation. Inspection of the lens shows substantial judgmental accuracy in attaching greatest weighting to dimension F (locus of control) and dimension H (fear of treatment), which strongly contributes to the criterion value. There is, however, considerable under utilization by subjects of dimension G (effortlessness) and dimension E (treatment power).

Figure 22.

**Lens Model Analysis : Clinic Subjects
Judgment for Therapy Options (Balance Sheet 2)**

	β	CUE	β	

	0.17	A	0.07	
	0.27	B	0.13	
	-0.14	C	-0.11	
	0.12	D	0.33	
	-0.31	E	0.07	
	0.42	F	0.48	
Ye	-0.47	G	-0.09	Ys
	0.34	H	0.40	
	-0.19	I	0.04	
	0.19	J	0.01	
	-0.05	K	0.24	
	0.07	L	-0.27	
	0.43	M	0.11	

Ye = Criterion value (Least Amount Smoked)
Ys = Judgment value (Intention ii for stopping smoking)

Tucker's (1964) Lens equation:

$$r_a = G \cdot R_1 R_2 + C \sqrt{1 - R_1^2} \sqrt{1 - R_2^2}$$

Applied to the decision to stop smoking (employing 13 cues of belief likelihood ratings from Balance Sheet 2).

G = 0.44 (Shows a better matching or "knowledge" than the preceding analysis for BS1. The strength of association remains relatively modest, however).

R₁ = 0.74 } Though still showing a high degree of
 } control, the two sides of the Lens equation
 R₂ = 0.80 } are less predictive than for BS1.

C = 0.41 (The correlation of residuals now indicates a modest level of non-linear variance between the 2 models).

$$r_a = 0.44 \times 0.74 \times 0.80 + 0.41 \sqrt{1 - 0.55} \sqrt{1 - 0.64}$$

$$r_a = 0.42$$

The resulting equation for the Balance Sheet 2 data may be interpreted as showing a better overall performance than the analysis for Balance Sheet 1. In particular, there appears to be a greater level of knowledge and a greater level of non-linear variation.

Following Dhir & Markman (1984), correlations of a priori estimates and actual weightings may be used to indicate the degree of dissimilarity between subjective and objective judgment policies. In everyday terms, the higher the figure, the more a person may be said to know their own mind. This simple extension to the Lens Model paradigm allows the fundamental differences between the Rationalist and Empiricist decision models to be crucially tested. For Rationalist models, such as Fishbein's, the two sets of policies should coincide. Dhir & Markman (1984) in a study of marital conflict, found the highest correlation to be a modest $r = .33$. A similar degree of association was obtained in this study for the weighting policies of the decision to stop smoking (Balance Sheet 1).

For the judgment to stop smoking with the aid of a selected anti-smoking treatment (Balance Sheet 2), the subjective and objective weightings are markedly different (correlating very weakly at $r = -.14$). Strong a priori weightings are given to *treatment onset* and *treatment power*, whilst the Lens Model shows the actuarial picture to be quite different, with high weightings given to *locus of control* and *fear of treatment* (see Table 39).

Table 39.

**Weights Assigned to Cue Variables
for Therapy Options (Balance Sheet 2)**

Dimension	Averaged apriori subjective estimates of cue weights	Averaged relative weights determined by LENS analysis
A treatment sensation	.09	.03
B treatment durability	.08	.06
C personal suitability	.03	.05
D treatment onset	.20	.14
E treatment power	.20	.03
F locus of control	.01	.20
G effortlessness	.03	.04
H fear of treatment	.08	.17
I withdrawal symptoms	.02	.02
J self approval	.18	.004
K treatment interest	.004	.10
L assist others	.07	.11
M social approval	.002	.05

Correlation $r = -.14$

Intra-System Lens Analysis

The cognitive conflict paradigm can be conveniently adapted to capture the intra-personal case. That is, to show the degree of matching between 2 related judgments by the same judge. This has a special significance for modelling the two meta decisions described in Bandura's (1977) model of self-efficacy, and implied in Eiser's reworking of Weiner's attributional model. The same general formula may be adapted.

Tucker's (1964) Lens equation:

$$r_a = G \cdot R_1 R_2 + C \sqrt{1 - R_1^2} \sqrt{1 - R_2^2}$$

G = 0.26 [correlation of the 2 predicted intentions ;
Y Intention (i) r. Y Intention (ii)] This
shows the matching of expectations between
personal efficacy and outcome efficacy.

R₁ = 0.82 (Cues used to predict the cognitive control
of outcome efficacy).
} [Following the cognitive conflict paradigm
} both are drawn from the judgment side of
} the Lens Model equation].

R₂ = 0.74 (Cues predicting cognitive control of
personal efficacy).

C = 0.05 [correlation of residuals]

$$r_a = 0.26 \times 0.82 \times 0.74 + 0.05 \sqrt{1 - 0.67} \sqrt{1 - 0.55}$$

$$r_a = 0.18$$

Overall, the resulting achievement figure is considerably lower than for either of the two sets of cues when independently worked in Lens analysis. This appears to be mostly an effect of the lowered "G" figure. That is, there is a relatively poor correspondence between the two sets of intentions. In terms of Bandura's (1977) model there is a discrepancy in expectations between perceived outcome efficacy and personal efficacy.

Oddly, perhaps, the degree of non-linear variance also appears to have been reduced substantially. Although the correspondence between the two cognitive sub-systems is reduced, the relationship appears to be more linear. Polynomial regression can be used, however, to further test the degree of linear or configural fit. Kerlinger & Pedhazur (1973) argue that with a few notable exceptions residuals from regression analysis are all too infrequently taken account of in social science research. Perhaps the Lens Model is to be applauded in this regard.

The appropriate degree of regression can be chosen with the aid of a preliminary Analysis of Variance generated through computer applications, in which the program builds a series of polynomial regressions from x^1 (x to the power of 1 or simple straight line) through x^2 (quadratic or U shaped) on to more complex equations such as x^6 . A preliminary Analysis of Variance table shows the additional sums of squares explained by models of successive degrees plus their associated F values and R squared values. (See Table 40) Viz:

Table 40.

**Preliminary ANOVA table
Intention scores Residuals**

Source	df	mean square	F-value
X ¹	1	57.34	.08
X ²	1	1321.45	1.88
X ³	1	144.76	.20
X ⁴	1	140.78	.19
Total	29		

On the basis of the highest resultant F value, the selected degree of regression = 2 (simple curvilinear fit)

R squared = 6.76 (Std error of est. = 26.54).

That is, the two sub-components of self-efficacy judgments are to some extent still related in a nonlinear form. It is worth recalling that Slovic & Lichtenstein (1971) found a consistent lack of linearity when it came to judges self-insight.

In all, the Lens model analysis clearly illustrates that for Clinic subjects there is only a modest degree of anticipated personal efficacy (success in treatment). Their expectations of realizing efficacious outcomes (benefits in changing to become non-smokers) are still more conservative. Neither set of judgments suggests a particularly optimistic anticipation of successful action. More than this, however, there is a distinct discrepancy between their expectations for the two kinds of efficacy. The two sets of considerations show quite a low level of correspondence.

The intra- system Lens Model analysis developed here allows different meta decisions to be matched for both internal consistency and accuracy with empirical criteria. Adapted in this form, the Lens Model provides a suitable and powerful algorithm for attributional models of decision making. In particular it may be used to capture the two sets of expectancies specified in Bandura's (1977) bifurcated model of self-efficacy.

Conclusions

Clinic subjects appear to have an initial preference for the Hypnosis option, before being presented with choice information in the experimental manipulation. Around half of the subject group would thus have been exposed to information indicating Hypnosis to be a less desirable therapy than Rapid Smoking, at least in terms of stability and locus. Even so, Clinic subjects show a clear choice, overall, for the Hypnosis therapy. Control subjects, in contrast exhibit a

more even choice pattern, reflecting the counterbalance of information in the experimental manipulation.

Analysis of variance shows no significant effects except for Clinic subjects differential expectancy of *stability* in the treatment options. Clinic subjects actual choice of therapy is not, however, influenced by this attribution. Intention scores for both Clinic and Control subjects, moreover, appear not to be influenced by the experimental manipulation of choice information. It may be that the manipulation of information failed to resonate with subjects' own attributional categories, or that the ANOVA framework artificially constricts the attributional information into unconvincing dichotomous categories.

Dispositional Locus of Control shows some generalized expectancy with decision making insofar as Internality correlates modestly with intention. This does not extend to predicting behavior in stopping smoking, however.

Some incidental evidence helps to corroborate Eiser's hypothesis that many smokers perceive their habit as "sick". Other content analyses of smokers' naive attributions fit the smoking typology of Russell et al (1974) tolerably well, but do not yield particularly informative statistical associations with other smoking history or decisional variables.

In an application of the Lens Model paradigm, likelihood ratings from the Balance Sheet procedure provide a set of usable cue ratings. With Intention regarded as the judgment value on the proximal side, and Least Amount Smoked as criterion value on the distal side, cue weightings can be derived. With this analysis, *Gain Weight* emerges as the strongest cue utilized on both sides of the lens. There is also considerable under-utilization of some cues, however, especially *Have nicer breath*. Tucker's (1964) Lens equation extends the analysis, revealing a modest performance level on average for smokers decisions to stop smoking ($r_a = 0.34$). That is, the decisions, on the whole, show a modest level of ecological validity. Interestingly, the set of cues from Balance Sheet 1 have quite a good fit with the two dependent variables. That is, they significantly predict intention (judgment value) and least amount smoked (criterion value). Substantial improvements in ecological validity could be made, however, through the G factor (amount of "knowledge" or correspondence in the two sides of the lens).

Dhir & Markman's (1984) methodology adds to the understanding of judges' decision policies. To this end, Balance Sheet importance ratings may be transposed into a priori estimates of cue weightings. Whereas subjects rate *increase autonomy* as their major concern in decision making (a finding consistent with the preceding analysis based on Rationalist algorithms), actuarial analysis through the Lens Model shows *gain weight* to be the cue (or salient belief) given the greatest utilization.

Lens Model analysis of the choice of treatments (Balance Sheet 2 data), demonstrates a better overall judgmental performance ($r_a = 0.42$). A priori and actuarial weightings are again weakly associated, however, ($r = -.14$). While subjects rate *treatment onset* and *treatment power* as their greatest concerns, the Lens analysis shows *locus of control* and *fear of treatment* to be the major deciding factors.

The Lens Model analysis has greatest potential when adapted to fit the intra-system case. That is, it may be used to capture the meta decisions made by the same judge to arrive at a single decision preceding action. This corresponds to the two sides of the attributional ANOVA matrix in the case of the Eiser/Weiner model, and to considerations of outcome efficacy and personal efficacy, in the Bandura model. In this new extension of the Cognitive Conflict paradigm, the Lens Model analysis replaces the ANOVA algorithm with a prospectively oriented formula based on Multiple Linear Regression techniques. Employed in this way, data from Balance Sheet 1 (the decision to stop smoking) may be taken as one system (equivalent to outcome efficacy), and data from balance sheet 2 (choice of treatment options) as the other system (corresponding to response efficacy. That is personal efficacy combined with treatment efficacy). The resulting intra-system Lens analysis reveals a lower level of decisional performance than for the separate analysis of the two sub-systems ($r_a = 0.18$). This indicates a discrepancy in the two sets of expectations, with a low correspondence of the meta decisions. Clinic subjects, that is, have a fairly poor knowledge of how their sets of judgments relate and the impact of them on a single decision focus for action.

Polynomial regression of residuals further shows that the two cognitive sub-systems are probably related in a configural (or curvilinear) fashion. In all, the Lens Model analysis shows considerable potential as an algorithm for extending the attributional models of decision making. It appears to be capable of modelling the hypothesized meta-judgmental processes, and revealing hitherto unseen features in the attributional resolution of information.

RESUME AND CRITIQUE OF STUDY THREE

The greatest difficulty for this, or indeed any empirical study attempting to model decision making processes, is to find a way of capturing and measuring the relevant cognitions without distorting them. Simply asking subjects to describe what goes through their minds or even researchers themselves engaging in detailed introspection can only be of limited value. Assuming no prior view as to what the data will consist of is patently a return to naive inductivism. It is also possible that decision makers may not have available the details of their cognitions. This, of course, implies some form of Empiricist model. Postulating any kind of internal audit is equally a version of Rationalism. Both models in turn rely on their respective propositional and algorithmic machineries.

Methodological Considerations

The Balance Sheet procedure explicitly operates within the Rationalist model. In effect, the procedure supplies respondents with an individual Rationalist algorithm to weigh issues in the balance and attach values to outcomes. In doing so the final data set of subjects beliefs undoubtedly favoured the Rationalist cause. Although it was possible to transpose the ratings into an Empiricist algorithm, this method of study will probably have reduced the validity of subsequent Empiricist based analysis. If nothing else, the Balance Sheet procedure will have reinforced in subjects' minds the representation of smoking issues based upon Rationalist thinking (typically encountered in health education campaigns). This as much as anything else may account for the high salience given to health and finance considerations. Even so, it is significant that the issue of autonomy (personal efficacy?) was the most frequently elicited belief in Balance Sheet 1.

It may have been revealing to employ Balance Sheet 1 (for the decision to stop smoking) a second time, after subjects had completed their therapy. In addition to providing a measure of test-retest reliability, this might also have thrown more light on the relationship between outcome and personal efficacy. In the form that the two Balance Sheets were used, however, they do give some indication of method variance. Using the same method on two different data sets, shows it to be a robust procedure, able to capture a broad spectrum of decisional considerations.

The scaling procedure also emerged as a convenient and workable technology. Though not exactly as Ajzen & Fishbein (1980) prescribe, the expectancy-value ratings format is

functionally equivalent, and able to assimilate the dimensions from both data sets. The 100% scaling intervals are arguably more akin to everyday uses of scales, and therefore have good external validity.

Some further scale purification would be an a worthy step, however. The collation of salient beliefs ultimately relies on the better judgment of the researcher. Categories are combined or recombined to fit in apparently coherent groups. Some form of ratification from the original subject group would, though, promote confidence in the workings of the salient set of beliefs.

In practice, most subjects tended to use the scales in the 10% units. Effectively then, they became classic 11 point rating scales. Some subjects, however, rated some dimensions with a nominal 1% value. This allowed the dimension to be retained, but suggests the possibility of statistical artifacts in the resolution of the algorithm. The use of such marginal ratings could be investigated further. Future studies in this area could profitably explore the convergent validity of the procedure by comparing it with other forms of audit taking.

The experimental manipulation of choice information about treatment options was meant to provide a suitably powerful empirical opportunity for the Empiricist model (particularly Eiser's version of Weiner's model) through the partitioning of locus and stability attributes. On the basis of Hayes' (1977) previous therapeutic work, an assumption was made in the planning stage of the study that the choice of Hypnosis and Rapid Smoking therapies would be, or could be presented as being, equally attractive options. It is very doubtful that this assumption was justified. Both Clinic and Control subjects showed a clear overall preference for Hypnosis regardless of attributes assigned in the experimental manipulation. Even so, it is noteworthy that the pattern of choices for Control subjects was in the predicted direction. Perhaps it is the case that for Clinic subjects about to engage in the brute realities of action, the imminent possibility of receiving nasty (rapid smoking) treatment will have concentrated their minds wonderfully. Future studies in this area would be better directed at discovering equally likely options in the first place.

The empirical study combined a case study approach with an experimental format. Consequently, the methodology was directed as intensive rather than extensive data gathering. The sampling procedure gave 10 subjects in each of the four cells of the experimental paradigm, with the aim of establishing sufficient reliability to operate the test model, rather than attempting to generalize to the broader population. As Kerlinger (1970) notes, however, randomization control procedures in experimental conditions only work well when there are enough subjects for the random variation to become evenly distributed. In this sense, the sample size used here probably reflects the minimum possible. The matched experimental control group doubles the sample size, of course, and shows in comparison that within the cells of the ANOVA design there is sufficient consistency for some confidence in the reliability of the experiment. A

greater problem, however, is the threat to the internal validity of the manipulation of choice information. Judd & Kenny (1981) point out that randomized experimental designs help overcome threats to internal validity, but are difficult to conduct. In particular, it is difficult to ensure that subjects stay within the design. In the Smoking Clinic manipulation, it is possible that intending non-smokers paid little attention to the choice information about stability and locus, having effectively made their choice for Hypnosis before hand.

Since such attempts to retain control may reduce construct validity, it may be better to use quasi-experimental designs (e.g. Cook & Campbell 1979) which allow subjects to self-select their own attributional categories as well as their own choice of outcomes.

The clinic context was created as a quasi-field setting. This was successful in the sense that it facilitated the sampling of self-selected subjects and hence provided a means of experimental manipulation in a meaningful setting. The clinic format, however, powerfully adds to the attribution of dependency by implicitly representing the smoking problem as one only available to expert treatment. Consequently, it helps perpetuate the attributional mythology of addiction. Much of Eiser's work has been directed at changing this. It is perhaps the case that research in this area should have regard for this problem. There is at least scope for research on the decision making about health issues to have a more emphatic Action Research basis. Although this study was intended to help subjects stop smoking as well collect data from them, it may not have been the most suitable form of intervention to progress their health careers. Instrumentally, the research context favours a particular version of content which has been challenged by the Empiricist model. Ethically, it is also questionable since it is doubtful that Clinics help smokers in the long run.

The clinic context has other ethical draw-backs especially when working within limited resources. The sampling operation did not in the end treat Waitlist subjects too kindly. Better planning may have dealt more efficiently with them, not only to aid their attempt to quit smoking but also to provide more detailed and pertinent comparisons with the fortunes of Clinic subjects. It should perhaps be an ethical rule of thumb that all prospective subjects receive in exchange a level of treatment (or other service) equal to their involvement in the study or equal to their degree of expectation generated by the study.

