

THE BELIEFS OF EDUCATIONAL ADMINISTRATORS ABOUT PROBLEM
FORMULATION

by

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ABSTRACT

This study developed a scale for use in assessing administrators' beliefs about problem formulation behaviour, examined selected aspects of its construct validity, and used the scale in an exploratory study to assess the problem formulation beliefs of educational administrators.

Based on theoretical and empirical studies of problem formulation (Allal, 1973; Getzels and Csikszentmihalyi, 1976) and the theory of Cognitive Orientation (Kreitler and Kreitler, 1972; 1976) a conceptual framework was developed in which four kinds of beliefs could be held about each of four component behaviours of problem formulation. A set of statements which were consistent with this framework was developed. Screening and rating procedures yielded four equivalent sets of statements, one set for each belief domain. With the addition of questions about biodemographic characteristics these formed the instrument which was pilot tested and revised prior to being sent to 317 administrators in 12 Community Colleges and four Provincial Institutes in British Columbia. A 60% (189) return rate yielded the data for the study.

Psychometric analyses indicated adequate internal reliabilities for the subtests. Hypotheses were tested by means of correlational analyses and showed that Normative,

Goal and Self beliefs about problem formulation were moderately correlated with each other but not with General beliefs. Normative beliefs were positively and more highly correlated with Goal beliefs than with General or Self beliefs.

A comparison of the responses of selected respondents (low scorers and high scorers) revealed that high scorers were more consistent than low scorers in the level and configuration of their responses. Training in problem solving was the only biodemographic characteristic found to distinguish significantly between low and high scorers.

The results suggest some need for further examination of existing theory: the four belief domains may not be independent but organized in particular ways; computation of a summary "cognitive orientation" score is not well legitimized by the present data. Respondents' ability to recognize four component behaviours of problem formulation is confirmed by the study but their beliefs about the components are not equally consistent. The study concludes with speculations about the usefulness of the scale as a tool in administrative preparation.

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CHAPTER I

THE BACKGROUND, PURPOSE AND SIGNIFICANCE OF THE STUDY

This study was concerned with one aspect of what administrators do, namely, the formulation of problems. It was not, however, directly an investigation of what administrators do when they formulate problems, but of what they believe about problem formulation. Specifically the problem for investigation was to develop an instrument by which to assess the problem formulation beliefs of educational administrators. The study was therefore an attempt (1) to develop a belief scale for use in assessing administrators' beliefs about problem formulation behaviour, (2) to examine selected aspects of its construct validity, and (3) to use the instrument in an exploratory study to assess the problem formulation beliefs of educational administrators.

In this chapter are described under the appropriate headings the background to the study, the purpose and design of the study, and an overview of the thesis.

BACKGROUND TO THE STUDY

The handling of problems has been long recognized as a fundamental part of the decision making process, a central

function of educational administration (Gregg, 1957; Halpin, 1958; Griffiths, 1958). Administrators have been viewed as facing two major tasks: problem formulation and problem solving (Pounds, 1969; Campbell et al., 1977). Problem formulation involves the identification of what is wrong, and the attempts to locate the cause of the difficulty (Campbell et al., 1977). Problem solving involves the application of a selected course of action from a set of potential actions.

But investigations of problem solving have been more numerous than investigations of problem formulation. Only three major studies have been carried out to investigate problem formulation (Allal, 1973; Getzels and Csikszentmihalyi, 1976; Lyles and Mitroff, 1980). Moreover, no empirical investigations of problem formulation behaviour in the context of educational administration have been undertaken, although it has been recognized as an important activity in educational administration (Getzels, 1978; Immergart and Boyd, 1979).

Problem Formulation Behaviour

A major contribution of the investigations of problem formulation (Getzels and Csikszentmihalyi, 1976; Lyles and Mitroff, 1980) has been the identification of differences in problem formulation behaviour as a result of differing responses to a problem situation. For example, if

an individual perceived a given problem situation to be one with which he was familiar, his formulation of the problem would be routine and would follow available established procedures. If, on the other hand the individual perceived the problem situation as one which was hard to define because of his lack of familiarity with it, his formulation of the problem would not follow established procedures but would need innovative responses. Problem formulation in this context depends largely on how the individual decides to specify the problem situation. It involves creativity and discovery.

In addition to the studies of problem formulation, there are some studies in the area of problem solving and problem finding which have implications for the study of problem formulation. Several studies on individual problem solvers have suggested that problem formulation is a function of cognitive style (Taylor, 1975), beliefs (George, 1980), the problem environment (Newell and Simon, 1972), and training in information processing skills (Allal, 1973; Elstein et al., 1979). Findings from studies of the problem finding process have suggested that problem formulation in a discovered problem situation, (that is a problem situation which an individual finds unfamiliar and thus hard to define), is a function of divergent thinking (Arlin, 1974; Getzels and Csikszentmihalyi, 1976), formal operational thought (Arlin, 1974), and the models which the individual chooses to use (Pounds, 1969).

Despite the implications of these findings and suggestions for educational administration, progress towards the development of systematic empirical research in the area of problem formulation has not occurred. The focus of empirical research has continued to be largely on problem solving.

Beliefs About What Administrators Do

Several researchers have pointed out that investigation into the area of beliefs would provide insights into the way administrators make sense of situations at their work place (Hills, 1975; Kimbrough and Nunnery, 1976; Campbell et al., 1977; Sergiovanni and Carver, 1980). They note that administrators come to hold simplified beliefs about the environment in an effort to make sense of its confusing and complex reality. Jastrow, the philosopher, supports this point in his statement that "mind is a belief seeking rather than a fact seeking apparatus" (as quoted in Rokeach, 1968: 113).

Theorists in educational administration have discussed in varying degrees the belief systems of administrators and their implications for administrators' behaviour in the work place (Campbell and Gregg, 1957). Some (Campbell et al., 1960; Cunningham et al., 1963, Downey and Enns, 1963; Gross, 1967) have called for a greater

emphasis on the beliefs of administrators in the research and in the study of administrative practice. The notion is that an individual's perceptions are filtered through beliefs which function as "conceptual maps" of different parts of his or her social and physical environment. The beliefs provide the individual with a relatively coherent way of organizing and making sense of what would otherwise be a confusing array of signals picked up from the environment. Hills (1975) notes that administrative actions are not the products of specific knowledge alone but are the products of incomplete knowledge and approximations which can give rise to judgements, beliefs, values, unverified assumptions and value commitments.

Beliefs have also been recognized in studies of organizational behaviour as performing a central function in administrative activity (Pfeffer, 1981; Smircich and Morgan, 1982). Pfeffer (1981) views the organization as a system of shared meanings and beliefs which assures continued compliance, commitment, and positive affect on its participants. Administrative action is thus viewed as being involved in building shared beliefs so that action can be interpreted in a way that is compatible with emergent norms and values. Smircich and Morgan (1982) view the administrative leader in the organization as the manager of shared meanings, who attempts to provide a basis for organized action. But despite these studies which recognize

the central role of administrators' beliefs there has been no development of systematic research designed to explore in greater depth the area of administrators' beliefs and values about what they do in the work place.

Perhaps one reason for the lack of progress in the development of systematic empirical investigations of administrators' beliefs about what they do, is that the manner in which they organize their experiences at their institutions of work is exceedingly complex. It involves the sets of ideas, concepts, values, attitudes and goals which they accept and which constitute the base from which they attempt to make sense of their world of work.

From the foregoing discussion, it seems plausible to conclude that since the manner in which educational administrators organize their experiences in the work place is complex, one kind of attempt to understand the complexity might be to focus on some fundamental aspect of it, for example, administrators' formulation of problems. Furthermore, the focus of empirical research has been largely on what administrators do rather than on their beliefs about what they do. In addition, theorists have pointed out the usefulness of attempting to understand the underlying conceptions of actions, therefore it is reasonable to conclude that a more useful approach to understanding the complexity would be to focus on educational administrators' beliefs about their formulation of problems in the work place.

The present study took this approach and focused on a small but essential area of inquiry: administrators' beliefs about problem formulation.

Description of Beliefs and Problem Formulation Behaviour

Beliefs have been described as symbolic systems, that is, systems of conceptions which represent meanings. Meanings are abstractions from experience (Parsons and Shils, 1951; Edelson, 1976; Kreitler and Kreitler, 1976).

Kreitler and Kreitler (1976) used a set of four different types of beliefs to obtain a comprehensive profile of an individual's beliefs. These beliefs included the following: (1) Normative beliefs which express evaluative standards and rules of an ethical or non ethical nature, (for example, "Administrators should accumulate as much information as possible before defining the nature of a problem."); (2) General beliefs which express assumed facts about behaviours, objects or events (for example, "Administrators often accumulate as much information as possible before defining the nature of a problem."); (3) Goal beliefs which express future actions, desired or rejected by "the self", (for example, "I want to accumulate as much information as possible before defining the nature of a problem,"); and (4) Beliefs about Self which express assumed facts about oneself, behaviour or traits (for

example, "I tend to accumulate as much information as possible before defining the nature of a problem.").

Kreitler and Kreitler (1972, 1976) maintain that the combination of these four types of beliefs forms a "cognitive orientation" cluster which provides a meaningful and valid summary of an individual's orientation to behaviour. The cluster of beliefs can also be used to predict the individual's orientation to a particular behaviour of interest. A major assumption of the theory of cognitive orientation is that the four beliefs are independent and that it is their interaction in the form of a cluster which provides a meaningful and valid index of the individual's orientation. In a series of studies of beliefs and their relation to a diversity of behaviours such as curiosity and achievement (Kreitler and Kreitler, 1976) the Kreitlers noted that the correspondence between the four beliefs differed in different domains of cognitive content.

Scholars in the field of psychology and philosophy have identified initial conceptions as a fundamental step in the problem formulation process (Dewey, 1938; Shulman et al., 1968, Newell and Simon, 1972; Elstein et al., 1972, 1979; Allal, 1973; George, 1980). Findings from these studies (Newell and Simon, 1972; Elstein et al., 1972, 1979; Allal, 1973) suggest that when an individual perceives a situation to be problematic, he or she generates an initial conception of the problem. Through

the process of evoking beliefs, acquiring additional information, testing and rejecting hypotheses, and investigating the nature of the problem, the individual formulates the problem in a form which facilitates its solution (Elstein et al., 1979; Lyles and Mitroff, 1980; Chi et al., 1981).

However, it can be argued that it is impossible to verify the connections between beliefs and problem formulation behaviour without some means of verifying the basic beliefs involved. No previous attempts have been made to identify empirically the problem formulation beliefs of administrators. Neither has a belief scale been developed for use in the assessment of the beliefs of educational administrators. The development of a Problem Formulation (PF) Belief Scale would thus contribute to the progress of empirical investigations of the relation between beliefs and problem formulation behaviour and the development of theory in educational administration. In addition, a study of this nature might be useful in the development of procedures for training students in educational administration in the task of formulating problems, and in recognizing explicit and unjustified constraints arising from their beliefs.

PURPOSE AND DESIGN OF THE STUDY

The purpose of the present study was: (1) to develop a Problem Formulation Belief Scale that could be used for the assessment of problem formulation beliefs and the prediction of problem formulation behaviour, (2) to examine selected aspects of the construct validity of the instrument, and (3) to apply the Belief Scale in an exploratory study to assess the problem formulation beliefs of educational administrators.

The development of the instrument was based on the literature on problem formulation and on the theory of cognitive orientation (Kreitler and Kreitler, 1976) which assumes that an individual's orientation to a particular behaviour, for example problem formulation, can be determined by measuring his or her Normative, General, Goal and Self beliefs about the specific behaviour. In the literature there is considerable ambiguity about the interrelationships of these four types of beliefs. Kreitler and Kreitler (1976) concede on the one hand, that there is an interrelationship among the four types of beliefs, but on the other hand maintain that the four types of beliefs, as components of cognitive orientation are independent. Each of the four beliefs contributes equally to the cognitive orientation cluster which provides a meaningful summary of

an individual's orientation to a specified behaviour. These two conflicting views of the relationships of the four beliefs have been left unresolved in the discussions of theoretical and empirical research (Parsons and Shils, 1951; Kreitler and Kreitler, 1972, 1976).

The present study was based on the assumption (following Parsons, 1951) that normative beliefs would function as evaluative standards, goal beliefs would give commitment to evaluative beliefs by providing the basis for action, and general and self beliefs would express assumed facts. Thus, in the context of problem formulation normative and goal beliefs would correspond more closely than the other pairs of beliefs, namely: general and normative beliefs, self and normative beliefs, general and goal beliefs, self and goal beliefs, and general and self beliefs. The view of Kreitler and Kreitler (1976) was incorporated into the present study by means of the assumption that the combination of beliefs of the four types provided a meaningful and valid index of an individual's orientation to problem formulation behaviour.

Through the examination of the correspondence of the normative, general, goal and self beliefs of administrators about problem formulation the tenability of each of the views of the relationships of the belief domains was assessed. The study also included exploring research questions designed: (1) to examine the data on

administrators' problem formulation beliefs among administrators whose scores on the Normative, General, Goal, and Self belief domains were farthest from the mean, and (2) to compare selected biodemographic characteristics of this sub-sample of administrators.

OVERVIEW OF THE THESIS

This chapter has provided a brief description of the background to the study and has described its purpose.

A review of the literature is presented in Chapter II together with the theoretical orientations relevant to the construction of the instrument. Three main areas are explored: problem formulation behaviour, beliefs and behaviour and the conceptual framework for the study of beliefs about problem formulation behaviour in the present study.

In Chapter III the development of the Problem Formulation (PF) Belief Scale is described and in Chapter IV the methodological aspects of the use of the developed instrument are discussed.

In Chapter V the characteristics of the respondents are described as well as the results of (a) the psychometric analyses, (b) the tests of the hypotheses, and (c) the supplementary analyses conducted.

Chapter VI presents the findings from an analysis of the characteristics of a selected sub-sample of 60 administrators whose total belief scores were approximately one standard deviation above or below the mean belief scores of the whole sample of post-secondary administrators. Each of the two main sections in this chapter deals respectively with one of the two research questions designed to examine differences in the responses to items of the PF belief scale and the biodemographic characteristics of the sub-sample of low and high belief scorers.

Chapter VII presents a summary of the study, followed by the conclusions and some of their implications.

CHAPTER II

PROBLEM FORMULATION AND BELIEFS: A REVIEW OF THE LITERATURE AND THE DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

The purpose of this chapter is first to examine the theoretical issues in the research literature which are relevant to the study, and second, to describe a conceptual framework for the study. The material is presented in three major sections. The first and second deal with problem formulation behaviour and beliefs respectively. The third describes the study's conceptual framework.

PROBLEM FORMULATION BEHAVIOUR

Despite the recognition of problem formulation as a fundamental aspect of the problem solving process, progress towards its investigation has been relatively negligible (Mintzberg et al., 1976; Getzels, 1978). Lyles (1980) has attributed this relative neglect to lack of attention in the workplace to the problem formulation process. She notes that in organizations managers are not required to analyse the process by which they formulate problems. Neither do organizations provide controls or rewards for problem formulation activity, although problem formulation is recognized to have an impact on organizational life. Gettys

and Fisher (1979) suggest that the lack of systematic inquiry in problem formulation may be due to the tendency for researchers to view problem formulation as an art rather than as an area of scientific study.

In recent times researchers of problem processes have suggested that empirical research into the area of problem formulation may be fruitful since it in large part determines subsequent courses of action (Getzels and Csikszentmihalyi, 1976; Mintzberg et al., 1976; Lyles, 1980). As early as 1931, Maier conducted an experimental study which demonstrated that the manner in which a problem is formulated determines the types of alternatives which are considered and the types of resources which are utilized to solve the problem. Einstein and Inheld (1938), in tracing the development of scientific discoveries in physics, noted that problem solution was merely a mathematical skill, whereas problem formulation involved creative imagination, the raising of new questions and the looking at old problems from a new perspective.

Since the 1930's, some progress has been made in both the theoretical and empirical investigations of problem formulation. The pace has been slow and uneven but several insights have been gained. In the following sections, the discussion will focus on attempts to conceptualize problem formulation and the variations that have been found to exist in problem formulation behaviour.

Conceptions of Problem Formulation

There has been considerable agreement among researchers of problem oriented processes that problem formulation begins when an individual senses that there is a problem to be formulated (Dewey, 1910; Allal, 1973; Getzels and Csikszentmihalyi, 1976; Lyles and Mitroff, 1980). These researchers have noted that problem formulation can be viewed as a process and as a product but that whatever the conception, problem formulation differs with the individual's response to the problem situation with which he or she is faced.

For example, Lyles and Mitroff (1980) investigated problem formulation as a process in the context of organizations and noted that problem formulation occurred in well-defined or in ill-defined problem situations. They found that the majority of managers who participated in their study of organizational problem formulation described the formulation of problems as arising only from ill-defined problem situations. Lyles and Mitroff (1980) viewed problem formulation as a process involving (1) the sensing that a problem existed, (2) the identification of contributing factors, and (3) the reaching of a definition of the problem. They defined problem formulation as:

a questioning or challenging of the current state of affairs in order to arrive at one or all of the following: well defined goals or objectives, a better understanding of the current situation, or an awareness of potential opportunities (Lyles and Mitroff, 1980: 104).

Allal (1973) and Elstein et al., (1979) have conceptualized problem formulation on the other hand, as a product of information processing in an "open system". The problem formulator does not have any previously established routine or standard procedure to follow in defining the problem but by a process of reasoning, deduction and induction makes attempts to find the problem and to discover its cause. Problem formulation has thus been equated with a diagnosis which, viewed as a product, has been defined in the medical context as a label ranging from the highly general to the highly specific [for example, from a general label such as "organic disorder" or "psychological problem" to a more specific label such as "myocardial infarction" or "glomerulonephritis"] (Allal, 1973: ix). More specifically, Allal has defined problem formulation as the identification of a "label having potential diagnostic and/or management implications which the physician generates on the basis of cues (Allal, 1973: ix)." In this context, then, problem formulation consists of a "working diagnosis" or "hypothesis", that is a fairly specific diagnostic label (Allal, 1973; Elstein et al., 1979:53).

Besides the conceptions of problem formulation as a product or as the initial phase of the problem solving process, problem formulation has also been viewed as a step in the problem finding process (Getzels and Csikszentmihalyi, 1976). Problem finding and problem solving have been conceived to be distinct in terms of their processes and their outcomes. Based on the theoretical discourse of Mackworth (1965), problem finding has been viewed as the detection of a need or discrepancy, whereas problem solving has been viewed as the selection and use of a course of action. Getzels and Csikszentmihalyi (1976) in their discussion of problem finding tend to use the term "discovered" to describe what others (Reitman, 1964; Hayes, 1978; Lyles and Mitroff, 1980) have called an "ill-defined" problem situation. The findings of both groups are consistent, however, in that they show that problem finding or problem formulation behaviour is done in response to the ill-defined (or "discovered") problem situation. It is the raising of many possible questions rather than the selection of a single solution.

Further explanations of the ways in which problem formulation has been conceptualized have shown that discussion has had one of two foci: an examination of the kinds of situations which give rise to various modes of problem formulation and an examination of problem formulation as a process.

Situations requiring problem formulation.

The

formulation of problems differs with respect to the type of problem situation with which the individual is faced. Getzels (1964) has proposed a continuum of problem situations at one end of which are well-defined problem situations. At the other end of the continuum are ill-defined problem situations.

In the well-defined (or "presented") problem situations there exists a known formulation of the problem which has been worked out by others, a routine method of solution, and a recognized solution. The individual needs only to recognize and retrieve the existing formulation and established procedures in order to meet the requirements of the situation. Examples of this type of problem situation are: What is the salary scale for a new teacher? or What is to be done if fire breaks out in a classroom at your school?

An intermediary type of problem situation is one in which the problem is presented but no standard method for solving it is known to the problem solver, although it is known by significant others. In this type of problem situation, the individual has to reflect upon the presented problem until he or she reaches a solution which matches the one that is already known. This process involves mainly reasoning and rationality whereas, in the case of the first

type of problem situation which has been identified, memorization and recognition are the main processes involved.

At the other end of the continuum are the ill-defined (or "discovered") problem situations which are novel and important and for which there are neither established routine formulations nor solutions. The individual has to be innovative and find the problem. Examples of this type of problem situation are: "How would you reorganize your Department?" or "Write a proposal of an intended research project." Ill-defined problems have been investigated by researchers of problem solving processes, who have identified the following problem formulation features as characteristic of such problems:

- (1) The problem solver has to take an active role in specifying what the problem is (Reitman, 1964; Simon, 1973; Hayes, 1978:206; Leinhardt, 1978).
- (1a) This means that the problem solver has to make decisions about how to decrease the discrepancy between the situation as perceived and the situation as conceived to be desirable.
- (2) The problem solver is required to make tentative problem solving attempts in order to find or understand what the problem is (Bartlett, 1958; Elstein et al., 1972; 1979; Getzels and Csikszentmihalyi, 1976).

Problem formulation as a process. Even among those who focus on problem formulation as a process, there has been considerable diversity in the ways in which that

process has been conceptualized. For example, Allal (1973) investigated the structural processes of problem formulation and identified three major component activities, namely: (1) generating competing formulations, (2) generating multiple subspaces, that is categorizing aspects of the problem situation and (3) identifying functional relationships between formulations.

These three components are different from those proposed by MacCrimmon (1980). He has viewed problem formulation as involving the identification of a problem. This requires the specification of conceptions of the desirable and of the actual states. The product of this process is a statement of the problem. MacCrimmon maintains that a prerequisite to adequate problem formulation is understanding what the problem is. He defines a problem as "a gap between an actual state and a desired state (1980:3)." The actual state is the situation in which the problem solver is, whereas the desired state is the situation in which he would like to be. MacCrimmon states that problem formulation requires independent specifications of the problem solver's actual state and desired state, and the contrasting of these specifications to produce more complete and useful formulations of the problem. MacCrimmon uses President Nixon's situation during the impeachment hearings of the House Judiciary Committee in July 1974, to illustrate how problem formulations can be generated:

To formulate the problem one might begin by specifying the DESIRED STATE: (1) Retain the Presidency. This would then direct one's attention to the following aspects of the ACTUAL STATE (as perceived by Nixon): (i) loss of congressional support, (ii) impeachment inquiry pending in the Senate, (iii) still have Presidential powers, (iv) increasing negative mood toward Nixon and Republican party, (v) upcoming Congressional elections.

These descriptions might then lead to the consideration of other aspects of the DESIRED STATE: (2) preserve (or restore) Nixon's reputation for posterity, (3) help strengthen the Republican party. This might lead to further ACTUAL STATE descriptions: (vi) lack of time to spend on matters of state, (vii) financial hassle with IRS over tax on income and capital gains, (ix) upcoming trials of former aides.

Such descriptions in turn could lead to a consideration of the DESIRED STATE: (4) retain control of tapes and records, (5) avoid criminal prosecution, (6) assure future financial security, and (7) obtain future peace of mind. These could lead to further ACTUAL STATE considerations: (x) deterioration in health, (xi) qualified for pension if resign, but not if impeached, and (xii) good relations with V.P. Ford (re pardon). By continuing to develop more complete descriptions of the actual state and desired state, the gap and its dimensions can be highlighted, and the following problem statements or formulations may result: For example,

1. How to turn the Congressional tide against impeachment.
2. How to aid the Republican party in the upcoming congressional elections.
3. How to have more time for regular Presidential matters and enhancement of his reputation.
4. How to avoid criminal prosecution for himself and his friends.
5. How to restore financial, physical and mental well-being (MacCrimmon, 1980: 13-17).

What Allal and MacCrimmon have in common is the view that problem formulation can be analysed in terms of a set of component behaviours. The notion of components is a useful one in examining the research which has investigated variations in problem formulation behaviour.

Variations in Problem Formulation Behaviour

The findings of several studies have indicated that variations exist among individuals with respect to certain component behaviours of the problem formulation process. For example in an experiment designed to observe the production of the creative works of artists, Getzels and Csikszentmihalyi (1976) observed notable differences among the subjects with respect to how they formulated problems. The subjects were requested to select, arrange and compose a still life composition in whichever way they pleased. The formulation of the problem was conceived of as occurring in the predrawing stage during which the artists attempted to determine what to do. The drawing phase was treated as the problem solving stage, and the stage in which the artists evaluated their drawings was called the problem evaluation stage.

Notable differences in the problem formulation behaviour of the subjects were found in: (1) the themes which they used in the paintings, (2) the number of objects manipulated, (3) the uniqueness of the objects selected for

the final arrangement of the still life, and (4) their exploratory behaviour while investigating the objects. Getzels and Csikszentmihalyi (1976) assumed that these behaviours were indicative of cognitive processes in a problem finding approach to a problem situation. The themes which the artists used in their paintings represented the problems which they had identified. The manipulation of objects represented the manipulation of ideas, symbols and information. The uniqueness of objects was interpreted as the criteria the subjects used in the selection of the objects. Exploratory behaviour referred to the investigative activities which the subjects undertook.

These four components behaviours, namely: (1) the identification of the problem, (2) the selection of information, (3) the use of criteria in the selection of information, and (4) exploratory behaviour provide a focus for the discussion of the variations in problem formulation behaviour.

Identification of the problem. In the problem finding experiment of Getzels and Csikszentmihalyi (1976) it was observed that the artists used different themes in their drawings. The themes represented the identified problem. Prior to the development of the themes, Getzels and Csikszentmihalyi (1976) noted that the artists experienced vague tensions and strong feelings that a "general" problem

or some apparent problem existed, and that there was a source behind this apparent problem. This represented the apprehension of a problem which was subsequently refined. It led to the identification of the specific problem.

In an experiment in problem formulation among experienced physicians and medical students, Allal (1973) examined the initial identification of problems in a different perspective. She restricted her investigation to the first few minutes of a physician's encounter with a patient who presents a number of complaints. The problems which were apprehended were considered initial problem formulations. Allal (1973) defined the number of problems identified as a measure of the thoroughness of a subject's performance. She noted that experienced physicians did not identify a unidimensional list of problems when dealing with a patient's complaints, but formulated a structured set of problems with the following characteristics:

- (1) Hierarchical organization, that is the organization of problems into a general to specific hierarchy along a single diagnostic category.
- (2) Competing formulations that provide alternative explanations for some group of symptoms.
- (3) Multiple subspaces, or different types of diagnostic categories which the decision maker used in categorizing cues or aspects of the problem situation.
- (4) Functional relationships between problem formulations (Allal, 1973: 114-115).

Allal (1973) found that the identification of competing sets of problems was a consistent characteristic of all physicians. Physicians and medical students trained in formulating problems were found to identify more thorough and appropriate sets of competing problems than untrained students. Thoroughness referred to the number of problems identified. Appropriateness referred to the number of diagnostic categories or subspaces of major importance that were used in identifying at least one problem. Allal (1973) noted that the major difference between the trained group of students and the control or untrained group of students was the latter's failure to identify multiple competing problems from a patient's reported complaints. Complaints were either interpreted as problems or as symptoms of underlying problems. Among the untrained medical students a patient's reported complaints tended to be interpreted as isolated problems. But among the trained students the complaints were interpreted as symptoms of multiple competing problems. These findings indicate that a dimension of variation of problem formulation behaviour that is relevant to its description is the identification of the problem.