Behavioral predictions from attitude studies and decisional research are inevitably only reliable in stable environmental circumstances. Although the questionnaire instruments sought a broad range of data relevant to subjects perceptions of their smoking habit and associated problems, little data was systematically gleaned about the actual social and other background factors in the lives of Clinic subjects. A more concerted attempt to apply Brunswik's concern for representative design could have gathered information on home and work environments

particularly to discover how supportive or counter-productive they might be in the smoker's attempt to quit the habit.

Both the Preliminary and Follow-Up questionnaires produced respectable return rates, and were mostly filled-in appropriately with few missing items. This testifies to the general validity of the question categories and shows the worth of detailed piloting. The Post Treatment Questionnaire, however, contained a short version Balance Sheet (3) which was not a successful item. Few subjects completed it at all, and those who did mentioned that they had difficulty remembering salient attributes. No doubt this is partly an effect of the 18 months time gap since attending the Clinic. It also throws into question, though, the appeal of the balance Sheet procedure.

In addition to the battery of quantified measures, the empirical study generated a mass of richly detailed qualitative data. Mostly this was accumulated as case notes by the experimental interviewers and the Therapist, but also includes additional notes written on questionnaires and letters sent by Clinic patients reflecting on their experience.

The experimental interviews were designed to facilitate decisional processes in subjects without influencing either the content or style of decision processing. Consequently they were deliberately conducted in a Rogerian fashion, being open-ended and unstructured beyond encouraging subjects to explore for themselves, the issues surrounding their decision to stop smoking and the choice of treatment options. In this regard they appear to have been remarkably successful. It is also clear, however, that there is scope for appropriately structured interview items and techniques, both to aid the decision maker and to systematically collect data.

The qualitative data show that subjects did not readily align their decision making strategies with either Rationalist or Empiricist models. Instead they portrayed their decisions as "right" or not, and their subsequent actions as "real" or not. In all, this may be subsumed under an authentication theme, and will be discussed more fully in the final chapter.

Rationalist Modelling

The findings presented in this study generally corroborate the broad picture reported by other researchers working with the Fishbein model. Conspicuously, against theoretical predictions, Modal Salient Beliefs (MSB) turn out to be better predictors of intention and behavior than are the set of Independent Salient Beliefs (ISB). The anomaly is largely a methodological artifact, or more correctly a weakness of the Fishbein algorithm.

Where respondents show a highly skewed distribution in the number of ISB (generally a function of the total size of the set of elicited beliefs), there are likely to be more null dimensions in the group audit of salient beliefs. (Evaluative beliefs which are *not* salient for individuals will be rated as zero or near to zero). Restricting the analysis to the first few beliefs with the highest modality (that is those beliefs which most people have in common), by definition reduces the proportion of zero rated dimensions. Analysis based on MSB thus reduces the amount of unwanted variance in the final regression equation and so improves levels of prediction. In the present study this effect was shown repeatedly with data from Balance Sheet 1 (costs and benefits of stopping smoking). The effect is lessened by use of the MAUT algorithm which gives higher relative weighting to shared salient beliefs (or perhaps more aptly, reduces the impact of beliefs not widely shared by the group).

Where groups of individuals are evenly spread in their salience, reducing the diagnostic set to a smaller number of MSB should have little impact on improving prediction. This again was clearly demonstrated in the data generated in this study. For Balance Sheet 2 (choice of treatment options) most Clinic subjects used most dimensions. Reducing the salient set to the shared range of Modal Salient Beliefs made no substantial improvement on predictability.

As long as the present form of simple linear additive algorithm is retained as the basis to the Fishbein model, sets of MSB will always prove superior predictors. A more efficient and appropriate method of collating ISB is therefore required where the audit is taken at the group level.

The saliency construct also retains conceptual problems beyond the the effective workings of the algorithm. Most importantly the categorization of elicited beliefs into areas of similar meaning remains an essentially inductive, and therefore unsatisfactory, process. Marsh & Matheson (1983) imported factor analytic techniques to sift the spread of emergent beliefs into fewer areas of common meaning. A similar technique was deployed in the present study. Although largely corresponding to previous findings, the emergent structure is dependent upon the common sense interpretation of the researcher (and that of previous researchers). To be true to the underlying rationalist principles, some form of ratification should be sought from the sample. As Thomas (1975) advocates, at the very least, some form of scale purification would seem to be called for. Thurstone and Likert techniques still have much to commend them in this regard.

Budd (1986) invokes an alternative strategy, by having individuals identify personal salience from a set of commonly presented items. In a study of beliefs about cigarette smoking Budd found semantic differential measures yielded significant correlations with evaluations of items identified as salient. Eiser, van der Plight & Friend (1979) obtained similar evidence from a study of smoking issues by employing free ranging (qualitative) discussions. Good predictions

are said to have been obtained from items identified as personally salient. Eiser & van der Plight (1988) go on to argue that the relationship between salience and evaluative consistency is of central importance in decision making models generally.

Transposing the Multi Attribute Utility algorithm to the Fishbein model revealed potential advantages in illuminating underlying patterns of organization in the salient set of beliefs. Like factor analysis, MAUT also ultimately depends upon interpretation by the researcher. Even so, the technique has considerable potential in this area especially if combined with some kind of sensitive analysis which imparts feedback to respondents and secures data on the basis of their subsequent reflections (compare, for example, Humphreys & McFadden 1980 or Phillips 1984).

Empiricist Modelling

As predicted the ANOVA framework was found to be relatively inefficient as an algorithm for generating and assimilating prospectively oriented attributional data.

The experimental manipulation in this study resulted in one striking anomaly for the Empiricist model. Although attributions of stability yielded a significant main effect with measures of expectation, no significant differences were found with intentions or actual choices. Given the consistency of previous findings (e.g. Eiser, van der Plight, Raw & Sutton 1985), it may be that the form of manipulation attempted here did not adequately produce attributions of stability in subjects minds. Certainly, research along these lines would be better placed after gathering some independent corroboration of subjects perceptions. To some extent the data of Control subjects should act as an appropriate comparison. The results show clearly enough that Clinic and Control subjects differ in how they attend to choice dimensions. Even so, neither group had their intentions influenced by the manipulation of stability.

Lens Model analysis of the decision to stop smoking demonstrates a modest performance level overall in judgment policy. In contrast to subjects' a priori (subjectively assigned) weightings of cues, however, and contra the preceding Fishbeinian analysis, the actuarial use of cues makes *gain weight* the most salient belief. That is, subjective judgment policies do not exactly mirror the objective use of information by decision makers. Applied to the choice of treatment options, the Lens Model reveals a slightly better performance level, but still shows a gap in subjective and actuarial weightings of cues. In particular, subjects believe they are most concerned with *treatment onset* and *treatment power*, whereas *locus of control* and *fear of treatment* are shown to be the most important predictors of choice. The analysis offers strong support for the Empiricist interpretation and challenges the Rationalist notion that people have available to them an ordered understanding of the dimensions used in their decision making.

Superimposed upon the Bandura model of self-efficacy the Lens model was shown to provide a potentially powerful and appropriate algorithm. Not only was the intra-system model developed here able to assimilate data representing the two forms of efficacy expectation, but it also illuminated hitherto unidentified problems in the correspondence of outcome and personal efficacy. Equally, Bandura's thinking could also add a much needed fertile propositional content to Social Judgment Theory, which appears to invest everything in the algorithmic heuristic of the Lens Model.

Conclusions

It has been possible to demonstrate the validity of transposing algorithms within the same research programme. Not only can this expand the empirical utility of theoretical models, but it also helps to locate areas of inconsistency between a research programme's propositional and algorithmic heuristics.

The Theory of Reasoned Action may be augmented by adapting MAUT techniques into the basic algorithm. Although not entirely solving the methodological problem associated with Individual Salient Beliefs, the transposed model reduces the problem by giving relative weight to saliency. The exercise also highlights the nature of the methodological artifact in the basic Fishbein model.

The attributional models of decision making yield limited predictions with the ANOVA based paradigm. The Lens Model algorithm transposes without great difficulty and also highlights hitherto unseen problems in the fit of attributional meta judgments. The intra-system Lens analysis introduced here has considerable potential for equipping attributional theories of choice with a suitable and powerful prospectively oriented algorithm.

Although some modest empirical findings can be claimed for both the Rationalist and Empiricist models of decision making, neither approach can be shown to be significantly superior to the other. Both supply complex explanations of decision processes and are able to generate data sets which give some credence to the underlying theoretical models. In the domain of smoking research, they offer a number of insights to account for smokers difficulties in attempting to stop smoking. The Rationalist model shows that smokers are influenced by complex catalogue of influences which they apparently attempt to trade off to reach a balanced decision. Their reasons may be rational, but they also appear to be incomplete and do not necessarily accord with intentions and subsequent behavior. The Empiricist model reveals that smokers have separate meta judgments to make about the potential outcome of a decision to stop smoking, and the problem of translating this into reality through the application of their personal efficacy. There is also some difficulty in reconciling the two forms of considerations.

The Rationalist and Empiricist decision models do not, however, appear to capture the essence of smokers' decision making experience nor predict with compelling accuracy. It appears that smokers' explain their own decision making in terms of its authenticity rather than optimum value or control of uncertainty.

Empirical studies generally add to the critical appraisal of scientific growth. As a part of the larger scientific practice they extend each research programmes positive heuristic as much as they provide singular tests of singular hypotheses. By exposing details of the propositional content to the workings of algorithmic operations they both test and create opportunities for elaborating problems and practice. Each anomaly or corroboration in turn facilitates further comparisons. Beyond this, empirical studies have an important function for the researcher's own decision making processes. As part of the practice of research, empirical work engages researchers in a primary form of action exactly as that described here for other decision makers. As Kaplan (1973) aptly describes, the aim of empirical methodology is in the broadest possible sense to help us understand the process of scientific enquiry rather than the products of it.

Ultimately, decisions are the processes by which we translate thoughts into action. This is as true for the body of science as it is for individuals. In this sense, understanding the growth of science also necessitates understanding the nature of decision making. Social Psychology has a particular role to play in this regard. Not only do research programmes of decision making have hard cores based on epistemological principles more usually associated with the growth of scientific method, but the conduct of research also depends upon the socio-psychological rudiments of decision making.

EPILOGUE

AUTHENTIC ACTION: Reasoned Control, Inferred Values

The Rationalist and Empiricist research programmes in decision making look set to continue their peculiar coexistence. As rival approaches to individual cognitive processing they continue to dominate mainstream Social Psychology. In offering two sides of the same coin they maintain a stable (or perhaps a self-perpetuating) theoretical currency. Hardly any integration has been achieved so far despite excursions by researchers into both realms. Even practice domains (such as the smoking cessation problem discussed here) feature little if any integration of the complementary work.

They do share, however, considerable problems of matching theory work (or more correctly, propositional heuristic) to aspects of scientific practice. Consistent with Lakatos's Methodology of Scientific Research Programmes, it has been possible to identify areas of positive and negative heuristic. Both the Rationalist and Empiricist research programmes of decision making survive partly through the protection of core constructs in the negative heuristics.

Scientific growth in Psychology, for these dominant research themes at least, shows the same kind of historical development as in other areas of science. There are striking resemblances, for example, with some of the problem shifts in astronomy well documented by Philosophers of Science. In particular there has been uneven development of theory and practice in the scientific enterprise. Dogged and unidirectional development of theory has sometimes continued despite a steady accumulation of empirical anomalies. At other times the story has shown powerful algorithmic heuristics being pursued to the neglect of propositional content.

Alternative research programmes founded upon other epistemologies have emerged in recent years to challenge the dominance of the Rationalist and Empiricist paradigms. Although they have had an acclaimed impact within some areas of Social Psychology (e.g. Reason & Rowan 1981), research programmes within the self-styled "new paradigm" have not as yet produced the kind of over-arching "normal science" seen in the Rationalist and Empiricist programmes. More than this, though, the Rationalist and Empiricist research traditions appear to be the only approaches offering viable models of decision making processes.

Decision making theories exemplify the individual approach to social cognition. An interesting set of challenges has emerged in recent years, however, to question how far such constructions of individual cognition really are the cornerstones in the edifice of Social Psychology. In particular the theme of social action has emerged as an alternative basis for Social Psychology. The concept is usually understood to refer to purposeful behavior guided by socially shared beliefs. That is, action is seen as embodying shared social meaning, not just the pursuit of individual goals (e.g. Beach 1985; Frese & Sabini 1985; Jaspers & Fraser 1984; von Cranach & Harré 1982).

Decisions as Representations

One influential school of thought has pressed the concept of *social representations* to account for widely held structures of beliefs (Moscovici & Hewstone 1983; Farr & Moscovici 1984). It is argued that the attitude concept should be broadened to incorporate the cultural and historical context in which attitudes are formed and transmitted. Moscovici's (1963) review of the attitude and opinion literature criticizes much American and British based research for its over-individual focus. Of particular relevance here it is said that the Fishbein type of approach ignores the social context which guides the collective aspect of shared attitudes and beliefs. That is, attitudes are argued to be more than isolated components in a single individual's thought and action sequence. Rather, it is argued that attitudes need to be understood as part of a wider social representation of reality. (In defence, Fishbein would, undoubtedly contend, however, that these are mediated through individual attitudes to the act and normative beliefs).

Within the Attribution theory literature there is also a new awakening to social representations. Moscovici & Hewstone (1983), for example, discuss the changing relations of science and the social representation of science. Common sense once influenced science, it is said, but now the direction is the other way around. Social representations are considered to be widely shared belief systems, the content of which may originate in scientific research or other forms of valued knowledge. Ideas from such lofty sources are thought to percolate down from various interest or elite groups, often via media representations, to become truisms in general society. Scientific or other "truths" become assimilated into the fabric of common sense wisdom and so change not only the content of widely held beliefs but also the consensual criteria for evaluating important social issues. Hence, they also determine the nature of attributions.

Can Social Representations provide an alternative theoretical basis for understanding decision making?

The task of the social scientist, according to this view, is to account for the emergence of social representations and to show how such social structures help define the world for us.

Widely held explanations of major social events appear to be based on collective beliefs of causality as much as attributional mechanisms. For social representations, such beliefs are not seen atomistically but as inter-related in wider patterns of beliefs. That is, in terms of underlying coherent lay theories. This takes on a particular force where there are wider public controversies. Protagonists to any debate may be thought to exploit images to influence social representations. This is especially relevant where the controversy is staged in the arena of the mass media.

It is revealing to note that in 1979/80 (around the time of the empirical phase of this study was established), the Health Education Council spent approximately £ 325,000 on anti-smoking propaganda. The tobacco companies, in contrast spent £ 30 million on advertising alone. The battle for hearts and minds through media representation is evidently fought on uneven grounds. Persuaders though do not simply try to get across their message and change the content of widely held beliefs. More significantly, by drawing on social representations, the metaphors they supply influence the processes by which people think. In Moscovici's words, they "retool" or transform the way in which people encode their attitudes.

What Social Representations were evident for the problem of deciding to stop smoking ?

Will Power and Healthy Choices

In interview records and Therapist case notes, just over one third of the Clinic sample volunteered the concept of will power as a partial explanation for their decision and action. This could be regarded as part of a lay theory (e.g. Furnham 1988), a manifestation of a widespread belief (Gaskell & Fraser 1990), or as evidence of a powerful social representation influencing their decisions about stopping smoking. Davison (1980) has similarly found from an in-depth survey of men with heart disease that 47% believe their inability to sustain preventive behaviors stems from an inherent lack of will power. O'Connor & Daly (1985) similarly conclude from their survey of smokers' attempts to stop smoking,

"Will power.. is the factor most commonly held to underlie ex-smokers' successful cessation attempts."

The will power concept is also found in the great majority of health education texts and popular self-help guides devoted to stopping smoking. Over the past decade health educators have distributed free to the public thousands of copies of anti-smoking leaflets and guides to quitting.

One of the more popular examples,
So You Want To Stop Smoking, (HEC booklet AS 533) proclaims,

"There is no aid to help you stop smoking that's better
than your own will power."

A summary of smoking cessation techniques produced by the West Midlands Health Services
similarly concludes,

"there is no one magical cure to help people quit
smoking - an individual's will power and determination
are the key to whatever method is chosen."

(Horlick 1981)

The *Which?* magazine review of anti-smoking products and services advises its members,

"There are aids and help which you can buy to support
you giving up - though nothing replaces the need for
will-power and determination."

(Consumers Association, August 1980)

FORESIGHT (the association for the promotion of preconceptual care) runs clinics where advice
can be sought by would-be parents. They also counsel that,

"Giving up smoking..is a matter of will power."
(*Times Health Supplement*, January 1982)

The same theme is consistently evident in popular off the shelf guides to stopping smoking. *Stop*
- a popular self-help book (which is cleverly produced to resemble a packet of 20 cigarettes),
prescribes the same unambiguous treatment,

"this remedy hasn't got one of those fancy medical
names; its called, simply: WILL POWER."

(The Addison Group 1981)

In the book to accompany a popular television series on general health (*Well Being*, Channel 4),
the same message is delivered,

"There is no magic method. Whether people stay stopped
or not has depended entirely on their own will power."

(Holmes & Associates 1982)

Miriam Stoppard (1982), one of the best known "T.V. Doctors" writes in her guide to stopping
smoking,

"Most smoking experts agree and I agree with them, that
there is no substitute for will-power."

Oliver Gillie (1977) a respected health correspondent for the Sunday Times newspaper, has also
written a guide to stopping, and also concludes in similar vein,

"If friends are unsympathetic and taunt you remember that they may not have the will power to give up themselves."

Insofar as the will power concept is pervasively advocated by influential health educators and is clearly aimed at influencing people in how they think about smoking cessation, it could be regarded as a social representation.

Alan Beattie (1984) observes that health educators have in the past few years invested much effort in the "generalized will power model". He further notes that this has the advantage of drawing on Social Learning theory, which is at least testable. Beattie says that the personal self-empowerment model of health education in attempting to encourage the development of internal locus of control, is akin to the behavioral science reformulation of the will power concept.

Some support for this interpretation may be found in a renowned study by Farr (1977). Farr re-analyzes Herzlich's (1973) work on the causal understanding of health and illness in attributional terms. Following Heider, he argues that positive health is attributed internally to the self but illness or negative health to non-self or external sources. Farr, however, goes beyond this to support Moscovici's contention that Social Representations are more "basic" or fundamental than social attributions.

It is not easy, however, to see how the concept of will power fits either of the two auxiliary hypotheses of social representations theory: anchoring and objectification.

Anchoring is thought to be a mechanism of codifying and categorizing new ideas. It provides cognitive integration, but at the social rather than individual level.

Most popular guides to stopping smoking reduce to the will power concept. Stripped of the rhetoric which purports to offer advice and practical help, they make pessimistic reading, leaving the would-be non-smoker with no practical help at all. Since will power remains undefined, or rather, unanchored, readers are ultimately left in the empty limbo of trying to summon up a semi-mystical force. The implication, moreover, appears to be that will power is a personal disposition or ability. No advice is given on how to access this essential property, or how to augment or acquire it if it is lacking in suitable strength.

Objectification is the process of making the abstract concrete and familiar. It is usually thought of as the transmutation of scientific concepts into the everyday world. Moscovici's familiar example is the commonplace usage of "complexes" (derived from Psychoanalysis) to explain certain problematic aspects of everyday social experience.

Perhaps following Beattie and other health educationalists, the invocation of will power in stopping smoking could be seen as an example of objectification. It could transform the abstract

scientific concept of locus of control into concrete or familiar terms. That is, it could be taken as an everyday interpretation of a self-empowerment model of health attainment (compare, for example, the work of Tones 1986).

Although consistently advocated by popular health educators, psychologically based work tends to be vociferous in repudiating the concept. Will power is regarded as either redundant or misleading. McKennell & Thomas (1967) say,

"Ex-smokers seldom give reasons for stopping smoking which fall into the category 'test of will power'... on these grounds alone there is reason to doubt the efficiency of anti-smoking theories based on this motive."

Even so, will power might be regarded as a social representation diffused by popular health educators rather than the scientific community. Harris (1978), in another popular self-help guide, but which draws on psychological theory says,

"In place of unreliable will-power, we should employ decision."

Given that it is the popular texts which advocate the will power concept, it appears to illustrate a case where social representations may co-exist with other representations, and not necessarily be percolated down from Science.

Indeed, Billig (1988) challenges Moscovici's view that Scientific concepts have massively infiltrated common sense with a new hegemony of thought which has effectively replaced traditional thinking. Rather, he argues that cultural frameworks must still exist in order to produce scope for transcendentalization of ideas. That is, the transformation upwards of common and concrete experience to abstruse and abstract knowledge.

Farr (1987) warns, moreover, that scientists themselves are not free from social representations in their abstruse worlds. Social representations occur in science as much as in lay domains. Restated, they may have other equally, or indeed more powerful determinants. It is conceivable that social representations take on a life of their own and are not statically determined by either the venerated status of scientific knowledge or the manipulations of powerful interest groups exploiting media images.

The will power concept has, of course, been in existence for a long time. It is predicated upon the wider concepts of exercising will, and especially free will. It is embedded in much of our culture, visible in both our legal infra-structure and religious heritage. In turn the concept is intricately bound up in the history of Western philosophical thought.

Ashton & Stepney (1982), like other scientists working in the smoking domain, are keen, however, to distance their work from this popular representation of the smoking problem. As they reflect,

"The conventional wisdom is that smoking, ultimately, is conquered only through the exercise of will power."

The will power based explanation is dismissed as simply an alternative way of explaining success where others fail. They add that the concept in fact offers no explanation of *how* people manage to succeed.

The greatest problem for research with social representations, though, is contained in the question, "what is it that is social or shared?". The collective representation may be thought of as the social distribution of beliefs or as a structural phenomenon in its own right. The former (weak) interpretation suggests a statistical mapping of shared meaning, whereas the latter (strong) version indicates the identification of objective content. Myths and legends, for example, could be considered as varieties of social representations which are sustained in structures but transformed in content over time. That is, the same essential meanings may be seen to reappear in suitably adjusted stories from time to time to fit the contemporary context.(cf. Sperber 1990).

In a closely argued critique, Wells (1987) shows that Moscovici's account of social representations is simultaneously a theory and a meta theory. For Moscovici, theories are subject to social representations and hence views about the nature of reality. Consequently, the dilemma is to show social representations as a competing theory within Social Psychology. As Wells expresses,

"It is a theory which has no escape from relativism and is therefore weak in critical power".

Social representation theorists are unclear, moreover, in their writings as to the content limits of representations. No solid theoretical justification exists to show whether social representations may exist for any issue or just for some large social issues. Discussion so far has been limited to low level explanations of saliency or the psychological importance of the issue to people generally. Left at this level the problem remains identical to that confronting individualist theories of action (such as Fishbein's); namely reliance upon a purely empirical solution. Ultimately this leads to circular explanations where social representations emerge because they are socially important, and are deemed socially important because they are the stuff of social representations.

Perhaps it is the case that representations become social when the underlying concern becomes elevated to a widely shared social value. In other words, they achieve *collective salience*. It is also interesting to ask how representations lose their saliency. Under what conditions do representations cease to be socially significant?

A major problem shift has occurred in Moscovici's work, however by moving social representations from the status of explanatory concepts to that of pertinent phenomena; as objects of study for Social Psychology. Regarded in this way, the concept may powerfully add to understanding the nature of decision processes. Certainly the Rationalist and Empiricist approaches reviewed so far have tended on the whole to trivialize the nature of peoples explanatory concepts. The algorithmic heuristics typically reduce peoples decision content to isolated belief statements connected only by mathematical relationships rather than other possible structures. As numerous critics have pointed out, it is at least paradoxical that scientists allow themselves the luxury of representing ideas in complex theory systems, but exclude other (lay) people from the same privilege. Essentially this reinforces a passive model of the individual, or at least reduces the content of their deliberations to a small array of dimensional scores.

In all, social representation theory looks unlikely to offer a serious challenge to the dominant Rationalist and Empiricist models of decision making. On a different (reflexive) level, however, social representations may provide a useful basis for understanding the wider social context of individual decision making, and perhaps more importantly, provide a means of codifying the social content of decisions. On this basis, the study of social representations may provide Psychology with much needed cultural and historical dimensions.

Psychological models of decision making are mostly different (scientific) representations of Rationalism and Empiricism. In turn, it may be that much common decision making is based upon the social representation of these themes.

Moral Order as a Basis for Decision Making

In developing Ethogenics, Rom Harré and his colleagues present the most coherent alternative (Harré 1979; Harré, Clarke & De Carlo 1985).

Parker (1989) observes that Harré,

"uses the work on social representations as grist to the mill of ethogenics".

Harré sees social representations as distracting attention away from Psychology's form to its content, even though Moscovici is explicit in wishing to focus on form. Harré (1984) criticizes social representations work as being little more than a,

"collective plurality of social knowledge."

With a predominantly qualitative emphasis, Ethogenics focuses research on account giving rather than quantified transformations of beliefs. Harré's contemporary ethogenic method is also now more subtle than the "open souls" doctrine propounded earlier in Harré & Secord (1972). The central theme now is that all action should be explained in terms of the actors "social competence" which sets limits on performance. Knowledge, moreover, is said to be made of social rules. The ethogenic view is to see people as possessing a store of social knowledge (cognitive resources) from which they draw to explain (account for) and engage in social action. This leads to methodological implications. Since action and account share the same basis one can be used to reconstruct the other. In turn this requires more than observational method since only the social context gives meaning to actions which would otherwise be empty.

Ethogeny stipulates two kinds of rules which are contained in accounts of action; regulative and interpretive (Collett 1977). Regulative rules effectively guide behavior through pathways of action (like rules of conduct or etiquette). Interpretive rules, however, are expressions of the meaning which people ascribe to their actions in the social context. Both kinds of rule necessarily combine to create a social performance, which can then interact with that of others.

Potter & Wetherall (1987) maintain that Harré (1983) and others in the ethogenic paradigm (e.g. Sabini & Silver 1982) have attempted to develop Wittgenstein's (1953) concepts in social research. Hence they continue the tradition of non-cognitive thought in linguistic philosophy and ethnomethodology (e.g. Ryle 1949). At the core of this programme is the argument that vocabulary describing the inner mental world actually has no objective referent. That is, it forms an autonomous relevant social practice and does not constitute mental states independent of the social world. It thus exemplifies a subjective epistemological relativism. This is shown most clearly by Harré (1985) who posits that the self is not an entity but a social construction. An active, willing self is for Harré a primary theoretical construct which we hold of ourselves. This in turn is made up of a constellation of beliefs about our own nature along with a repertoire of speech acts, making for a linguistic model of moral order.

Ethogeny, according to Harré (1974) has the advantage of focusing on the search for folk theories about the social world. As he pithily describes,

"Everyone is, in a certain sense, a fairly competent social scientist, and we must not treat his (or her) theory about the social world with contempt."

Potter & Wetherall (1987), however, draw an interesting contrast between Harré's reliance on accounts and Nisbett & Wilson's (1977) critique which proposes that "verbal reports" are often ad hoc and frequently mistaken causal explanations. (Insurance reports which ascribe accidents to inanimate objects in intentional terms are perhaps the most familiar example).

Potter & Wetherall contend that Harré faces a trap of adopting subjects accounts as *factual* rather than *functional* since his form of ethogenic research depends upon performance data. Indeed at a wider level, as they cogently explain,

"There is a tension in Social Psychology between the principle that people can be trusted to describe their internal states and the principle that the researcher must remain vigilant of the possibilities of conscious or unconscious fraud."

In fact, the same tension exists as much for the subjects as for the researcher. That is, in delivering their account people are also concerned to generate a trustworthy explanation for themselves. A concern for true or authentic representation is arguably a fundamental feature of the decision making process. It is at least a prerequisite for any active model of the decision maker.

Goal Directed Action as a Rival Theory of Decision Making

The Ethogenic paradigm has developed a potential decisional research focus through Goal Directed Action. During the 1980's Goal Directed Action (GDA) emerged as another (mostly European) challenge to the dominant anglo-saxon research tradition. The nascent paradigm draws on a diverse range of influences striving for an integrated perspective between three empirical areas; Manifest action, social meaning and conscious cognitions.

Hacker (1982), for example, defines GDA in terms of control theory concepts owing much to the work of Miller, Gallanter & Pribram (1960). With an explicit theme of regulation by anticipation this formulation has a clearly Empiricist epistemological basis. Harré (1982), however, extends ethogeny in an *Aristotelian Schema* in which expressed motives are to be understood rhetorically. That is, as social explanations rather than vectoral forces. Kalbermatten (1982) argues for the capture of localized cognitions (consciousness) which accompanies the stream of action. Different representations in consciousness are hypothesized to have functional and temporal relationships with the direction of goal related action.

All contributors to the GDA paradigm claim to hold a realist interpretation of action. This entails moving out of the laboratory and attempting to explain the cognition and actions of people in their natural social context. Methodologically, the problem is to unite the method of accounting with direct observational methods. Proponents see in this an opportunity to creatively expand both theory and method in Social Psychology. Although there have been some interesting developments, such as the self-confrontation interview method, most empirical work has been conducted within traditionally defined areas, such as ethologically based studies of kindergarten interactions (e.g. von Cranach & Kalbermatten 1982).

The GDA research programme also carries unresolved conceptual problems. Action is differentiated from mere behavior in terms of purposiveness. Goals are construed as imagined or anticipated end-states of actions. The conceptualization is, however, arguably tautological. Actions are deemed purposive because they embody goal intentions, and goals are specified as the product of actions. In short there is no independent way of establishing means-end objectives.

Within GDA, decisions have a specific meaning. They occur at nodal points in the course of action (where there are two or more alternatives). According to von Cranach & Kalbermatten (1982) decisions are resolved through value rather than goal considerations. They say,

"Decision cognitions tend to begin with perceptions, proceed to searching processes, resort to criteria and end by execution. Rules, values and (general) knowledge are more often referred to and used as criteria than plans and goal related cognitions."

In effect this amounts to a principle of bounded rationality akin to Simon's (1957) concept of satisficing. As an auxiliary hypothesis it does not sit easily with other GDA concepts derived from systems theory (and hence based upon Empiricist principles).

At this stage of development GDA seems unlikely to offer any serious challenge to the more established Rationalist and Empiricist research programmes in decision making. It is praiseworthy, however, for its holistic focus. It offers a pertinent reminder that human action is multi-faceted. Few theories attempt to show human agency in its broader social and historical context.

Smokers' Accounts of the Will Power Problem

As noted earlier, will power was a major explanatory concept volunteered by just over one third of Clinic Subjects, though interesting differences may be observed in how the notion was articulated and employed.

Subjects' accounts of their decision making processes in this study were not specifically elicited, however, but were collated from the various interviews and records collected during the course of the Clinic operation. It is important to note that some subjects volunteered little insight into their reasoning and inference making whilst others furnished rich and complex testimonials. Content Analyses based only upon statistical frequency consequently has little value other than showing the general prevalence of any particular theme. As Gaskell & Fraser (1990) similarly conclude,

"establishing a widespread belief must go beyond the simple counting of heads."

Cohen & Manion (1980) report a number of methodologies for the qualitative analysis of accounts. Tracing a Theme is described as part of the Experience Sampling Method which transcends superficial or manifest boundaries each item of evidence immediately implies. They also add, however, that further research is required to authenticate accounts. In effect, an account of accounts is required (Browne & Sime 1977).

Spontaneous accounts also undoubtedly differ with regard to the depth of meaning imparted by the account giver and the degree to which the meaning should be interpreted literally or symbolically. In a revealing study of everyday explanations of health and illness, Cornwell (1984) distinguishes between people's private and public accounts. Private accounts are described as those given only to the self and close, significant others. Public accounts, in contrast are often concerned with legitimating medicine and implied moral values. It may be that the accounts of Clinic subjects fall only into the public category. Even so, the unsolicited accounts of Clinic subjects provide valuable qualitative data and make interesting comparisons with data extracted through application of Rationalist and Empiricist decision making algorithms.

Austin (1961) in his *Plea for Excuses* argues that free will problems can be understood if refocused on what people see as inhibiting their actions. This has a particular pertinence for will power based explanations of stopping smoking.

Several of the Clinic Subjects reported that they sought a treatment which would externally augment their own level of will power. As one explained:

"I prefer a treatment with as little need for will power as possible."

Another based her choice on:

"Anything which would strengthen my resolve."

For four subjects this pointed clearly to one treatment option:

"Having stopped once by will power, Hypnosis would be more suitable."

"Hypnosis gives will power."

"Hypnosis overcomes lack of will power (i.e. power of hypnosis is stronger than my own desires)."

"Hypnosis might induce will power."

Interestingly, though, the same concept was also used by smokers who chose the other treatment option. As one reflected:

"Rapid smoking took away the pleasant connotations but unfortunately it doesn't last without a supreme effort of will."

A number were disappointed to discover that their chosen treatment did not in fact deliver the hoped for will power boost. One subject reported:

"The treatment had no effect on my will to cease."

For some, the application of will power was closely identified with the investment of personal effort. As they regretted:

"I had decided beforehand to opt for hypnosis. I was hypnotized each time but didn't maintain a big enough personal effort to stop."

"I relied 70% on the treatment, 30% on my own effort."

"The treatment was very good. If I had tried much harder.."

"I realized its me who is going to have to make the effort. Treatment won't work automatically."

"I'm not trying hard enough, but feel happier about giving up."

Expressed in terms of applied personal force the will power explanation is consistent with the representation conveyed in the popular guides to stopping smoking, and could be seen as an objectification of locus of control. Furthermore, several of the Clinic sample portrayed will power as a limited personal resource. Mostly they appeared to despair of their own lack of this vital essence:

"I don't seem to be able to stop smoking by will power alone."

"There is a distinct lack of will power on my part."

"I suffer a lack of will power."

"I don't seem to have any will power."

"Cutting out completely is beyond my will power."

"I am weak willed. I do not posses the will power required (would try hypnosis again)."

Regarded as a shortfall in ability, the will power concept could also be taken as support for Eiser's thesis. That is, attributing an absence of will power is effectively equivalent to the self-attribution of addiction (a problem of fixed stability and internal locus). This interpretation is

also consistent with other related attributional themes such as Seligman's (1975) concept of Learned Helplessness.

Against this, however, Clinic subjects do not appear defeated by their attributions. That is they did not portray their predicament as a reason for not acting (as in learned helplessness). Rather, their attributions locate an area in which they perceive a need for external assistance in order to sustain their chosen course of action. Hypnosis, for example was identified by 30% of the Clinic sample as having the advantage of "effortlessness", mostly through boosting will power.

Other Clinic subjects drew a more subtle distinction between the possession of will power as a motive force and their level of desire for achieving the goal. As one discerned:

"I have the desire but lack the will."

Others expressed the theme in terms of temptation and weakening:

"I don't feel I can trust myself unaided; determination is not enough."