Selection of information. Kuhn (1963:105) has noted that the selection of information is important to the identification of phenomena as members of some particular class or concept. Dewey (1938) has asserted that the

selection of information is guided by the individual's conceptions as ideas or hypotheses. These ideas, he has argued, play a crucial "operational" role in the selection, interpretation, arrangement and ordering of information obtained from a problematic situation. His notion is that ideas (hypotheses) do not only lead to the detection of information, but interact with the detection of facts. The ideas in turn instigate and direct the further selection of information. The ideas usually become embodied in symbols which act as signals and direct subsequent activity.

In the problem finding experiment of Getzels and Csikszentmihalyi (1976) subjects identified and manipulated a number of objects ranging from as many as 19 of 27 objects to as few as two. This behaviour was used as a measure of the breadth of investigation. Of particular interest is the suggestion of Getzels and Csikszentmihalyi (1976: 136,147) that in an experiment in which symbols and ideas are being manipulated, the symbols and ideas can be taken as the analogue of objects as used in their study.

Given this, Shulman's investigation of human inquiry using school teachers becomes relevant. Shulman (1965) examined the information which subjects used in the inquiry process. He used two variables to assess the information processing activities. They were (1) "bits of information used", and (2) "information sources" used. The first variable was used as a measure of the problems sensed (that

is problems initially formulated) whereas the second variable was a measure of the categories or kinds of information a subject used. A subject had the opportunity to use varying numbers of bits of information from internal and external sources. The bits of information which a subject wished to use could be manipulated in which ever way the subject chose. Shulman found that there were significant differences among subjects with regard to the number of bits of information used. Subjects who were more variable and flexible in their search for information employed a higher number of bits of information from both internal and external sources. This was assumed to measure the breadth of the subject's information seeking relative to the total number of materials processed during the inquiry session.

Allal (1973), on the other hand, used the measure "cues" to determine the data base which subjects used in their formulation of problems. Cues referred to elements of data which a subject used for identifying problems. She found that there was no significant difference between the groups of subjects on this variable. The average performance in the selection of information by the subjects who had received training in problem formulation and those who had not was high, that is they attained over 70% of the maximum possible score on the variable.

Allal concluded that the subjects had already attained, prior to the experiment, a high level of skill in detecting cues and using them to identify at least one problem. However on the variable which related cues used to the problems identified there were significant differences between the untrained subjects and the trained subjects. This was attributed to the effect of training in the use of selecting information to formulate problems. This involved the recognition of information and the undertaking of a search. Allal noted, however, that a knowledge of the domain and the use of search strategies in obtaining information were necessary in this activity of selecting adequate information.

An examination of these studies suggests that another dimension of problem formulation which is relevant to its description is the selection of information which a subject uses in his or her attempts to formulate the problem.

Utilizing criteria in the selection of information.

In the literature on problem formulation, differences in the information selection of subjects have been viewed partly as the result of the use of different criteria (Allal, 1973; Getzels and Csikszentmihalyi, 1976; Ross, 1981a;b). Ross (1981a: 4; 1981b), in his development of an instrument to measure student decision making, conceptualized criteria

used in the making of decisions in terms of five levels, namely: (1) no criteria, (2) criteria based on good things and bad things, (3) self-referenced criteria, (4) criteria which refer to other people, and (5) criteria which are general principles.

At level 1 - no criteria - the individual did not consider alternative criteria. At level two - good things and bad things - the individual did not apply the same reasons to all the alternatives considered. A different set of good and bad reasons was given for each alternative. Level 3 - self-referenced criteria - was characterized by an explicit set of criteria which the individual applied systematically to all his alternatives. The distinguishing feature of these criteria was that they were entirely self-referenced. They concerned the individual's personal needs, wants, and goals without reference to other people. At level 4 - criteria referring to other people - the individual had an explicit set of criteria which applied to each alternative considered. This set included self-referenced criteria and some criteria that referred to other people. Level 5 - criteria as general principles - was characterized by self-referenced concerns and the consideration of other people into a general set of principles of human action having universal validity. This differed from level four criteria in the consideration of concerns from a theoretical level or as a principle.

In the application of the model to a training program, Ross (1981b) found that there was considerable difficulty in raising to a higher level an individual's performance in the utilization of criteria. He suggested that this might be due to the single linearity of his scheme which might have been concealing other kinds of growth, that is, model misfit.

Getzels and Csikszentmihalyi (1976) focussed on the intuitive aspects of thinking in their investigation of the problem finding behaviour of art students. They argued that creative problem formulation depended on sensitivity, intuition, and holistic evaluation rather than on objectivity, reasoning, and analytical ability. They maintained that associated with intuition were deep emotional feelings and experiences which led to discovery. A main assumption was that subjects who identified unique objects rather than popular objects had selected the objects on the basis of intuition and deep emotional feelings. In the experiment these subjects received higher scores for the objects they selected (judged on the basis of the criteria they used) than did those subjects who had chosen popular objects. The latter group of subjects was assumed to lack deep emotional feelings.

From an entirely different perspective Allal (1973) examined the criteria which physicians and medical students used in their search for cues when formulating problems.

Allal was concerned with subjects' use of previously acquired knowledge, experience, thoroughness of cue acquisition, and style of information integration in generating accurate problem formulations in the medical context. Allal's focus was thus on the outcome of the subjects' information processing and logical diagnostic reasoning. The criteria which she considered relevant in problem formulation pertained to the types of cues that were utilized. Allal noted that four main types of criteria were used in detecting, interpreting, and selecting cues: (1) unconscious criteria, (2) impressionistic criteria, (3) general criteria, and (4) criteria based on a principle.

Allal (1973) found that among experienced physicians the selection of a cue or strategy was often an unconscious process. Physicians reported that cues and relationships among cues suddenly came to mind. Impressionistic criteria were a type of criteria found to be used by physicians who focussed on non verbal data to form impressions of the patient for use in judging the accuracy and objectivity of the symptoms the patient reported. Some physicians made greater use of their initial impressions of the patient than others. The third category of criteria which physicians used in selecting cues - general criteria - were selected on the basis of the relative frequency of a complaint or incidence of disease, presenting complaints of patients, major complaints of the patient or single salient cues. A

fourth type of criteria was based on principles. Elstein et al., (1979) noted that physicians did not usually differentiate between cues and criterial findings but that they adhered to principles in rank ordering their hypotheses. These principles pertained to the probability of a particular disease causing the patient's problem, the seriousness of the conditions, the treatability of alternative diseases, or the novelty of a hypothesis which might serve to keep the physician interested in the case or to ensure that unlikely avenues were explored.

Although Allal (1973) did not examine the criteria that physicians used in terms of different levels, she identified types of criteria which were similar to what Ross (1981b) identified as differing levels of criteria. From the preceding discussion it can be concluded that another dimension of variation that is relevant to the description of problem formulation behaviour is the criteria which are used in the selection of information.

Exploratory behaviour. Although the literature on problem formulation is relatively silent on exploratory behaviour, work on problem solving has insights to offer. In these problem solving studies, the problem solving process has been conceptualized as an overall process including the formulation of the problem and the selection and execution of a course of action. Findings from these

studies which are relevant to the discussion of exploratory behaviour are included in this section.

Getzels and Csikszentmihalyi (1976) investigated the amount of exploratory activity displayed by subjects in the selection and arrangement of objects. Exploration included a range of variations in behaviour such as merely transferring objects from one table to another, intently observing objects and feeling their texture, and actively experimenting with some objects by changing their positions and shapes and rearranging them. Subjects who merely transferred objects were given low scores, whereas those who observed and actively experimented with objects were given high scores.

Kolb (1976) approached exploratory behaviour in a different context, the context of managerial learning and problem solving. According to Kolb's model, problem solving activity¹ begins with concrete experiencing, then proceeds through reflective observation to abstract conceptualization and finally to active experimentation. Getzels and Csikszentmihalyi (1976) observed behaviours similar to those

¹ Kolb uses the term "problem solving" to refer to both the processes identified by Pounds (1969) as problem finding and problem solving. The problem solving process as conceptualized by Kolb (1976:26) involves the following stages: (1) choosing a model or goal, (2) comparing it to reality, (3) identifying differences (problems), (4) selecting a problem, (5) considering alternative solutions, (6) evaluating consequences of solutions, (7) selecting a solution, and (8) executing the solution.

described by Kolb (1976), but in their definition of exploratory behaviour, active experimentation followed conceptualization.

But Einstein and Infeld (1938) envisaged experimentation from a slightly different perspective. For them experimentation was a conceptual process involving the manipulation of symbols. An example which they cited can be used to illustrate the point. Einstein and Infeld (1938) noted that intuitive thinking subscribed to the idea that the greater the action the greater was the velocity. This led to the representation that a cart would stand still if someone stopped pushing it. The result of this idea was sterility. However Galileo reasoned that if no external forces were acting on a body it would move uniformly, that is, always with the same velocity along a straight line. This was speculative thinking (different from intuitive thinking) which involved idealized experimentation that could never be performed. It led to discovery.

McDermott and Larkin (1978) examined the investigative behaviour of problem solvers attempting to solve physics problems and conceptualized the investigative process in terms of four stages during which different representations of the problems were constructed. These stages were reformulated by Chi et al., (1981) for use in their study of the categorization and representations of problems. These "stages" are described as follows:

- (1) "Literal representation contains "surface structures", such as objects, literal terms, and the replication of the physical configurations described in the presented task.
- (2) "Naive representation contains literal objects and spatial relationships as stated in the presented task.
- (3) "Scientific" representation contains idealized objects and physical concepts which are necessary for generating equations that will solve the problem.
- (4) Algebraic (quantitative) representation contains "deep structures" which include abstractions in the form of equations.

Getzels and Csikszentmihalyi (1976) in their problem finding study made observations which pertained to issues of problem representation and exploratory behaviour similar to those addressed by McDermott and Larkin (1978). They noted that subjects explored their situations at differing levels. For example, an artist may have looked at an object literally as an object on one level, and simultaneously may have looked at the object as symbolic of a human figure at a more abstract level. This alternative interpretation suggests greater interaction among the "stages" of representation than was proposed by McDermott and Larkin (1978). Getzels' interpretation allows for the tentative conception of the problem and its subsequent refinement as more information is gathered and it avoids discrete stages.

Chi et al., (1981) investigated the "basic approach" of novices and experts to problems to be solved and found that there were differences between the groups in the way

they explored, manipulated and interpreted problem features. Novices exhibited little exploration in their arrangement and organization of problem features, and in the preliminary procedures which they adopted in developing an approach to the problem. They were found to examine the problem features in terms of global frameworks, to focus on solving rather than identifying the problems, to interpret literally features of the problem and to resort to the immediate quantification of terms without much qualitative analysis. Experts on the other hand were found to use deeper level structures, to focus more on the abstract conceptualization of the problem features and on qualitative analysis with respect to some principle.

These findings indicate that differences in exploratory behaviour exist and can be traced to the individual's system of conceptual constructs. Larkin et al., (1980) noted that a main and obvious difference that they found in the problem solving behaviour of experts and novices was that experts possessed more knowledge. This accounted for the quality of the representations of the problem which they generated and their recognition of patterns which evoked vast amounts of stored information from their memory.

Hills (1975) in a report of his observations of the principalship noted that several principals exhibited unproductive behaviours when dealing with problems. This

led him to conclude that there was a lack, among other skills, of exploratory activity among principals. Selected aspects of his conclusions which are relevant to the discussion of the exploration of problems are:

- (a) Administrators seldom question the problematic status of situations, or the desirability of stated objectives.
- (b) Little effort is made to identify the conditions that permit (and/or cause) problematic situations to occur. Problems are seldom seen as symptoms of underlying causes.
- (c) Problems tend to be treated as discrete, independent, isolated phenomena. Relations among problems are seldom identified.

From the preceding discussion, it is clear that exploratory behaviour constitutes a fourth variable dimension of problem formulation behaviour.

Summary. From the literature on problem formulation and solving two main conclusions can be made. First, problem formulation can be defined in terms of four component behaviours, namely: (1) identification of the problem, (2) selection of information, (3) the use of criteria in the selection of information, and (4) exploratory behaviour. Second, these component behaviours are not unitary behaviours but have ranges of variation.

In the next section a discussion of beliefs with reference to problem formulation behaviour is presented.

BELIEFS AND THEIR RELATION TO BEHAVIOUR

Holsti (1976) has pointed out that the connections between beliefs and behaviour are not simple and direct but involve cognitive activities. This view has been supported by several researchers of beliefs and cognitive tasks such as decision making, problem solving, and problem formulation (Shapiro and Bonham, 1973, Taylor, 1975, George, 1980). The notion is that beliefs are conceptions and that the starting point for cognitive tasks such as decision making, problem solving, and problem formulation is in the conceptions of the individuals.

In the following sections relevant research into the area of beliefs about problem formulation is discussed. The discussion focusses first on classifications of beliefs, second, on the Kreitlerian theory of "cognitive orientation" and third, on beliefs about problem formulation.

Classifications of Beliefs

Parsons and Shils (1951: 140) have defined beliefs as "symbol systems in which the cognitive function has primacy." As symbolic systems, beliefs represent meanings, for symbols are distinctive entities which by convention, stand for, represent, or present a meaning. A meaning is both an abstraction and a conception. Thus a belief

represents a conception which is an abstraction from detailed experience (Edelson, 1976).

In a cultural system, human behaviour has been associated with four different types of symbol systems - the cognitive symbol system, the expressive symbol system, the moral-evaluative symbol system, and the constitutive symbol system (Parsons, 1965: 495-523). These four symbolic systems give rise to four types of beliefs which represent conceptions of information and thought, desire and feeling, value and evaluation and the ultimate meaning of behaviours, objects and events. The four types of beliefs (Parsons and Shils, 1951; Parsons, 1965) have been used as the basis for the classification scheme of beliefs developed by Kreitler and Kreitler (1972, 1976) for determining an individual's "cognitive orientation" to a particular behaviour of interest.

The Kreitlerian classification of beliefs. Kreitler and Kreitler (1976) have defined a belief as a combination of concepts which have been produced as the result of a meaning generation process. More specifically they have defined a belief as a complex unit consisting of at least, a concept linked by a relational concept to another concept (Kreitler and Kreitler, 1972; 1976: 80), for example, "School administrators exist only for the improvement of instruction and welfare of the students." A belief could

therefore be expressed as an affirmative or negative proposition relating to a behaviour, object, state or event (Abelson and Rosenberg, 1958; Rokeach, 1968:113; Bem, 1970:43; Cappella and Folger, 1980).

Kreitler and Kreitler (1976) have adapted the classification of belief systems developed by Parsons and Shils (1951) to devise a set of beliefs which, they have hypothesized, comprehensively describes an individual's cognitive, expressive and evaluative orientation to a behaviour, object or event. Two of these kinds of beliefs refer to the individual's internal world, that is beliefs about Self and Goal beliefs, and two refer to the external world, that is General beliefs and Normative beliefs. The combination of the different types of beliefs has been assumed to give a valid indication of an individual's "cognitive orientation"² to a specified behaviour, object or event. The types of beliefs which Kreitler and Kreitler (1976) have used in their classification system are described as follows:

² Kreitler and Kreitler (1976:69) use the term, cognitive orientation to refer to a network of "meanings" which implies relating to objects on the basis not only of factual knowledge but also in terms of their gratificatory significance and value standards. This usage of the term "cognitive" differs from the Parsonian definition of "cognitive" which refers to an orientation to objects in terms of knowledge. Through investigation one obtains knowledge of the object (Parsons and Shils, 1951).

- (1) Normative Beliefs (N). These express general standards or rules relating to what people should think, say or do with regard to other people, objects or situations, for example, "Preparation programs in educational administration should place an emphasis on the development of problem-solving skills."
- (2) General Beliefs (GB). These express cognitive propositions about people, objects or situations in the present, past or future; for example, "Most administrators tend to be random and unsystematic in their search for solutions to problems."
- (3) Goal Beliefs (Go). These express affective propositions concerning future actions, objects or states, i.e., those desired or rejected by the self; for example, "I want to explore more fully the area of strategies and their application in the teaching of problem solving skills."
- (4) Beliefs about Self (BS). These express cognitive propositions about one's self; for example, "I often approach the formulation of a problem by first specifying the features that appear to contribute to the problem."

These beliefs have been used singly and in varying degrees in studies of belief systems of individuals and groups. But less frequently have they been used as a set of four types of beliefs in studies designed to attain a comprehensive portrait of an individual's orientation to a particular object, behaviour or event, or in studies designed to predict a specified behaviour.

The use of different types of beliefs in studies of beliefs and behaviour. Studies which have sought to analyze the consistency between beliefs and behaviour, and attitudes and behaviour, have attempted to use more than one type of belief. The importance of doing so has been exhibited in several studies.

Fishbein and Ajzen (1975) proposed adding personal normative beliefs, which indicate an individual's motive to comply with the norm, to the investigation of the attitude-behaviour relation. O'Keefe (1980) proposed adding beliefs which emphasized the cognitive to evaluative beliefs which were claimed to be the predominating kinds of beliefs used by investigators of attitudes and behaviour. In the context of beliefs, Cancian (1975) suggested the inclusion of three types of normative beliefs in determining the consistency between beliefs and behaviour. Schwartz (1973) showed that the function of beliefs about personal responsibility for one's own actions and the consequences for the welfare of others were important. An aggregation of these diverse findings suggests that it may be fruitful to utilize a diversity of beliefs in examining individuals' beliefs and the relation of beliefs and behaviour.

Kreitler and Kreitler (1976: 338-364), in a review of 117 attitudinal studies, noted that the attitudinal scales in studies in which attitudes and behaviour were found to be positively correlated contained statements which represented an average of three types of beliefs. Attitudinal scales in studies in which no, or negative correlations were found between attitudes and behaviour contained statements which represented on average one type of belief. Ninety-one percent of the attitudinal scales in

studies that obtained positive correlations between attitudes and behaviour were found to contain statements which represented three or four different types of beliefs. On the other hand, only seven percent of the attitudinal scales in studies in which no or negative correlations were found contained attitudinal statements represented by three or four different types of beliefs. In addition, in the attitude scales of studies with no or negatively correlated findings, goal beliefs were least represented in the statements of the scales. These findings supported assumptions of the cognitive orientation theory which Kreitler and Kreitler (1976) developed in the course of their investigations of beliefs.

The Theory of Cognitive Orientation

Kreitler and Kreitler (1976) have noted that in order for behaviour to be predicted from beliefs, a combination of four types of beliefs - Normative Beliefs, General Beliefs, Goal Beliefs, and Beliefs about Self - which are relevant to any specific stimulus input has to be identified. The inclusion of one or more Goal beliefs with Normative, General, and Self beliefs creates a "Cognitive Orientation" (CO) cluster which prescribes the direction for behaviour. The goal belief forms the core of the CO cluster. If the relevant beliefs have previously undergone clustering, as is common in recurrent and significant

situations, these clusters may be assumed to be stored in memory from where they are retrieved when needed. The significance of the CO cluster is that it is a valid and meaningful summary of an individual's orientation to a specific behaviour and that it can be used to prescribe behaviour. This has been the central proposition in the Kreitlerian theory of cognitive orientation.

Each of the component beliefs of the "cognitive orientation" cluster is assumed to be independent, and performing a specific function. Yet in the theoretical discussions of the four types of beliefs, Kreitler and Kreitler (1976) admit that these beliefs are interrelated. Following the theory of the socialized actor developed by Parsons (Parsons and Shils (1951) normative beliefs have been described as evaluative standards which function in the evaluation of actions or individuals on the basis of how well they conform to some standard. They define the actions and attributes which distinguish a particular rank. Normative beliefs are thus rules which enable an individual to select the best behaviour pattern for him or herself and to evaluate the behaviour of others. These beliefs specify whether a behaviour is good or bad. They are assumed to bring existing and desired states of affairs into close conformity with desirable states of affairs (Parsons, 1951).

General beliefs and beliefs about self are both cognitive types of beliefs which express assumed facts about behaviours, objects or events. The difference between them is that general beliefs pertain to all individuals whereas beliefs about self pertain to assumed facts about oneself. These two types of beliefs express cognitive meanings which first have to be established before affect and evaluation can be established. (Exceptions may occur in situations where there is not much knowledge about an object but it is still evaluated. For example, a student may not have much knowledge about a course which is being offered but may still consider it a good course. However the evaluative belief is based on the cognitive belief that such a course exists.)

Goal beliefs represent conceptions of the desired which are distinct from normative beliefs which are conceptions of the desirable that define the direction of beliefs. Goal beliefs specify states which are to be achieved in a given context. Since they give commitment to evaluative beliefs thereby providing the basis for action they are viewed as having a closer correspondence with normative beliefs than with cognitive beliefs such as beliefs about self and general beliefs. In addition, Kreitler and Kreitler (1972, 1976) have maintained that the goal beliefs prescribe the direction of the beliefs cluster because of their propensity for action.

From this discussion, it is clear that despite the claim of Kreitler and Kreitler (1976) that the four types of beliefs are independent there is support for the notion that normative beliefs as evaluative standards function so as to bring cognitive and goal beliefs into close conformity with beliefs about the desirable state of affairs (that is normative beliefs). Furthermore, goal beliefs which represent conceptions of the desired and which give commitment to evaluative beliefs would appear to correspond more closely to normative beliefs than would cognitive beliefs.

Apart from the studies of the consistency of beliefs and behaviour which have been reviewed earlier, several studies using cognitive process models have shown that the decision maker can be viewed as a believer whose "conceptual baggage" has some effect on his decision making behaviour, thus having implications for the study of problem formulation. These studies will be discussed briefly in the following section.

Beliefs About Problem Formulation

Both classical and contemporary theorists (Dewey, 1938: 104; Miller et al ., 1960: 172-173; Hills, 1975) have noted that the starting point for the formulation of problems is the conceptions of individuals. Differences between the conceptions of what a situation is and what a

situation ought to be lead to the formulation or creation of problems. Kuhn (1963) notes that conceptions are, however, rooted in perception, a process which involves both the detecting and the decoding of sensory input. Detecting involves the use of the senses in order to identify stimuli. Decoding involves the use of the brain and conceptions for the purpose of interpreting incoming signals from the environment (Kuhn, 1963; Cappella and Folger, 1980; George, 1980).

The process of detecting and decoding signals from the environment involves the evocation of beliefs. The explanation is that the sensing of stimuli does not take place in an empty organism but in one who has already formed certain concepts, preferences and beliefs. This makes decoding possible. The individual uses already formed concepts and beliefs which are integrated and hierarchically organized in terms of conceptual dimensions. These systems of conceptions (which are beliefs) are used for making inferences and for generating predictions (Schroeder et al., 1967). Among individuals there are differences in the integration and hierarchical organization of their systems of conceptions. These differences have been decribed in terms of complexity, organization and integration (Schroeder et al., 1967; Shapiro and Bonham, 1973; George, 1980; O'Keefe, 1980). The differences have been attributed to differences in learning and experience (Shapiro and Bonham,

1973).

Shapiro and Bonham (1973: 161) in a study of the effects of the beliefs of policy experts on their decision making behaviour noted that the beliefs of the policy experts accounted for most of the variance in their decision making behaviour. They defined beliefs as causally related concepts which were operationalized as cognitive maps. Cognitive maps were maps consisting of linkages between four main types of concepts which policy analysts used in their explanation of events. The explanations were used by the researchers as a way of describing the subjects' decision making behaviour. Shapiro and Bonham (1973) found that the policy makers whose cognitive maps contained few and simple linkages gave simpler and more evident explanations of the cause of the events when compared with those who exhibited complex cognitive maps. These complex cognitive maps were more densely structured and contained more complex interrelations among the various concepts used.

This investigation is only one example of the central role that beliefs play in cognitive tasks such as decision-making in general and in problem formulation in particular. Taylor (1975) has noted that beliefs have an effect on the formulation of problems. They may contribute to limited information search and constraints in the identification of the problem. In educational administration, attributes such as attitudes, goals,

perceptions, preferences and values have been discussed globally with beliefs in the general context of administrative behaviour, but rarely in the particular context of problem formulation (Immegart and Boyd, 1979; Sergiovanni and Carver, 1980). This clearly suggests implications for empirical research in this area.

THE DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

In the sections which follow, the conceptualization of the study is discussed under three topics, namely: (1) problem formulation behaviour, (2) beliefs about problem formulation behaviour, and (3) variations in beliefs about problem formulation behaviour.

Problem Formulation Behaviour

From the review of the literature in the preceding sections problem formulation can be defined as the process of identifying an actual or anticipated aspect of a situation as different from what is held to be desirable. The problem formulation process consists of four component behaviours: (1) the identification of the problem, (2) the selection of information, (3) the use of criteria in the selection of information, and (4) exploratory behaviour. The findings of the major studies of problem formulation indicated that the four component behaviours might each have

TABLE II.1

PROBLEM FORMULATION BEHAVIOURS AND VARIATIONS

COMPONENT BEHAVIOURS OF PROBLEM FORMULATION	RANGE OF VARIATIONS			
	1	2	3	4
A: Identif- ication of the problem	Simple	Moderate- ly simple	Moderate- ly complex	Complex
B: Select- ion of infor- mation	Inform. near at hand and general	Inform. near at hand and particular	Inform. general near at hand and distant	Inform. general, partic., near at hand and distant
C: Use of selection criteria	Criteria that come to mind	Self ref- erenced criteria	General criteria that other administr- ators use	Criteria based on princ- iples
D: Explor- atory Behaviour	Literal and Concrete	Naive and ref- lective	Experim- entative and practical	Abstract and concept- ual

a four point range of variation. Table II.1 shows the matrix created by displaying each component behaviour with its range of variations.

In the empirical investigation of problem formulation behaviour, levels of behaviour ranging from the simple to the complex have been identified. Simple problem formulation has been characterized by the following variations for each of the four component behaviours: (1) identifying a single specification of a view of the problem, (2) selecting general information which is near at hand, (3) using criteria which readily come to mind, and (4) literally interpreting details of the problem situation. These kinds of behaviours are consistent with what is found in the so-called "presented" problem situation. That is to say, there is an absence of questioning and challenging the status of the problematic situation which might be perceived. The problem situation which is perceived is accepted as it is initially perceived; criteria which readily come to mind are used in selecting information; search behaviour for finding information is limited; and literal and concrete levels of exploration are exhibited.

Complex problem formulation has been characterized by the following variations for each of the four component behaviours: (1) identifying many views of the problem and their relations, (2) selecting general and particular bits of information which may be near at hand or distant, (3)

using criteria based on principles, and (4) abstractly interpreting details of the problem situation. These kinds of behaviours are consistent with what is found in a "discovered" problem situation and are indicative of ideas of creativity, the questioning and challenging of perceived problematic situations, the use of criteria based on principles, extensive search for general and particular types of information, and the conceptualization of aspects of the problematic situations in terms of cases of types of situations

Each of the four component behaviours of problem formulation and its range of variations are discussed in the following sub-sections.