This also shows that subjects themselves are capable of complex internal representations of their own decision-action processes. These particular accounts also suggest the kind of internal discourse Billig (1988) advocates as appropriate data for Social Psychology.

For some Clinic subjects at least, in contrast to McKennell & Thomas (1967) the attempt to stop smoking *was* seen as an opportunity to test their will power. As they explained:

" I want to prove to myself that I have will power. "

" I will have self approval for exercising will power. "

Unfortunately for others, the test had already been failed:

"I disapprove of not being able to give up purely by my own will power. "

One subject, however, was able to reflect triumphantly that the experience of stopping smoking had reaffirmed his will power:

"I am getting pleasure out of free will. Denying myself a source of pleasure I feel I'm doing something about general problems by not smoking- by exerting control over events. "

**Failures of Will to Action :
Decision Making and the Philosophy of Action**

Donald Davidson (1980) reawakens an old philosophical theme and asks how weakness of the will is possible. Classically referred to as *akrasia* or incontinence, it is the problem of understanding how and why people sometimes act against their own better judgment. Incontinent action, like the more vulgar understanding associated with care of the sick and elderly, implies an inability to control and a mismatch of desires and ensuing behavior. As Davidson aptly expresses,

"Life is crowded with examples"

The difficulties associated with smoking cessation provide a most powerful contemporary illustration of *akrasic* action on a wide scale. The same philosophical problem also lies at the centre of psychological theories in decision making. For both the Rationalist and Empiricist research programmes of decision making, the fundamental issue is to explain how thoughts are translated into action. Equally, however, they must also account for the failure of this correspondence. In similar vein, Harré (1983) refers to agency and *akrasia* as "sibling concepts".

Although philosophers have devoted considerable attention to the problem of incontinent action, most have regarded it as a problem of moral philosophy, whereas, Davidson argues, it may be better understood in terms of the philosophy of action.

Aristotle characterizes *akrasia* or incontinence as the abandoning of choice or conclusions. Aristotle, Aquinas and R.M. Hare all provide an image of incontinence as a battle between two opposing forces, such as passion versus reason. Plato, Butler and others supply a different contest with the struggle occurring between desire, reason and will. (In this case will is the agents representative). Mostly it has been portrayed as being overcome by passion, or falling to temptation. This would appear to be consistent with some Clinic subjects accounts of their will power problem.

Davidson points out, though, that incontinent action can equally well include instances of morally superior action (e.g. pursuing something noble despite it being perceived as against our own best interests). It could also include action which results in significant achievement, but which was not a part of our original intentions. Sabini and Silver (1982) propose four forms of failure to act, all underlied by some form of psychological strain. Harré (1983) suggests sloth as an equally important form of *akrasia*, and adds that all forms of sloth are, moreover, various social representations of the protestant ethic, the prevailing form of moral order.

Nietzsche (1968) insists that moral judgment is a form of will. However, "will to power" should not be thought of as an inner force which realizes action. Rather, it should be seen from a perspective which addresses how all behaviors facilitate the agents power. (Cooper 1983)

Akasia is best characterized, though, by our surprise. Not only can we not help ourselves with incontinent action, we are also at a loss to make sense of it. As Davidson cogently expresses,

"What is special in incontinence is that the actor cannot understand himself: he recognizes in his own intentional behavior, something essentially surd [sic]"

Davidson claims to solve the philosophical problem of incontinence through a somewhat torturous argument in logic. Basically this is :

Action X is continent if X is done for reason R
and if there is no other reason R' (including R)
which the agent judges makes another action better
than X.

That is, akrasic agents do not hold contradictory beliefs, nor are they subject to moral failure. Incontinent actions arise because the agent has reasons for doing one thing, but not a better reason for the other. Davidson adds that a person may have a reason for doing one thing but lack a reason for not letting better reason (for not doing it) prevail. One way to reconceptualize the logic of Davidson's proof is to portray the reasons as elements in the transitivity problem uncovered in SEU theory. Here, intransitivity is solved by allocating a relative weighting to the combination of elements in the choice. A relevant hypothetical example might be:

- (i) Smoking is unhealthy therefore I intend to quit
- (ii) I can only maintain good health if unstressed
- (iii) Continued smoking is the only way I can remain unstressed
- (iv) Therefore I must continue smoking

Davidson's proof decomposes into the problems of accessing salient beliefs. Davidson deals with the problem of intransitive choice through introducing relative reasons (relative weighting).

Pears (1984) makes essentially the same point. As he aptly describes, in Davidson's thesis the agent is,

"changing his mind about the relative values of the course of action open to him."

Fishbein theory, of course, remains at odds with this part of the solution. In the hypothetical example given above, Fishbein would describe clause (iii) "smoking keeps me unstressed" as an impact effect. That is, an uncovered but salient belief.

The strong rationality principle of decision making is best exemplified in Fishbein's work. The Theory of Reasoned Action makes explicit that all action is volitional. There is no irrational action, only incomplete information (as sources of inferential beliefs to the individual subject,

and more poignantly as "impact effects" to the researcher). Fishbein theory, however, does not consider how such effects modify the original premise, other than through the simple additive algebra of the internal audit (i.e. the third belief must be more salient, or have higher $b_1 \cdot e_1$ loading than the first belief statement).

Davidson's proof in fact provides an additional conceptual basis for understanding one of the major empirical anomalies in Fishbein's model; namely that Modal Salient Beliefs for a group are usually found to be better predictors of action than Individual Salient Beliefs (contrary to theoretical predictions).

In the preceding Empirical Study it was shown that giving relative weighting to Individual Salient Beliefs (through MAUT techniques), counter-acts to a large extent the regression problem associated with group statistics based on Individual Salient Beliefs. At the individual level, Salient Beliefs which are additional to the Modal set are given appropriate (continent) impact through relative weighting within the salient set.

Although his work marks an important shift of the topic from moral philosophy to the philosophy of action, Davidson's proof ultimately reduces to a version of the Rationality based theories of decision. As a matter of external history, Davidson co-authored an influential text which strongly argued that the axioms of behavioral decision theory gave empirical force to explanations of action (Davidson, Suppes and Siegel (1957)).

Davidson argues finally for a principle of continence, which he says,

"Exhorts us to actions we can perform if we want; it leaves the motives to us."

Most significantly of all, though, Davidson draws attention to the incontinency problem as a psychological phenomenon in its own right, and locates it appropriately within the theoretical domain of decision making.

Ought or Want : Authentication in Decision Making

As noted earlier the concept of will is little used as a formal explanatory concept in Psychology. It is seen, however, in existential theories of psychology and in existential therapies.

Existential theorists use Will in two senses (Rosenhan & Seligman 1989). Exhortive will, meaning will power or exertion of inner force to overcome difficulties and sustain effort. It is often urged upon us (as in the self-help guides to stopping smoking), but goal directed will is seen by existentialists as freely chosen.

Goal directed will, in contrast, embodies future goal setting. It generates hope, expectation and competence. Arendt (1978) picturesquely refers to it as, "the organ of the future" in contrast to memory as "the organ of the past". When people are regarded as being capable of will they are considered to hold themselves responsible for their experiences. This allows them to plan for the future in addition to living in the here and now.

Disorders of will are identified by existential theorists where people have a discrepancy between what they ought to do or have and what they want. With no understanding of what they want their action becomes lusterless and goals become difficult to achieve. Inauthentic behavior or acting in a false way is said to arise because true wants are seen as unobtainable.

Existential writers mostly portray authentication in metaphors of search and struggle, and inauthenticity as resulting from abandoning the quest. Heidegger (1927) perhaps the most influential, if not the most difficult, of existential philosophers, distinguishes inauthenticity as a "fallenness" or "absorption" into the everyday world when there is no space for self-reflection. The other major influence, Adorno (1973), sees the living of inauthentic life style as caused by socio-economic pressures, particularly class structure (perhaps as a psychological correlate of alienation).

David Cooper (1984) points out that the theme of authenticity appears with force at various times and places in recent history. As he describes,

"Concern for authenticity seems to have attained epidemic proportions - among German students of the 1920's, 'cafe existentialists' of post-war Paris and the California 'hippies' of the 1960's".

The significant question is why the theme of authenticity emerges with such poignancy at different times. Of particular relevance here, is the portrayal of the decision to stop smoking as a problem of authenticity. For many would-be non-smokers the issue appears to be represented as such an existential dilemma.

Clinic subjects clearly demonstrate awareness of the absurdity entailed in their intentions and actions. As two subjects emphatically expressed :

"Help! Why can't I stop ? There is no apparent reason for my lack of respect for my life- in all other ways I am self respectful."

"I'm most afraid of smoking. Always had guilt complexes about it."

These statements could be viewed simply as evidence of Dissonant smoking, in which subjects continue to smoke whilst being aware of the desire to stop (McKennell & Thomas 1967). Indeed, there is no doubt that these accounts express the same perceived inconsistency in their thoughts

and actions. The theme, however, is broader. Other Clinic subjects were aware not just of their dissonant smoking but also of paradoxes in other aspects of their decisions and actions. As two other subjects reflected:

"When I go to the cinema, although I sit in the smoking section with people around me smoking, I never smoke myself."

"I find a cigarette is both relaxing and calming, however, this is now outweighed by my general dislike for being with people who smoke which I find unpleasant. This sounds a contradiction in terms but funnily enough is the way I feel."

Really Wanting to Stop : The Authentication of Stopping Smoking

Like the will power concept, the theme of authenticity is explicitly represented in numerous guides to stopping smoking. Typically they portray success in quitting as a problem of would-be non-smokers tapping the ultimate source of their motivation. Above all else, their *wants* must be consistent with what they feel they *ought* to do. It is a moral battle for their own hearts and minds, fought through a combined strategy of self-insight and self-persuasion. The result is *real* or authentic correspondence in decision and action.

The HEC booklet *So You Want To Stop Smoking* (AS33) challenges its readers:

"The big question is do you really want to stop? Because this is the key to success. Make up your mind you are going to stop and you will. Lots of people have been surprised how easy it was to stop once they had really made up their minds."

Similarly, in another HEC booklet (AS6), aimed at pregnant smokers, the theme of *real* motivations is repeated:

"Deciding to stop and really meaning it, is more than half the battle."

The HEC/ASH booklet (GP6) is designed to look like a general practitioners prescription pad. It dispenses the same theme:

"Tell yourself that this time you are really going to give up smoking...for good."

The Cancer Research Campaign/TACADE (1988) educational board game for young people combines will power with authenticity. In their smokers plan the players are told:

"You've enough will power to succeed - and you will if you really want to."

The authenticity theme is also evident in some of the popular self-help guides to stopping smoking, along with the will power concept. Gillie's (1977) guide to stopping smoking asks:

"Do you sincerely want to stop?"

Stoppard in an article for *Cosmopolitan* magazine (Jan 1982) says:

"First you must really want to stop, so that all the effort comes from yourself."

Interestingly, psychologically based texts which reject the will power concept, refer to the need to make valid, or authentic choices. The psychologically sophisticated *Smokers Guide to Non-Smoking*, written by Raw for the HEC (Booklet AS23) underlines the theme repeatedly:

"You've got to really want to give up and make up your mind that you're going to. You've got to say to yourself: 'Right, this is really it, I'm stopping smoking.' And really mean it."

Jacobson (1981) even incorporates a similar theme into the feminist perspective:

"If you are not convinced by your own reasoning you will undoubtedly fail. Your success depends on the balance you strike between the rational and emotional factors in your life, which together keep you smoking and wanting to stop at the same time."

True Accounts and Authenticated Actions

The subject of authenticity was also a major concern to Clinic subjects in this study. Few actually used the term directly, but instead offered a variety of descriptive language, all of which shared a concern with the ultimate motivation underlying their judgment processes and the correspondence of their intentions and action. In all, 31 (78%) expressed concern with the gap between their thoughts and actions in terms directly related to authenticity. The decision to stop smoking for many was not a resolved choice but was replete with contradictions and dilemmas. Often expressed as a kind of internal debate (as Billig would have it), this theme had to be reconstructed from the accounts of Clinic subjects, drawing together apparently otherwise disparate themes.

Some smokers complained about their lack of motivation to quit and of their need for increased incentives to stop smoking. Yet others presented the most poignant inducements imaginable (one pregnant subject blamed her smoking habit for the spastic condition of her previous child; another was convinced that her continued smoking exacerbated her husband's lung cancer condition).

A number of Clinic subjects portrayed the problem as a discrepancy between different levels of explanation or different perspectives. Some reflected on the "failure" of their chosen treatment:

"Smoking is a symptom of something deeper."

"My [wrong] choice was based on [my] pragmatic and mechanical outlook at the time."

"I particularly wanted hypnosis so didn't attend to advice. I was a bad hypnotic subject. Hypnosis would work again though."

"I went because I thought hypnosis would work but was advised the other. This isn't what I'd call choice."

These could be seen as simple cases of dissonance reduction. A better interpretation, along with the other quotes here, however, would be to see the choice as being inauthentically labelled.

Many would-be non-smokers appeared to express their smoking akrasia (or action incontinence) in terms of inauthentic decision making. They typically volunteered accounts relating the *genuineness* of their desire to quit smoking, of being *truly ready* to stop and of *really wanting* to stop smoking.

The authenticity theme of being "ready" could mean choosing an optimal time to give up or of mental preparedness (as in the "psyching-up" of athletes and other performers). It also means, though, internal readiness in terms of orchestrating appropriate decision-action structures (ie. authenticated or validated judgments). As some Clinic subjects disclosed:

"I was not ready to give up."

"Not yet ready to give up."

"I was not fully ready to give up at the time."

"If life became well-ordered I may decide the time to stop."

"Readiness" is an authentication theme closely linked to "really" or "honestly" wanting to stop. It reflects a commitment of intention but also implies harmonious decision elements, free from discordant or inauthentic feelings. This can be seen clearly in the thoughts of other subjects:

"My attitude at the time was wrong. I did not honestly want to stop. My lack of motivation. When I finally stopped I just stopped, but this time I really wanted to stop."

"I know that its really up to me to stop."

"Only when the individual has made up his mind will they be successful."

"Peace of mind helped me believe I could do this."

Authenticity thus comes to represent not only consistency in decision and action, but also in self-appraisal. When a major life choice is to be put into effect, it appears just as important for the internal world to be prepared as the external.

The authenticity themes expressed by the Clinic subjects overlap with or are similar to the will power concept and the authenticity themes forwarded by the popular self-help guides. The authenticity theme, however, provides a broader phenomenology.

Authentication as a Basis for Understanding Action

In part, authentication is reducible to a simple validation motive as are dissonance and other consistency theories (Pepitone 1964). Essentially, this means decision makers continually appraise the correspondence between their decisions and actions. That is, like consistency theory, it concerns the mechanism for implementing the train of action, of ensuring that the behavioral outcome corresponds with intention (as a truly desired goal). More than this, however, it also signifies the discovery of intentions. Authenticated actions are those which people are prepared to own.

The authenticity theme provides a coherent framework for collating Clinic subjects diverse accounts of their decision to stop smoking and the difficulties of bringing about the intended outcome. How though does the authentication of action relate generally to the process of decision making?

When intentions become decisions the major consequence is commitment to action. In Kurt Lewin's terms the decision moment becomes "frozen". The same property of irreversibility implied by commitment also features in Janis & Mann's (1977) rationalist model of decision making. They argue that the concept of commitment is central to most psychological theories of decision making, noting that,

"Post decisional stability is predicated upon commitment."

Once intentions are made explicit, perhaps by announcing them, resolve changes into commitment. Indeed, legal contracts may be thought of as mechanisms to solidify commitment to a course of action following expressed intentions. That is, they are material guarantees to avoid reversals or absence of action.

The bridge burning strategy certainly seems to be a well used ploy by decision makers to help translate their intentions into action. Schelling (1960) calls this manoeuvre a "side bet" which worsens the payoff if the intender fails to fulfill the action.

Appropriately for this study, Janis & Mann (1977) also comment that,

"commitment followed by reminders and self-monitoring is sufficient to enable a sizeable percentage of heavy smokers to carry out their wish to give up smoking."

Harre (1983) makes a similar point from another perspective. He argues that commitment functions within moral orders to facilitate action. It is essentially an interpersonal declaration of intention and not a subpersonal (private, cognitive) statement of resolution to act.

The Expression of Authenticity

David Cooper (1983) points out that the everyday usage of authenticity suggests two distinct themes. The first implies correspondence (as in an "authentic work of art"). The second implies genesis (as in "an authentic signature"). Both connotations of authenticity appear in the accounts of Clinic subjects with regard to their decisions to stop smoking.

In commercial advertising the same concepts are frequently expressed nowadays to motivate product buying. The best known example of correspondence authenticity is perhaps *Coca Cola* which is sold as "the real thing". Wines and cheeses which are marketed as "the authentic taste of France" provide a familiar example of genesis authenticity.

Sloan (1986) argues that authentication plays a major part in life choices, where decisions are vulnerable to self-deception. Intentions according to Sloan, are informed by two orders of judgment; "ontological" - which are purified and detached considerations, and "ontic" - which are practical and based on common wisdoms. Ontic considerations often result in inauthenticity because they are based on stereotyped modes of reasoning. It may be that for many smokers the decision to quit is informed only by the ontic.

Interestingly, self-deception has recently begun to emerge as an identifiable research topic to social psychologists. (See for example the anthology by McLaughlin & Rorty 1988). From a philosophical perspective, however, David Pears (1984) argues that psychological research has invested substantially in self-deception, but has neglected wishful thinking. He maintains that the pervasive influence of Freudian thinking has led to a general belief that,

"any lapse between thought and action must be explained as the result of some intellectual fault, and the popular explanation is that the lapse is kept out of consciousness."

Pears further distinguishes between a forwards and backwards connection in thought and action. The forwards connection concerns the mechanisms which translate thought into action, often seen as a correspondence between valuing and doing. The backwards connection focuses upon the reasoning processes by which sense is made of action. Intentions for example are inferred

when seen to be supported by value judgments. The logic underlying both forms of connection is, moreover, said to be the same.

Consideration of the forwards connection shows, according to Pears, that people may act irrationally through not recognizing the moment of choice. That is, failures to act are missed opportunities as much as akrasic incontinence. This insight is consistent with predictions derived from Baillie's (1978) World Four Thesis; namely, that progressive actions exploit novel opportunities. Degenerative forms of practice, in contrast, are characterized by missed opportunities.

Would be non-smokers typically explain the correspondence in their thoughts and actions in terms suggesting an authenticity theme. They do not say of their intentions that they got it right, but that they *really* did mean it. Where the correspondence is not adequate, they explain their action as unintentional or inauthentic. In objectivist terms, they reconstruct a correspondence between the propositional content of their belief system and the World Four status of their actions.

Pears maintains, though, that study in this area is confounded by the fact that philosophy has evolved a sophisticated language for sentential reasoning but that nothing equivalent exists for action which remains,

"a very lumpish thing."

Interestingly, some of the most compelling work in the ethogenic paradigm bears out the same point, though of course from another philosophical perspective (eg Semin & Manstead 1983). Harré (1983) describes evocative examples of social excuses and apologies. By positing excuses people redefine their actions (the social meaning of their actions in Harré's terms). Most significantly, they infer different intentions, typically insisting "I didn't mean to do that". Whereas Harré explains this as an adjustment to the social rules, it is better understood as an expression of inauthentically labelled action. The effect, however, is the same. The agent comes to disown the action. The mechanism of explanation, moreover, is understood by all. No doubt there are appropriate social rules governing how and when such explanations may be proffered and accepted. Even so the appeal to authenticity is the key element.

Does Authentication offer an alternative epistemological basis to decision making?

Cooper (1983) argues for authenticity as a educational goal. Drawing on Nietzsche, Cooper claims that Peters, Dearden and other influential educational philosophers have at least a sympathetic notion of autonomy. The argument is that the two must go together since it makes no sense to advocate people should be able exercise criterion-less choices.

Nietzsche's philosophy focuses upon problems of living authentically whilst avoiding nihilism. This amounts to understanding and promoting authentic beliefs and values. Ultimately for the individual this entails deriving the value of actions from oneself, often in contrast to the superficiality of the poseur.

Cooper distinguishes two themes within self-concern for authenticity. The first, has a *situational* or Polonian emphasis (being true to oneself). The second has a *projective* or Dadaist concern (stressing spontaneous choices unimpeded by convention). Both, however are criticized as inadequate. The Polonian model implies that there are multiple selves, only one of which is true. This leaves the actor introspectively "bogged down". For the Dadaist, truth and knowledge are mere illusions, leaving the actor with no real appreciation of self or circumstances. Instead, Cooper argues that the jargon of authenticity revolves around the human capacity for self-concern. That is, the attempt to understand the origin and workings of the self and to relate self to society.

Authentication is best regarded though at a phenomenological level. Although manifested in the writings of existentialists, it can be usefully employed in the social psychology of decisions and actions without reliance on existential philosophy. The explanatory basis, indeed, may be better served by an entirely different epistemological basis.

Social Representation theorists, such as Farr (1987) cite the Hegelian tradition as the only alternative philosophical basis to replace the over-individual psychology currently dominant. Ethogenists such as Harré (1979), proclaim the "new paradigm" from different (Wittgensteinian) philosophical underpinnings. An alternative approach, however, can be founded upon a Popperian epistemology.

Kruglanski (1978) attempted to incorporate Popperian themes in his version of attribution theory. Although offering some useful extensions to attribution theory, his Lay Epistemology does not make effective use of the epistemic basis of Popper's work.

Just as Popper's earlier work was used to show that induction cannot provide an adequate basis for scientific method (observations cannot be used to induce theory), so too beliefs cannot be used to induce action. Attempting to reveal the course of action from observation of beliefs is symmetrical in logic to the inductive fallacy (attempting to generate facts or knowledge from the pure observation of nature). This holds both for the actor and the observer.

Just as scientists need not believe in their own research programmes, so too people need not believe in their own action programmes. More widely, they may even believe that they are committed to a different programme to that revealed by their actions (hence incontinence or akrasia). To use Lakatos's phrase, rationality resides in human action, not in belief.

Decisions may thus be said to have signal properties which inform the decision maker of how effectively they translate their ideas into actions. The information gain, however, depends entirely upon the veracity of the perceivers cognitions, or more correctly upon the heuristic merit of their explanation. Human action, however, does not speak for its instigator any more than facts speak for themselves in nature. Nor can the subjective beliefs of an individual be taken at face value as corresponding exactly to action outcomes, any more than a set of observations can prove a scientists theory. That is, we not only do not always know what we do, but why we do it.

On this basis inauthenticity may be redefined as a form of degenerating problem shift at the level of individual action. The opposite of inauthenticity, however, is not non-inauthenticity or consistency, but authenticity in the sense of ascending or progressive problem and practice shifts. According to the underlying Lakatosian model, all programmes have in the end to be described as moving in one direction or the other.

This marks a radical departure from the Rationalist and Empiricist versions of action, both of which assume that decision makers have as a minimum a core specification of their own intentions. The positive heuristics of both programmes rely on this feature as unproblematic. All the auxiliary hypotheses focus on the decision makers form of information gathering and the nature of the machinery used to digest the evidence. Both rely on the behavioral objective or goal being unambiguously specified even if the gathering and accruing of data is prone to error.

A Methodology of Individual Action Programmes

A modified Lakatosian model (incorporating Baillie's World Four epistemology) may provide a viable alternative to the Rationalist and Empiricist models of decision making. A Methodology of Individual Action Programmes could be developed which aims at providing a means of rationally reconstructing action for the individual and the researcher. To this end decisions would be identified not as isolated junctions in an otherwise quasi-random or stimulus controlled behavior pattern, but as content increasing or decreasing manoeuvres forming part of a larger action programme. Interpreted in this way, it should become possible to unfold the objective or propositional content of an individuals belief system, and to locate the algorithmic properties of behavior. Where behavior change is instigated, such as in stopping smoking, the method would seek to encourage transitional behaviors which have a direct heuristic relevance rather than a delegated instrumental value.

Portrayed in the crude terms of a model of man, the version proposed here would be that of scientific methodologist rather than model of man as an epistemologist (Kruglanski 1980), or

man as scientist (Kelley 1967). The actor is considered to be like a scientist typified by the nature of the scientific endeavour, not just the content of theories.

Adopting a model of man as scientist is not new, of course. Heider, Brunswik and Kelley each advocated versions of it for the Empiricist programme. All were amis, however, in basing the model on a singularly inductive version of science.

The Heuristic Function of Decisions; The Conjectural Nature of Actions

In the movement from decision to action, choice behavior can be seen to have a conjectural function. Decisions may be used to discover the essential operating features of human action and agency. In addition to perceived rewards and costs, human behavior has an informational value for the agent.

Any departure from habit is an opportunity to test individual "theories" or explanations of cognition-action relationships (or intentionality). Employing the World Four epistemological basis (Baillie 1978) it is argued that human action embodies propositional content (empirical verisimilitude) over and above any subjective beliefs associated with it.

According to Baillie's thesis actions have a logic of their own. Each decision point is held to prespecify a logical set of consequences regardless of the agents intentions. What seems to be important from the decision makers point of view is not simply the potential consequences but also the range of actions and options which are thereby excluded. In other words, each decision committed also burns several other bridges. It precludes or denies other states of the world. In this sense action has a dictatorial supremacy, specifying not only what remaining options are possible but also those which are foreclosed.

What counts for individuals attempting to predict and control their action is the availability of appropriate hypothetico-deductive cognition. It is the individuals ability to locate and assess the propositional content of choice behavior and to understand its correspondence with the instrumental or algorithmic content. That is, the beliefs must accurately represent both the outcome and the action itself. For this same reason, Bandura's (1977) bifurcated model of self-efficacy has much to commend it. The self-efficacy model is ultimately inadequate, however, because it reduces decisions to inferences dependent upon the actors expectations. The alternative proposed here differs significantly, however, in recognizing that the decision makers cognitions cannot be used to directly infer action. The decision maker, moreover, shares with the scientific observer the task of reconstructing the veracity of decision related cognitions.

The central problem of course becomes that of encapsulating the relevant action programme and its rival alternative(s).

Problem Shifts in Smokers' Action Programmes.

Some subjects in the Empirical Study were aware not only of the discrepancy in their attitude (outcome evaluation) to stopping smoking, but also found it difficult even to begin appraising the alternative. As they expressed:

"I find it difficult to see myself as a non-smoker."

"I couldn't think of any aspect of non-smoking to analyze. Even the term sounds negative."

Close inspection of the data suggests that social pressure may have propelled some subjects to seek treatment. Certainly the normative component showed a relatively strong influence in Balance Sheet 1 for Stopping Smoking. This was by no means always the case, however. Some subjects revealed clearly that the discrepancy was through attitudinal (or perhaps, personally normative) rather than socially normative considerations. Two subjects, for example, reflected:

"Not sure that the advantages of not smoking are greater than those of smoking."

"I'm very keen to give up but can't find positive aspects to giving up."

Some recognized, moreover, that smoking not only filled an important function in their life, but that, in Exchange Theory terms, it also paid for a balance in the social price. (Blau 1964). One subject explained:

"I smoke to distance myself from the job and its context - it makes smoking 'better' for me - I feel justified in smoking - they don't have my problems."

Seen in this light it appears that some would-be non-smokers looked to the Clinic treatment programme to persuade them in some way, to help them authenticate their decision to stop smoking, rather than providing them with a behavioral strategy. It is possible that the persuasive methodology of hypnosis was in this sense a more appropriate choice than a behavioral commitment legislated through the conditioning techniques of rapid smoking. The treatment programme for this sub-group thus functions as a mechanism to ratify (or authenticate) choice, not to sustain an action. That is, to help create a progressive problem shift rather than a practice shift.

Practice Shifts in Smokers' Action Programmes.

For other Clinic subjects, however, the focus lay not in the nature of the outcome, but in the process of transition. As shown earlier, this was sometimes expressed in accounts of will power problems. For some this was seen as a contest between forces:

"I have the desire but lack the will power."

"I have desire but temptation is always there."

"I disapprove of not being able to give up by my own will power."

Treatment was seen by this sub-group as an aid to resisting temptation, or in Bandura's terms as a means of enhancing personal efficacy. That is, as a mechanism to sustain action following an unambiguous decision to stop smoking. One subject asked rhetorically:

"Should I resist the temptation to smoke?"

Another similarly pondered:

"I'm afraid I may not be able to resist after treatment."

Progressive Problem but Degenerating Practice Shifts in the Transition to Non-Smoking.

For some Clinic subjects there was already a transformation in their taste, so that smoking was perceived as *unpleasant*. At the very least, any therapy based upon changing taste (eg the aversive effects of rapid smoking or hypnotic suggestion to reverse desire) would be inappropriate. Their smoking actions were already labelled as intrinsically negative. As they expressed, they were already put off:

"I smoke for reasons you can discover. Certainly not for the taste."

"I don't see smoking as a source of pleasure -don't enjoy cigarettes."

"There's only a small portion of cigs that I honestly enjoy."

"I don't often enjoy smoking."

"I smoke most at work and at home in evenings, and when with friends. Smoking is no longer a source of pleasure. I dislike the taste and notice the smell on clothes and in hair."

For these would be non-smokers, the habit appears to be indulged and disliked in equal measure. They were not only aware of the dissonance in their beliefs and actions, but also at a loss to explain it. For this sub-group of would-be non-smokers the treatment programme was seen as a means of reconciling (or restoring consistency to) their individual action programmes.

Progressive Practice but Degenerating Problem Shifts in the Transition to Non-Smoking.

In direct contrast to this subset, a greater proportion were aware of a definite inauthenticity through their continued *enjoyment* of the smoking experience. Though presenting themselves as candidates to quit, their smoking remained a distinct source of pleasure. As they declared:

"I thoroughly enjoy smoking. Deep down I don't want to give up."

"Smoking is one of my few pleasures along with reading."

"I like an occasional smoke and don't see why I shouldn't."

"Without cigs my only pleasure will be removed. I use smoking to reward myself and the life I lead."

It could be that this group desired clinic treatment to help them change their minds, that is to change their attitude. Such an interpretation would be forbidden, though, by the negative heuristic of the Rationalist programme in a strict application of the Fishbein model. Only by adding the epicycle of an "attitude towards ones attitude towards smoking" could this theme be accommodated. Janis & Mann's (1977) model of decisional conflict might reinterpret the accounts as some form of decisional bolstering (perhaps hedging their bets by declaring a belief in a negative outcome). This, however, would be stretching the concept of defensive avoidance.

The Empiricist approach copes a little better. In Bandura's terms these subjects appear to seek assistance in transforming their outcome (response) efficacy rather than enhancing personal efficacy. They are, however, more than expressions of efficacy expectations. The statements, that is, would not reduce to simple confidence ratings. Rather, they amount to normative appraisals of the the action programme. These subjects are aware that a transition to non-smoking would entail pursuing a course which is inconsistent with their current overall action programme. In everyday terms they are rethinking the purpose which smoking has in their life. They are reconstructing their intentions.

Yet it was the case that some found themselves caught on the horns of such a dilemma; half way towards giving up but also recognizing that if successful, their efforts would result in a different kind of negative outcome. As one subject pin-pointed:

"smoking is still pleasurable. Its left a big hole in my life."

The very success of the treatment procedure for some Clinic subjects exposed an ambivalence in their decision making and left them with acute feelings of fraudulence or inauthenticity. As some confessed:

"Not enthusiastic. I feel more aware of the fact I'm smoking."

"I have the realization that unpleasantness [brought about by rapid smoking] is not preventing me from smoking. Not sure how hard to try not to smoke and how much to leave to treatment."

"I will make a conscious decision not to smoke - tomorrow. Felt a bit of a fraud with treatment."

These subjects could be acknowledging an internal-external locus distinction. More accurately, however, they are expressing feelings of inauthenticity. They may be characterized as struggling to resolve the potential self-deception in their efforts to quit smoking. For several subjects, this meant considerable cognitive juggling:

"I played games with myself. Aware of something missing."

"There is a danger my intention to give up is weakening - beginning to kid myself."

"I enjoy smoking so perhaps I don't want to be put off."

Authentication as the Discovery of Intentionality.

Authentication is perhaps best thought of as an expression of reconstructed decisions. That is, people recognize or reconstruct the decision moment in terms of authenticity. Actions perceived as authentic are likely to have greater commitment invested in them. Consequently they are more likely to resist reversal and more likely to be sustained even where they run counter to other forms of appraisal. In terms of the Rationalist model, people will be more likely to sustain a costly or unpleasant action, provided it is seen as authentic. That is, a negative outcome in the internal audit may be discounted or over-ridden. In the Empiricist frame, actions which are labelled as authentic are more likely to be followed even if they do not reduce uncertainty. Described in this way the theme of authenticated action goes beyond the Rationalist and Empiricist models.

The Rationalist model of decision making is based on the fundamental assumption that people realize their intentions through the resolution of their values (the internal audit). The Empiricist

model, in contrast, posits that people come to their preferences by making inferences about their behavioral experience (reducing uncertainty). The concept of Authentication suggests that both forms of information base are utilized by decision makers, who reconstruct their intentions on the basis of correspondence between their reasons and inferences.

Future studies in the authentication of action would need to develop explicit criteria of progress and degeneration in individual action programmes. Although the Methodology of Individual Action Programmes suggested here provides a credible basis for reconstructing decisions and actions it amounts to retrospectively oriented methodology. True decision theories, however, need to be prospectively oriented in predicting action. For this a more sophisticated algorithm is required.

Statistical complexity alone will not, however, guarantee veracity if based on inappropriate epistemological foundations. The mathematical machinery of any algorithm only serves to digest the form of evidence created through the underlying data generator. For a new model of decision making based on objectivist epistemology this might consist of measuring the perceived authenticity of actions against alternative action programmes and a critical appraisal of problem and practice shifts. This might entail combining objective and subjective probabilities with objective and subjective values.

The Changing Status of Intentions

Rosenberg (1988) describes desires, beliefs and actions as a "conspiracy" linked by intention. All forms of action are for Rosenberg inescapably intentional since they reflect the propositional content inherent in desires and beliefs. As he eloquently expresses,

"Because both desires and beliefs are meaningful states of an agent, the explanation they provide gives action its meaning in a very literal sense."

Some philosophers and many social scientists extend this basic truth to the idea that social science must be a version of language learning. Harré (1979; 1983), is perhaps the most relevant example here. He sees intentions as having an action function. Intentions, according to Harré, should be seen as a public declaration which occurs in the space of moral order rather than a private resolution. Here above all, the commonality with Wittgenstein's philosophy can be clearly seen. In his *Philosophical Investigations* Wittgenstein (1953) asks why in disclosing our intentions to another,

"I reveal to him something of myself when I tell him what I was going to do - Not, however, on grounds of self-observation, but by way of response."

From the Rationalist perspective Davidson (1968) suggests that intention is the same as an outright value judgment, which also means an imperative to action. As he expresses,

"Someone who acts with a certain intention acts for a reason - there is no mysterious act of will."

Harré (1983), however, rejects the idea that a psychology of action is reducible to a psychology of decision making. He portrays Davidson's *Actions, Reasons and Causes* as a paragon of "mental machinery" theories. In particular, Harré is critical of such schemes for the regress of mental sub-components (intentions, beliefs, desires etc).