Identification of the problem. Based on the investigations undertaken by Allal (1973) and Getzels and Csikszentmihalyi (1976) the identification of the problem situation was identified as a relevant component of problem formulation behaviour. It refers to the number of aspects of the problem and the relationships that are considered in determining the nature of the difference between an actual and desirable situation. Variations in the identification of problems are differentiated as follows:

- (1) The simple identification of the problem is characterized by the consideration of limited attributes of the problem situation. Only a single specification of the state(s) of the problem is considered.

- (2) The moderately simple identification of the problem is characterized by the identification of one or two aspects of the problem situation as problematic. Considerations of the problem situation are limited and similarities and differences between sets of conditions are identified.
- (3) The moderately complex identification of the problem is characterized by the identification of two or three views of the problem situation. They are simultaneously held in focus and compared and cases are made for each different view. The relationships and the interactive effects of the different views are considered.
- (4) The complex identification of the problem is characterized by the identification of many views of the problem situation which are simultaneously held in focus and compared. The outcomes of various comparisons of views of the problem situation produce statements about their functional relations and lead to the emergence of new ways of viewing the problem.

Selection of information. Based on the investigations of Shulman (1965), Allal (1973), and Getzels and Csikszentmihalyi (1976) the selection of information was identified as the second component behaviour of problem formulation. The behaviour refers to the cues or bits of information which are obtained about a problem situation and used for refining one's conception of the problem. It reflects the breadth of one's search activities in formulating the problem. Variations along the dimension of the selection of information might be differentiated as follows:

- (1) The selection of general information which is near at hand refers to the use of global information

obtained from the presented situation. The search for information is minimal.

- (2) The selection of particular bits of information which are near at hand refers to the use of specific bits of information extracted from the presented situation. Search is required in selecting relevant bits of information.
- (3) The selection of general information which is near at hand and distant refers to the use of global information obtained from the presented situation and from searching and questioning aspects of the situation. This requires the introduction of information from other sources.
- (4) The selection of information which is particular, general, near at hand and distant refers to the use of global and specific bits of information extracted from the presented situation and obtained from other sources as a result of the questioning and challenging of aspects of the situation.

The use of criteria in the selection of information.

From the discussion of the investigation of Ross (1981a;b) coupled with the findings of Allal (1973) and Getzels and Csikszentmihalyi (1976) the use of criteria in the selection of information appears pertinent to the definition of problem formulation. Criteria refer to the standard points of reference which are employed when information pertaining to a problem situation is selected.

Based on the literature, the use of criteria in the selection of information might range from the use of criteria which readily come to mind to the use of criteria based on principles. Variations might be differentiated as follows:

- (1) The use of criteria which readily come to mind is characterized by the spontaneous acceptance of whatever criteria come to mind. No consideration is given to alternative points of reference.
- (2) The use of self-referenced criteria is characterized by the use of personal criteria as a point of reference when selecting information.
- (3) The use of general criteria is characterized by the consideration of criteria which other administrators use besides one's personal preferences.
- (4) The use of criteria based on principles is characterized by the consideration of general criteria including personal standards and other people's standards as a point of reference, but they are considered in terms of principles.

Exploratory behaviour. The synthesis of findings from the major studies of problem formulation which were reviewed indicate that exploratory behaviour can be characterized by investigation involving reasoning and interpretation of the nature of the problem (Allal, 1973, Getzels and Csikszentmihalyi, 1976; Kolb, 1976; Larkin et al., 1980; Chi et al., 1981). Exploratory behaviour is viewed as an indicator of the depth and complexity of the investigation undertaken. Variations along this dimension might be described as follows:

- (1) Literal interpretation represents a response to environmental conditions or the problem situation as presented. Interpretation of the situation is literal. Investigation is limited and restricted to the immediate experiences of the situation.
- (2) Naive interpretation represents an analysis of reactions, and observations with respect to the details of the problem situation. The individual

interprets aspects of the situation in a quasi literal manner and considers possible relationships between observed aspects of the situation. In the case of medical problem formulations, the routines of history taking and a physical examination represent this form of investigation.

- (3) Experimentative interpretation represents the application, testing and extension of ideas about the problem. It involves questioning and challenging aspects of the situation which are manipulated with practical objectives in mind. Aspects of the situation are interpreted as symptomatic of problems.
- (4) Abstract conceptualization represents the integration and assimilation of experiences and tentative conclusions made from observations and from experimentation. There are the questioning and challenging of aspects of the situation, which are analysed and manipulated in many different ways, leading to new ways of thinking about the problem. Aspects of the situation are interpreted as symptoms of kinds of problems to be explored.

Patterns of Problem Formulation Behaviours

The four components behaviours of problem formulation and their four-point range of variation yield a matrix of 256 cells which can be used to describe the variety of ways in which individuals formulate problems. This matrix is shown in Table II.2, in which each cell indicates a possible combination (or pattern) of problem formulation behaviours. Thus the cell labelled (1111) would describe individuals who display the following pattern of problem formulation behaviours: - (a) the simple identification of problems (IP:1), (b) the selection of general information which is near at hand (INFO:1), (c) the

TABLE II.2: MATRIX OF PROBLEM FORMULATION BEHAVIOUR

		A																
		1				2				3				4				
		B	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	1	1111	1211	1311	1411	2111	2211	2311	2411	3111	3211	3311	3411	4111	4211	4311	4411	
	2	1121	1221	1321	1421	2121	2221	2321	2421	3121	3221	3321	3421	4121	4221	4321	4421	
	3	1131	1231	1331	1431	2131	2231	2331	2431	3131	3231	3331	3431	4131	4231	4331	4431	
	4	1141	1241	1341	1441	2141	2241	2341	2441	3141	3241	3341	3441	4141	4241	4341	4441	
2	1	1112	1212	1312	1412	2112	2212	2312	2412	3112	3212	3312	3412	4112	4212	4312	4412	
	2	1122	1222	1322	1422	2122	2222	2322	2422	3122	3222	3322	3422	4122	4222	4322	4422	
	3	1132	1232	1332	1432	2132	2232	2332	2432	3132	3232	3332	3432	4132	4232	4332	4432	
	4	1142	1242	1342	1442	2142	2242	2342	2442	3142	3242	3342	3442	4142	4242	4342	4442	
3	1	1113	1213	1313	1413	2113	2213	2313	2413	3113	3213	3313	3413	4113	4213	4313	4413	
	2	1123	1223	1323	1423	2123	2223	2323	2423	3123	3223	3323	3423	4123	4223	4323	4423	
	3	1133	1233	1333	1433	2133	2233	2333	2433	3133	3233	3333	3433	4133	4233	4333	4433	
	4	1143	1243	1343	1443	2143	2243	2343	2443	3143	3243	3343	3443	4143	4243	4343	4443	
4	1	1114	1214	1314	1414	2114	2214	2314	2414	3114	3214	3314	3414	4114	4214	4314	4414	
	2	1124	1224	1324	1424	2124	2224	2324	2424	3124	3224	3324	3424	4124	4224	4324	4424	
	3	1134	1234	1334	1434	2134	2234	2334	2434	3134	3234	3334	3434	4134	4234	4334	4434	
	4	1144	1244	1344	1444	2144	2244	2344	2444	3144	3244	3344	3444	4144	4244	4344	4444	

C

Legend

	Component Behaviours of Problem Formulation	RANGE OF VARIATIONS			
		1	2	3	4
A	Identification of the problem	Simple	Moderately simple	Moderately complex	Complex
B	Selection of information	General & near at hand	Particular & near at hand	General, near at hand & distant	General & particular, near at hand & distant
C	Use of criteria in the selection of information	Criteria that come to mind	Self-referenced criteria	General criteria that other administrators use	Criteria based on principles
D	Exploratory behaviour	Literal & concrete	Naive & reflective	Experimentative & practical	Abstract & conceptual
		(1111)	(2222)	(3333)	(4444)
For example:					
A1 + B1 + C1 + D1 = (1111)					
A2 + B2 + C2 + D2 = (2222)					
A3 + B3 + C3 + D3 = (3333)					
A4 + B4 + C4 + D4 = (4444)					

use of criteria which readily come to mind (CRIT:1), and (d) exploratory behaviour characterized by literal interpretation of the details of the problem situation (EXP:1). Likewise, the cell labelled (4444) describes people who have the following pattern of problem formulation behaviours: - (a) the complex identification of problems (IP:4), (b) the selection of general and particular bits of information which are distant and near at hand (INFO:4), (c) the use of criteria based on principles (CRIT:4), and (d) exploratory behaviour characterized by abstraction and conceptualization of details of the problem situation (EXP:4).

Beliefs About Problem Formulation

The study is concerned with normative, general, goal, and self beliefs (N, GB, Go and BS) about problem formulation. Each of these kinds of beliefs can be held about each of the four components of problem formulation behaviour, each of which in turn has four points of variation. These behaviours can be used as bases for generating statements representing beliefs. Thus, in the first example cited earlier (p.57) a pattern of four behaviours was shown (IP:1 INFO:1, CRIT:1, EXP:1). Belief about these behaviours (using phrasing appropriate to Normative beliefs) would be as follows.

- (a) When faced with a perplexing work-situation, administrators should concentrate on discovering the single major problem which the situation poses.

- (b) Administrators should think about the discrepancies which are obvious in the given work-situation as the problems to attack.
- (c) Administrators, in deciding what information they need when investigating the nature of a problem, should rely chiefly on whatever criteria come to mind.
- (d) When exploring the nature of a problem, administrators should consider obtaining a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available.

Equivalent statements could be constructed to represent the other kinds of beliefs about these behaviours or other behaviours in the range shown in Table II.1.

Hypotheses and Exploratory Questions

Based on the Kreitlerian theory of cognitive orientation, it can be assumed that (a) the Normative, General, Goal and Self beliefs about each of the four values of the four component behaviours provide together a meaningful summary of an administrator's orientation to problem formulation. The tenability of the two views of the relationships of the four belief types remains to be examined. The claims of the independence of the four belief types as components of cognitive orientation based on the empirical studies of Kreitler and Kreitler (1976) are counter to the claims of their interrelationship as supported by the theoretical studies of Parsons (1951).

However, in the area of problem formulation, it might be more reasonable to argue that normative beliefs function as a standard to which other types of problem formulation beliefs tend to conform (Parsons, 1951). This conformity results from the internalization of evaluative standards pertaining to problem formulation which individuals have learned. An expected outcome would be that individuals' motivation and goals become harnessed to the fulfilment of their normative beliefs about problem formulation and the normative beliefs in turn would bring their cognitive and affective beliefs (beliefs about the desired, that is goal beliefs) into close conformity with their beliefs about the desirable. It was thus hypothesized that in the content area of problem formulation, normative beliefs would represent standards to which the three other types of beliefs would conform.

Furthermore, goal beliefs were claimed by Kreitler and Kreitler (1976) to prescribe the direction of the combined cluster of the four types of beliefs. They also express commitment to evaluative beliefs by providing the basis for action (Parsons and Shils, 1951). Accordingly, goal beliefs were hypothesized to exhibit a closer correspondence with normative beliefs than would the other beliefs (GB, N); (BS, N).

Two other relationships were hypothesized. First, that goal beliefs would exhibit a greater correspondence

with beliefs about self (both beliefs pertaining to the internal world) than with general beliefs (which pertain to the external world). Second, that the close correspondence between goal and normative beliefs, and between beliefs about self and goal beliefs would account for an even closer correspondence between self and normative beliefs than between general and normative beliefs.

Given these considerations the following hypotheses were tested:

Hypotheses

Ho: That there will be no significant correlations between pairs of belief scores grouped as follows:

Normative and General belief scores,
 Normative and Goal belief scores,
 Normative and Belief about Self belief scores,
 General and Goal belief scores,
 General and Belief about Self belief scores, and
 Goal and Belief about Self belief scores.

However, if the null hypothesis were to be rejected, that is if significant relationships were found to exist between pairs of grouped belief scores, the following plausible alternative was proposed:

H1: (a) That there will be a significantly higher correlation between the Normative and Goal belief scores than between the following pairs of beliefs scores grouped as follows:

the Normative and General belief scores,
 the Normative and Belief about Self belief scores,
 the General and Goal belief scores,
 and the Goal and Belief about Self belief scores.

(b) That there would be a significantly higher correlation between the Goal and Belief about Self

belief scores than between the Goal and General belief scores.

- (c) That there would be a significantly higher correlation between the Normative and Belief about Self belief scores than between the Normative and General belief scores.

Exploratory analysis of administrators' beliefs. In order to examine in greater depth (a) the consistency between the performance of the developed Problem Formulation Belief Scale and the assumptions and interpretations of the theory of cognitive orientation, and (b) the characteristics of respondents who exhibited an orientation to problem formulation consistent with either what is found in the so called "presented" problem situation or with what is found in the so called "discovered" problem situation, two exploratory questions were posed.

The first question was designed to explore the response patterns of normative, general, goal and self beliefs about problem formulation found among the extreme scorers, (that is administrators whose belief scores were approximately one standard deviation from the mean belief scores). The second question was designed to explore the differences in the biodemographic characteristics of these groups of low and high scorers. The characteristics which were of interest were: (a) administrative characteristics including administrative position, and years spent in administration; (b) educational characteristics including

highest level of education attained and training in problem solving; and (c) biographic characteristics including age and gender. These characteristics were taken from studies of problem formulation and problem inquiry (Allal, 1973; Lyles and Mitroff, 1980) which suggested that they might have an effect on the problem formulation process.

The research questions were as follows:

- (1) What, if any, differences are apparent in the problem formulation beliefs of educational administrators grouped according to low problem formulation and high problem formulation belief scores, respectively?
- (2) What, if any, differences are apparent in the biodemographic characteristics of educational administrators grouped according to low problem formulation and high problem formulation belief scores, respectively?

CHAPTER III

THE DEVELOPMENT OF THE PROBLEM FORMULATION BELIEF SCALE AND
THE PILOT STUDY

The purpose of this study was (a) to develop a belief scale for use in assessing administrators' beliefs about problem formulation behaviour, and (b) to examine selected aspects of its construct validity. A major task, therefore, was to develop the instrument, the PF belief scale, to assess administrators' normative, general, goal, and self beliefs about component behaviours of problem formulation and their range of variations as defined in the last part of Chapter II.

The instrument was developed and validated in three sequential steps. The three steps were:

- (1) Development of the PF belief scale which involved:
 - (1.1) Generation of statements representing beliefs and
 - (1.2) Assessment of their construct validity by a panel of selected experts;
- (2) Pilot testing of the PF belief scale, and
- (3) Empirical validation of the PF belief scale.

This chapter deals with the first two of these steps. The methodology and design of the study for the empirical validation of the PF belief scale are presented in Chapter IV.

DEVELOPMENT OF THE PROBLEM FORMULATION BELIEF SCALE

The objective of this phase of the study was (a) to develop four sets of statements to represent respectively normative, general, goal and self beliefs about problem formulation behaviour, (b) to have the statements evaluated by experts in administrative decision making processes, and (c) to conduct a preliminary validation of the retained statements in the form of a pilot test of the resulting instrument, the PF belief scale.

Generation of Statements

Using the four component behaviours of problem formulation and their range of variations as shown in Table II.1 (p.51), an initial set of 48 statements was generated to express beliefs about each variation of each component behaviour of problem formulation. The main guidelines for the generation of the statements, representing beliefs were:

- (1) Statements were to be stated in a clear, simple and straightforward manner. This approach was aimed at attaining a high level of face validity.
- (2) Each statement was to be stated as a General Belief, (that is the subject of the proposition was not to refer to the "self" and the relational concept which linked the subject to the predicate

of the proposition was to be of a declarative or assertive type reflecting some presumed or denied fact), for example, "Administrators often think of many different aspects of a problem situation when formulating a problem."

The decision to generate statements representing general beliefs, and to avoid initially, statements representing normative, goal or self beliefs, was based mainly on the need to work with a homogeneous set of statements so as to ensure as much consistency of expression as possible and to reduce any possible confusion which might result from mixing statements representing different kinds of beliefs at this initial stage. It would be possible later to reformulate these statements in forms appropriate to the other belief domains.

For example, the General Belief "Administrators often approach problems rationally" could be restated as a Normative Belief by changing the relational concept to one expressing "ought" or "should", like "Administrators should often approach problems rationally". Restated as a Goal Belief, both the subject of the proposition and the relational concept joining the subject and the predicate would be changed to form a statement such as "I would like to approach problems rationally". A Belief about Self would require changing only the subject of the proposition representing the General Belief, as, for example, in "I often approach problems rationally".

The process of generating statements began with a search of the relevant literature for examples which met the criteria outlined above. Particular attention was paid to statements made by Allal (1973), Getzels and Csikszentmihalyi (1976), Shulman (1965), Chi et al., 1981, and Ross (1981a,b). The statements found were used as models for the generation of the 48 statements for initial consideration.

This literature review was supplemented by interviews with administrators about problem formulation. A group of 16 educational administrators was randomly selected from those attending graduate classes in educational administration at the University of British Columbia in the summer of 1982. Using a semi-structured interview guide (see Table III.1), the administrators were interviewed and asked to discuss the meaning of the term "problem formulation". Administrators for whom the term did not mean anything were presented with a sample problem and asked to discuss the meaning of problem formulation.

The responses were then examined and all possible references to what the respondents saw as problem formulation behaviour were itemized. This analysis confirmed the existence of the four component behaviours identified from the literature, and did not suggest the addition of any new ones.

TABLE III.1: SAMPLE INTERVIEW SCHEDULE

- (1) Does the term "PROBLEM FORMULATION" mean anything to you?
- (2:a) If yes: Could you please state in writing what "problem formulation" means to you?
- (2:b) If no: I would like to relate to you an incident. Afterwards, I would like us to discuss it.

"A car is travelling on a deserted country road and blows a tire. The driver goes to the trunk and discovers there is no jack. He says to himself: "Where can I get a jack?" He recalls that he has not seen a house nearby but that several miles back he had passed a service station. He decides to walk to the station for a jack. While he is gone, another car coming from the other direction also blows a tire. This driver goes to the trunk, and discovers that there is no jack. He thinks for a moment and says: "How can I raise this car?" He looks around and sees that adjacent to the road is a barn with an old pulley. He pushes the car to the barn, raises it on the pulley, changes the tire and drives away while the driver of the first car is still walking to the station." (Getzels, 1978)

- (3) From the situation I have just described what comments would you like to make about the ending of the scenario - that is when both drivers found that what they needed was not available.
- (4) What do you imagine the drivers were thinking then?
- (5) A person can be described in terms of his age, height, weight, sex, etc., how would you describe "problem formulation"?
- (6) If problem formulation is described as a process: How would you describe the process of problem formulation?
- (7) If "problem formulation" is described as a product: How would you describe problem formulation as a product?

THANK YOU

The Construct Validation Process

The selected aspects of construct validation which were carried out in this study pertained to the rating and evaluation of the statements, representing Normative, General, Goal, and Self beliefs about problem formulation by experts in the field of administrative behavioural processes, problem oriented processes or educational measurement.

Preliminary screening of statements. Statements generated from the literature were first screened to reduce overlap and repetition and then evaluated to provide an initial assessment of their construct validity. These activities were completed by 11 faculty members with expertise in administrative processes or test construction and measurement. The eleven raters were all experienced as administrators or students of administration or both. They included one University Department Head, two administrators of graduate programs, three coordinators of academic or continuing education programs, one former supervisor of public schools who had become a doctoral student in administration and four professors of educational administration. Their qualifications are shown in general terms in Table III.2. They were asked to sort the

TABLE III.2: CHARACTERISTICS OF THE FACULTY INVOLVED
IN INITIAL SCREENING AND RATING

N	Specialization	Average No. Years Experience	
		As An Administrator	As An Academic
4	Decision Making/ Problem Solving	6.8	10.5
4	Administrative Education	8.8	9.8
2	Educational Measurement	5.0	8.0
1	Educational Planning	5.0	5.0

statements into clusters each referring to one of the component behaviours of problem formulation and to evaluate the assignment of each statement to its category. Particular attention was paid to the wording of the statements.

This initial process of screening and rating permitted the selection of 16 statements which conformed to the model of problem formulation. That is, each statement was referenced to one of the four points of variation of each of the four component problem formulation behaviours.

Thirty two statements from the initial set were thus eliminated because they failed to meet one or more of the criteria of plausibility, clarity, and consistency with the model of problem formulation used in the study. The 16 selected statements were rephrased so as to produce plausible and clearly worded equivalent statements representing normative, goal and self beliefs. Thus four sets of items each containing 16 statements representing problem formulation beliefs were developed. Each set represented a different type of belief (normative, general, goal and self beliefs) and included one statement about each of the points of variation for each of the four problem formulation behaviours (see Table II.1, p.51).

In order to verify the validity of these four sets of statements, the strategy of increasing the accepted core of 16 statements was adopted. This was done in order to provide some choice in the process of their evaluation. Thus, 16 other statements which had been shortlisted in the initial screening process and which represented each of the four component problem formulation behaviours and their four point range of behaviour were chosen to expand the set of statements to be rated. The following procedure was used in the selection of the supplementary statements. The 16 statements representing general beliefs were rephrased to produce equivalent statements representing Normative, Goal and Self beliefs. From this set of 64 supplementary

statements, 16 were randomly selected. Their distribution among the four belief domains was as follows. Seven statements represented normative beliefs; six represented general beliefs; one represented a goal belief and two represented beliefs about self.

The selection of these 16 supplementary statements provided alternatives to the core of 16 initially accepted statements that were to be finally evaluated. The addition of such a small number of statements to the rating set did not substantially increase the total number of statements to be rated and thus the time to be spent on the rating task. The 16 supplementary statements and the four sets of 16 statements which were accepted in the preliminary screening and rating process comprised a set of 80 statements that were to be rated.

Rating of the statements. The rating of the statements was conducted in order to corroborate the clusters described above and to assess the 80 statements representing Normative, General, Goal, and Self beliefs about problem formulation. The process of rating provided evidence of the verification of the construct validity of the statements. The set of 80 statements was divided into nine sets of mainly 30 statements each, in a manner described below. These were distributed to independent raters for their evaluation in two ways: (a) for each

statement's relevance to a particular belief (rating task 1), and (b) for each statement's relevance to a particular problem formulation behaviour (rating task 2). Nine raters completed both tasks 1 and 2.

Sample of raters. The nine raters who participated in this validation process were experts in educational measurement or problem oriented processes. Of these nine faculty members two had participated in the screening procedures described earlier. These faculty members included one professor of educational measurement, two professors of adult education (one with expertise in program planning, one in decision making), two professors of higher education (one specialized in decision making processes, the other in Community College and Provincial Institute Affairs), three professors of educational administration (two with expertise in decision making, the other in administrators' belief systems) and one lecturer whose area of research was cognitive strategies.

Procedures. In order to reduce the time each rater would have to spend on the task, the 80 statements were randomly divided into nine sets of mainly 30 statements each as shown in Table III.3. Thus all statements were evaluated by at least three raters. The 80 statements were rated

TABLE III.3: DISTRIBUTION OF STATEMENTS FOR RATING

Grouping of Statements by Nos.	Sets of Statements For Rating								
	1	2	3	4	5	6	7	8	9
1- 5	X			X				X	X
6-10	X			X				X	X
11-15			X		X	X	X		
16-20		X			X	X			X
21-25	X	X		X				X	X
26-30	X				X		X		
31-35				X		X			X
36-40			X	X		X			X
41-45	X		X				X		
46-50	X		X			X	X		
51-55			X		X	X	X		
56-60			X		X		X	X	
61-65		X			X			X	
66-70		X	X		X			X	
71-75		X		X	X			X	
76-80		X	X					X	

using a five point Likert type scale of relevance to a particular problem formulation behaviour (1 = not relevant; 2 = slightly relevant; 3 = somewhat relevant; 4 = relevant; 5 = highly relevant). In addition, to the right of each statement, the letters N, GB, Go, and BS appeared and raters were asked to check the letters corresponding to the types of beliefs to which they considered a statement belonged. The order of the statements was random. Each rater was provided with a package containing the following materials:

- (1) A letter explaining the nature of the research and requesting the cooperation of the raters,
- (2) A five page "introduction" explaining the concepts in the study and the problem that was being investigated. This was included so as to allow the raters to familiarize themselves with the concepts and definitions needed in order to carry out the rating task.
- (3) A sheet of instructions for completing the rating task. The procedures which the raters were to follow were explained on this sheet. In addition the raters were also invited to make comments or suggestions concerning any of the statements.
- (4) A draft of the introductory sheets for the five parts of a questionnaire which would later be developed if the procedure for rating the statements proved to be satisfactory. On the introductory sheet of Part I, the purpose of the proposed questionnaire and general information about the study were introduced. On the introductory sheets of the other parts of the questionnaire the type of belief was explained as well as the instructions the respondents were to follow.
- (5) The rating form which included the 30 statements that were to be rated.

- (6) A self-addressed envelope for the return of the rating forms.

A copy of this rating package is presented in Appendix A.

Analysis of responses. Two measures were used in analysing the responses: (1) the mean of the ratings assigned by all raters for the relevance of a statement to a problem formulation behaviour. This was called the M.R. measure, and (2) the proportion of raters who agreed on the designation of a statement as belonging to a particular belief domain. This was called the P.A. measure.

The criteria used for the retention, modification or elimination of statements were as follows:

- (1) A statement was retained "as is" if (a) its M.R. was ≥ 3.00 and (b) its P.A. was $\geq 66.6\%$ (i.e., two thirds of the raters agreed).
- (2) A statement was rephrased if it met the first criterion but two or more judges suggested changes in the phrasing of the statement or (b) if it had been consistently rated as belonging to more than one type of belief.
- (3) A statement was eliminated if (a) its M.R. was < 3.00 and its P.A. was $< 66.6\%$ or (b) if the statement having met the criteria for retention was found to be a duplication of another accepted

statement which was rated more highly.

The M.R. and P.A. values were considered satisfactory in view of the small number of raters who in this phase of the rating task evaluated each set of statements.

Results of the rating of statements.

The

application of the above criteria resulted in the retention of the 64 initially accepted statements. Ten of them were rephrased, and the 16 supplementary statements were eliminated. Table III.4 shows the actions which were taken with regard to each of the 80 statements in the set for rating. The summary statistics for all 80 statements are shown in Table III.5, and similar information for the 64 retained statements is displayed in Table III.6. Of the 10 statements which were rephrased six pertained to the item, "criteria used in the selection of information". Of the remaining four statements, two represented Normative and General beliefs respectively about exploratory behaviour, the other two represented Normative and General beliefs respectively about the selection of information. The results of the ratings of the raters were consistent and high.