Pears (1984), though, distinguishes amongst the sub-components. He contends that "mere desires" are independent of intentional action, having a more primitive status for the agent who does not necessarily pass them through "the strong checkpoint of valuation". That is, Pears distinguishes an outer intention (intending to do something) from an inner intention (intending oneself to do something). The latter is said to act as the agent's quasi command to themselves. This analysis has, of course, more than a passing resemblance to Ryle's infinite regress.

Some researchers within Psychology are now beginning to speak of intentions as real psychological events (e.g. Sutton, Marsh & Matheson 1987). Intentions are coming to be regarded as real cognitive events, as inner mental expressions prior to the engagement of action. They are becoming, that is, accredited with phenomenological status, marking a substantial problem shift from, for example, Fishbein's original formulation, which defined intentions only through the negative heuristic. At best, however, they represent the researchers measure of some hypothetical mediational processes.

The propositional content of belief systems, though, cannot necessarily be made "available" or more correctly, derived and articulated. In some circumstances people may be unable to establish the appropriate correspondence between their thoughts and actions. Nisbett & Ross (1980) make a similar point in criticizing Freud's account of the unconscious. They contend that unconscious content remains so for the simple reason that people lack the necessary cognitive machinery for bringing the information into consciousness. As they aptly express,

"The resistance to such discoveries is no more remarkable than the 'resistance' of any formal scientist to unusual propositions challenging a firmly entrenched theory."

Nisbett & Ross criticize particularly the motivationally based notion of repression. Rather than being repressed through an unconscious desire not to know an unpleasant fact, they propose that repression phenomena are best explained through the availability heuristic and the fundamental attribution error.

The availability heuristic has mostly been taken as a problem of accessing information. In Baillie's thesis, however, the products of the human mind are better thought of as fabricated in a workshop from stored raw materials rather than as retrieved intact from a warehouse (Baillie

& Thomas 1990). Consequently, the form of decisional algorithm based on subjective data, no matter how sophisticated will always be insufficient to alone infer appropriate paths of action.

Appropriate Intervention to Authenticate Action

One interesting implication to follow from adopting a Lakatosian methodology would be the creation of an appropriate form of therapy. Traditionally regarded as holding an empathetic role with their patients, therapists might be better employed as critical agents. They might, for example, encourage the production and testing of new heuristic beliefs. That is, therapy could be seen as an opportunity to rationally reconstruct the problem action pattern, and to substitute more progressive forms of practice (or authentic actions). A not dissimilar line of thinking was previously given expression in the work of George Kelly.

Kelly's (1955) Personal Construct Theory provides an interesting comparison with the theme advocated here. Repertory grid technique is based on the idea that the underlying constructs are there to be revealed. Although strongly purported by its adherents to be a constructivist research programme, in practice the algorithmic heuristic takes on a clearly inductivist character. All the researcher (or therapist) needs to do according to Personal Construct Theory is sample the constructs, reveal the connections statistically and the inferences will be logically obvious. Induction at the individual level, however, is beset with the same logical problems as scientific induction.

Whilst some of the propositions may be available to cognition, other parts can only be developed, not discovered intact. In the process of developing the connections, moreover, the general nature of the belief system may undergo change. Ironically this very effect can be seen in one of the most potent applications of repertory grid technique, namely Fransella's (1972) work with speech impaired patients. Progressive reconstruing of the grid brings about change at both the cognitive and behavioral level.

Conclusions

For would-be non-smokers, the decision to stop smoking entails a whole series of inter and intra personal discoveries. Most psychological research in this area has been conducted within rival Rationalist and Empiricist research programmes. In turn, the difficult problem of stopping smoking has brought into sharp relief the strengths and failings of decision models based upon the dominant Rationalist and Empiricist epistemologies.

Though each paradigm illuminates some interesting aspects of the decision to stop smoking, neither adequately addresses the gap perceived by smokers themselves in their decisions and actions. Smokers, in this study at least, typically refer to the relationship between their decisions and actions in terms of authenticity.

Rationalist models of decision making have been extensively employed by health educators and other change agents wishing to persuade smokers to stop their habit. Whilst largely successful in motivating reappraisals of the value of smoking they have fallen far short of explaining how such new values may be realized. For smokers, however, the transition from deciding to stop, selecting, sequencing and implementing transitional behaviors is far from self-evident. Hence the prevalence of dissonant smokers (McKinnell & Thomas 1967).

Empiricist models have found favour with change agents more concerned with the therapeutic basis of anti-smoking interventions. Whilst offering powerful instruments of behavior change, they effectively ignore the problem of reconciling the values attached to the new and old behaviors. For smokers, however, deciding exactly what behavior to replace with what is massively problematic. In each individual smoker's life space, smoking fills many distinct inter and intra-personal functions. The entailed chain of choices is both complex and disruptive of other social decisions.

The two forms of decisional model, moreover, appear to co-exist as significant social influences without either theoretical or practical integration. The consequence has been to leave smokers with a confused and confusing set of representations. This is most apparent in the guides to stopping smoking which contain at best a highly eclectic battery of strategies for deciding to stop, for implementing behavior change and sustaining a new course of action.

Smokers left in this limbo, it appears, often fail in their decision making. That is, they fail to explain or accomplish their intended actions. The correspondence between their decisions and actions thus comes to be regarded as inauthentic. In other words, they disown the original intentionality.

Authenticity is a theme with its own strong philosophical ancestry, mostly through the work of existential theorists. This has concerned the realization of values through action, but has been broadly focused on problems of reconciling life's choices with the human predicament.

The model advanced here also interprets authenticity as a correspondence between human purpose and practice. With a more specific focus, however, the authenticity theme is taken to be best understood as a contemporary phenomenology of decision making. That is, authentication is seen as an everyday expression of the way in which people attempt to reconcile their decisions and actions.

It is quite possible that in different topic areas of human decision making, at different times or in different cultural contexts, different vocabularies could be used to express the same correspondence. Themes of meaningfulness, harmony or even purity might serve equally as well as authenticity. Whatever the jargon, an objectivist epistemological basis is identified as the fundamental property of the decision making process.

Psychological theories of decision making have largely been true to either Rationalist or Empiricist principles. Like the Rationalist and Empiricist programmes of decision making, the alternative outlined here specifies both a core model of the decision maker and a corresponding methodological approach, though of course, much needs to be developed.

The main features of this process are:

People recognize responsibility for their decisions and ascribe intentionality (authenticate their actions) where:

Their belief system adequately explains the change to the selected option and anticipates novel facts (progressive problem shift).

This, however, must correspond with their behavior which adequately accomplishes the selected option and allows the exploitation of novel opportunities (progressive practice shift).

Choices are predicted in the direction where these two features can be jointly maximized (Where the selected option can be both explained and accomplished). Failing this correspondence, choices will be made which best support the action programme (protect it from revision or being abandoned). This may mean sustaining a degenerating problem shift whilst pursuing a progressive form of practice, or vice versa.

Unlike the existentialist concept of authenticity, the theme of authenticated action described here shows that decisional options are interpreted by decision makers in the light of their overall action logic. Even the existential decision described by Kierkegaard as a "leap in the dark" is illuminated by the glow of the underlying epistemology.

Lakatos (1970) notes that Popper's *Logic of Scientific Discovery* contains an apparent paradox in equating logic and discovery. This is explained by reference to the World Three thesis which states that we can only discover not invent the epistemic content, since World Three is independent. Consequently, Lakatos advocates a heuristic approach to discovery. By the same token, a heuristic approach is advocated here. We can only discover the principles of our own action, not invent them. We can of course choose to act in certain ways, but we cannot always guarantee the outcome. Equally, we can choose what outcome we desire, but cannot be certain of obtaining it. In this way, decisions function as part of the heuristic process of discovery.

The World Four thesis outlined here allows the creative process of generating and sustaining action to be discussed outside the realm of the irrational and helps rid the debate of psychologisms. For Social Psychology it could provide the the beginnings of a new model of human action and a more sympathetic understanding of human decision making. For the Philosophy of Science there is the possibility of incorporating social psychological insights into

our understanding Scientific action. More than this, the World Four thesis provides the analysis of scientific practice with a bedrock of epistemology.

It is interesting to recall that Popper had earlier consigned the invention of theories (conjectures) to the realm of Psychology. He was correct in one sense, of course, but he fell short of recognizing that the creative process is also built upon an operating logic. This is not to imply that we can become creative simply through another inductive application of the principles of logic. Rather, it is that without a working logic, the creative output of ideas would be lost in a vacuum of fantasy. It is the logic of discovery which keys creative intentions into the reality of action.

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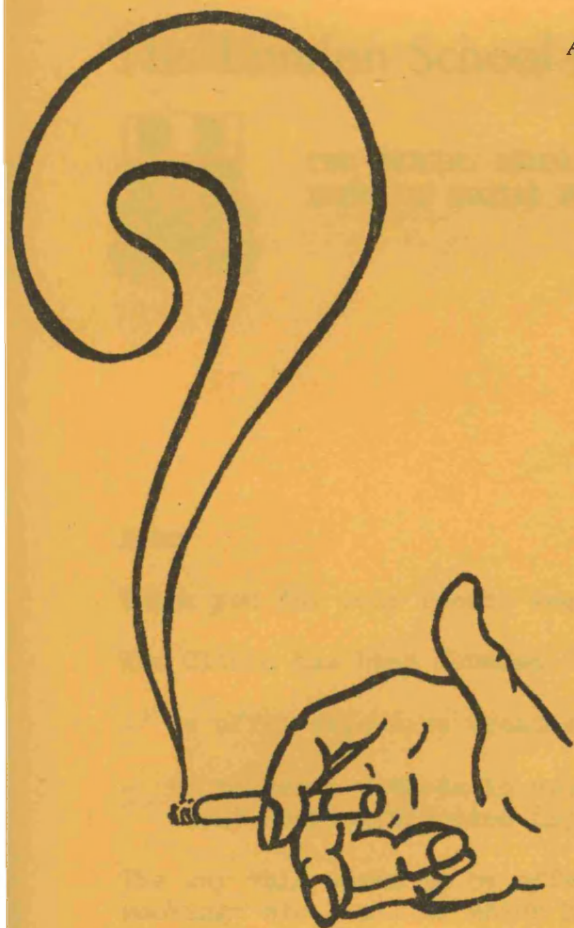
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**Just one more
Then you'll be**
*GIVING UP
Smoking ?*

IF YOU'D LIKE HELP
TO BREAK THE HABIT

Contact us for ***free treatment***

Write or phone
for details

Smoking Research Clinic
Dept. of Social Psychology
London School of Economics
Houghton Street
LONDON WC2

405 7686 x 563

The London School of Economics and Political Science

(University of London)



THE SMOKING RESEARCH CLINIC
DEPT. OF SOCIAL PSYCHOLOGY

Houghton Street,
London, WC2A 2AE

Telephone: 01-405 7686 X 563

Dear

Thank you for your recent enquiry concerning our Smoking Clinic.

The Clinic has been founded for two main purposes:

- to offer effective treatment to aid smokers wishing to give up the habit;
- to research methods in order to improve techniques and further knowledge about smoking/nicotine dependence.

The way this works is by offering a choice of treatments (hypnosis; rapid smoking; etc.) all of which have been tested and proved to give effective results. In return, we ask patients for their views on the treatments and smoking in general.

A preliminary interview is held to explain in detail the methods used and how they work. This is followed by a course of treatment, which takes place in sessions lasting approximately 45 minutes. A maximum of four sessions is all that is necessary to complete treatment, and all information is, of course, handled with total confidentiality. We would expect to maintain contact with patients for some time after treatment is completed in order to follow up on the long term success of patients in losing the smoking habit.

In order to participate in the Smoking Clinic, I would be grateful if you would complete the enclosed questionnaire and return it to me as soon as possible, but not later than

Shortly after we have received your completed questionnaire, we will contact you again to arrange an interview and appointments for subsequent treatment sessions.

As you will appreciate, the demand for places is obviously great and it sometimes becomes necessary to waitlist candidates for future treatment. If you are waitlisted, we will let you know as soon as possible.

I look forward to hearing from you in the near future.

Yours sincerely,

D. RAWSON
PROGRAMME CO-ORDINATOR

The London School of Economics and Political Science

(University of London)



THE SMOKING RESEARCH CLINIC
DEPT. OF SOCIAL PSYCHOLOGY

Houghton Street,
London, WC2A 2AE

Telephone: 01-405 7686 X 563

Dear

Thank you for returning your completed questionnaire.

I am pleased to inform you that a course of treatment has been arranged for you at the following times:

Preliminary Interview

1st Therapy Session

2nd Therapy Session

3rd Therapy Session

4th Therapy Session

I would be grateful if you would confirm that you will be attending these appointments. If any of the above times are not convenient, would you contact me, as soon as possible, in order to arrange a more suitable occasion.

Please note that a course of treatment is completed after four sessions. However, patients may attend fewer sessions if, at any time, they feel that their treatment is complete. In this event a minimum of 24 hours notice must be given.

I enclose a leaflet on travel directions and look forward to hearing from you in the near future.

Yours sincerely,

D. RAWSON
PROGRAMME CO-ORDINATOR

Appendix 4

The London School of Economics and Political Science

(University of London)



THE SMOKING RESEARCH CLINIC
DEPT. OF SOCIAL PSYCHOLOGY

Houghton Street,
London, WC2A 2AE
Telephone: 01-405 7686 X 563

Dear

Thank you for returning your completed questionnaire.

I regret that we are currently unable to offer you a course of treatment, as demand for therapy has exceeded the number of places we have available.

We have therefore placed your name on our waiting list and will contact you again when further sessions begin.

In the meantime, I enclose an information leaflet, which I hope will help you to give up smoking on your own and wish you every success.

Yours sincerely,

D. RAWSON
PROGRAMME CO-ORDINATOR

The London School of Economics and Political Science

(University of London)



Houghton Street,
London, WC2A 2AE

Telephone: 01-405 7686

Dear

I am looking for a number of smokers who would be willing to spare about one hour of their time to be interviewed on the subject of smoking.

This study is being conducted as part of a London University research programme, which aims at a more complete understanding of smoking behaviour. Your views and judgments would make a valuable contribution in this area of study and all information would be handled with strict confidentiality.

If you agree to an interview, please indicate below a suitably convenient meeting. I would, of course, be willing to travel to your home or place of work to conduct the interview.

Thank you for your co-operation.

Yours sincerely,

Don Rawson
Research Officer for the
Smoking Research Clinic

	AM	PM	EVEN
MON			
TUES			
WED			
THURS			
FRI			
SAT			
SUN			

Please indicate the most suitable time and day for interview:

Time:

Date:

Name:

Address and telephone to be contacted

The London School of Economics and Political Science

(University of London)



THE SMOKING RESEARCH CLINIC
DEPT. OF SOCIAL PSYCHOLOGY

Houghton Street, Aldwych
London, W.C.2

Telephone: 01-405 7686 X 566

Dear

SMOKING STUDY: Guide for Sampling Contacts

Please contact 3 people for interview in this study, one from each of the categories below:

COMMITTED SMOKER: Someone who has a regular smoking habit and with no immediate intention of stopping. (They may have stopped smoking in the past, so long as they intend to continue smoking in the foreseeable future.)

COMMITTED EX-SMOKER: Someone who used to have a regular smoking habit, but who has now stopped completely and has no intentions of returning to smoking.

COMMITTED NON-SMOKER.
OR NEVER SMOKER: Someone who has never had a regular smoking habit. (They may have tried the odd cigarette, so long as they did not practice a regular smoking habit.)

Please explain the purpose of the study is to establish differences in attitudes towards and experience of smoking. No attempt will be made to change people's attitudes on the subject and all information will be kept in the strictest confidence.

DON RAWSON
Research Officer for the Smoking Research Clinic

Preliminary Questionnaire

Personal Details

Name

Address

.....

.....

Age Sex

Occupation

Appointments Details

Please indicate those times which you would definitely NOT be available to attend the clinic.

	Mon	Tue	Wed	Thu	Fri
Morn					
Aft					
Even					

Any Special

Problems of

Attending

.....

Below are a number of questions which will help us to help you.

Please consider every question carefully and answer each one as accurately as you can.

1. On average how many cigarettes, cigars or pipe loads (indicate which) do you smoke each day?
2. What is the lowest number you could smoke per day without feeling discomfort?
3. What is the highest number you could smoke per day without feeling discomfort?
4. What brand do you usually smoke?
5. Which other brands (if any) do you also smoke fairly often?
6. How old were you when you first started smoking regularly (once a day or more)?
7. How many times (if any) have you seriously tried to stop smoking before?
8. If you have stopped before, what is the longest period during which you have not smoked?

Appendix 7

- 9. What kind of help or treatment did you have
(including any methods of your own)? Please
describe fully.
.....
- 10. What kind of treatment do you feel would
be the most helpful to you?
- 11. How has smoking affected your general health
(if at all)?
- 12. Have you a history of any serious illness?
(please say which)
- 13. How did you learn about this clinic?
- 14. Do you know anyone personally who has attended
the clinic?

Signature Date

Please use the space below, and overleaf if you wish to add anything further about your smoking or problems of giving up smoking.