TABLE III.4: LISTING OF THE STATEMENTS RATED AND
THE RESULTS OF THE RATING ANALYSIS

PFB	Stat No.	Belief Type	Mean P.A. on Beliefs	M.R. for Relevance	Std. dev.	Action Taken
A1	61	N	100.00	4.33	0.58	Accepted
	62	GB	100.00	4.33	1.15	Accepted
	63	BS	100.00	4.67	0.58	Accepted
	64	GB	66.67	4.00	1.00	Deleted
	65	Go	66.67	4.67	0.58	Accepted
A2	66	BS	100.00	4.25	0.96	Accepted
	67	GB	100.00	4.50	0.58	Accepted
	68	Go	100.00	4.25	0.96	Accepted
	69	N	100.00	4.25	0.50	Accepted
	70	GB	66.67	4.00	1.41	Deleted
A3	71	BS	100.00	4.50	1.00	Accepted
	72	N	100.00	4.75	0.50	Accepted
	73	N	50.00	3.75	1.26	Deleted
	74	Go	100.00	4.25	0.96	Accepted
	75	GB	100.00	4.25	0.96	Accepted
A4	76	N	100.00	5.00	0.00	Deleted
	77	GB	100.00	5.00	0.00	Accepted
	78	BS	100.00	4.67	0.58	Accepted
	79	Go	100.00	4.67	0.58	Accepted
	80	N	100.00	5.00	0.00	Accepted
B1	41	GB	100.00	4.67	0.58	Accepted
	42	BS	100.00	4.67	0.58	Accepted
	43	N	100.00	4.67	0.58	Deleted
	44	Go	100.00	4.00	1.73	Accepted
	45	N	100.00	4.33	1.15	Accepted
B2	46	BS	100.00	4.50	1.00	Accepted
	47	N	100.00	4.50	1.00	Accepted
	48	GB	100.00	4.50	0.58	Accepted
	49	Go	100.00	4.25	1.50	Accepted
	50	GB	100.00	4.25	1.50	Deleted

TABLE III.4 Continued

PFB	Stat	Belief	Mean P.A.	M.R. for	Std.	Action
No.	Type	on	Beliefs	Relevance	dev.	Taken
B3	51	GB	75.00	4.25	0.96	Deleted
	52	GB	100.00	4.50	0.58	Rephrased
	53	N	100.00	4.00	1.15	Rephrased
	54	BS	100.00	4.25	0.96	Accepted
	55	Go	100.00	4.25	0.50	Accepted
B4	56	N	100.00	4.75	0.50	Accepted
	57	BS	75.00	4.25	1.50	Accepted
	58	BS	100.00	4.25	0.96	Deleted
	59	GB	100.00	4.25	0.96	Accepted
	60	Go	100.00	4.50	1.00	Accepted
C1	21	Go	100.00	4.40	0.55	Rephrased
	22	N	100.00	4.60	0.55	Rephrased
	23	GB	100.00	4.60	0.55	Rephrased
	24	BS	100.00	4.40	0.55	Rephrased
	25	N	100.00	4.80	0.45	Deleted
C2	26	N	100.00	4.00	1.73	Accepted
	27	BS	100.00	4.33	0.58	Accepted
	28	GB	100.00	4.33	0.58	Accepted
	29	Go	100.00	3.33	1.53	Rephrased
	30	N	100.00	4.67	0.58	Deleted
C3	31	N	100.00	5.00	0.00	Accepted
	32	Go	100.00	4.67	0.58	Rephrased
	33	GB	100.00	4.67	0.58	Accepted
	34	GB	100.00	4.67	0.58	Deleted
	35	BS	100.00	4.67	0.58	Accepted
C4	36	BS	100.00	4.75	0.50	Accepted
	37	N	100.00	5.00	0.00	Accepted
	38	GB	100.00	5.00	0.00	Accepted
	39	Go	100.00	5.00	0.00	Accepted
	40	N	100.00	5.00	0.00	Deleted

TABLE III.4 Continued

PFB	Stat No.	Belief Type	Mean P.A. on Beliefs	M.R. for Relevance	Std. dev.	Action Taken
D1	01	N	100.00	4.00	0.82	Accepted
	02	GB	100.00	4.75	1.30	Accepted
	03	Go	100.00	4.50	0.58	Accepted
	04	N	75.00	4.75	0.50	Deleted
	05	BS	100.00	4.75	0.50	Accepted
D2	06	GB	100.00	4.50	0.58	Accepted
	07	N	100.00	5.00	0.00	Accepted
	08	Go	100.00	4.25	0.96	Accepted
	09	BS	100.00	4.75	0.50	Accepted
	10	Go	100.00	4.00	0.82	Deleted
D3	11	BS	100.00	3.50	1.73	Accepted
	12	N	75.00	3.50	0.82	Accepted
	13	GB	100.00	4.00	1.15	Rephrased
	14	GO	100.00	4.00	0.81	Accepted
	15	GB	75.00	3.75	1.50	Deleted
D4	16	N	75.00	4.50	0.58	Rephrased
	17	BS	100.00	4.00	0.82	Deleted
	18	Go	100.00	4.25	1.50	Accepted
	19	GB	100.00	4.50	1.00	Accepted
	20	BS	100.00	4.50	1.00	Accepted

N = Normative Belief GB = General Belief
 Go = Goal Belief BS = Beliefs about Self
 P.A. = Percent Agreement M.R. = Mean Rating
 PFB = Problem Formulation Behaviour

The Construction of the Questionnaire

The construction of the questionnaire is described under three headings: (1) Biodemographic information, (2) Belief Scales and (3) Scoring.

TABLE III.5:
SUMMARY STATISTICS OF ALL STATEMENTS RATED

STATEMENTS = 80

N of RATERS = 9

Domain of Beliefs	Number of statements	Mean Rating	Standard Deviation	Percent Agreement
Normative	23	4.53	0.44	94.56
General	22	4.42	0.32	94.52
Goal	17	4.34	0.39	98.04
About Self	18	4.43	0.32	98.61
Total	80	4.44	0.37	96.25

TABLE III.6:
SUMMARY STATISTICS OF RETAINED STATEMENTS

STATEMENTS = 64

N of RATERS = 9

Domain of Beliefs	Number of statements	Mean Rating	Standard Deviation	Percent Agreement
Normative	16	4.34	0.45	96.88
General	16	4.52	0.27	100.00
Goal	16	4.36	0.39	97.92
About Self	16	4.46	0.32	98.44
Total	64	4.45	0.36	98.31

Biodemographic information.

Biodemographic

information was collected for the purpose of describing the sample and ascertaining the degree to which administrative, educational and biographical characteristics may have affected subjects' orientation to problem formulation.

Lyles and Mitroff (1980) investigated the effects of selected demographic variables such as level of education, managerial experience, and managerial level on the attitudes of managers to organizational problem formulation. They found that except for managerial level, the characteristics had little effect on the managers' attitudes. Managerial level was found to be related to managers' attitudes toward rational problem formulation behaviour. Findings from Allal's (1973) study of problem formulation among experienced physicians and second year medical students suggested that selected variables such as training and experience may have an effect on individuals' problem formulation processes.

In view of these findings six biodemographic characteristics were identified for study of their association with respondents oriented to problem formulation in a "presented" problematic situation as compared with respondents oriented to problem formulation in a "discovered" problematic situation. The characteristics were: (1) number of years spent in administration, (2) administrative level, (3) highest educational level

attained, (4) training in problem solving, (5) age, and (6) gender.

Belief scales. The 64 retained statements were separated into four groups according to the type of belief which the statement represented. Each belief domain group of 16 statements was further subdivided according to the behaviour to which the statement was referenced. The subdivided groups of four statements each contained statements representing a four point range of variation on the particular component problem formulation behaviour. That is, a set of four statements representing normative beliefs about the identification of problems (IP) would range from statements representing normative beliefs about the simple identification of problems to normative beliefs about the complex identification of problems. Examples of these statements are:

- (1) Administrators should concentrate on discovering the single major problem which the situation poses.
- (2) Administrators should concentrate on discovering one or two major problems and their relation to more specific problems which the situation poses.
- (3) Administrators should concentrate on discovering two or three major problems which the situation poses.
- (4) Administrators should concentrate on discovering as many problems as possible and how they might be related to more specific problems.

This ordering was developed in conformity with the model of problem formulation and its range of variations discussed in the section on the conceptual framework in Chapter II. Another way of describing the grouping of the statements is that a group of four statements about a particular behaviour represented an item. Each item had four options which were weighted according to the level which it represented. On the instrument an item was presented as numbers (1), (2), (3) or (4) respectively and comprised of four options: (a), (b), (c), or (d). Items (1), (2), (3) and (4) represented respectively beliefs about: the identification of problems, selection of information, criteria used in the selection of information and exploratory behaviour. The items were ordered as follows: Item (1) represented IP; Item (2) represented EXP; Item (3) represented CRIT and Item (4) represented INFO. This ordering within a domain was kept constant across the four belief domains. The four options were ordered from the simple, to the moderately simple, to the moderately complex, to the complex and were randomized within each item in the four belief domains. The instrument was thus comprised of randomly ordered options within items of which there were four in a belief domain. There were four different belief domains.

Scoring

Four scores corresponding to the four belief domains were computed according to the scoring guide presented in Table III.7. These belief domain scores are described as follows:

Normative belief score. This score was designed to reflect a Subject's beliefs about how administrators should formulate problems.

General belief score. This score was designed to reflect a Subject's beliefs about how administrators actually do formulate problems.

Goal belief score. This score was designed to reflect the Subject's beliefs about what he or she as an administrator would like to aim for when formulating problems.

Beliefs about Self score. This score was designed to reflect the Subject's beliefs about what he or she personally did when formulating problems.

Subjects were asked to choose for each item the option with which they agreed most by placing a check mark against it. The maximum score a subject could be awarded for an item was four. The lowest score was one. Since there were four different items in a belief domain it was possible that a respondent could be awarded the maximum total domain score of 16 or the minimum total domain score

TABLE III.7: SCORING GUIDE FOR ITEMS WITHIN BELIEF DOMAINS

Component Behaviour	Description of Range of Variation	Points
IP (Identification of the Problem)		
1	Simple identification of the problem	1
2	Moderately simple identification of the problem	2
3	Moderately complex identification of the problem	3
4	Complex identification of the problem	4
EXP (Exploratory Behaviour)		
1	Literal and concrete investigation of the problem	1
2	Naive and reflective investigation of the problem	2
3	Practical and experimentative investigation of the problem	3
4	Abstract and conceptual investigation of the problem	4
CRIT (Criteria Used in the Selection of Information)		
1	No alternative criterion is used; whatever comes to mind is used as the point of reference	1
2	Criteria of personal preferences	2
3	Criteria of the standards which other administrators use	3
4	Criteria of theoretical principles	4
INFO (The Selection of Information)		
1	Selection of general information immediately at hand	1
2	Selection of particular bits of information immediately at hand	2
3	Selection of general information at hand or distant	3
4	Selection of general and particular bits of information at hand or distant	4

of four. For example a respondent who selected statements about: (1) the complex identification of problems, (2) an abstract and conceptual interpretation of the nature of problems, (3) the use of criteria based on principles, and (4) the selection of general and particular bits of information at hand and distant was given a score of four points for each of the four items: IP, EXP, CRIT, and INFO. Thus the respondent would receive a total score of 16 in that particular belief domain.

On the other hand, if a respondent selected statements about (1) the simple identification of problems, (2) a literal and concrete interpretation of the problem, (3) the use of criteria which readily come to mind, and (4) the selection of general information which is near at hand, the respondent would receive a score of one point for each of the four items, IP, EXP, CRIT and INFO. Thus the respondent would receive a total score of four points in that particular belief domain. The underlying assumption in scoring was that a high total score indicated an orientation to problem formulation consistent with what is found in a "discovered" problem situation, whereas a low total score indicated an orientation consistent with what is found in a "presented" problem situation.

Questionnaire form. The biodemographic section and the sections dealing with the four different types of

beliefs were assembled to form one questionnaire. Each section was colour-coded to facilitate the transition between sections for the respondents. White was chosen for the section on biodemographic information, pink for the normative beliefs scale, green for the general beliefs scale, yellow for the goal beliefs scale, and blue for the scale pertaining to beliefs about self. The sections were introduced with a brief statement of the content and the direction for responding. Only one side of the page was used in the construction of the questionnaire, thus resulting in a questionnaire of 15 pages.

The total questionnaire was pretested by nine graduate students and two faculty members in educational administration. Eight of the students had previous experience in educational administration. Following this pretest was the pilot testing of the questionnaire.

THE PILOT TESTING OF THE INSTRUMENT

The purpose of the pilot testing of the instrument was to determine its appropriateness for the intended target population of post-secondary administrators and to examine the psychometric properties of the belief scales.

Sampling Procedure

The pilot testing of the PF instrument was conducted in late July, 1983. Questionnaires were distributed to 35

administrators, 31 of whom had registered for graduate courses in educational administration and/or higher education during the 1983 summer session. The other four individuals worked as administrators in post-secondary institutions. Of the 35 questionnaires administered, 23 were returned. Of those returned, one was blank in all parts and the other four were incomplete. Thus, a sample of 18 (51%) administrators participated in the pilot study.

Analysis of Pilot Data

Responses on the questionnaires were coded by the investigator on fortran sheets. From these sheets the codes were keypunched into the computer (AMDAHL 470 V/6 Model II using the Michigan Terminal System) and placed on disk files. A manual check was made of all the filed data for both coding and key punching errors. Errors were double checked and corrected.

The LERTAP computer program (Nelson, 1974) was used to analyse the items, and to determine the internal consistency (Hoyt, 1941) of the subtests. The computation of Cronbach's stratified alpha (Cronbach, 1951) and a correlational analysis were also conducted in order to determine the degree of correspondence among the different types of beliefs.

Results and Discussion

Characteristics of the sample. A description of the biodemographic characteristics of the sample of administrators is presented in Table III.8. In summary, the sample consisted of 14 males and four females most of whom were principals or coordinators with over 2.5 years experience as full-time administrators, and with some training in problem solving.

Item level data. As shown in Table III.9, the internal consistency (Hoyt, 1941) values for the four belief subscales were low: .39 for N, .21 for GB, .11 for Go, .26 for BS. These low values were ascribed for the most part to the short length of the subscale and the small size of the sample who did not exhibit much variability in their responses. The mean scores for the subscales were moderately high and represented over 50% of the possible subscale scores. For the Normative belief subscale the mean score was 12.33, representing 75% of the possible subscale score; for GB it was 8.89, representing 56%; for Go it was 11.78, representing 74%, and for BS it was 9.56, representing 60%. The standard deviations for the N, GB, Go

TABLE III.8: BIODEMOGRAPHIC CHARACTERISTICS
OF SUBJECTS (N=18)

	Number	%
Gender:		
Male	14	77.8
Female	4	22.2
Institution:		
Crown Corporation	1	5.6
School Board	3	16.7
Elementary/Junior High/Senior High School	4	22.2
Community College	6	33.3
Ministry of Education	1	5.6
Provincial Council	1	5.6
University	2	11.1
Years in Administration (Full Time):		
15.6 - 25.0 years	1	5.6
10.6 - 15.5 "	-	-
5.6 - 10.5 "	5	27.8
2.6 - 5.5 "	6	33.3
1.0 - 2.5 "	6	33.3
Years in Administration (Part Time)		
10.6 - 15.0 years	-	-
5.6 - 10.5 "	-	-
2.6 - 5.5 "	6	33.3
0.5 - 2.5 "	5	27.8
0.0 "	7	38.9
Involvement in Institutional Research:		
10.6 - 15.0 years	1	5.6
5.6 - 10.5 "	-	-
2.6 - 5.5 "	2	11.1
0.5 - 2.5 "	3	16.7
0.0 "	12	66.6
Training in Problem Solving:		
Course work	7	38.9
Management training	1	5.6
Workshops	1	5.6
No training	9	50.0

TABLE III.9: SUMMARY TEST STATISTICS FOR THE
PF BELIEF INSTRUMENT BY BELIEF DOMAIN

	N	GB	Go	BS	TT
No. of Items	4	4	4	4	16
Mean	12.33	8.89	11.78	9.56	42.56
St. Dev.	2.11	2.49	2.13	2.20	5.90
Hoyt's r.	0.39	0.21	0.11	0.26	0.57*
Std. Error	1.43	1.93	1.74	1.64	3.78

Legend

* = Cronbach's Composite alpha
 N = Normative beliefs subtest
 GB = General beliefs subtest
 Go = Goal beliefs subtest
 BS = Beliefs about Self subtest
 TT = Total test

and BS subscales were 2.11, 2.49, 2.13 and 2.20 respectively. The standard error ranged from 1.43 for the Normative belief subscale to 1.93 for the General beliefs subscale.

To clarify further this situation, the results of the item analyses were examined (see Appendix B). In the Normative beliefs and Beliefs about Self subscales there were two options which did not receive any responses. They were option 2 of IP and option 4 of EXP respectively. These two options were evaluated. Option 2 of the identification of problems did not exhibit any irregularities in the General, Goal and Self belief subscales. Neither did option 4 of EXP in the Normative, General and Goal beliefs domains. The absence of responses to these two items was attributed to the small sample size that was used. Thus, it was decided to retain these items for subsequent use with a larger sample. Options one, three and four were the most popular responses among the items. This finding suggested that the pilot sample may have consisted of largely extreme scorers.

In 67% of the cases the point biserial correlations behaved as expected, ranging from negative values for the more simple options (one and two), to positive values for the more complex options (three and four). In the other cases the options misbehaved thereby revealing inconsistent choices of options of items within the belief domains.

These observations led to the conclusion that in the context of problem formulation beliefs it is possible that responses to component behaviours might be a function of individual items rather than the collective set of items. Considering that two thirds of the options behaved as expected and that a small sample size was used, the decision was taken to explore this issue of administrators' responses to items, representing problem formulation beliefs with a larger sample.

Domain level data. The low reliabilities of the subscales led to an examination of the Cronbach's composite alpha (1951) for the total test. The reported value of .57 suggested that there was more than one underlying factor in the belief scale. As a result of this finding the correlations of the subscales, (Pearson-Product moment correlations), as reported in Table III.10 were examined. As shown, the correlations among the N, GB, Go, and BS subscales ranged from -0.07 to .43. The patterns of correlations left unanswered the question raised in Chapters I and II concerning the interrelationship of the four belief domains. From this pilot study the relationships between the belief domains were not clear since a small sample was used.

However, Kreitler and Kreitler (1976) noted that in different areas of content or in different cultural or

TABLE III.10: PEARSON PRODUCT-MOMENT CORRELATIONS
BETWEEN NORMATIVE, GENERAL, GOAL, SELF BELIEFS

	Normative	General	Goal	Self
Normative		-0.07	.06	.32
General			.43	.38
Goal				.35
Self				

personality contexts the relative independence of the four beliefs, Normative, General, Goal, and Self beliefs may be altered, resulting in varying correspondences between the four beliefs.

Revision of the Instrument

As a result of the pilot study two types of revisions were made to the PF instrument. The first type of revision was made to Part I of the Questionnaire, which was designed to elicit biodemographic information about the subjects. First, headings in the introductory part of the questionnaire were adjusted. Second, the responses to questions in Part I indicated that some questions required rewording in order to avoid ambiguity and others required expansion for greater clarity. The first question

pertaining to institution of work was rephrased slightly and its open ended response format was changed to one of a check mark to identify either College or Institute as the place of work. Questions on the years spent in full-time and/or part-time administration were expanded to include years and time spent in administration at the present institution and at other institutions. Questions on age and highest educational level attained were incorporated into this first part of the questionnaire. On the question pertaining to training in decision making, the format was changed to one using check marks against identified areas of training.

The second type of revision was made to item (3) in Parts II to V of the Questionnaire on beliefs. This item referred to the criteria used in the selection of information. The alternative response options for this item in the four belief domains were rephrased so as to distinguish the use of different levels of criteria. The word "chiefly" was inserted to aid in achieving this distinction. The revised items were incorporated into the instrument which was used in the field survey among post-secondary administrators. The final form of the instrument used in the study is presented as Appendix C.

CHAPTER IV

THE USE OF THE INSTRUMENT, I: METHOD

In order to conduct a partial empirical validation of the Problem Formulation (PF) belief instrument, an analytical field survey was undertaken. The survey was designed to investigate the normative, general, goal and self beliefs about problem formulation among administrators of post-secondary institutions, and to examine the responses of a selected subsample of administrators to items of the PF belief instrument and the biodemographic characteristics associated with those responses.

In this chapter the method used in the application of the instrument is described. It includes three major sections: (1) sampling procedures, (2) data collection and, (3) data preparation and analysis.

SAMPLING PROCEDURES

The target population was administrators currently employed in Community Colleges and Institutes in the province of British Columbia (B.C.). It would have been ideal if included in the population were administrators with outstanding skills in problem formulation. But the available means for identifying administrators with such

skills were not known. It was thus decided that a representative sample of administrators from different level positions and with varying amounts and types of administrative experience would be adequate for the purposes of this study.

Sample

The potential sample sources were the 15 Community Colleges and the six Institutes in B.C. The Community Colleges were established to provide university parallel courses, general education and vocational training, and to serve community cultural needs. The Institutes were more specialized institutions, established to provide specific training for vocations such as art, technology, and law enforcement.

The administrative structure and mandate of the post-secondary institutions were such that differences might be expected to exist at each institution. Because of this, sampling of all Community Colleges and Provincial Institutes in B.C. was attempted. This included all full-time administrators at all administrative levels in these institutions. For purposes of this study, full-time administrators were defined as individuals who spent over 65% of their time in administrative duties, that is coordinating, controlling and directing activities. This definition of full time administrator was consistent with

what was used in these institutions. The administrators who were sampled were 317 in total.

DATA COLLECTION

In September, 1982 the principals of all 15 Community Colleges in British Columbia were sent letters which described the purpose of the study and requested their consent for the researcher to request the participation of administrators in their institutions. (See Appendix D.) Their own participation in the study was also requested. Of the 15 principals approached, one principal was unable to give consent; two did not reply. The institutions of these three non-participating principals exhibited differences in administrative structures, a feature typical of the Community College in British Columbia. Two were single campus institutions with single administrative bodies; the other was a multi-campus institution. At each of its campuses there was an administrative unit which was coordinated by a centralized administrative body.

In September, 1983 letters similar to those sent to the principals of Community Colleges were sent to the principals of all six Institutes. All the principals consented to participate. At the time of the distribution of the questionnaire a labour dispute arose at one Institute, which prevented its administrators from

participating in the study. Another Institute was later eliminated from the study because of the small number of its administrators. Thus, two Institutes were eliminated.

In November of 1983, packages were distributed to the 12 Community Colleges and Four Institutes. Each package contained (1) a covering letter explaining the purpose of the study, and requesting voluntary participation, (2) the PF belief questionnaire, and (3) a self-addressed return envelope. Each package was coded with an ID number on the outer and inner envelopes for identification purposes. The ID number identified both the Institution and the individual. The administrators were assured that anonymity would be maintained and that all results would be treated confidentially. Return of the completed questionnaire in the envelope provided was requested within one week from the date of distribution.

Procedures in the Questionnaire Distribution

Because of different administrative policies and structures in these educational institutions three procedures were used in the distribution of questionnaires. They are shown in Table IV.1 and are described below:

TABLE IV.1: PROCEDURES USED IN THE DISTRIBUTION
OF QUESTIONNAIRES TO COMMUNITY
COLLEGES AND INSTITUTES

Institution	Procedure Used	No. of Administrators who were sent Questionnaires
Community Colleges:		
001	3	40
002	1	12
003	1	10
004	1	19
005	1	9
007	1	19
008	1	17
009	2	12
010	1	16
011	1	8
014	1	29
015	1	15
Sub total		206
Institutes:		
006	*1	3
012	2	42
013	2	25
016	1	13
017	2	28
Sub total		111
Total		317

Legend

* Subsequently eliminated because of
small sample size.

Procedure 1: The Principal provided a list of the names and postal addresses of full-time administrators at the particular institutions. Packages were prepared and mailed to each administrator who in turn returned the completed questionnaire in the stamped self-addressed envelope to the researcher.

Procedure 2: The Principal provided a list of the names of full-time administrators and handled the distribution of packages. Packages, addressed to the individual administrators were thus, sent to the Principal for his distribution. The completed questionnaires were returned in the self-addressed envelopes either directly to the researcher or to the Principal who in turn forwarded them to the researcher.

Procedure 3: The Principal provided the number of full-time administrators at his institution and the appropriate number of packages was prepared and sent to the principal for his distribution. The packages containing completed questionnaires were returned to the Principal who in turn forwarded them to the researcher.

DATA PREPARATION AND ANALYSIS

As questionnaires were received, their identification numbers were recorded and the date of their return was noted. Each questionnaire was reviewed for completeness. Twelve questionnaires had incomplete sections and thus were not used in the study. One returned questionnaire was not used because of the small sample size at that particular institution.

The biodemographic items in Part 1 of the questionnaire were examined for completeness and converted to numerical codes with the use of a questionnaire key, recorded on fortran sheets, and double checked for accuracy. The coded data were keypunched into a computer file and the file was then checked against the original forms for key punching errors. All errors were double checked and corrected.

Responses to the belief items in Parts II to V of the Questionnaire were converted to scores with the use of a Questionnaire Key, recorded on fortran sheets, and double checked for accuracy. The data were then keypunched into a computer file and checked for accuracy following the procedure outlined above.

All subsequent data analyses were done using the computing facilities at the University of British Columbia.

Preliminary Analysis and Results

A preliminary analysis was conducted to test for possible differences among institutions with respect to administrators' normative, general, goal and self beliefs. This was necessary in order to ascertain whether the institution or individual was the appropriate unit of analysis. In the literature upon which the items were developed the individual was typically used as the unit of analysis. These studies had been carried out largely in the field of psychology where individuals could be randomly assigned to treatment groups. In this study administrators were members of institutions and the removal of any institutional effects in the case that an administrator's beliefs were not formed independently of the institution in which he or she worked was necessary.

OWMAR, (Hakstian, not dated) a computer program, maintained by the Department of Psychology, U.B.C., was used to perform a multivariate test of differences in central tendency among the institutions and to test the tenability of the assumption of homogeneity of variance-covariance.

Results

As shown in Tables IV.2 and IV.3, the null hypotheses of no significant differences for mean belief

scores and of homogeneity of variance-covariance among the institutions were rejected at the .05 level of significance. Standardization of the scores within each institution (mean 0; standard deviation 1) revealed that the lack of homogeneity of variance-covariance was attributable to the lack of variance. Further examination of the differences among means (nonstandardized) revealed that the significance was attributable to one or more complex contrasts. The simple contrasts between pairs of institutions for each variable were not significant.

Given these results, and taking into account the large degrees of freedom and the magnitude of the F ratio, the decision was taken to retain the raw scores and to disregard institution as a variable, that is, to pool subjects across institutions. This permitted reporting of results in the metric used in obtaining the responses, thereby aiding in the interpretation of the results.

Psychometric Analysis

Two main issues concerning reliability were considered. First, the reliability of scoring the variable, administrative level, was examined. Second, the coefficients of reliability for the belief variables were examined.

TABLE IV.3: SUMMARY OF ANALYSES FOR HOMOGENEITY OF
VARIANCE-COVARIANCE AND DIFFERENCES AMONG
MEAN BELIEF SCORES OF INSTITUTIONS

Test	DF1	DF2	F Ratio	Prob.
MANOVA Likelihood Ratio Test for differences among Means	60.0	666.0	1.394	0.030*
Bartlett-Box Homogeneity of Dispersion Test	150.0	4110.61	1.491	0.000*

* $p < .05$

Reliability of the variable, administrative level.

Administrative level was determined from responses to question two of Part 1 of the questionnaire. Given the differences in administrative structures and the considerable variation in the titles used to designate various positions among the institutions, judgements had to be made in assigning administrators to a particular administrative level. For example, whether to place a Dean from Institution 1 at level 2 or 3, a Director from Institution 8 at level 2, or the Principal of a multicampus institution at level 1 or at level 2 required the making of judgements. Thus, the issue of consistency of judgement was the primary concern in estimating inter-scorer reliability on this variable.

A random sample of ten administrators' responses (5% of the responses) was scored independently by the researcher and a second professional in educational administration and

teacher education. The intraclass correlation coefficient (Ebel, 1951) was used to estimate the inter-scorer reliability of the ten responses. The coefficient obtained was 0.97. On the basis of this high coefficient it was concluded that scoring with regard to the variable, administrative level did not constitute a source of unreliability in the data.

Reliability of the belief variables. Reliability coefficients were calculated for each belief variable, that is for each type of belief on the basis of the scores of the whole sample of 189 administrators. These coefficients were calculated by means of Hoyt's (1941) analysis of variance technique using the LERTAP program (Nelson, 1974).

In order to establish compensatory evidence for the reliability of the PF belief instrument, item analysis was undertaken by examining the point biserial correlation coefficients for the response options on the subtests.

Selected aspects of the validity of the PF belief instrument were addressed by examining the relationships of the four mean belief scores. This was based on assertions of the theory of cognitive orientation (Kreitler and Kreitler, 1972; 1976). Of major concern were the interpretations of the correspondence among the mean normative, general, goal and self belief scores.

Statistical Analyses

The analyses which were conducted to test the hypotheses and to explore the research questions stated in Chapter II (pp. 62-64) are described in this section.

Correlational analyses. The hypotheses were tested by means of correlational analyses. Three main procedures were used. First, scatter plots for all six combinations of Normative, General, Goal, and Self beliefs (N vs. GB; N vs. Go; N vs. BS; GB vs. Go; GB vs. BS; Go vs. BS) were drawn in order to determine whether a linear relationship existed between the various combinations. Second, Pearson product-moment correlations were computed in order to determine the magnitude of the linear relationship among the four variables - Normative, General, Goal and Self beliefs. Third, a Z correlational test (Glass and Stanley, 1970: 313) was conducted in order to test for differences between pairs of correlations of belief scores. The following formula was used:

$$Z = \frac{\sqrt{n}(R_{xy} - R_{xz})}{\sqrt{(1-R_{xy}^2)^2 + (1-R_{xz}^2)^2 - 2R_{yz}^3 - (2R_{yz} - R_{xy}R_{xz})(1-R_{xy}^2 - R_{xz}^2 - R_{yz}^2)}}$$

where n is the sample size,
 R_{xy} is the sample correlation of X and Y,
 R_{xz} is the sample correlation of X and Z, and
 R_{yz} is the sample correlation of Y and Z.

Analyses of Exploratory Questions

Based on the major investigation of problem finding processes by Getzels and Csikszentmihalyi (1976) problem formulation was conceptualized as the formulation of problems in a continuum of problem situations, the extreme ends of which were "presented" problem situations and "discovered" problem situations. These problematic situations and associated problem formulation behaviours and cognitive processes were discussed in Chapter II.

Since problem formulation in a "presented" problem situation was viewed as a simple behaviour and problem formulation in a "discovered" problem situation was viewed as complex, low scorers as assessed by the PF belief instrument were viewed as one kind of extreme scorer (the simple) and high scorers on the PF belief instrument were viewed as another kind of extreme scorer (the complex). On the basis of this conceptualization of the problem

formulation scores and considerations of manageability of the analysis and clarity in showing the correspondence between the collected data and the theoretical claims in the literature, a subsample of extreme scorers was identified. Their responses to items on the PF belief instrument were analysed and the biodemographic characteristics associated with these scorers.

The extreme scorers, thus represented two classes of respondents, the simple and the complex. Both groups were identified by their level of scores. Those whose total scores were approximately one standard deviation above or below the mean belief scores of the sample of post-secondary administrators were selected as the sub-sample of extreme scorers. An approximation of one standard deviation rather than exactly one standard deviation was used in order to incorporate into the group outlier respondents who formed a natural break in the distribution of respondents, for a cut off point. Thus, a group of 30 administrators whose scores were approximately one standard deviation below the mean belief scores was selected and identified as low belief scorers; another group of 30 whose scores were approximately one standard above the mean belief scores was selected and identified as high belief scorers. This subsample of extreme scorers was used for all the exploratory analyses.

Based on the literature on problem formulation (Pounds, 1969; Allal, 1973; Lyles and Mitroff, 1980) six biodemographic characteristics were identified as potentially capable of having an effect on problem formulation behaviour. These were explored in order to determine if they differed between the low and the high scorers.

Grouping of Demographic Variables

Due to insufficient sample sizes, the scoring of several of the biodemographic variables was revised. These revisions included:

(1) Administrative level: (a) Level one represented the level at which reports were made directly to the governing board. Heads and principals of one-campus Community Colleges and Institutes, and of multi-campus institutions were represented at this level.

(b) Level two represented those who reported to superiors who in turn reported directly to the Governing Board. These administrators included Vice-Principals, Bursars, and other administrators such as Deans whose positions as described in the administrative structure of the institution conformed to level two as described in this study.

(c) Level three represented administrators at three reporting levels from the Governing Board. At this level were included Directors, Managers of centres such as Computing Services and Plant Operations and some Deans, depending on the structure of the particular Institution.

(d) Level four contained administrators at four reporting levels from the Board. It comprised mainly Coordinators and middle management personnel.

These four levels were identified by the following labels:

(a) the principalship level, (b) the vice-principalship level, (3) the deanship or directorship level, and (d) the level of the coordinator. Due to the lack of coordination in the titles used to describe the administrative positions among the post-secondary institutions, organizational charts, job descriptions, and levels of reporting to the governing board were examined.

(2) Age. The original nine age groupings were regrouped as follows: (1) 39 years and under, (2) 40 - 49 years, (3) 50 years and over.

(3) Educational level. The data on educational characteristics obtained from questions (5) and (6) on the questionnaire were put into five groups, indicating the highest educational level attained: (1) no diploma or degree, (2) diploma, (3) bachelors, (4) masters, and (5) doctorate.

(4) Administrative experience. For administrative experience, the years spent in administration at the present institution and at other institutions were added and placed into four groups: (1) 0-4 years, (2) 5-7 years, (3) 8-10 years, and (4) over 10 years.

(5) Training in problem solving. Data pertaining to training in problem solving were categorized as follows: (a) administrators who had studied problem solving in a course or as a major area of study, (b) those who had taken a workshop or seminar in problem solving, and (c) those who reported having received no course work or other training in problem solving.

Analysis of responses to the PF belief instrument.

Because of small subsample sizes, descriptive statistical analyses were used in the exploratory analysis of the responses of the extreme scorers. These analyses included frequency distributions, the range, mode and rank of the responses. Ranking was based on the percentage distribution of responses. The option with the highest percentage of responses was assigned the first rank; the option with the second highest percentage of responses was assigned the second rank and so on.

Two characteristics of the responses were examined, the consistency of the level of responses across and within belief domains and the configuration of composite belief domain responses. Consistency referred to either the constant selection of the same option for any given item across the Normative, General, Goal and Self belief domains or the constant selection of a given option for all items within a given belief domain. Configuration referred to the high and the low points of the response pattern of a respondent for all four belief domains. It was not a measure of the level of an individual belief score per se but of the relative level of the four belief scores, that is the Normative, General, Goal and Self belief domain scores. This configuration score was calculated by adding the respondent's four item scores (IP, EXP, CRIT and INFO scores). The range of scores for each item was 1 to 4 and since each domain included four items, the total score which a respondent could achieve in any one domain ranged from 4 to 16. The four resulting domain scores were then classified as follows: HIGH (scores from 12 to 16), MEDIUM (scores from 9 to 11), LOW (scores from 4 to 8). Through this procedure a respondent's configuration of belief domain scores was derived.

Analysis of biodemographic characteristics. Chi

square tests were used in the analysis of nominal level data such as administrative, educational and personal characteristics to determine whether they differed significantly from an expected normal distribution between both low and high scorers at the .05 level of significance. For the two characteristics, age, and years spent in administration, the Kruskal-Wallis test was conducted to determine whether these characteristics of the low and high scorers were from the same population or from populations which were similar with regard to a measure of central tendency. The alpha level was set at .05.

The results of the tests of hypotheses are presented in the next chapter. The results of the exploratory analyses of the extreme scorers are presented in Chapter VI.

CHAPTER V

THE USE OF THE INSTRUMENT, II: RESULTS OF THE STUDY OF ADMINISTRATORS' BELIEFS

This chapter presents the results of analyses undertaken in validating the Problem Formulation Belief Scale and in testing the hypotheses described in Chapter two. It includes three main sections: (1) characteristics of the respondents, (2) results of psychometric analyses, and (3) results of analyses conducted to test the research hypotheses.

CHARACTERISTICS OF RESPONDENTS

A summary of the distribution of questionnaires is presented in Table V.1. In total 317 questionnaires were distributed. Of this number, 203 (64%) questionnaires were returned. Fourteen of the returns were non-usable yielding an overall usable return rate of 60%. These rates compare favourably to those discussed by Warwick and Lininger (1975) as being good return and usable rates in survey studies.

Description of the Sample

A summary of the characteristics of the sample of administrators is presented in Table V.2.

TABLE V.1: DISTRIBUTION OF QUESTIONNAIRES ISSUED
AND RETURNED BY COMMUNITY COLLEGE
AND INSTITUTE AND TOTAL NUMBER OF
INSTITUTIONS

Category	No. of Question- naires Issued	Questionnaires returned		Questionnaires Usable	
		No.	%	No.	%
Community Colleges:					
001	40	24	60	24	60
002	12	7	58	7	58
003	10	6	60	6	60
004	19	9	47	6	32
005	09	7	78	7	78
007	19	13	68	10	53
008	17	9	53	8	47
009	12	8	67	8	67
010	16	15	94	10	63
011	08	4	50	4	50
014	29	15	52	14	48
015	15	8	53	8	53
Institutes:					
006	3	1	33	0	0
012	42	23	55	23	55
013	25	22	88	22	88
016	13	5	38	5	38
017	28	27	96	27	96
Total Sample	317	203	64	189	60

Legend

Fourteen questionnaires were not retained for data analysis. Three were blank in all of Parts I to V of the questionnaire. Eight were substantially incomplete. Two were blank in Parts II to V. One was not used because it was the only return from that Institution.

TABLE V.2: BIODEMOGRAPHIC CHARACTERISTICS
OF THE SAMPLE

	N =189	Percent
Administrative Characteristics		
Years in administration:		
0 -4 years	65	34
5 -7 years	37	20
8 - 10 years	42	22
10 + years	45	24
Administrative level:		
Principal	14	7
Vice-Prin.; Dean	40	21
Director	81	43
Coordinator	54	29
Educational Characteristics		
Highest educ. level attained:		
No Degree or Diploma	07	4
Diploma	39	21
Bachelors	43	23
Masters	80	42
Doctorate	20	11
Training in problem solving:		
Course work	96	51
Some training	47	25
No training	46	24
Biographic Characteristics		
Age:		
39 + under	56	30
40 - 49	81	43
50 + over	52	27
Gender:		
Male	161	85
Female	28	15

Administrative characteristics. As shown in Table V.2, 34% of the respondents had spent four years or less in administration. Of the remainder, 20% had spent five to seven years, 22% had spent 8 to 10 years, and 24% had spent over 10 years in administration. Directors (43%) comprised the largest group in the sample. The next largest group consisted of coordinators (29%). Deans or Vice-Principals made up 21% and Principals seven percent.

Educational characteristics. The Masters degree was the highest educational level attained by 42% of the respondents (see Table V.2). Those at the Bachelor's degree level or the Diploma level comprised 23% and 21% of the sample respectively. Doctoral degrees were held by 11% of the respondents. Lastly, respondents, who had no degree or diploma accounted for four percent of the sample.

Fifty-one percent of the sample reported that they had course work in problem solving; 25% reported that they had taken a seminar or workshop in problem solving; and 24% reported that they did not have any course work or training in problem solving.

Biographical characteristics. As shown in Table V.2, 43% of the respondents were between 40 and 49 years old. Those below 40 years and those 50 years and over

represented 30% and 27% of the sample respectively. Eighty-five percent of the sample was male and 15% female.

RESULTS OF PSYCHOMETRIC ANALYSES

The summary results of the analyses of the four belief subscales are presented in Table V.3. Item analysis data for the individual belief subscales are reported in Appendix E. As shown in Table V.3, the internal consistency (Hoyt, 1941) values for the four subscales were low: .26 for N, .42 for GB, .27 for Go, .24 for GB. These low values can be ascribed for the most part to the short length of each subscale. The mean scores for the subscales were relatively high and represented over 55% of the possible subscale scores. For the Normative belief subscale the mean score was 11.93, representing 75% of the possible subscale score; for GB it was 8.96, representing 56%; for Go it was 11.81, representing 74%, and for BS it was 10.71, representing 67%. The standard deviations for the subscales were as follows: 2.33 for N, 2.38 for BS, 2.39 for Go and 2.59 for GB. The standard error ranged from 1.72 for GB to 1.80 for BS.

To clarify further this situation, the results of the item analyses were examined (see Appendix E). For each item within each subscale all options were responded to, although options three and four were the more popular and accounted for between 45 and 55% of the responses. This

TABLE V.3: SUMMARY TEST STATISTICS FOR THE PROBLEM FORMULATION BELIEFS INSTRUMENT

Four Domains of Beliefs					
	N	GB	Go	BS	Total
No. of items	4	4	4	4	16
Mean	11.93	8.96	11.81	10.71	43.42
St. Dev.	2.33	2.59	2.39	2.38	6.88
Hoyt's r	.26	.42	.27	.24	.67*
St. Error	1.73	1.72	1.77	1.80	3.91

Legend

N = Normative beliefs

GB = General beliefs

Go = Goal beliefs

BS = Beliefs about Self

* = Cronbach's composite alpha (Cronbach, 1951)

finding was not surprising given the high mean scores of the subscales. The point biserial correlations behaved as expected, ranging from negative values for the more simple options (one and two), to positive values for the more complex options (three and four). Further examination of individual responses revealed that generally respondents would respond to either options worth one or two points across all items, or to options worth three or four points across items, suggesting a somewhat consistent pattern. Given these observations, it was concluded that the small number of items, together with the restriction of range, led

to the low values for internal consistency. The decision was, then, taken to retain the use of the subscale scores in subsequent data analyses.

Problem Formulation (PF) Belief Scale

The mean, standard deviation and Cronbach's alpha for the total PF score are reported in Table V.3. Of interest here is the value for Cronbach's alpha, an index of the homogeneity of the four subscales. A value close to one would indicate the subscales were measuring a single factor. The value obtained for the PF scale, .67 suggested that the subscales probably measured more than one underlying factor. Thus, correlations of the subscales were examined. First, scatter plots for the six pairs of tests were drawn. They revealed that there were no nonlinear relationships, thus Pearson product-moment correlations were computed to reflect the magnitude of linear relationships among the subscales. The Pearson-Product correlations for the N, GB, Go and BS subscales are reported in Table V.4.

As shown, the correlations among N, Go, and BS subscales ranged from .53 to .67. In contrast, the correlations of the GB subscale with each of these three subscales were much lower (.06, .03, and .25). Taken together, these findings indicated that the PF scale was not unidimensional.

TABLE V.4: PEARSON PRODUCT-MOMENT CORRELATIONS BETWEEN
NORMATIVE, GENERAL, GOAL, SELF BELIEFS

	Normative	General	Goal	Self
Normative		.06	.67*	.53*
General			.03	.25*
Goal				.55*
Self				

* significant at $p < 0.01$

The independence of the General belief subscale from the other subscales might be indicative of the difference and independence of perceptions relating to General beliefs and Normative, Goal and Self beliefs. Kreitler and Kreitler (1976) used in their construction of the four types of beliefs two sets of factors, namely (1) beliefs pertaining to the external world, that is the world of "non-I", for example N and GB beliefs and those pertaining to the internal world, that is the world of "I", for example Go and BS beliefs, and (2) beliefs pertaining to (a) the factual or cognitive, for example GB and BS beliefs, (b) the evaluative, for example N beliefs and (c) the expressive, for example Go beliefs. At first sight, the independence of GB from the N, Go and BS subscales does not conform to the factors Kreitler and Kreitler (1976) used in the development

of the four types of beliefs, as components of one's "cognitive orientation". But a closer examination of the finding seems to be supportive of the "Non-I" and "I" factorial distinction, provided that the N belief subscale is interpreted as representing personal evaluative standards rather than general norms. Further implications of these findings will be discussed in Chapter VII.

Results of the Hypotheses Tests

As shown in Table V.4, the correlations between N and Go, N and BS, and Go and BS were significant at the .01 level, therefore the null hypothesis that the correlations between the normative, general, goal and self belief scores were equal to zero was rejected. It was noted that although the correlation between BS and GB was statistically significant ($p < .01$), the relationship was weak.

A conclusion which was drawn from the results was that in the content area of problem formulation, there was a greater difference in and independence of perceptions relating to General beliefs than to Normative and Goal beliefs and Beliefs about Self. The findings also suggested that in the content area of problem formulation respondents might not be as flexible in their N, Go and BS beliefs pertaining to problem formulation as in their GB beliefs.

In what follows, the results of the z correlational tests are discussed with respect to the second set of hypotheses stated in Chapter II (pp. 62-63).

The results of the analyses indicated that ($p < .01$):

- (a) Normative beliefs had a stronger relationship with Goal beliefs than with General beliefs.

Normative beliefs had a stronger relationship with Goal beliefs than with Beliefs about Self.

Normative beliefs had a stronger relationship with Beliefs about Self than with General Beliefs.

Goal beliefs had a stronger relationship with Normative beliefs than with General beliefs, and

Goal beliefs had a stronger relationship with Beliefs about Self than with General beliefs.

- (b) The strength of the relationship between Goal beliefs, Normative beliefs and Beliefs about Self was equal.

In the review of the literature in Chapter II, it was noted that Kreitler and Kreitler (1972, 1976) maintained that Normative, General, Goals, and Self beliefs each played a unique role in the formation of cognitive orientation clusters which prescribed the direction and level of behaviour. Kreitler and Kreitler (1976) also maintained that goal beliefs were instrumental in the formation of the

cognitive orientation cluster for they largely prescribed the direction in which the beliefs were clustered. This suggestion that goal beliefs were crucial in the organization of normative, general and self beliefs was borne out by these findings, particularly in the finding of relationships of equal strength between Goal and Normative and Self beliefs. This contrasts with the finding of a stronger relationship between Normative and Goal beliefs than between Normative beliefs and Beliefs about Self.

The findings also led to a reexamination of the theoretical and empirical based assumptions about the role of Normative and Goal beliefs. According to the theory of the socialized actor (Parsons, 1951; Parsons and Shils, 1951), individuals through socialization learn shared evaluative standards and normative beliefs. This resulted in the motivation of individuals to conform to these evaluative standards and beliefs, to orient their actions to these general values, and to make selections according to these shared normative standards. Thus, it was expected that there would be a correspondence between personal goal beliefs and shared normative beliefs. The findings that N was more strongly related to Go than to GB and BS supported the Parsonian theoretical claims. In addition, the finding that the strength of the relationship between Go and N and BS was equal supported the Kreitlerian empirically derived assumptions of the instrumentality of Goal beliefs in the

integration and organization of other types of beliefs for action. Although the testing of hypotheses was concerned with only six comparisons of correlations of belief scores, other correlations were compared in order to explore the nature of the relationships with Beliefs about Self and General Beliefs. The six sets of correlations which were examined were:

- (1) BS, N and Go,
- (2) BS, Go and GB,
- (3) BS, N and GB,
- (4) GB, N and Go,
- (5) GB, N and BS,
- (6) GB, Go and BS.

An examination of the correlations of the sets of beliefs scores revealed that three of the comparisons were significantly different at the .01 level, namely (a) BS, Go and GB; (b) BS, N and GB and (c) GB, N and BS. Beliefs about Self had a positive and stronger relationship with Goal and Normative beliefs than with General Beliefs, but General beliefs had a stronger negative relationship with Normative beliefs than with Beliefs about Self. These results conformed to earlier theoretical discussions of perceived differences between the beliefs about the actual, and the desired and desirable state of affairs.

Review of the Results of the Hypotheses Tests

The null hypothesis that the correlations between the normative, general, goal, and self beliefs were equal to zero was rejected. Four significant correlations at the .01 level were found, namely: between N and Go (.67), N and BS (.53), Go and BS (.55), and GB and BS (.26). This finding supports the case that in the content area of problem formulation there is a significant interrelationship of the four types of beliefs, the components of cognitive orientation clusters.

The second hypothesis was confirmed in five out of six areas. The area in which there was no confirmation was between N, Go and BS. No significant difference was found between the correlation of Go and N and Go and BS scores. In the following areas significant differences at the .01 level were found:

- Normative beliefs had a stronger relationship with Goal beliefs than with GB beliefs.
- Normative beliefs had a stronger relationship with Goal beliefs than with BS beliefs.
- Goal beliefs had a stronger relationship with Normative beliefs than with General beliefs.
- Goal beliefs had a stronger relationship with Beliefs about Self than with General beliefs.

- Normative beliefs had a stronger relationship with Beliefs about Self than with General beliefs.

On the basis of these findings of significant correspondences between the beliefs of the four types conclusions which pertain to the content area of problem formulation can be drawn. They are discussed in Chapter VII.

CHAPTER VI

THE USE OF THE INSTRUMENT, III:
CHARACTERISTICS OF EXTREME SCORERS

The previous chapter established that the performance of items in the Problem Formulation (PF) Belief Scale was such as to suggest its validity. The present chapter describes the use of that validated instrument to ascertain what it shows about the beliefs of administrators.

The literature tends to describe problem formulation behaviour in terms of a continuum, the extreme points of which are behaviours suggesting a response to a "presented" problem as distinct from those in which the subject "discovers" the problem; the simple views of a problem as distinct from the complex ones, and so on. In the PF belief scale, low scorers represent one kind of extreme (the "simple") and high scorers the other (the "complex"). In order therefore to make the analysis both manageable and as revealing as possible about the correspondence between the present data and what is said in the literature, the responses and characteristics of the low scorers were compared with those of the high scorers.

Following the procedure described in Chapter IV, two groups of extreme scorers were identified on the basis of their belief scores. Those whose total scores were approximately one standard deviation above or below the mean

belief scores of the sample of post-secondary administrators were selected as the sub-sample group.

This chapter consists of two main sections which deal respectively with each of the following research questions:

- (1) What, if any, differences are apparent in the responses to the items of the Problem Formulation Belief Scale of the low and high scoring subjects, respectively?
- (2) What, if any, differences are apparent in the biodemographic characteristics of the low and high scoring subjects, respectively?

RESPONSES TO THE PROBLEM FORMULATION BELIEF SCALE

It will be recalled that the options for each item represented beliefs about component problem formulation behaviours ranging from simple to more complex behaviours and scored from one to four.

Comparisons of Responses of Extreme Scorers

Some aspects of the differences in the responses of the low and high scorers are inevitable given in the definitions of the two groups of extreme scorers. Thus, we will expect to find that low scorers tend to choose options 1 or 2 in responding to each item and that high scorers tend

to choose options 3 or 4. Two kinds of differences, however may be masked by focussing only on the overall level of responses. First, there may be differences in the consistency with which certain options are selected by the members of each group. By consistency is meant either the constant selection of the same option for any given item across all four belief domains or the constant selection of a given option for all items within a given belief domain.

Second, there may be differences in the configuration of the responses. By configuration is meant the shape of the response pattern for all four belief domains. In examining configurations one is focussing not on the level of the scores per se but on the relative level of the scores in the Normative, General, Goal and Self belief domains.

The examination of these aspects of the responses makes use of frequency distributions and for some purposes, the rank order of respondents' choices. The data displayed in Table VI.1 are the basic data needed for the discussion which follows.

Consistency Across Belief Domains

The following paragraphs examine the responses to each of the four behaviours across all four belief domains. Table VI.1 (p. 136) summarizes for the low and high scorers respectively the frequency and percentage distribution of responses.

TABLE VI.1: EXTREME SCORERS: RESPONSE FREQUENCY
DISTRIBUTION FOR FOUR ITEMS IN NORMATIVE,
GENERAL, GOAL, AND SELF BELIEF DOMAINS

IP				EXP				CRIT				INFO				
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Low Scorers N=30																
Normative																
No.	19	3	3	5	8	3	12	7	9	13	3	5	11	4	10	5
%	63	10	10	17	27	10	40	23	30	43	10	17	37	13	33	17
General																
No.	19	1	4	6	19	6	1	4	8	16	5	1	9	12	7	2
%	63	3	13	20	63	20	3	13	27	53	17	3	30	40	23	7
Goal																
No.	17	6	3	4	7	5	12	6	8	17	2	3	8	6	11	5
%	57	20	10	13	23	17	40	20	27	57	7	10	27	20	37	17
Self																
No.	18	5	5	2	16	6	8	0	10	15	4	1	8	14	5	3
%	60	17	17	7	53	20	27	0	33	50	13	3	27	47	7	10
High Scorers N=30																
Normative																
No.	0	0	3	27	0	1	12	17	1	6	1	22	1	0	17	12
%	0	0	10	90	0	3	40	57	3	20	3	73	3	0	57	40
General																
No.	4	4	7	15	9	3	8	10	5	7	9	9	6	7	7	10
%	13	13	23	50	30	10	27	33	17	23	30	30	20	23	23	33
Goal																
No.	1	0	1	28	0	0	7	23	1	3	0	26	1	2	15	12
%	3	0	3	93	0	0	23	77	3	10	0	87	3	7	50	40
Self																
No.	0	1	3	26	2	2	13	13	2	6	3	19	2	2	12	14
%	0	3	10	87	7	7	43	43	7	20	10	63	7	7	40	47

The identification of problems (IP). Table VI.1, confirms the expected difference in the way in which the low and high scorers chose options for the item, the identification of problems. Among the low scorers, the highest percentages of choices were for either option 1 or option 2 in all four belief domains. Among the high scorers, option 4 was clearly chosen over the other options by at least 50% of the group in the four belief domains.