ALTERNATIVE _____

Positive Considerations +

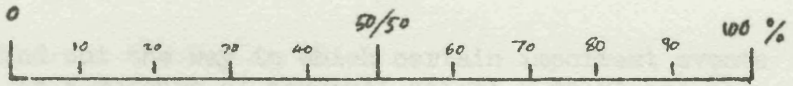
Negative Considerations -

<p>1. Gains + and Losses - for SELF</p>		
<p>2. Gains + and Losses - for OTHERS</p>		
<p>3. SELF APPROVAL + or SELF DISAPPROVAL -</p>		
<p>4. SOCIAL APPROVAL + or SOCIAL DISAPPROVAL -</p>		

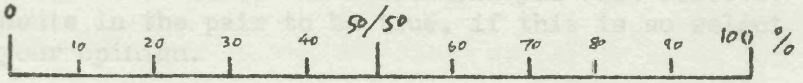
Appendix 10

← HARDLY IMPORTANT AT ALL NEITHER IMPORTANT NOR UNIMPORTANT EXTREMELY IMPORTANT →

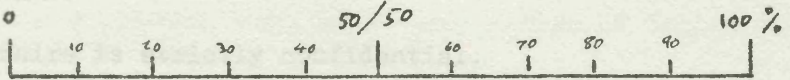
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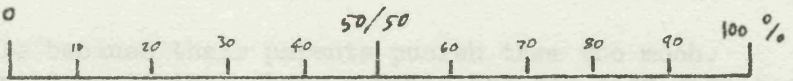
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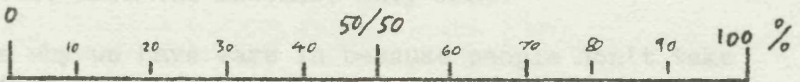
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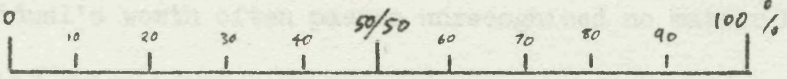
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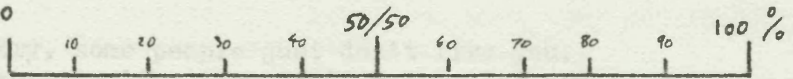
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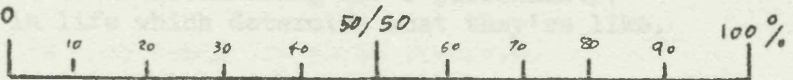
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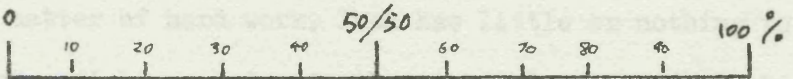
How important is it that :



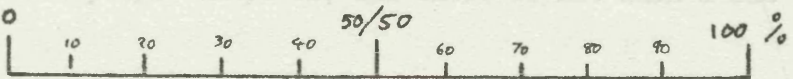
How important is it that :



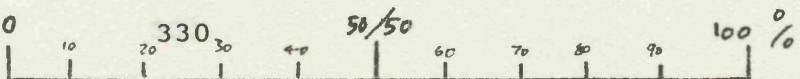
How important is it that :



How important is it that :



How important is it that :



Appendix 11

SOCIAL REACTION INVENTORY

This is a questionnaire to find out the way in which certain important events affect different people. It is a measure of personal belief - there are no right or wrong answers. Please select the ONE statement of each pair which you believe to be nearest the truth. Don't select the one you think you ought to choose, or the one you would like to be true. In some cases you will believe both or neither of the statements in the pair to be true, if this is so select the one nearer the truth in your opinion.

PUT A TICK BY THE STATEMENT YOU CHOOSE.

PLEASE DO NOT MISS OUT ANY PAIRS.

Information on this questionnaire is strictly confidential.

AGE SEX NAME

1. (a) Children get into trouble because their parents punish them too much.
(b) The trouble with most children is that their parents are too easy with them.
2. (a) Many of the unhappy things in people's lives are partly due to bad luck.
(b) People's misfortunes result from the mistakes they make.
3. (a) One of the major reasons why we have wars is because people don't take enough interest in politics.
(b) There will always be wars, no matter how hard people try to prevent them.
4. (a) In the long run, people get the respect they deserve in this world.
(b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tried.
5. (a) Without the right breaks one cannot be an effective leader.
(b) Capable people who fail to become leaders have not taken advantage of their opportunities.
6. (a) No matter how hard you try, some people just don't like you.
(b) People who can't get others to like them don't understand how to get along with others.
7. (a) Heredity plays the major role in determining one's personality.
(b) It is one's experiences in life which determine what they're like.
8. (a) I have often found that what is going to happen will happen.
(b) Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
9. (a) Becoming a success is a matter of hard work, luck has little or nothing to do with it.
(b) Getting a good job depends mainly on being in the right place at the right time
10. (a) The average citizen can have an influence in government decisions.
(b) This world is run by the few people in power, and there is not much I can do about it.

Appendix 11

11. (a) When I make plans, I am almost certain that I can make them work.
(b) It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
12. (a) There are certain people who are just no good.
(b) There is some good in everybody.
13. (a) In my case, getting what I want has little or nothing to do with luck.
(b) Many times we might as well decide what to do by flipping a coin.
14. (a) Who gets to be the boss often depends on who was lucky enough to be in the right place first.
(b) Getting people to do the right thing depends on ability, luck has little or nothing to do with.
15. (a) As far as world affairs are concerned, most of us are victims of forces we can't understand or control.
(b) By taking an active part in political and social affairs people can control world events.
16. (a) Most people don't realise the extent to which their lives are controlled by accidental happenings.
(b) There is really no such thing as 'luck'.
17. (a) One should always be willing to admit one's mistakes.
(b) It is usually best to cover up one's mistakes.
18. (a) It is hard to know whether or not a person really likes you.
(b) How many friends you have depends upon how nice a person you are.
19. (a) In the long run, the bad things that happen to us are balanced by the good things.
(b) Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
20. (a) With enough effort we can wipe out political corruption.
(b) It is difficult for people to have much control over things politicians do in office.
21. (a) A good leader expects people to decide for themselves what they should do.
(b) A good leader makes it clear to everybody what their jobs are.
22. (a) Many times I feel I have little influence over the things that happen to me.
(b) It is impossible for me to believe that chance or luck plays an important role in my life.
23. (a) People become lonely because they don't try to be friendly.
(b) There's not much point in trying too hard to please people; if they like you they like you.
24. (a) What happens to me is my own doing.
(b) Sometimes I feel that I don't have enough control over the direction my life is taking.
25. (a) Most of the time I can't understand why politicians behave the way they do.
(b) In the long run, people are responsible for bad government on a national as well as on a local level.

Appendix 12

Slide Illustrations of Clinic Treatment



SLIDE
A



SLIDE
B



SLIDE
C



SLIDE
D

Appendix 13

Slide Illustrations of Hypnosis Therapy



SLIDE
E



SLIDE
F



SLIDE
G



SLIDE
H

Appendix 14

Slide Illustrations of Rapid Smoking Therapy



SLIDE
I



SLIDE
J



SLIDE
K



SLIDE
L

Tape transcript: Introduction to Clinic Treatment.

Slide illustrations printed in *Appendix 12*.

To accompany Slide A:

The Smoking Research Clinic aims to develop effective treatments for smokers wishing to lose the habit. For this reason, the therapy we offer is closely tied to our smoking research.

The information you supply to us in questionnaire or other research measures will not only help us to help you; it will also add to the growing knowledge on smoking and nicotine dependence.

All information is, of course, handled with total confidentiality.

To accompany Slide B:

Treatment begins with an informal interview in which patients have an opportunity to discuss their individual smoking habits and the problems of giving up smoking.

You are encouraged to examine your smoking habit and the effect of the smoking treatment - and to express your views openly. Acting as your counsellor, the Therapist can offer you support and advice in addition to specific treatments for your smoking habit.

Since smokers vary so much in their smoking habits and general behavior patterns, it is our policy to offer the choice of treatment to each patient.

To accompany Slide C:

We offer you a choice between two different methods of treatment - either RAPID SMOKING or HYPNOSIS. The choice is an important one and we urge you to consider each alternative carefully and in detail before deciding which treatment is the right one for you.

Hypnosis and Rapid Smoking are the two most effective treatments currently available. Both are equally successful methods, but neither is universally suitable for all smokers. Indeed, the long term effectiveness of treatment is highly dependent upon the correct choice being made; that is, matching the most suitable treatment to each individual patient.

To accompany Slide D:

We believe that YOU are in the best position to judge which is the most appropriate form of therapy. It is you, after all, who is most intimately concerned with your smoking habit.

After you have heard the descriptions of treatment by hypnosis and Rapid Smoking you are advised to consider how each treatment might best fit your particular needs before committing yourself to a definite decision.

Finally, we hope that the information given to you will enable you to make the correct choice and that your therapy will be successful. Thank you.

Tape transcript: External Locus choice information.

Slide illustrations printed in *Appendix 13-14*.

To accompany Slides E/I

Here we see the beginning of a therapy session using HYPNOSIS/RAPID SMOKING. Successful treatment by HYPNOSIS/RAPID SMOKING relies considerably upon the skill of the Therapist at administering the procedure, and also upon the chance that the patient happens to be amenable to this type of treatment.

The knowledgeable therapist is able to induce HYPNOSIS in most patients by varying the hypnotic procedure to suit each individual patient. Recognizing the level of susceptibility within each patient, he can alter the wording and tone of his suggestions to induce in patients a desire to stop smoking. / The knowledgeable therapist can effectively retrain most patients behavior through the correct application of RAPID SMOKING principles. By breaking the each patients habit down into a number of behavioral units he can locate the cause of the habit and condition the patient against smoking.

To accompany Slides F/J

In a sense, you are HYPNOTIZED whenever you see a good film and forget that you are a part of the audience, but instead feel part of the story.

In HYPNOSIS treatment, the Therapist plays a recording of a low, deep humming sound. This has a deeply soothing effect to induce in the patient a responsiveness to the hypnotic suggestions. / The RAPID SMOKING process works rather like fatigue. If you lift a heavy weight repeatedly, you would sooner or later reach a point at which it becomes impossible for you to lift it again.

In the RAPID SMOKING treatment, the Therapist plays a recording of a bleep which occurs every 7 seconds. This is to regulate the patients intake of smoke, and control the rate of conditioning.

Tape transcript: Internal Locus choice information.

Slide illustrations printed in *Appendix 13-14*.

To accompany Slides E/I.

Here we see the beginning of a therapy session using HYPNOSIS/RAPID SMOKING. The success of HYPNOSIS/RAPID SMOKING depends largely upon the patients ability to concentrate and upon the patients willingness to cooperate in following the Therapists instructions.

Successful HYPNOTIC/RAPID SMOKING patients try hard to experience the effects suggested by the therapist. Consequently, they are able to make full use of the HYPNOSIS/RAPID SMOKING procedure and to take advantage of the opportunity to stop smoking.

To accompany Slides F/J.

Your cooperation and interest are what are required for this therapy. By becoming involved in the therapeutic procedure you will be in a position to experience the effects of treatment to help you stop smoking.

In a sense you are HYPNOTIZED whenever you see a good film and forget that you are part of the audience, but instead feel part of the story. The patient listens to a tape recording of a low, deep humming sound in the HYPNOSIS treatment. This is to help patients learn to relax and focus their thoughts on the therapists suggestions.

The RAPID SMOKING process works rather like fatigue. If you lift a heavy weight repeatedly, you would sooner or later reach a point at which it becomes impossible to lift it again. The patient listens to a tape recording of a bleep which occurs every 7 seconds in the RAPID SMOKING treatment. This is to help patients regulate their intake of smoke accurately, and to control their rate of conditioning.

Tape transcript: Unstable Expectancy choice information.

Slide illustrations printed in *Appendix 13-14*.

To accompany Slides G/K.

Treatment by HYPNOSIS/RAPID SMOKING has the immediate advantage of directness and simplicity. Therapy takes only a short time and the results are visible immediately after the first session.

Patients have a reduced or completely eliminated desire to smoke even after one therapy session. This allows patients to begin thinking of themselves as non-smokers and so begin adjusting to a new way of life as soon as possible. The experience of HYPNOSIS/RAPID SMOKING is often found by patients to be both interesting and dramatic, and this may contribute to the therapeutic effect.

To accompany Slides H/L.

Unfortunately, there can be a longer term disadvantage to treatment by HYPNOSIS/RAPID SMOKING. The effects of HYPNOSIS/RAPID SMOKING may wear off later and the need for smoking may arise again through the patients unconscious. Repeated dreams or fantasies of smoking can, for example, haunt patients long after treatment has been completed.

There is also the possibility of symptom substitution occurring. In symptom substitution, patients may take on some other habit to meet their underlying needs - for example, increased eating, drinking or fidgeting.

Tape transcript: Stable Expectancy choice information.

Slide illustrations printed in *Appendix 13-14*.

To accompany Slides G/K.

Unfortunately, the experience of HYPNOSIS/RAPID SMOKING may cause patients some frustration during treatment. Because HYPNOSIS/RAPID SMOKING involves detailed procedures carefully matched to the smoking habit, patients may feel frustrated with progress during therapy.

The results of treatment, moreover, may not be immediately apparent. Since the effect is cumulative, it may take some time for smoking to be completely eradicated. This is an immediate disadvantage.

To accompany Slides H/L.

In the long term, there is a clear advantage to treatment by HYPNOSIS/RAPID SMOKING. Patients who receive HYPNOSIS/RAPID SMOKING therapy tend to experience fewer or milder withdrawal symptoms than is usually the case after giving up smoking. Tension and irritability, for example, tend to be worked through during the treatment sessions.

The effects of HYPNOSIS/RAPID SMOKING, moreover, tend to be sufficiently durable for the patient to become adjusted to life as a non smoker. Thus, by the time the effects have worn off, the patient no longer needs the smoking habit.

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

UNIVERSITY OF LONDON

HOUGHTON STREET ALDWYCH LONDON WC2

Telephone: 01-405 7686 X 563

THE SMOKING RESEARCH CLINIC
DEPT. OF SOCIAL PSYCHOLOGY

TREATMENT CONSENT

Conditions of Treatment : Please read carefully.

1. The clinic offers a course of treatment free of charge to anyone wishing to stop smoking. Patients are expected to co-operate, however, in completing a few research questionnaires.
2. A course of treatments is deemed completed after 4 therapy sessions. Patients may attend fewer sessions if, at any time, they feel their treatment is complete. 24 hours notice of cancellation must be given.
3. The clinic will not be held liable for any effects caused directly or indirectly as a result of treatment.

I have read and agree to the above conditions of treatment.

Signature

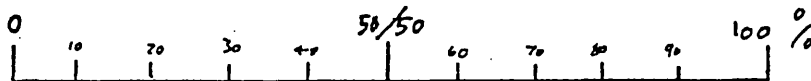
Date

TREATMENT CHOICE

* Delete where appropriate.

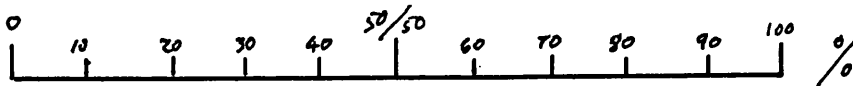
* I choose to be treated by the * method.

I intend to stop smoking :

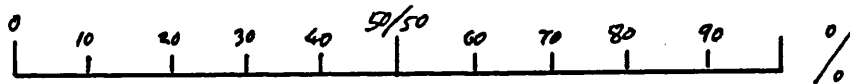


SMOKERS QUESTIONNAIRE

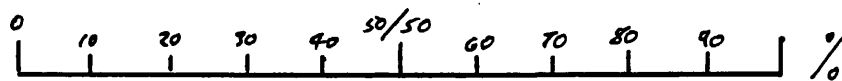
Overall, how effective do you think the
treatment would be in helping smokers to stop smoking?



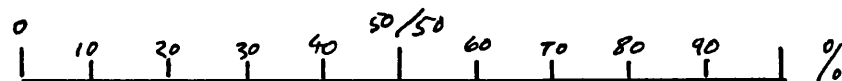
What proportion of this success would be due to their own efforts?



How effective do you think the other (.....)
treatment would be in helping smokers to stop smoking?



What proportion of this success would be due to their own efforts?



EX-SMOKERS QUESTIONNAIRE

Age: Sex: Occupation:
.....

On average, how many cigarettes
did you smoke each day?

What brand did you usually smoke?

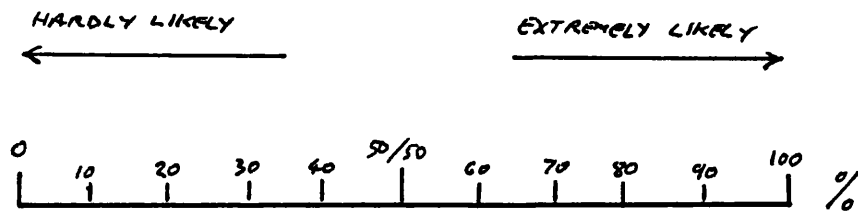
How old were you when you first
started smoking regularly (once
a day or more)?

What is the longest period
during which you have not smoked?

What kind of help or treatment
did you have (including any
methods of your own)? Please
describe fully.
.....
.....
.....

How many times (if any) did you
seriously try to stop smoking
before you finally succeeded?

How likely is it that you will stay a permanent non smoker?



SMOKING RESEARCH CLINIC

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COMMITTED SMOKERS QUESTIONNAIRE

Age: Sex: Occupation:
.....

On average, how many cigarettes
do you smoke each day?

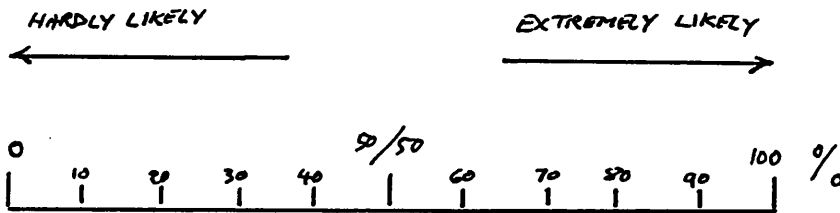
What brand do you usually smoke?