Exploratory behaviour (EXP). Table VI.1 shows that the low scorers' responses concerning exploratory behaviour were less uniform than in the case of problem identification. For exploratory behaviour, option 1 was most frequently chosen only in two belief domains (GB and BS) and option 3 was the most frequent choice in the other two domains (N and Go). Another way of describing the situation is to say that 40% of the low scorers appeared to believe that exploratory behaviour in problem formulation should be of the kind which characterizes a "discovered" problem (i.e. the Normative Belief) and that that is what they would like to aim for (the Goal Belief). A majority of these low scorers, however, reported beliefs that administrators in fact use the kind of exploratory behaviour

found in a "presented" problem situation, as do they themselves (GB and BS domains). Among the high scorers, option 3 or option 4 accounted for the highest percentage of choices in all belief domains, but it is noticeable that the N and Go domains show greatest proportion of option 4 choices in this group.

Criteria in the selection of information (CRIT). As shown in Table VI.1, option 2 accounted for the highest percentage of responses in all belief domains for the low scorers. Among the high scorers, responses to this item were not as uniform as they were to the IP and EXP items. Although the highest percentage of responses was for option 4 in all domains, the General belief domain showed a tie in the percentage of responses for option 3 and option 4, each receiving 30% of the responses.

The selection of information (INFO). There was much more variation in the responses of the low and high scorers to the item pertaining to the selection of information than was the case with the responses to the other items. Among the low scoring group, option 1 received the highest percentage of responses (37%) in the Normative belief domain. In the General and Self belief domains, option 2 received the highest percentage of responses (40%, 47%). In

the Goal belief domain, option 3 received the highest percentage of responses (37%).

Among the high scorers, there was also variability in the responses. The highest percentage of responses was for option 3 in the Normative and Goal (57%, 50% respectively) belief domains and option 4 in the General and Self belief domains (33%, 47%) with option 3 of the Beliefs about Self domain receiving 40% of the responses.

In the Goal belief domain the modal response for this item among both the low and high scorers was option 3. This option refers to the selection of general (as distinct from particular) information and it is notable that this response of both groups in the Goal belief domain contrasts with their response in the domains of General and Self beliefs. There, option 2 for the low scorers and option 4 for the high scorers were favoured. Both of those options referred to the selection of particular bits of information but the difference was in the amount of search required for obtaining the information. The high scorers' choice of option 4 represented the belief that search was required to obtain particular bits of information which might not necessarily be near at hand. Options 2 which the low scorers chose referred to particular information which was immediately available.

Consistency Within Belief Domains

The foregoing paragraphs have relied primarily upon a reading of the vertical columns of Table VI.1. In order to examine consistency within domains, it is necessary to read that table's horizontal rows.

Normative beliefs domain. Reference to Table VI.1 shows that the most frequently chosen responses for the low scorers in the N belief domain varied among the different items and ranged from option 1 to 3. Thus for IP, option 1 was most frequently chosen as it was for INFO, but EXP evoked option 3 most frequently and CRIT, option 2. The most frequent responses for high scorers, on the other hand was option 4 of all items except INFO, where it was option 3 (4:IP, 4:EXP, 4:CRIT, 3:INFO).

General beliefs domain. The responses of the low scorers in the General belief domain were not as variable as in the Normative belief domain. The most frequently chosen options were 1 (IP and EXP) and 2 (CRIT and INFO). For the high scorers the most frequent choices also covered two levels, but for this group the levels were 3 and 4 (4:IP, 4:EXP, 3=4:CRIT, and 4:INFO).

Goal beliefs domain. Table VI.1 shows a similar kind of difference between the responses of the low and high scorers in the Goal belief domain as was seen in the Normative belief domain. The most frequently chosen responses for the low scorers in the Go belief domain were: 1:IP, 3:EXP, 2:CRIT and 3:INFO. The only difference between these most frequently chosen responses and those of the N belief domain was the choice on the INFO item. The most frequently chosen responses for high scorers, on the other hand were for items which ranged between the same two levels as in the N and Go belief domains. They were 4:IP, 4:EXP, 4:CRIT, and 3:INFO.

Beliefs about self domain. Table VI.1 shows the similarity between the range and level of responses of the low scorers in the General and the Self belief domains. The most frequently chosen responses for the low scorers in both of these domains were 1:IP, 1:EXP, 2:CRIT and 2:INFO. The range and level of responses for the high scorers on the other hand were uniform in the four belief domains. The most frequently chosen responses for high scorers were: 4:IP, 3=4:EXP, 4:CRIT, and 4:INFO.

Configurations in Belief Domain Scores

The previous sections have examined the consistency in the frequency with which low and high scorers respectively chose particular options for the items on this PF belief scale. The analysis focussed on the level of responses chosen. It is possible, however, that there may be differences between low and high scorers which are not seen in an examination of the levels at which they respond, but are seen in an examination of the differences in levels chosen in different domains. Thus, one respondent might show high scores for the N and Go domains with low scores for the GB and BS domains, whereas another might show low scores in all domains. If these scores were to be shown graphically in the Normative, General, Goal and Beliefs about Self sequence, they would result in the first case in a zizzag pattern, and in the second case in a straight line. In this sense one may examine the configurations yielded by the responses.

Since the range of scores for each item is one to four and since each domain includes four items, the total score which a respondent could achieve in any one domain ranges from four to 16. To use this 12 point range as a basis for examining configurations would yield an unworkably large number of possible configurations and in many cases, it would be difficult to discern any real meaning in the

differences among them. For this reason, the scores have been combined to yield three kinds of scores: High (scores from 12 to 16), Medium (scores from 9 to 11) and Low (scores from 4 to 8).

Using this three point system there are 81 (3^4) possible configurations across the four belief domains. Some of these however, are identical in shape: for example, all four domains may be scored high by one respondent and low by another, and both cases yield the same profile, namely a straight line. Similarly, the profile yielded by scores of High-High-High-Medium is no different from that yielded by Medium-Medium-Medium-Low, but both are different from High-High-High-Low. To consider only configurations whose shapes are different from all others yields 65 different ones rather than the 81 possible ones referred to above. These 65 may be seen as falling into four groups:

- A. Straight Line configurations (in which all four scores are at the same level),
- B. Divergent configurations (in which three scores are at one level and the fourth is divergent),
- C. Split configurations (in which there are two pairs of similar scores), and
- D. Erratic configurations (in which no more than two scores are at the same level)

In order to examine the data in terms of the configuration scores, the four domain scores for each

respondent were calculated by adding the IP, EXP, CRIT and INFO scores. The four resulting domain scores were then classified as HIGH, MEDIUM, or LOW and the respondent's configuration was plotted. Of the 65 possible configurations, 20 proved to be present in the data. These configurations and the group in which they were found are shown in Table VI.2.

Table VI.2 shows that 16 of the 60 extreme scorers displayed straight line profiles. Of these 16, five were low scorers and 11 were high scorers. Nineteen of the high scorers had divergent profiles in comparison with 10 among the low scorers. Among the 19 high scorers with divergent configurations, 16 (84%) were divergent on their general belief scores, that is the scores of the N, Go and BS domains were at one level whereas the General belief score was at a different level. Only four of the 30 (13%) low scorers had divergent configurations as a result of their discrepant general belief scores. The divergency of the general belief scores supports considerations of the possible independence of this general belief subscale.

The high scorers displayed only A and B configuration types while the low scorers displayed all four types, that is A, B, C, D. That is, 30% of the high scorers displayed the straight line configuration and 63% displayed a configuration with divergency on one belief score. The distribution of configuration types among the low scorers

TABLE VI.2: FREQUENCY DISTRIBUTION OF PROFILES
OF RESPONSES OF EXTREME SCORERS

Type	No. of Profile	N	GB	Go	BS	Low Scorers	High Scorers	Total
A:	1	H	H	H	H	-	11	16
	2	L	L	L	L	5	-	
B:	3	H	H	H	M	-	1	29
	4	M	M	M	L	3	-	
	5	H	H	M	H	-	1	
	6	M	M	L	M	1	-	
	7	H	M	H	H	-	11	
	8	M	L	M	M	3	-	
	9	H	L	H	H	-	5	
	10	M	H	H	H	-	1	
	11	L	L	M	L	1	-	
	12	L	M	L	L	1	-	
	13	M	L	L	L	1	-	
C:	14	M	M	L	L	1	-	12
	15	M	L	L	M	1	-	
	16	L	M	M	L	1	-	
	17	L	M	L	M	3	-	
	18	M	L	M	L	6	-	
D:	19	M	L	H	L	1	-	3
	20	H	L	M	L	2	-	

was: five of the 30 low scorers (17%) had straight line configurations; 10 (33%) had divergent ones; 12 (40%) had configurations which were split and three (10%) had erratic configurations. Since the A and B types indicate "more consistency" whereas the C and D types indicate "less consistency" in terms of the high and low points of the set of four scores it was concluded that consistency in shape of responses was what distinguished the high scorers from the low scorers.

Far fewer configurations were present among the high scorers. Of the 20 configurations which were identified from the data, 16 were displayed by the low scorers and six were displayed by the high scorers.

BIODEMOGRAPHIC CHARACTERISTICS OF EXTREME SCORERS

A summary of the biodemographic characteristics of the subsample of extreme scorers is presented in Table VI.3. Six biodemographic characteristics were examined (administrative characteristics, administrative level, educational characteristics, training in problem solving, age and gender).

As shown in Table VI.3, 18 out of 30 (60%) respondents in the low scoring group had spent at least eight years in administration whereas among the high scoring group 15 out of 30 (50%) respondents had spent a similar

TABLE VI.3: BIODEMOGRAPHIC CHARACTERISTICS
OF THE SUBSAMPLE

	LOW SCORING GROUP		HIGH SCORING GROUP	
	N	(%)	N	(%)
	=30		=30	
Administrative Characteristics				
Years in administration:				
0 -4 years	8	(27)	9	(30)
5 -7 years	4	(13)	6	(20)
8 - 10 years	8	(27)	5	(17)
10 + years	10	(33)	10	(33)
Administrative level:				
Principal	2	(07)	3	(10)
Vice-Prin.	8	(27)	6	(20)
Director	12	(40)	14	(47)
Coordinator	8	(27)	7	(23)
Educational Characteristics				
Highest educ. level attained:				
No Degree or Diploma	0	(00)	1	(03)
Diploma	7	(23)	4	(13)
Bachelors	5	(17)	6	(20)
Masters	17	(57)	16	(53)
Doctorate	1	(03)	3	(10)
Training in problem solving:				
Course work	11	(37)	20	(67)
Some training	8	(27)	6	(20)
No training	11	(37)	4	(13)
Age:				
39 + under	8	(27)	10	(33)
40 - 49	13	(43)	12	(40)
50 + over	9	(30)	8	(27)
Gender:				
Male	27	(90)	22	(73)
Female	3	(10)	8	(27)

amount of time in administration. Those who had spent less than 8 years in administration included 50% of the high scorers and 40% of the low scorers.

The low scorers included no one without a diploma or degree. Representation in both the low and high scoring groups was highest among subjects with masters degrees. Fifty seven percent of the low scorers had masters degrees compared with 53% of the high scorers. The extreme scorers revealed similar patterns in the three age groupings. The respondents in the middle age grouping comprised 43% and 40% of the low and high groups respectively. There was a relatively even distribution among those 39 years of age and younger and those 59 years of age and over in both the low scoring and high scoring groups.

For each of these variables a chi square test was performed to ascertain whether there were any statistically significant differences between the low and high scoring groups. Only the variables concerned with training in problem solving showed such differences and the results for these are shown in Tables VI.4 and VI.5.

Data pertaining to training in problem solving were grouped in two ways: (1) those who had taken course work in problem solving and those who had not, (2) those who had no training in problem solving, those who had some training in problem solving (which included attending seminars, workshops and other activities such as institutes related to

the development of problem solving skills), and those who had taken course work in problem solving.

Using the dichotomous grouping of those who had taken course work and those who had not (Table VI.4), significant differences were found between the high and low scoring groups at the .05 level. The corrected chi square was 4.271 with 1 degree of freedom. Among the high scorers a ratio of two to one was found to exist between those who reported having had course work in problem solving and those who reported not having had course work. Among the low scorers this ratio was reversed. Eleven out of thirty (37%) of the low scorers reported that they had taken course work in problem solving, in contrast with 19 out of 30 (63%) who reported that they had not.

When the distribution of extreme scorers was examined with regard to the second grouping, that is subjects with no training, subjects with some training, and subjects with training by means of course work (Table VI.6), significant differences were found at the .10 level of significance. The chi square was 6.165 with 2 degrees of freedom.

TABLE VI.4: FREQUENCY AND CHI SQUARE DISTRIBUTION
OF EXTREME SCORERS BY DICHOTOMOUS
GROUPING OF TRAINING IN PROBLEM SOLVING

	No Courses Taken N	Courses Taken N	Chi Square with 1 degree of freedom
Low Scorers %	19 (63.3)	11 (36.7)	
High Scorers %	10 (33.3)	20 (66.7)	4.271*

* significant at $p < .05$ level.

TABLE VI.5: FREQUENCY AND CHI SQUARE DISTRIBUTION
OF EXTREME SCORERS BY THREE GROUPINGS
OF TRAINING IN PROBLEM SOLVING

	No Training	Some Training	Course Work Training	Chi Square with 2 Degrees of Freedom
Low Scorers %	11 (36.7)	8 (26.7)	11 (36.7)	
High Scorers %	4 (13.3)	6 (20.0)	20 (66.7)	6.165*

*Significant at $p < .10$

SUMMARY OF FINDINGS AND DISCUSSION

In this chapter the responses of the low scoring and high scoring groups to items representing beliefs about problem formulation were compared as well as their biodemographic characteristics. The comparison of responses indicated that there were differences between the low scorers and the high scorers in the consistency of their responses to the four items, IP, EXP, CRIT and INFO across the four belief domains and within each belief domain. There were also differences in the configuration of their composite belief domain responses. These differences are discussed in this section.

There was greater consistency in the most frequently chosen options among the high scorers than among the low scores. For the former, the consistent and most frequently chosen options were for IP, EXP and CRIT, but for the latter they were only from IP and CRIT. From the perspective of the performance of the items among the low and high scorers the item with the most consistent first choice option across the four belief domains was the identification of problems. The item with the least consistent first choice option across the four belief domains was the selection of information. Among the low scorers alone the first choice option of CRIT was also consistent and to a lesser extent

the first choice option of EXP. Among the high scorers, the consistency of the first choice options of EXP and CRIT items was similar. For EXP, option 4 was the first choice in the Normative, General and Goal belief domains. Option 4 tied with option 3 in the Beliefs about Self domain. For CRIT, option 4 was the first choice in the Normative, Goal and Self belief domains. In the General belief domain option 4 tied with option 3 as the most frequently chosen option.

These findings of differences in the consistency of responses to the four component problem formulation behaviours, IP, EXP, CRIT and INFO, across belief domains suggest that the prevailing view of problem formulation in the literature as a compound consisting of four component behaviours combined at uniform levels among individuals may be incorrect. The findings suggest that consistency in an individual's level of orientation to the identification of the problem appears to be essential. It was also noted that the level of the extreme scorers' beliefs about the identification of the problem corresponded to their overall orientation to problem formulation. Consistency in the level of the other items, namely exploratory behaviour, criteria used in the selection of information and the selection of information, appears to be less essential across the four belief domains. This is an area which needs further examination.

Responses to the item pertaining to the selection of information were varied among both the low and the high scorers. One possible explanation of this observation comes from the literature on problem formulation which associates administrators' selection of general information with lack of search and specificity, skills which have been found to be essential in the reduction of ambiguity and global diffuseness when identifying the nature of a problem (Allal, 1973; Hills, 1975). Feldman and March (1981), however noted that managers often obtained information not for specific decision making purposes but for surveillance purposes. The selection of information in this scanning mode would involve mainly general information.

Another explanation for the variations in the choice of options 3 and 4 (which pertained respectively to the selection of general information at hand and distant, and general and specific bits of information at hand and distant) among the high scorers is that administrators regard information as symbols of competence and social efficacy and thus their gathering of information is often ritualistic. In a ritualistic mode of operation, consideration is given more to being the first person to receive the information or to the resources expended to retrieve the information rather than to the generality or specificity of the information (Feldman and March, 1981).

The problem formulation beliefs of the high scorers approached the ideal pattern of 4:IP, 4:EXP, 4:CRIT, 4:INFO more closely than those of the low scorers approached the ideal pattern of 1:IP, 1:EXP, 1:CRIT, 1:INFO in each of the four belief domains. These patterns were discussed in Chapter 2. This suggested greater deviation from the ideal type by the low scorers in comparison with the high scorers. Since the ideal types reflected consistency in the level and in the configuration of response profiles, the responses of the low scorers can be characterized as reflecting less consistency in their level and configuration than the responses of the high scorers.

The high scorers' choices of options of the four items can thus be characterized as representing an orientation to problem formulation in a "discovered" problem situation. For example, among the high scorers the first choice options across the four items, IP, EXP, CRIT and INFO within the four belief domains were N:4443; GB:444(3=4)4; Go:4443; BS:43=444.

For the low scorers on the other hand, the first choice options were N:1321; GB:1122; Go:1323; BS:1122. These beliefs represented an orientation to the following: (1) the simple identification of problems, (2a) active experimentation in the exploration of a problem as well as (2b) a literal and concrete interpretation of problems, (3) the use of criteria based on personal preferences when deciding what information to use in the formulation of a

problem, (4a) the selection of general information which is near at hand, (4b) the selection of particular bits of information which are near at hand, and (4c) the selection of general information which may be near at hand or distant. Thus, the low scorers exhibited an orientation to problem formulation more like that found in a "presented" problem situation than a "discovered" one.

The comparison of the configurations of responses of the low and high scorers indicated two main features. First, the high scorers' responses revealed fewer different configurations when compared with the low scorers' responses. This information again confirms the consistency that existed among the high scorers. If the straight line and divergent profiles were viewed as more consistent response profiles and the split and erratic profiles were viewed as less consistent response profiles, then 50% of the low scorers can be viewed as displaying less consistency in their responses across the four belief domains, whereas the high scorers (100%) can be viewed as displaying more consistent response profiles.

Sixteen of the 19 high scorers (84%) who had displayed divergent profiles exhibited configurations in which the level of the scores of the general belief domain was different from the level of the other three sets of belief domain scores. This unique bit of information about the divergent responses in the general belief domain is of

potential value to considerations of weighting the general belief subscale in the context of problem formulation beliefs. Since 84% of the high scorers had divergent general belief profiles it could be assumed that among the high scorers general beliefs were perceived to be independent of the other three types of beliefs. The independence of the general belief domain appears to require further in depth consideration.

The differing function of the general belief domain has also been noted by Kreitler and Kreitler (1976: 96) who state that general beliefs relied on the other beliefs for manifestation. They suggested that the general beliefs operate at a lower level position in the clustering of the four types of beliefs to form the total orientation cluster. They cite the following example: "A general belief like - "Tomorrow the sun will rise at five o'clock and 52 minutes," - may seem devoid of cognitive orientativeness unless considered in conjunction with a goal belief like "I want to see the sunrise" or a normative belief like "People should get up before sunrise" or a belief about self like "I enjoy returning home from a night party after sunrise".

Of the six biodemographic characteristics which were analysed for differences between the low and the high scorers, only one was found to differ significantly between both groups. This was the characteristic of training in problem solving. This finding supports the observations of

Larkin et al., 1980 that training and knowledge differentiate the problem orientation behaviour of experts from that of novices. Evidence from the study of Lyles and Mitroff (1980) on organizational problem formulations indicates that educational level, total years of experience in managerial position, type of industry in which the manager has been employed have little effect on the managerial attitudes to problem formulation. Allal's study of individual problem formulation supported the notion that beliefs about problem formulation were independent and individualized beliefs which were affected largely by training.

CHAPTER VII

SUMMARY, CONCLUSIONS AND IMPLICATIONS

This chapter presents a brief summary of the study, its conclusions and some implications of these conclusions for theory, further research and application in administrator preparation programs.

SUMMARY

The purpose of the study was (a) to develop a Problem Formulation Belief Scale which could be used for the assessment of administrators' beliefs about problem formulation, (b) to examine selected aspects of its construct validity, and (c) to apply the Belief Scale in an exploratory study to assess the problem formulation beliefs of educational administrators.

Development of a Conceptual Framework

On the basis of a review of the literature, and in particular of the works of Allal (1973); Getzels and Csikszentmihalyi (1976); and Kreitler and Kreitler (1976) a conceptual framework for the development of the problem formulation belief scale was devised. Problem formulation was defined as the process of identifying an actual or

anticipated aspect of a situation as different from what is held to be desirable and refining the difference identified. Problem formulation consisted of four component behaviours: (1) the identification of the problem (IP), (2) the selection of information (INFO), (3) the use of criteria in the selection of information (CRIT), and (4) exploratory behaviour (EXP). These behaviours were conceptualized as having a four point variation, ranging from simple to more complex behaviours.

Based on the cognitive orientation theory developed by Kreitler and Kreitler (1976) normative, general, goal and self beliefs about each of the four component problem formulation behaviours were used to obtain a comprehensive summary of post-secondary educational administrators' beliefs about problem formulation. Statements representing these beliefs were used in the development of the belief scale.

Procedure

This study involved the development of the instrument (which included preliminary construct validation procedures) and the application of the instrument to assess administrators' beliefs about problem formulation. On the basis of a review of the literature on problem formulation, 48 statements representing general beliefs about the four component problem formulation behaviours were generated.

They were screened and initially rated by 11 faculty members with expertise in administrative processes or educational measurement. This initial process of screening and rating permitted the selection of 16 statements which conformed to the model of problem formulation. The 16 selected statements representing general beliefs were rephrased so as to produce in addition plausible and clearly worded equivalent statements for the normative, goal and self belief domains. Thus four sets, each of which contained 16 statements were developed. Each set represented a different type of belief (normative, general, goal and self beliefs) and included one statement about each of the points of variation for each of the four problem formulation behaviours (see Table II.1, p.51).

In order to verify the validity of these four sets of statements, they were subjected to further rating. To ensure that any possibly weak statements could be identified, 16 extra statements were added (one for each behaviour in each domain). The resulting batch of 80 statements was then subdivided into nine sets of statements and distributed to nine independent experts for the assessment of their degree of relevance to a particular problem formulation behaviour and to a particular problem formulation belief. The pre-defined criteria of validity were a mean rating of 3.00 and a percentage agreement of 66.66% for a set of four statements, that is an equivalent

set of four statements in each of the Normative, General, Goal and Self belief domains.

The results of the rating confirmed that the 64 initially accepted statements were valid indicators of problem formulation beliefs of four types. Ten statements were slightly rephrased. The 64 validated statements, together with questions about biodemographic information (pertaining to number of years spent in administration, administrative level, highest educational level attained, training in problem solving, age and gender) formed the questionnaire.

A pilot test of the instrument was conducted in which 18 administrators from post-secondary institutions in British Columbia participated. The results of the pilot test were evaluated and final refinements of the PF belief scale were made. This was followed by the exploratory study designed to validate empirically the PF belief scale. A total of 189 administrators in Community Colleges and Institutes in the province of British Columbia participated in the study. The data on the beliefs of administrators were collected and analysed for evidence of the reliability of the items of the scale and to test two hypotheses.

Hypotheses

The hypotheses were:

Ho: That there will be no significant correlations between pairs of belief scores grouped as follows:
 Normative and General belief scores,
 Normative and Goal belief scores,
 Normative belief and Belief about Self scores,
 General and Goal belief scores,
 General beliefs and Belief about Self scores, and
 Goal beliefs and Belief about Self scores.

However, if the null hypothesis were to be rejected, the following plausible alternative was proposed:

- H1: (a) That there will be a significantly higher correlation between the Normative and Goal belief scores than between the following pairs of beliefs scores grouped as follows:
 the Normative and General belief scores,
 the Normative and Belief about Self belief scores,
 the General and Goal belief scores,
 and the Goal and Belief about Self belief scores.
- (b) That there will be a significantly higher correlation between the Goal and Belief about Self belief scores than between the Goal and General belief scores.
- (c) That there will be a significantly higher correlation between the Normative and Belief about Self belief scores than between the Normative and General belief scores.

In order to examine at greater depth the normative, general, goal and self beliefs of respondents to the PF belief scale, the responses of 60 respondents whose scores were approximately one standard deviation above or below the mean belief scores of the total sample were examined. The biodemographic characteristics associated with these extreme scorers were also examined. The specific research questions

were:

- (1) What, if any, differences are apparent in the responses to the items of the Problem Formulation Belief Scale of the low and high scoring subjects, respectively?
- (2) What, if any, differences are apparent in the biodemographic characteristics of the low and high scoring subjects, respectively?

Results

The psychometric analyses revealed that the reliabilites of the four subscales were low (.26 for N, .42 for GB, .27 for Go, and .24 for BS). This was ascribed to the shortness of the four subtests and their restricted ranges. The composite reliability of .67 (Cronbach, 1951) suggested that the PF belief scale was not unidimensional. This was further supported by the intercorrelations of the four subscales which ranged from .53 to .67 for the correlations among N, Go and BS subscales and .06, .03 and .25 for their correlations with the GB subscale respectively. The correlations of the four subscales indicated that one dimension was represented by the normative, goal and self beliefs subscales and another dimension was represented by the general beliefs subscale. The independence of the general beliefs subscale was attributed to the difference in how respondents perceived

administrators to formulate problems. These perceptions seemed to be independent of how the respondents perceived themselves in the formulation of problems or how they perceived problems should be formulated and how they wanted to formulate problems. The indications of multidimensionality of the PF belief scale raised questions about the claims of Kreitler and Kreitler (1976) that the four belief domains as components of cognitive orientation were independent dimensions.

A further question was also raised about another aspect of the work of Kreitler and Kreitler (1976). They concluded that Normative beliefs were to be regarded as beliefs pertaining to general ("Non-I") evaluative standards. The findings of the present study suggested that this might not be so. The respondents to the PF belief scale might well have interpreted Normative beliefs as personal evaluative beliefs, that is beliefs about what the individual considers to be desirable.

The results of the tests of the hypotheses indicated that the correlations between N and Go (.67), N and BS (.53), Go and BS (.55), and BS and GB (.25) were significant at the .01 level, therefore the null hypothesis was rejected. A comparison of the correlations of the belief domains using a z correlation test (Glass and Stanley, 1970: 313) indicated that Normative and Goal beliefs had a positive and stronger relationship than did

either Normative and General beliefs or Normative and Self beliefs, but that there was no difference in the magnitude of the relationship between Goal and Normative beliefs and between Goal and Self beliefs ($p < .01$).

The supplementary correlational analyses which were conducted to examine the differences in the relationships of Beliefs about Self and General Beliefs indicated that relationships between Beliefs about Self and Goal beliefs, and Beliefs about Self and Normative beliefs were positive and were stronger than the relationship between Beliefs about Self and General beliefs. However, General beliefs had a negative and stronger relationship with Normative beliefs than with beliefs about Self. These findings confirmed theoretical discussions of the perceived differences between the actual and the desired or desirable.