How old were you when you first
started smoking regularly (once
a day or more)?

What is the longest period
during which you have not
smoked?

What kind of help or treatment
did you have (including any
methods of your own)? Please
describe fully.
.....
.....
.....
.....

How likely is it that you will be able to stop eventually,
if you decide to?



Hypnosis Treatment: Basic Therapeutic Suggestions.

Session 1:

Imagine now that you are with your friends.

Picture yourself with your friends having a good time.

You feel good and relaxed. relaxed and good.

Try to imagine someone offering you a cigarette. Someone offers you a smoke, but you feel relaxed, good and relaxed.

You don't want a smoke. You don't need to smoke.

Just feel relaxed. Good and relaxed.

Whenever someone offer you a cigarette, you'll want to shake your head and say, "No thank you- I don't smoke." You will just feel relaxed and good. Good and relaxed.

As soon as someone offers you a smoke you'll shake your head and say, "No thank you- I don't smoke." Shake your head and say, "No thank you- I don't smoke" !

It will happen automatically. Someone will offer and you'll shake your head and say, "No thank you- I don't smoke."

Session 2:

Now try and imagine yourself on a long journey. You are on a long journey and you still have a long way to go. You've been travelling for hours, and you still have a long way to go yet. You begin to feel restless with such a tedious journey.

You feel restless and bored. Everytime you think about your journey it seems to go on longer and longer, and you feel more restless and bored. restless and bored.

If you were a smoker you would want to light up a cigarette and smoke away the long hours.

You would want to smoke a cigarette to help you while away the time.

But instead you begin to feel relaxed. Feel relaxed. You are a non-smoker now and instead of lighting up a cigarette, you begin to feel relaxed. You feel relaxed, and then you can take a fresh interest in your journey.

You feel relaxed and refreshed, relaxed and refreshed. And now you can take a fresh interest.

Take a fresh interest in your journey.

Now imagine arriving at the end of your journey. You feel relaxed and refreshed. Relaxed and refreshed.

Appendix 24

Session 3:

Imagine now that you have just eaten a good meal.

Picture yourself having just finished eating a full meal.

You've eaten a good meal and you feel quite full. If you were a smoker you would want to light up a cigarette and have a smoke. Your meal would not feel complete without a smoke. You would want to round off your meal with a cigarette. But instead, you begin to feel relaxed.

Content with your meal. Content and relaxed. Just feel relaxed.

Whenever you've eaten a meal, you'll feel that eating makes it complete. You will feel satisfied just with having eaten.

Eating will make it complete. And then you will feel content and want to relax. Relaxed and content. It will happen automatically. You'll complete your meal and you'll be content to relax.

Content with your meal; then you'll want to relax. Content and relaxed. Content and relaxed.

Session 4:

Imagine now that you have been trying to solve an important problem.

Picture yourself searching for an answer. You've been trying to find a solution, but nothing seems to fit. There just doesn't seem to be a solution. The more you try to solve the problem, the more tense you become. You feel tense and frustrated. Tense and frustrated. The more you think about it, the more tense you become. You feel tenser and tenser. Frustrated and annoyed. You feel so frustrated and annoyed.

If you were a smoker you would want to light up a cigarette and have a smoke. You would want to smoke your problems away. You would want to wind down with a cigarette.

But instead, you begin to feel relaxed. Good and relaxed. Begin to feel relaxed. Feel relaxed and good, good and relaxed. Just feel relaxed.

Whenever you feel tense through working at a problem, you'll want to relax and take a fresh look for an answer. You'll just feel relaxed and take a fresh look. Relaxed and refreshed. Being relaxed the solution will come to you. The answer will be there, plain for you to see. It will happen automatically. When you have a problem you'll feel relaxed and refreshed. Relaxed and refreshed.

General Non-Smoking Suggestion for all Sessions:

Now relax and try to imagine yourself as a non-smoker.

Picture yourself as someone who doesn't smoke. You're a non-smoker now and you don't smoke.

Notice how relaxed you feel. You feel relaxed. Good and relaxed, good and relaxed.

As a non-smoker you feel good and relaxed.

You won't want to smoke. You don't need to smoke because you're a non-smoker.

Instead you feel good and relaxed. You don't want to smoke. You don't need to smoke. Just feel good and relaxed. You feel good and relaxed.

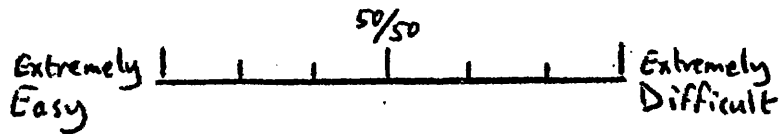
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SMOKING RESEARCH CLINIC

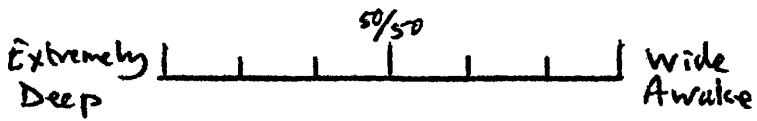
Therapy Report : Hypnosis

Patient's Name Date Session.....

Ease of Hypnotic induction



Hypnotic depth



Hypnotic appearance :

Hypnotic Challenges :

BREAKS CHALLENGE

- Session 1. Clasped Hands
- 2. Eye Opening
- 3. Standing
- 4. Speaks Name

Not at all	Partially	Completely

Additional Observations :

RAPID SMOKING THERAPY - INSTRUCTIONS

I want you to light up a cigarette and take a good draw of your cigarette everytime you hear the bleep.

This will occur every 7 seconds. Just inhale as you would do normally.

Take a draw of your cigarette every time you hear the bleep ad hold the smoke in for the same amount of time as you would do normally.

Continue to smoke your cigarette in this way.

When that cigarette is finished light up another one straight away, so that you can continue to take a draw of smoke every time you hear the bleep.

When you reach the point at which smoking any more becomes intolerable, stub out your cigarette and say,

"I DON'T WANT TO SMOKE ANY MORE!"

We will then pause for one minute, which will mark the end of one complete trial.

After the one minute pause, I want you to light up a cigarette and continue to smoke again in time to the bleep, for the next trial.

You should continue with as many trials as possible.

When you are quite sure that you cannot face another trial, stub out your cigarette and say,

"I REFUSE TO SMOKE ANYMORE!"

This will complete one therapy session.

SMOKING RESEARCH CLINIC

Therapy Report : Rapid Smoking

Patient's Name Date Session

Rapid Smoking Check List

Observations

First Round

- 1. Cigarettes smoked
- 2. Time taken

Second Round

- 1. Cigarettes smoked
- 2. Time taken

Third round

- 1. Cigarettes smoked
- 2. Time taken

Fourth Round

- 1. Cigarettes smoked
- 2. Time taken

Fifth Round

- 1. Cigarettes smoked
- 2. Time taken

Sixth Round

- 1. Cigarettes smoked
- 2. Time taken

Seventh Round

- 1. Cigarettes smoked
- 2. Time taken

Eighth Round

- 1. Cigarettes smoked
- 2. Time taken

Post-Treatment Questionnaire

NAME:

ADDRESS:

.....

TEL NO:

Below are a number of questions which will help us to evaluate our treatment programme and thereby help other smokers wishing to lose the habit. Please consider every question carefully and answer each one as accurately as you can.

- 1. Since you last attended the Clinic Do you now smoke a) Not at all? b) Less than before? c) Same as before? d) More than before? (PLEASE TICK ONE)

- 2. After your last treatment session what was the longest period you went without a cigarette?

- 3. On average, how many cigarettes per day do you now smoke (if any)?

When you first attended the Clinic, you were offered a choice between two different methods of treatment; either _____ or _____. These were described to you by means of a slide show with a taped commentary. Since the choice was an important one, we would like to know how useful this method of presentation is.

Was the amount of information given to you about the treatment methods

- Not enough
About right
Too much

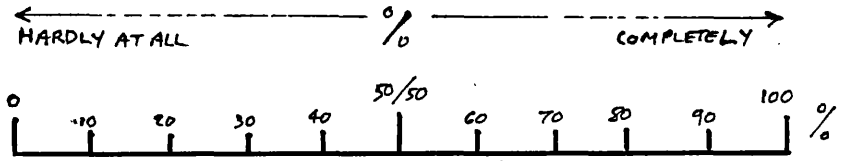
(PLEASE TICK ONE)

Was the time allowed for you to decide on one or other treatment

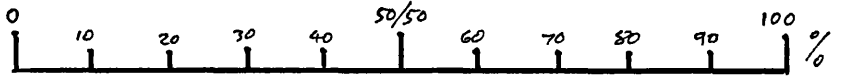
- Not enough
About right
Too much

(PLEASE TICK ONE)

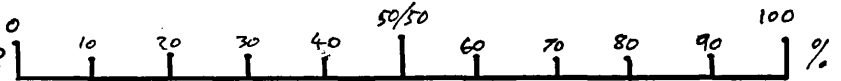
How effective was the therapist in administering the treatment that you received?



If you still smoke, how likely is it that you will be able to stop eventually?



If you no longer smoke, how likely is it that you will stay a permanent non-smoker?



Signature: Date:

Please use the space below if you wish to add anything further about your treatment at the Clinic or problems of giving up smoking. We are grateful for all your comments.

**** THANK YOU FOR YOUR CO-OPERATION ****

Follow-up Questionnaire

NAME:

ADDRESS:

.....

TEL NO:

Below are a few questions which will help us to evaluate our research and thereby help smokers wishing to lose the habit. Please consider every question carefully and answer each one as accurately as you can.

1. Since you applied to the Clinic Do you now smoke

- a) Not at all?
b) Less than before?
c) Same as before?
d) More than before?

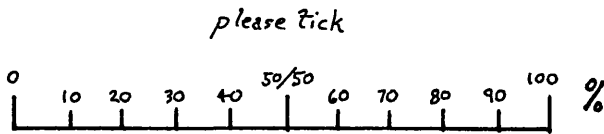
2. On average, how many cigarettes per day do you now smoke (if any)?

3. What is the longest period during which you have not smoked since you applied to the Clinic?

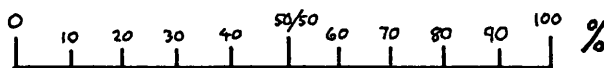
4. What kind of help or treatment did you have (including any methods of your own? Please describe fully.

.....

5. If you still smoke, how likely is it that you will be able to stop eventually?



6. If you no longer smoke, how likely is it that you will stay a permanent non-smoker?



HARDLY AT ALL % COMPLETELY

7. Listed below are 5 different types of strategy for giving up smoking. Which kind do you think would be most suitable in a new scheme?

PLACE THEM IN ORDER OF SUITABILITY BY PUTTING A NUMBER 1 AGAINST YOUR FIRST PREFERENCE, 5 AGAINST YOUR LEAST PREFERRED STRATEGY AND SO ON.

Preference
Number

- a) Join a 'smokers anonymous' group, where you exchange support and ideas with other smokers who are also committed to giving up the habit.
- b) Receive expert treatment from a therapist practising some established technique, such as hypnosis, acupuncture, rapid smoking, etc.
- c) Learn a method of discovery which reveals the precise reasons for your own smoking habit and then suggests suitable ways of coping.
- d) Take a prescribed course of medication, such as nicotine chewing gum or tablets, which substitutes for cigarettes and allows you to gradually phase out your smoking.
- e) Be placed in a situation over an extended time period where cigarettes are simply not available, so giving you an opportunity to adjust without them.

Please use the space below if you wish to add anything further about the problems of giving up smoking, or any suggestions for creating a suitable scheme for helping smokers quit the habit.

We are grateful for all your comments.

THANK YOU FOR YOUR CO-OPERATION

Smoking History

Clinic Treatment Group

	\bar{x}	sd	median	min	max
age started	17.07	3.14	17	11	26
years smoking	14.87	10.18	11.50	3	45
cigs per day	30.22	12.73	27	10	70
nicotine yield (mg/cig)	1.22	0.32	1.3	0.6	1.5
longest abstinence (weeks)	32.72	112.50	2	0	677.9
attempts to stop	2	1.38	2	0	6

Waitlist Control Group

	\bar{x}	sd	median	min	max
age started	17.29	3.96	17	9	28
years smoking	20.5	12.72	17	3	63
cigs per day	28.97	11.29	30	7	50
nicotine yield (mg/cig)	1.22	0.34	1.3	0.7	2.7
longest abstinence (weeks)	15.77	29.19	6	0	156
attempts to stop	2.37	1.39	2	0	6

Treatment Responsiveness

The Treatment Responsiveness Scores (TRS) for Rapid Smoking are more closely associated with actual reduction in smoking rates, than are Hypnosis TRS scores. viz:

Spearman's rho correlations were obtained for:

Rapid Smoking TRS and reduced smoking rate: $r = .98$ ($p = .01$).

Hypnosis TRS with Reduced Smoking Rate: $r = .43$ ($p = .05$).

With only 6 people in the Rapid Smoking group, however, the results must be interpreted cautiously.

Summary Table of Results

Treatment taken	Treatment Responsiveness					Sessions attended		
	n	(%)	\bar{x}	sd	medn	\bar{x}	sd	medn
hypnosis	34	(85)	1.86	0.98	2.16	3.2	1.03	4
rapid smoking	6	(15)	2.56	0.59	2.88	3.66	0.82	4
overall	40	(100)	1.96	0.96	2.21	3.28	1.01	4

Though a less popular choice, Rapid Smoking treatment appears to be associated with higher levels of responsiveness. Only 3 subjects in the Hypnosis treatment, however, failed to respond at all to the hypnotic suggestions. The median value indicates that most subjects responded quite vigorously to the test suggestions. Patients case notes add some qualitative support to the picture, showing that treatment experience to have clear face validity.

Appendix 32

Changes in smoking rate during treatment programme

Reduction in
Daily Cigarette consumption
as a % of subjects base rate

treatment taken	highest rate		lowest rate		final rate	
	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd
hypnosis	42.56	32.51	78.7	31.10	63.13	35.31
rapid- smoking	40.83	26.45	97.83	3.48	69	39.36
overall	41.70	29.25	88.27	17.29	64.11	35.5

Although the Rapid Smoking treatment shows a generally superior performance in reducing smoking rates, Mann Whitney U tests revealed no significant differences compared to Hypnosis treatment.

Changes in smoking rate during the course of treatment provide the most direct means of measuring treatment impact. It is interesting to note that the final smoking rate (measured at the end of the the last treatment session taken) was generally not the best reduction obtained.

Appendix 33

Previous Methods Attempted

On average Clinic subjects had tried between 1 and 2 different methods previously. In all, 46 of the 80 previous attempts specifically mentioned methods to aid quitting.

A variety of phased withdrawal programmes were the most popular method (35%). 7 of these employed nicotine substitutes such as lobeline tablets or Nicorette chewing gum. The other 9 relied on variously graded cigarette filters or reduction programmes such as the Five Day Plan.

11 (24%) of previous methods attempted were by "Cold Turkey" (just stopping without recourse to any aids).

7 (15%) had tried to quit with the help of expert treatment. 3 of these were through Hypnosis, 1 through acupuncture and 3 with local health authority anti-smoking clinics.

6 (13%) of previous attempts to stop were classified as Opportunities of Constraint, that is, circumstances which precluded smoking (e.g. being ill in hospital, or whilst confined during pregnancy).

Finally, 5 (11%) of tries involved Negative Clause Contracts such as signing the pledge or asking friends to invoke a penalty if the attempt failed.

Interestingly, no respondents mentioned support groups or Methods of Discovery (as contained in self-help guides).

General Preferences for Treatment Strategies

Arrow Diagram showing rank order preferences

Treatment strategy	Clinic Applicants	Experimental Controls
expert treatment	1	3
discovery method	2	1
phased withdrawal	3	5
constraining opportunity	4	4
support group	5	2

Disaggregating the data further into subgroups also reveals some striking differences:

Arrow diagram showing rank order preferences

Treatment strategy	Never-Smokers	Ex-Smokers	Committed-Smokers
discovery method	1	3	3
support group	2	2	4
expert treatment	3	4	2
phased withdrawal	4	5	5
opportunity of constraint	5	1	1

Whilst Never-smokers see *opportunity of constraint* as of lowest value, Ex-smokers and Committed-smokers agree in placing this as their most preferred treatment strategy.

Ex-smokers and Committed-smokers also concur in setting methods of discovery as middle order preference, whilst Never-smokers place it first.

Also of interest, whilst *phased withdrawal* was the most popular method actually tried, all three subgroups place it in the lower order of preferences.

Appendix 35

**Choice of Treatment Options by Sub-groups
of Control Subjects**

Experimental Controls sub-group	n	Hypnosis		Rapid Smoking	
		n	%	n	%
Never-Smokers	16	8	50	8	50
Ex-Smokers	12	7	58	5	42
Committed-Smokers	12	9	75	3	25
All	40	24	60	16	40

Ex-Smokers appear to be most like Never-Smokers in their choice pattern for treatment preferences, being more or less evenly disposed between Hypnosis and Rapid Smoking. Committed-Smokers, in contrast appear to have a greater preference for the Hypnosis therapy.

The contingency table yields a Chi-Square of 1.805 ($p = .405$), however, showing the differences amongst Experimental Control sub-groups to be non significant.

Appendix 36

SOCIAL REACTION INVENTORY (Locus of Control Scale)

experimental controls sub-groups	\bar{x}	s.d
Never-sokers	10.75	4.16
Ex-smokers	9.25	4.54
Committed-smokers	10.08	3.78