The comparison of the responses of the extreme scorers indicated that there were differences between the low scorers and the high scorers in the consistency of their level of responses to the three items, IP, EXP, and CRIT across the four belief domains and within each belief domain. For the high scorers, consistency in which options were most frequently chosen was found in IP, EXP and CRIT, but for the low scorers it was found only in IP and CRIT. There were also differences in the configurations of the composite belief domain responses of the group of extreme scorers. High scorers were found to exhibit more consistent

profiles than low scorers. The beliefs of the high scorers approached the ideal pattern of 4:IP, 4:EXP, 4:CRIT, 4:INFO more closely than those of the low scorers approached the ideal pattern of 1:IP, 1:EXP, 1:CRIT, 1:INFO in each of the four belief domains. Given the way each of the low and high scoring groups was defined, approximations to the ideal patterns (4444 for high scorers and 1111 for low scorers) were expected. What is interesting about these results is that only the high scorers' pattern resembled expectations. The data suggest the possibility of untapped complexity in the low scorers, especially with regard to EXP and INFO.

Of the six biodemographic characteristics which were analysed for differences between the low and the high scorers, only one was found to differ significantly between both groups. This was the characteristic of training in problem solving.

CONCLUSIONS AND IMPLICATIONS

The conclusions of the study need to be seen in the context of two important limitations. The shortness of the test is the first of these. Essentially the instrument consisted of four four-item subtests and the low number of items may have accounted in large part for the low internal reliability estimates.

The second limitation pertains to the nature of the study. It was correlational and descriptive and focussed on face and construct validity to the exclusion of predictive validity. Because of this predictions could not be made.

These limitations notwithstanding, the study has established a first step in the assessment of administrators' beliefs. A conceptual framework has been articulated and an instrument constructed and partially validated. Its use has raised a number of questions. Given the exploratory nature of the study, the conclusions are necessarily more tentative than firm. They are grouped in three sets. The first concerns the existing theory of beliefs as components of cognitive orientation. The second concerns existing views of problem formulation and the third set of conclusions concerns probable directions which are suggested for further research and instrument development and application.

Concerning Theories of Beliefs and Cognitive Orientation

The findings of this study raise questions about two aspects of existing approaches to the study of beliefs and also the effects of different content areas on their correspondence.

1. The theoretical base from which the study was drawn (Kreitler and Kreitler, 1976) postulated four independent belief domains which, taken together could summarize an individual's "cognitive orientation". The

present study found that the belief domains were not independent. Indeed, the pattern of correlations suggested that they may be "organized" in a particular way. This "organization" in the present data seems to consist of two main dimensions, namely: General beliefs in the one and Normative, Goal, and Self beliefs in the other (see Chapter V, Table V.3: p. 124; Table V.4: p.126).

These results are interesting, not only because they suggest interdependence where independence had been postulated, but also because the groupings they suggest do not conform to one of the original conceptualizations of Kreitler and Kreitler (1976). As discussed in Chapter II (p. 41), Kreitler and Kreitler (1976) included in their conceptual framework the identification of beliefs as being either about the personal world (the "I") or the external world (the "Non-I"). In this view, Normative and General beliefs pertain to the "Non-I" and Goal beliefs and Beliefs about Self to the "I". Moreover, they considered that the two kinds of "Non-I" beliefs could be considered as one set and the "I" group as another. In the present data, two aspects of the results call this view into question. First, as already noted, General beliefs seemed separate from all the others. Second, in the cluster formed by Normative, Goal and Self beliefs, the relationship between Normative and Goal beliefs is stronger than that between Normative and Self beliefs and the same as that between Goal and Self

beliefs. This suggests two considerations. First, the dominant position of Goal beliefs in this set of correlations tends to confirm the notion of Kreitler and Kreitler (1976) that it is Goal beliefs which lend direction to the composite set of beliefs as an orientation cluster. Second, however, the results also support the Parsonian view that it is Normative beliefs which, functioning as evaluative standards and shared prescriptions are regulators of other types of beliefs.

The present study thus cannot settle the question of whether Normative or Goal beliefs are solely dominant. In the absence of a firm conclusion on oneside or the other, however, it is possible to speculate on a third possibility, namely, that Normative and Goal beliefs may operate together. The normative beliefs may function as evaluative standards and the goal beliefs as commitments to these standards thereby providing the basis for action. However for this interpretation to be valid, one must make one further observation. Either the Kreitlerian classification of Normative beliefs as "Non-I" must be changed or this set of three beliefs found in the present data must be viewed as containing both "I" and "Non-I" beliefs. If the "I"/"Non-I" distinction is assumed to be valid, then the former interpretation makes better sense than the latter. It is conceivably the case that for the subjects in the present sample, Normative beliefs functioned as personal, not external evaluative standards.

The questions which these findings raise suggest that a profitable area for further research is in the investigations of the correspondence of goal and personal evaluative beliefs and their organization with other types of beliefs. This issue of the correspondence of the four beliefs has relevance to the derivation of the index to measure individuals' orientations to problem formulation behaviour, a procedure which is necessary if the instrument is to be used for predictive purposes.

2. In the conceptual framework of Cognitive Orientation (CO), developed by Kreitler and Kreitler (1976), the four types of beliefs, as the components of CO are assumed to be of equal status and are thus given equal weights in their computation of a CO index. This index which is a measure of the interaction of the beliefs of the four types is used to predict the level and the direction of the specified behaviour. In this study, the findings that the N, GB, Go and BS subscales may be bifactorial raised questions about the computation of the CO score in the context of the problem formulation beliefs of administrators.

Kreitler and Kreitler computed the index of cognitive orientation in the following way: They assigned an equal weight of one (1) to each belief domain. Thus four belief scores are computed: one for each type of belief

domain (N, GB, Go, BS). If a subject's score is above the mean of the sample's mean belief score the individual is awarded 1 point. If the individual's particular belief score is below the mean belief score he or she is awarded 0 points. These points are finally summed to derive the CO score which ranges from a minimum of zero to a maximum of four. The finding that the PF belief scale may be bifactorial raises the question of what weights should be used in the derivation of a CO score for problem formulation. This is an area which can be explored in future research undertakings.

3. The finding that normative, general, goal, and self beliefs about problem formulation may be organized along two dimensions raises another question--whether the organization of the four beliefs is a function of the characteristics of the problem formulator, or of the nature of the content area or both. The characteristics of the problem formulator have already been investigated and training has been found to have an effect on problem formulation beliefs. One goal of future research then, should be to determine the way in which the nature of the content area affects the organization of the four types of beliefs. It may not be sufficient to identify only a topical area of content such as problem formulation in order to examine the interrelationships between the four beliefs. Rather it will be necessary to construct carefully cases

using different specific areas of content to ascertain the effects of the various content areas on the four types of beliefs.

Concerning Views of Problem Formulation

Findings from the analysis of the data on the problem formulation beliefs of administrators have raised several questions about the components of problem formulation.

Investigations of problem formulation have not been concerned with the structural characteristics of problem formulation. For example, Getzels and Csikszentmihalyi (1976) defined problem formulation in terms of three component behaviours (see Chapter II, pp. 23-24) but did not investigate how the component problem formulation behaviours were combined among the subjects of their experiment. Their underlying assumption seems to be that the behaviours were of equal importance. Neither did Allal (1973) investigate this area although she explored the structural characteristics and processes of problem formulation. Two conclusions relevant to these questions are noted.

1. The present findings suggest that beliefs about the four components of problem formulation are not necessarily combined at uniform levels. For example, beliefs about the identification of problems among the extreme scorers exhibited uniform levels unlike the beliefs

about exploratory behaviour and the selection of information, the levels of which varied. It was also noted that the level of the extreme scorers' beliefs about the identification of the problem corresponded to their overall orientation to problem formulation. Beliefs of the extreme scorers about the criteria used in the selection of information also exhibited uniform levels across the four belief domains but they were not consistent with overall orientations to problem formulation of the two groups.

The observations from this study suggest that two areas for future research should be the investigation of: (a) the structural relationships among the four component problem formulation behaviours in each individual belief domain, and across belief domains, and (b) the extent to which performance on one component could be predicted from the performance on another item, for example the extent to which performance on the items, EXP, CRIT and INFO could be predicted by performance on IP.

2. The second conclusion about the problem formulation aspect of the study concerns what might determine the approach to different component behaviours. Previous work has suggested that personal and demographic characteristics may be important in this respect (Allal, 1973; Lyles and Mitroff, 1980). In the present study the findings from the analysis of the biodemographic characteristics of the extreme scorers support the

conclusion that the subjects' were not affected by biographic characteristics such as age and gender or by administrative and educational characteristics except for training in problem solving.

Concerning Further Development of the Instrument

Four conclusions are made concerning the development of the instrument. They pertain to reliability, construct validity, predictive validity and the use of the instrument.

1. The validity and reliability tests which were conducted provided results which indicated that the instrument was adequate for further exploratory research into administrators' beliefs about problem formulation. Two main considerations were taken into account in the study: the internal reliability and construct validity of the test. The internal reliability estimates of the subtests were considered adequate given their shortness. But the shortness of the test stands out as an area which should be pursued in further research if the instrument is to be improved. This could include increasing the number of items in the subtests, (that is the items which comprise the N, GB, Go, and BS belief subtests) in order to increase the reliability of the tests. This would conform with test theory which maintains that the reliability of a test is a function of its length.

2. The process of construct validation was begun in this study. It is recognized in test theory that construct validation is an ongoing process. What is now needed is to extend attempts at construct validation by examining, for instance the responses of extreme scorers in different situations and the sampling of administrators in different levels of the educational system.

3. A third area for improving the instrument is that of its predictive validity. Since the results of the study indicate that the instrument can be used to assess the normative, general, goal, and self beliefs about problem formulation the next logical step is to apply the instrument in a context where its predictive validity could be assessed. A study of that nature would require the testing of hypotheses to examine the relationship between the levels of beliefs about problem formulation and levels of problem formulation behaviour.

Kreitler and Kreitler (1972, 1976) in their model of cognitive orientation noted that the combination of Normative, General, Goals and Self beliefs formed a cognitive orientation cluster which could be used to predict the level and direction of the specified behaviour. This would mean that the cognitive orientation of administrators would vary systematically with their problem formulation behaviour. Following the present study, it could then be assumed that a cognitive orientation to problem formulation as found in a "discovered" problem situation would be

predictive of a complex level of problem formulation behaviour and a cognitive orientation to problem formulation as found in a "presented" problem situation would be predictive of a simple level of problem formulation behaviour.

4. Even without further research and development the PF beliefs instrument may have a number of useful applications in administrative educational programs which are designed to train students in the acquisition of problem formulation skills. Three such applications come readily to mind.

The PF instrument could be easily packaged for individual use with a scoring scheme and an explanation of its administration. It could then be made available for the use of students on an individual basis. Students may use the instrument to assess their problem formulation beliefs and thus their level of orientation to problem formulation. In the process students may be instructed to reflect on other available alternatives which may be appropriate in handling problems in different problem situations.

The instrument could also be used in group settings such as in a class or seminar on problem formulation. In such a setting it would be useful to have a group discussion follow the administration of the instrument. Different levels of orientation to problem formulation and the constraints arising could be discussed.

Finally, the instrument could be used in conjunction with materials designed for use in course work pertaining to problem formulation and analysis. For example, the instrument could be included in the instructional materials and coordinated with a simulation exercise on problem formulation behaviour. Performance on the belief scale could then be compared with performance on the simulation exercise and the results used as a focus for instruction and training.

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APPENDICES

APPENDIX A

RATING PACKAGE FOR RATERS

Thank you for agreeing to help me in my doctoral work.
I am asking that you do the following:

- Read the five page "Introduction" so as to familiarize yourself with the concepts and definitions needed.
- Read the Instructions following the Introduction.
- Rate each of the thirty (30) statements in two ways:
 - (a) for its relevance to a particular variable, and
 - (b) for its relevance to a particular belief.

Thank you.

INTRODUCTION

The Beliefs about Problem Formulation Scale

The problem for investigation is the development of a belief scale for use in assessing the beliefs of educational administrators and in predicting the direction and level of their problem formulation behaviour. The development of the Belief Scale is based on the view that what are called cognitive orientation clusters can provide a framework for predicting certain aspects of behaviour. The cognitive orientation clusters comprise four types of beliefs. Analysis of these four types of beliefs can, it is held, provide a basis for predicting both the direction and level of behaviour (Kreitler and Kreitler, 1976). The four types of beliefs are:

- (1) Beliefs about Self (BS),
- (2) General Beliefs (GB),
- (3) Goal Beliefs (Go) and
- (4) Normative Beliefs (N).

Description of Four Types Of Beliefs

A belief is defined as an affirmative or negative proposition relating to an object, a state or event. Four types of beliefs are used in this instrument. They conform to the classifications made by Parsons and Shils (1951) and used by Kreitler and Kreitler (1972, 1976). The four types of beliefs are described as follows:-

- (1) Beliefs about Self (BS) express cognitive propositions about one's self; for example, "I often approach the formulation of a problem by first specifying the features that appear to contribute to the problem."
- (2) General Beliefs (GB) express cognitive propositions about people, objects or situations in the present, past or future; for example, "Most administrators tend to be random and unsystematic in their search for solutions to problems."
- (3) Goal Beliefs (Go) express affective propositions concerning future actions, objects or states, i.e., those desired or rejected by the self; for example, "I want to explore more fully the area of strategies and their application in the teaching of problem solving skills."

- (4) Normative Beliefs (N) express general standards or rules relating to what people should think, say or do with regard to other people, objects or situations, for example, "Preparation programs in educational administration should place an emphasis on the development of problem-solving skills."

The differences among the four types of beliefs are in the nature of the concepts that serve as subject of the proposition, the relational concept, and the concept which stands for the predicate. For example:

A general belief may be stated as follows: "Considering many views of a problem and thinking about their relative consequences are essential in formulating a problem." A reformulation of this statement into statements of Normative (N), Goal (Go), and Self (BS) beliefs respectively are as follows: "Problems should be formulated by considering many different views of the problem and thinking about their relative consequences (N);" "I aim at viewing a problem from many different perspectives and comparing these perspectives (Go);" "I often think about many different views of the problem situation when formulating a problem (BS)."

As indicated, the focal behaviour is problem formulation. This can be described in terms of four variables varying along four different values (Allal, 1973; Getzels and Csikszentmihalyi, 1976). The four variables are:

- (1) Identification of the problem,
- (2) Selection of information,
- (3) Criteria used in the selection of information, and
- (4) Exploratory behaviour in investigating the nature of the problem.

The four values along each of the four problem formulation variables are shown in the table below:

TABLE 2

Variables of Problem Formulation	Four Alternate Values			
	1	2	3	4
A: Identif- ication of the problem	Simple	Moderate- ly simple	Moderate- ly complex	Complex
B: Select- ion of infor- mation	General and immediate	Particular and immediate	General, immediate and distant	Particular & general immediate & distant
C: Criteria used in selection of infor- mation	No criteria, reliance on intuition	Self ref- erenced criteria	Criteria admini- strators use	Criteria based on princ- iples
D: Explor- atory Behaviour (Investi- gation)	Literal investi- gation	Naive investi- gation	Active investi- gation	Abstract investi- gation

DEFINITION OF VARIABLES OF PROBLEM FORMULATION BEHAVIOUR

A: Identification of the Problem

This behaviour describes the number of aspects of the problematic situation and the relationships that are considered in determining the nature of the difference between the actual and desirable situation. Variations in the identification of the problem are differentiated as follows:

- (1) Simple identification of the problem,
- (2) Moderately simple identification of the problem,
- (3) Moderately complex identification of the problem, and
- (4) Complex identification of the problem.

A1: Simple identification of the problem. This behaviour is characterized by the consideration of limited attributes of the problem situation. Only a single specification of the state(s) of the problem is considered.

A2: Moderately simple identification of the problem. This behaviour is characterized by the identification of one or two aspects of the problem situation as problematic. Considerations of the problem situation are limited and similarities and differences between sets of conditions are identified.

A3: Moderately complex identification of the problem. This behaviour is characterized by the identification of two or three views of the problem situation. They are simultaneously held in focus and compared and cases are made for each different view. The relationships and the interactive effects of the different views are considered.

A4: Complex identification of the problem. This behaviour is characterized by the identification of many views of the problem situation. These views are simultaneously held in focus and compared. The outcomes are considerations of aspects of functional relationships and new ways of viewing the problem situation.

B: Selection of Information

This behaviour describes the type of information which is selected when identifying the nature of a problem. The cues or bits of information which are obtained about the problem situation are used for refining the conception of the problem. The four levels of selection of information are:

- (1) Selection of general information from immediate sources,
- (2) Selection of particular information from immediate sources,
- (3) Selection of general information from immediate and distant sources, and
- (4) Selection of particular and general information from immediate and distant sources.

B1: Selection of general information from immediate sources. This behaviour refers to the use of general information obtained from the presented situation. The search for information is minimal.

B2: Selection of particular information from immediate sources. This behaviour refers to the use of specific bits of information extracted from the presented situation. Search is required in selecting relevant bits of information.

B3: Selection of general information from immediate and distant sources. This behaviour refers to the use of general information obtained from the presented situation and from searching and questioning aspects of the situation. This requires the introduction of information from other sources.

Selection of particular and general information from immediate and distant sources. This behaviour refers to the use of general and specific bits of information extracted from the presented situation and obtained from other sources as a result of the questioning and challenging of aspects of the situation.

C: Criteria Used in the Selection of Information

This behaviour refers to the points of reference and values which an individual employs when selecting information pertaining to a problem situation. Four different values may be used:

- (1) No criteria,
- (2) Criteria based on personal preferences,
- (3) Criteria which other administrators use,
- (4) Criteria based on theoretical principles.

C1: No criteria. This behaviour is characterized by a reliance on gut-level feelings and intuition as a point of reference. No consideration is given to alternative points of reference.

C2: Criteria based on personal preferences. This behaviour is characterized by a reliance on one's personal interests and judgement as a point of reference.

C3: Criteria based on what other administrators use. This behaviour is characterized by a reliance on the knowledge of the practices of other administrators as a point of reference, besides one's personal preferences.

C4: Criteria based on principles. This behaviour is characterized by the consideration of personal standards and other administrators' standards as a point of reference, but they are considered in terms of theoretical models and principles.

D: Exploratory Behaviour in Investigating the Nature of the Problem

Exploratory behaviour refers to the depth and complexity of the investigation which is carried out when attempting to understand the nature of the problem. The investigation may range from a literal and concrete level to an abstract and conceptual level. The four levels of exploratory behaviour are:

- (1) Literal investigation,
- (2) Naive investigation,
- (3) Active investigation, and
- (4) Abstract investigation.

D1: Literal investigation. This type of investigation is characterized by the following features:

- (a) A focus on discrepancies which are obvious, and
- (b) Acceptance of the obvious discrepancies without questioning them. Investigation is limited and restricted to the immediate experiences of the situation.

D2: Naive interpretation. This type of behaviour is characterized by the following features:

- (a) A focus on discrepancies which are obvious, and
- (b) Limited examination of the obvious discrepancies within the given context.

D3: Active investigation. This type of behaviour is characterized by the following features:

- (a) A focus on discrepancies which are obvious and obscure, and
- (b) Limited examination of the discrepancies outside the given context. This behaviour involves questioning and challenging aspects of the problematic situation with practical objectives in mind.

D4: Abstract conceptualization. This type of behaviour is characterized by the following features:

- (a) A comprehensive examination of discrepancies which are obvious and obscure, and
- (b) The examination of discrepancies at an abstract level. Aspects of the situation are questioned, analysed and manipulated in many different ways, leading to new ways of thinking about the problem. Aspects of the situation are interpreted as symptoms of kinds of problems to be explored.

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INSTRUCTIONS

I have developed 80 statements each of which is assumed to relate to one of sixteen orientations to problem formulation behaviour. A set of 30 of these statements has been selected for you to rate. These statements appear on the following pages and are arranged in sets of five. Each set of five statements is related to a particular variable of problem formulation behaviour, for example, A1: Identification of a single problem, or D1: Exploratory Behaviour: Literal Investigation. The problem formulation variable is given at the beginning of each set of five (5) statements.

I would like you to rate the statements in two ways:

- (1) Indicate the degree to which each statement is relevant to the particular problem formulation variable (for example, a problem formulation variable may be identified as "C2: Criteria based on personal preferences") by circling one of the five numerals below the statement: 1, 2, 3 4, 5.

(1) refers to a statement which is not relevant to the variable of problem formulation behaviour; 2 = slightly relevant; 3 = somewhat relevant; 4 = relevant; and 5 refers to a statement which is highly relevant to the variable of problem formulation behaviour.)

Please feel at liberty to make notes or suggestions underneath the statements.

- (2) Indicate to which of the four types of beliefs the statement seems most relevant, by checking one of the following codes to the right side of the statement: (BS, GB, Go and N)
BS refers to Beliefs about Self, GB refers to General Beliefs, Go refers to Goal Beliefs and N refers to Normative Beliefs.

Before proceeding with your rating of the statements I would like you to read the definition of the terms stated in the Introductory Section.

I would also like you to read the Sample of Instructions which will accompany the final instrument and which has been included in Section II for your suggestions and comments, specific or general which you may have to offer.

Thank you for your cooperation.
YOUR ASSISTANCE AS A JUDGE IN THIS PROJECT IS APPRECIATED.
It would assist me greatly if you could return your responses by the end of the day. Thank you.

SECTION II

A SAMPLE OF INSTRUCTIONS TO THE SUBJECTS

BELIEFS ABOUT PROBLEM FORMULATION SCALE

Purpose

This questionnaire is based on the idea that there is a difference between solving problems and formulating them, and it focuses only on the second of these activities.

When we try to solve a problem we are in effect trying to remove what we see as the discrepancy between actual conditions and conditions which are desired. WHEN WE FORMULATE A PROBLEM, WE TRY, IN SOME WAY, TO IDENTIFY WHAT IT IS THAT MAKES THE ACTUAL CONDITIONS DIFFERENT FROM THAT WHICH IS DESIRED. The way we do this may be deliberate and conscious or it may not, but it has some effect on the way we eventually set about solving the problem.

In this questionnaire you are invited to consider the formulation of problems which go beyond the run-of-the-mill, routine kinds of problems that arise everyday. Thus we are concerned with THE NON-ROUTINE, COMPLEX KINDS OF PROBLEMS FACED BY INDIVIDUAL ADMINISTRATORS.

This questionnaire, then is designed to assess your beliefs about the way problems are formulated.

General Description of the Questionnaire

The questionnaire has five parts. The first deals with demographic information and the next four deal with four different types of beliefs about problem formulation. Each type of belief is independent of the other three. Thus, each set of questions is to be answered independently of the others.

PART II deals with beliefs about how you think administrators should formulate problems,

PART III deals with beliefs about how administrators actually do formulate problems,

PART IV deals with what you personally would like to aim for when you formulate problems, and

PART V deals with what you think you personally do when you formulate problems.

Please answer each part in the order in which it is presented. Read carefully the instructions for that part before answering its questions.

Answer all questions, but if you have difficulty understanding the statement, circle the statement number.

The questionnaire pertains to a general study of the theory of problem formulation and your responses will be used for research purposes only. The answers that you give and the general information which you provide will be considered confidential. The analysis and reporting will not refer to individual responses in anyway. I appreciate your willingness to participate in this study despite your busy schedule. Thank you for your cooperation.

..... It would assist the project greatly if you could return your completed questionnaire by the end of the week.

PART I

Demographic Information

1. At what kind of institution do you work?

2. What is your present position?.

3. What is your sex?

Male ☐

Female ☐

4. How many years have you worked as a full time administrator?

Years _____

5. Have you carried out administrative duties on a part-time basis in an educational institution?

No ☐

Yes ☐

6. If Yes: How many years have you worked as a part-time administrator in an educational institution?

Year(s) _____

7. Are you presently involved in institutional research?

No ☐

Yes ☐

- A. IF YES: How long have you been involved in institutional research?

Year(s) _____

8. Have you been involved in institutional research in the past?

No ☐

Yes ☐

- A. IF YES: What is the nature of this involvement in institutional research?

9. Have you had any formal training (as distinct from learning by experience) in decision making and/or problem solving?

No ☐

Yes ☐

A. IF YES: Please specify the nature of this training.

PART II: NORMATIVE BELIEFS

HOW ADMINISTRATORS SHOULD FORMULATE PROBLEMS

Instructions

These statements express beliefs about how administrators should or should not go about formulating problems.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

PART III: GENERAL BELIEFS

HOW ADMINISTRATORS ACTUALLY FORMULATE PROBLEMS

Instructions

These statements express beliefs about how administrators actually formulate problems.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

As you may have noted, in Parts II and III of the questionnaire you have been considering how administrators formulate problems.

Now I would like you to think about how you personally formulate problems.

In Part IV, I would like you to think about what you would want to aim for when formulating problems.

In Part V, I would like you to think about how you actually go about formulating problems.

PART IV: GOAL BELIEFS

MY OWN GOALS WHEN FORMULATING PROBLEMS

Instructions

These statements express personal goals, (beliefs about your aims) in formulating problems.

Please read each statement carefully. Then identify the statement which most nearly characterizes your goals by placing a check mark next to it.

PART V: BELIEFS ABOUT SELF

HOW I ACTUALLY FORMULATE PROBLEMS

Instructions:

These statements express beliefs about how you actually go about formulating problems. Respond to each statement only on the basis of what you believe is true about yourself and describes best what you actually do, and not what you would like to be true about you.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

STATEMENTS REPRESENTING BELIEFS ABOUT PROBLEM FORMULATION

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

StatementsResponse OptionsD1: Exploratory Behaviour: Literal Investigation

1. Administrators should think about the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N

1 2 3 4 5

2. Administrators often think about the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N

1 2 3 4 5

3. I would like to aim at investigating the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N

1 2 3 4 5

4. Discrepancies which are obvious in the given work-situation should be the problems to be attacked. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

5. I tend to think about the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N
- 1 2 3 4 5

D2: Exploratory Behaviour:- Naive Investigation

6. Administrators often think about several aspects of the discrepancies which are obvious in the given work situation as the problems to attack. BS GB Go N
- 1 2 3 4 5

7. Administrators should think about several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N
- 1 2 3 4 5

8. My goal is to investigate several aspects of the obvious discrepancies in the given work-situation as the possible problems to attack. BS GB Go N
- 1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

9. I tend to think about several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N

1	2	3	4	5
---	---	---	---	---

10. I would like to aim at investigating several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack. BS GB Go N

1	2	3	4	5
---	---	---	---	---

D3: Exploratory Behaviour:- Active Investigation

11. I tend to think about the discrepancies which are obvious and those which are not as symptoms of problems to be discovered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

12. Administrators should think about the discrepancies which are obvious and those which are not as symptoms of problems to be discovered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

13. Administrators often think about the discrepancies which are obvious and those which are not, as symptoms of problems to be discovered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

14. I would like to aim at investigating the discrepancies which are obvious and those which are not, as the symptoms of problems to be discovered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

15. Investigating discrepancies which are obvious and those which are not can provide indications of whether they are symptoms of a problem or not. BS GB Go N

1	2	3	4	5
---	---	---	---	---

D4: Exploratory Behaviour:- Abstract Investigation

16. Administrators should think about every conceivable discrepancy as a symptom of some particular kind of problem to be discovered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

17. I am inclined to think of conceivable discrepancies as symptoms of some particular kind of problem. BS GB Go N

1 2 3 4 5

18. My goal is to investigate every conceivable discrepancy as a symptom of some particular kind of problem which is to be discovered. BS GB Go N

1 2 3 4 5

19. Administrators often think about every conceivable discrepancy as a symptom of some particular kind of problem to be discovered. BS GB Go N

1 2 3 4 5

20. I tend to think about every conceivable discrepancy as a symptom of some particular kind of problem to be discovered. BS GB Go N

1 2 3 4 5

C1: Criteria Used:-No Criteria

21. My goal is to use my intuitive judgement as a point of reference when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

22. Administrators should rely on their intuition as a guide when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

23. Administrators use criteria based on their intuition when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

24. When deciding what information will be useful in identifying the kind of problem that exists, I focus on the information in terms of my intuitive judgement. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

25. Administrators should rely on their intuition and not consciously impose on themselves any theory when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

C2: Criteria Used:-Criteria Based on Personal Preferences

26. Administrators should rely on their personal preferences as a guide when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

27. I focus on the information in terms of my personal preferences when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

28. Administrators use criteria based on their personal preferences when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

29. My goal is to use models which conform with my personal preferences as a point of reference when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

30. Personal preferences should be recognized as an important feature when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

C3: Criteria Used:-Criteria Which Other Administrators Use

31. Administrators should rely on their knowledge of other administrators' standards as a guide when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

32. My goal is to use models similar to what other administrators would use as a point of reference when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

33. Administrators use criteria based on their knowledge of other administrators' standards when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

34. Administrators focus on information from the perspective of other administrators when deciding what information to use in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

35. When deciding what information will be useful in identifying the kind of problem that exists, I focus on the information in terms of what other administrators would do in such situations. BS GB Go N

1	2	3	4	5
---	---	---	---	---

C4: Criteria Used:-Criteria Based on Theoretical Principles

36. I focus on the information in terms of theoretical principles when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

37. Administrators should rely on theoretical principles as a guide when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

38. Administrators use criteria based on theoretical principles when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

39. My goal is to use theoretical principles as a point of reference when deciding what information will be useful in identifying the kind of problem that exists. BS GB Go N

1	2	3	4	5
---	---	---	---	---

40. When deciding what information will be useful in identifying the kind of problem that exists principles such as seriousness, solvability and probability are to be considered. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

B1: Selection of Information:-Particular Pieces of Information From Immediately Available Sources

41. Administrators consider particular pieces of information which are immediately available. BS GB Go N

1 2 3 4 5

42. I tend to consider particular pieces of information, which are immediately available. BS GB Go N

1 2 3 4 5

43. Because of time and energy constraints administrators should pay most attention to particular pieces of information which are at hand. BS GB Go N

1 2 3 4 5

44. My goal is to consider particular pieces of information, which are immediately available. BS GB Go N

1 2 3 4 5

45. Administrators should consider particular pieces of information, which are immediately available. .. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

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Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

B2: Selection of Information:-General Information From
Immediately Available Sources

46. I tend to obtain a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available. BS GB Go N

1 2 3 4 5

47. Administrators should consider obtaining a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available. BS GB Go N

1 2 3 4 5

48. Administrators consider obtaining a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

49. My goal is to obtain a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available. BS GB Go N

1 2 3 4 5

50. Administrators try to get a good idea of the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available. BS GB Go N

1 2 3 4 5

B3: Selecting of Information:- General Information From Immediate and Distant Sources

51. When considering what information to use in attempting to understand the nature of a problem administrators consider getting a good idea of the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately to hand or not. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

52. When considering what information to use in attempting to understand the nature of a problem administrators consider obtaining a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately to hand or not. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

53. When considering what information to use in attempting to understand the nature of a problem administrators should consider obtaining a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately to hand or not. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

54. When considering what information to use in attempting to understand the nature of a problem I tend to obtain a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately at hand or not. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

55. When considering what information to use in attempting to understand the nature of a problem my goal is to obtain a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately to hand or not. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

B4: Selecting Information:- Particular Pieces of Information From Immediate and Distant Sources

56. When considering what information to use in attempting to understand the nature of a problem: administrators should consider particular pieces of information which may or may not be immediately available. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
57. When considering what information to use in attempting to understand the nature of a problem: I tend to consider particular pieces of information on which may or may not be immediately available. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

58. When considering what information to use in attempting to understand the nature of a problem I find myself searching for as many pieces of information as possible which may or may not be immediately available. BS GB Go N

1 2 3 4 5

59. When considering what information to use in attempting to understand the nature of a problem administrators consider particular pieces of information which may or may not be immediately available. . BS GB Go N

1 2 3 4 5

60. When considering what information to use in attempting to understand the nature of a problem: my goal is to consider particular pieces of information which may or may not be immediately available. BS GB Go N

1 2 3 4 5

A1: Identification of a Single Major Problem

61. When faced with a perplexing work-situation administrators should concentrate on discovering the single major problem which the situation poses. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

62. When faced with a perplexing work-situation administrators often identify a single major problem. BS GB Go N

1	2	3	4	5
---	---	---	---	---

63. When faced with a perplexing work-situation I look for the single major problem which I believe is essential to understanding the situation. BS GB Go N

1	2	3	4	5
---	---	---	---	---

64. When faced with a perplexing work-situation in educational departments it is often only necessary to discover the single major problem which the situation poses. BS GB Go N

1	2	3	4	5
---	---	---	---	---

65. When faced with a perplexing work-situation my goal is to identify the single major problem which I believe is relevant to understanding the situation. BS GB Go N

1	2	3	4	5
---	---	---	---	---

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

A2: Identification of at Least Two Major Problems

66. When faced with a perplexing work-situation I look for at least two major problems which I believe are essential to understanding the situation. BS GB Go N

1 2 3 4 5

67. When faced with a perplexing work-situation administrators often identify at least two major problems. BS GB Go N

1 2 3 4 5

68. When faced with a perplexing work-situation my goal is to identify two or three major problems which I believe are relevant to understanding the situation. BS GB Go N

1 2 3 4 5

69. administrators should concentrate on discovering at least two major problems which the situation poses. BS GB Go N

1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

70. When faced with a perplexing work-situation it is poor practice not to identify two or three major problems. BS GB Go N
- 1 2 3 4 5

A3: Identification of One or Two Major Problems as Related to More Specific Problems

71. When faced with a perplexing work-situation I look for one or two major problems which are related to more specific problems which I believe are essential to understanding the situation. BS GB Go N
- 1 2 3 4 5
72. When faced with a perplexing work-situation administrators should concentrate on discovering one or two major problems and their relation to more specific problems which the situation poses. BS GB Go N
- 1 2 3 4 5
73. When faced with a perplexing work-situation it is good administrative practice to concentrate on discovering one or two major problems. BS GB Go N
- 1 2 3 4 5
74. my goal is to identify one or two major problems and their relation to more specific problems, which I believe are relevant to understanding the situation. BS GB Go N
- 1 2 3 4 5

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

75. When faced with a perplexing work-situation administrators often identify one or two major problems and their relation to more specific problems. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

A4: Identification of Multiple Major Problems and Their Relation to More Specific Problems

76. When faced with a perplexing work-situation it is not enough to identify a few major problems; administrators should identify multiple sets of interrelated major and more specific problems. . BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

77. When faced with a perplexing work-situation administrators often identify as many major problems as possible and how they might be related to more specific problems. BS GB Go N
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

NOT	SLIGHTLY	SOMEWHAT		HIGHLY
1	2	3	4	5
RELEVANT	RELEVANT	RELEVANT	RELEVANT	RELEVANT

BS = BELIEFS ABOUT SELF

GB = GENERAL BELIEFS

Go = GOAL BELIEFS

N = NORMATIVE BELIEFS

78. When faced with a perplexing work-situation I look for as many major problems as possible and how they might be related to more specific problems, which I believe are essential to understanding the situation. BS GB Go N

1 2 3 4 5

79. When faced with a perplexing work-situation My goal is to identify as many major problems as possible and their relation to more specific problems which I believe are relevant to understanding the situation. BS GB Go N

1 2 3 4 5

80. When faced with a perplexing work-situation Administrators should concentrate on discovering as many major problems as possible and how they might be related to more specific problems. BS GB Go N

1 2 3 4 5

APPENDIX B

ITEM ANALYSIS DATA FOR THE PILOT TEST

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 1 NORM

ITEM NUMBER 1				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	1	5.6 C	-0.39	-0.11	-0.80	-0.22 C	9.00	40.00
C 2	2	0	0.0 C	0.0	0.0	0.0	0.0 C	0.0	0.0
C 3	3	4	22.2 C	-0.35	-0.33	-0.48	-0.46 C	11.00	39.00
C 4	4	13	72.2 C	0.52	0.36	0.70	0.48 C	13.00	43.85
TOTAL		18							

ITEM NUMBER 2				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	1	5.6 C	-0.28	-0.49	-0.56	-1.00 C	10.00	31.00
C 2	2	1	5.6 C	-0.51	-0.62	-1.05	-1.26 C	8.00	28.00
C 3	3	14	77.8 C	0.41	0.47	0.57	0.65 C	12.79	44.00
C 4	4	2	11.1 C	0.03	0.18	0.05	0.30 C	12.50	45.50
TOTAL		18							

ITEM NUMBER 3				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	2	11.1 C	-0.32	0.27	-0.52	0.45 C	10.50	47.00
C 2	2	1	5.6 C	-0.51	-0.62	-1.05	-1.26 C	8.00	28.00
C 3	3	2	11.1 C	0.03	0.21	0.05	0.35 C	12.50	46.00
C 4	4	13	72.2 C	0.46	-0.03	0.62	-0.04 C	12.92	42.46
TOTAL		18							

ITEM NUMBER 4				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	6	33.3 C	-0.86	-0.31	-1.12	-0.41 C	9.83	40.00
C 2	2	1	5.6 C	-0.04	-0.15	-0.08	-0.31 C	12.00	39.00
C 3	3	10	55.6 C	0.74	0.28	0.94	0.35 C	13.70	44.00
C 4	4	1	5.6 C	0.20	0.19	0.40	0.38 C	14.00	47.00
TOTAL		18							

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 2 GENERAL

ITEM NUMBER 1				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	7	38.9 C	-0.57	-0.67	-0.73	-0.86 C	7.14	37.71
C 2	2	3	16.7 C	0.08	0.27	0.12	0.40 C	9.33	46.00
C 3	3	3	16.7 C	-0.29	0.01	-0.43	0.01 C	7.33	42.67
C 4	4	5	27.8 C	0.80	0.50	1.06	0.67 C	12.00	47.20
TOTAL		18							

ITEM NUMBER 2				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	6	33.3 C	-0.60	-0.42	-0.78	-0.54 C	6.83	39.17
C 2	2	5	27.8 C	0.34	0.31	0.45	0.41 C	10.20	45.40
C 3	3	5	27.8 C	-0.02	-0.10	-0.03	-0.14 C	8.80	41.60
C 4	4	2	11.1 C	0.45	0.34	0.75	0.56 C	12.00	48.00
TOTAL		18							

ITEM NUMBER 3				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	7	38.9 C	-0.25	-0.22	-0.31	-0.28 C	8.14	41.00
C 2	2	4	22.2 C	-0.20	0.11	-0.27	0.16 C	8.00	43.75
C 3	3	6	33.3 C	0.18	0.03	0.23	0.04 C	9.50	42.83
C 4	4	1	5.6 C	0.51	0.19	1.05	0.38 C	14.00	47.00
TOTAL		18							

ITEM NUMBER 4				COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P	PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	6	33.3 C	-0.16	-0.07	-0.21	-0.09 C	8.33	42.00
C 2	2	5	27.8 C	-0.43	-0.30	-0.58	-0.40 C	7.20	39.80
C 3	3	2	11.1 C	0.23	0.12	0.39	0.20 C	10.50	44.50
C 4	4	5	27.8 C	0.44	0.29	0.58	0.38 C	10.60	45.20
TOTAL		18							

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 3 GOALS

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	1	5.6	C	-0.09	-0.15	-0.19	-0.31	C	11.00	39.00
C 2	2	4	22.2	C	-0.33	-0.10	-0.46	-0.14	C	10.50	41.50
C 3	3	4	22.2	C	-0.07	-0.17	-0.10	-0.23	C	11.50	40.75
C 4	4	9	50.0	C	0.38	0.29	0.47	0.36	C	12.56	44.22
TOTAL		18									

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	2	11.1	C	-0.56	-0.80	-0.93	-1.34	C	8.50	29.50
C 2	2	4	22.2	C	-0.14	-0.17	-0.19	-0.23	C	11.25	40.75
C 3	3	9	50.0	C	0.16	0.45	0.20	0.56	C	12.11	45.11
C 4	4	3	16.7	C	0.41	0.27	0.61	0.40	C	13.67	46.00
TOTAL		18									

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	2	11.1	C	-0.13	0.18	-0.22	0.30	C	11.00	45.50
C 2	2	2	11.1	C	-0.65	-0.62	-1.07	-1.03	C	8.00	32.50
C 3	3	2	11.1	C	-0.05	0.21	-0.08	0.35	C	11.50	46.00
C 4	4	12	66.7	C	0.55	0.15	0.71	0.20	C	12.58	43.17
TOTAL		18									

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	5	27.8	C	-0.47	-0.38	-0.63	-0.51	C	10.20	39.00
C 2	2	1	5.6	C	0.03	0.19	0.05	0.38	C	12.00	47.00
C 3	3	9	50.0	C	0.05	0.15	0.07	0.19	C	11.89	43.44
C 4	4	3	16.7	C	0.48	0.14	0.72	0.21	C	14.00	44.33
TOTAL		18									

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 4 SELF

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	3	16.7	C	-0.74	-0.77	-1.11	-1.15	C	6.00
C 2	2	2	11.1	C	-0.17	-0.28	-0.29	-0.47	C	8.50
C 3	3	8	44.4	C	0.50	0.44	0.63	0.55	C	10.75
C 4	4	5	27.8	C	0.19	0.35	0.25	0.47	C	10.20
TOTAL		18								45.80

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	2	11.1	C	-0.42	-0.22	-0.70	-0.36	C	7.00
C 2	2	8	44.4	C	-0.18	-0.20	-0.23	-0.26	C	9.13
C 3	3	8	44.4	C	0.45	0.34	0.56	0.43	C	10.63
C 4	4	0	0.0	C	0.0	0.0	0.0	0.0	C	0.0
TOTAL		18								

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	11	61.1	C	-0.33	0.04	-0.41	0.05	C	9.00
C 2	2	3	16.7	C	-0.26	-0.36	-0.38	-0.53	C	8.33
C 3	3	3	16.7	C	0.44	0.22	0.66	0.32	C	11.67
C 4	4	1	5.6	C	0.39	0.15	0.80	0.30	C	13.00
TOTAL		18								46.00

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	4	22.2	C	-0.33	-0.21	-0.46	-0.30	C	8.25
C 2	2	3	16.7	C	-0.46	-0.36	-0.69	-0.53	C	7.33
C 3	3	5	27.8	C	0.36	0.13	0.48	0.18	C	10.80
C 4	4	6	33.3	C	0.31	0.34	0.40	0.44	C	10.50
TOTAL		18								45.33

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 1 NORM

ITEM NUMBER	1	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	1	5.6	3.611	0.778	0.211	0.281		
2	2.0	0	0.0						
3	3.0	4	22.2						
4	4.0	13	72.2						
TOTAL		18							

ITEM NUMBER	2	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	1	5.6	2.944	0.639	0.113	0.679		
2	2.0	1	5.6						
3	3.0	14	77.8						
4	4.0	2	11.1						
TOTAL		18							

ITEM NUMBER	3	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	2	11.1	3.444	1.042	0.028	-0.043		
2	2.0	1	5.6						
3	3.0	2	11.1						
4	4.0	13	72.2						
TOTAL		18							

ITEM NUMBER	4	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	6	33.3	2.333	1.029	0.602	0.374		
2	2.0	1	5.6						
3	3.0	10	55.6						
4	4.0	1	5.6						
TOTAL		18							

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 2 GENERAL

ITEM NUMBER 1					ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	7	38.9	2.333	1.283	0.268	0.626		
2	2.0	3	16.7						
3	3.0	3	16.7						
4	4.0	5	27.8						
TOTAL		18							

ITEM NUMBER 2					ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	6	33.3	2.167	1.043	0.156	0.357		
2	2.0	5	27.8						
3	3.0	5	27.8						
4	4.0	2	11.1						
TOTAL		18							

ITEM NUMBER 3					ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	7	38.9	2.056	0.998	0.057	0.214		
2	2.0	4	22.2						
3	3.0	6	33.3						
4	4.0	1	5.6						
TOTAL		18							

ITEM NUMBER 4					ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	6	33.3	2.333	1.237	-0.050	0.271		
2	2.0	5	27.8						
3	3.0	2	11.1						
4	4.0	5	27.8						
TOTAL		18							

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 3 GOALS

ITEM NUMBER	1	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	1	5.6	3.167	0.985	-0.086	0.266		
2	2.0	4	22.2						
3	3.0	4	22.2						
4	4.0	9	50.0						
TOTAL		18							

ITEM NUMBER	2	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	2	11.1	2.722	0.895	0.282	0.777		
2	2.0	4	22.2						
3	3.0	9	50.0						
4	4.0	3	16.7						
TOTAL		18							

ITEM NUMBER	3	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	2	11.1	3.333	1.085	0.010	0.144		
2	2.0	2	11.1						
3	3.0	2	11.1						
4	4.0	12	66.7						
TOTAL		18							

ITEM NUMBER	4	ITEM STATS				CORRELATIONS			
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC	
1	1.0	5	27.8	2.556	1.097	0.054	0.331		
2	2.0	1	5.6						
3	3.0	9	50.0						
4	4.0	3	16.7						
TOTAL		18							

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 4 SELF

ITEM NUMBER 1					ITEM STATS		CORRELATIONS		
OPTION	WGT	N	P		MEAN	S.D.	ST	TT	EC
1	1.0	3	16.7		2.833	1.043	0.275	0.809	
2	2.0	2	11.1						
3	3.0	8	44.4						
4	4.0	5	27.8						
TOTAL		18							

ITEM NUMBER 2					ITEM STATS		CORRELATIONS		
OPTION	WGT	N	P		MEAN	S.D.	ST	TT	EC
1	1.0	2	11.1		2.333	0.686	0.252	0.358	
2	2.0	8	44.4						
3	3.0	8	44.4						
4	4.0	0	0.0						
TOTAL		18							

ITEM NUMBER 3					ITEM STATS		CORRELATIONS		
OPTION	WGT	N	P		MEAN	S.D.	ST	TT	EC
1	1.0	11	61.1		1.667	0.970	0.108	0.137	
2	2.0	3	16.7						
3	3.0	3	16.7						
4	4.0	1	5.6						
TOTAL		18							

ITEM NUMBER 4					ITEM STATS		CORRELATIONS		
OPTION	WGT	N	P		MEAN	S.D.	ST	TT	EC
1	1.0	4	22.2		2.722	1.179	-0.022	0.412	
2	2.0	3	16.7						
3	3.0	5	27.8						
4	4.0	6	33.3						
TOTAL		18							

APPENDIX C

FINAL FORM OF THE PROBLEM FORMULATION

BELIEF INSTRUMENT

BELIEFS ABOUT PROBLEM FORMULATION SCALE

This questionnaire is based on the idea that there is a difference between solving problems and formulating them, and it focuses only on the second of these activities.

When we try to solve a problem we are in effect trying to remove what we see as the discrepancy between actual conditions and conditions which are desired. WHEN WE FORMULATE A PROBLEM, WE TRY, IN SOME WAY, TO IDENTIFY WHAT IT IS THAT MAKES THE ACTUAL CONDITIONS DIFFERENT FROM THAT WHICH IS DESIRED. The way we do this may be deliberate and conscious or it may not, but it has some effect on the way we eventually set about solving the problem.

In this questionnaire you are invited to consider the formulation of problems which go beyond the run-of-the-mill, routine kinds of problems that arise everyday. Thus we are concerned with THE NON-ROUTINE, COMPLEX KINDS OF PROBLEMS FACED BY INDIVIDUAL ADMINISTRATORS.

This questionnaire, then is designed to assess your beliefs about the way problems are formulated.

General Description of the Questionnaire

The questionnaire has five parts. The first deals with demographic information and the next four deal with four different types of beliefs about problem formulation. Each type of belief is independent of the other three. Thus, each set of questions is to be answered independently of the others.

PART II deals with beliefs about how you think administrators should formulate problems,

PART III deals with beliefs about how administrators actually do formulate problems,

PART IV deals with what you personally would like to aim for when you formulate problems, and

PART V deals with what you think you personally do when you formulate problems.

Please answer each part in the order in which it is presented. Read carefully the instructions for that part before answering its questions.

Answer all questions, but if you have difficulty understanding the statement, circle the statement number.

The questionnaire pertains to a general study of the theory of problem formulation and your responses will be used for research purposes only. The answers that you give and the general information which you provide will be considered confidential. The analysis and reporting will not refer to individual responses in anyway. I appreciate your willingness to participate in this study despite your busy schedule. Thank you for your cooperation.

.....

It would assist the project greatly if you could return your completed questionnaire by the end of the week.

.....

PART I

Demographic Information

1. At what kind of institution do you work?

College

☐

Institute

☐

2. What is your present position?

3. What is your sex?

Male

☐

Female

☐

4. What is your age?

under 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or over

5. Do you have a Diploma or other professional, non-degree qualifications?

No ☐

Yes ☐

A. IF YES: In what field?

(a) in Art ☐

(b) in Music ☐

(c) in Trades/
Technology ☐

(d) in Teaching ☐

(e) Other
(Please specify the field) ... ☐

.....

6. Do you have a university degree?

No ☐

Yes ☐

A. IF YES: Which of the following best describes your highest degree?

•• Bachelor's Degree ☐

•• Master's Degree

- (a) in educational administration . ☐
- (b) in business administration ... ☐
- (c) in higher and/or
adult education ☐
- (d) not in administrative, adult,
or higher education
(Please specify the area
of specialization) ☐
-

•• Doctoral Degree

- (a) in educational
administration ☐
- (b) in business
administration ☐
- (c) in higher and/or
adult education ☐
- (d) not in administrative, adult,
or higher education
(Please specify the area
of specialization) ☐
-

7. For how many years and for what percentage of time have you been employed as an administrator in your present institution?

(Please place a check mark in all appropriate cells)

% Time spent in administration	YEARS							
	0-1	2-4	5-7	8-10	11-15	16-20	21-25	over 25
Under 50%								
50%-65%								
66%-75%								
Over 75%								

8. How much time are you spending in administrative duties, in your assignment this year? (Please check one item only.)

50%-65% ☐

66%-75% ☐

over 75% ☐

9. Have you in the past carried out administrative duties at other educational institutions?

No ☐

Yes ☐

10. IF YES: For how many years and for what percentage of time have you worked as an administrator in other educational institution(s)?

(Please place a checkmark in all appropriate cells)

% Time spent in administration	YEARS							
	0-1	2-4	5-7	8-10	11-15	16-20	21-25	over 25
Under 50%								
50%-65%								
66%-75%								
Over 75%								

11. Are you presently involved in institutional research, that is research relating to the operation of your institution?

No

☐

Yes

☐

- A. IF YES: How long have you been involved in institutional research?

Year(s) _____

12. Have you been involved in institutional research in the past?

No

☐

Yes

☐

- A. IF YES: What is the nature of this involvement in institutional research?

13. Have you had any formal training (as distinct from learning by experience) in decision making and/or problem solving?

No

☐

Yes

☐

- A. IF YES: Please indicate the nature of this training by placing a check mark against one or more of these items.

Course work _____ Workshop _____

Seminar _____ Major area of study _____

Other _____

PART II: NORMATIVE BELIEFS

HOW ADMINISTRATORS SHOULD FORMULATE PROBLEMS

Instructions

These statements express beliefs about how administrators should or should not go about formulating problems.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

1. When faced with a perplexing work-situation:
(Choose one of the following)

- a. _____ administrators should concentrate on discovering two or three major problems which the situation poses.
- b. _____ administrators should concentrate on discovering one or two major problems and their relation to more specific problems which the situation poses.
- c. _____ administrators should concentrate on discovering as many major problems as possible and how they might be related to more specific problems.
- d. _____ administrators should concentrate on discovering the single major problem which the situation poses.

2. Problems are characterized by discrepancies between actual conditions and desired conditions. When examining the nature of these discrepancies:
(Choose one of the following)

- a. _____ administrators should think about the discrepancies which are obvious in the given work-situation as the problems to attack.
- b. _____ administrators should think about several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack.

c. _____ administrators should think about the discrepancies which are obvious and those which are not, as symptoms of problems to be discovered.

d. _____ administrators should think about all conceivable discrepancies as symptoms of particular kinds of problems to be discovered.

3. When faced with a problem, administrators consciously or unconsciously, need to decide what kind of problem it is. In order to find out, they sometimes (consciously or unconsciously) seek information. How should they decide which information to seek?

(Choose one of the following)

a. _____ by letting whatever comes to mind guide their choice.

b. _____ by relying chiefly on their personal preferences as a guide.

c. _____ by relying chiefly on theoretical principles as a guide.

d. _____ by relying chiefly on their knowledge of other administrators' standards as a guide.

4. Having decided what kind of problem they are facing, administrators sometimes need to explore the nature of the problem further. To do this, they will use information. What information should they use?

(Choose one of the following)

a. _____ administrators should consider particular pieces of information which are immediately available.

b. _____ administrators should consider particular pieces of information which may or may not be immediately available.

c. _____ administrators should consider obtaining a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available.

d. _____ administrators should consider obtaining a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available, whether immediately at hand or not.

PART III:GENERAL BELIEFS

HOW ADMINISTRATORS ACTUALLY FORMULATE PROBLEMS

Instructions

These statements express beliefs about how administrators actually formulate problems.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

1. When faced with a perplexing work-situation:
(Choose one of the following)

- a. _____ administrators often identify one or two major problems and their relation to more specific problems.
- b. _____ administrators often identify two or three major problems.
- c. _____ administrators often identify a single major problem.
- d. _____ administrators often identify as many major problems as possible and how they might be related to more specific problems.

2. Problems are characterized by discrepancies between actual conditions and desired conditions. When examining the nature of these discrepancies:
(Choose one of the following)

- a. _____ administrators often think about the discrepancies which are obvious and those which are not, as symptoms of problems to be discovered.
- b. _____ administrators often think about the discrepancies which are obvious in the given work-situation as the problems to attack.
- c. _____ administrators often think about several aspects of the discrepancies which are obvious in the given work situation as the problems to attack.
- d. _____ administrators often think about all conceivable discrepancies as symptoms of particular kinds of problems to be discovered.

3. When faced with a problem, administrators consciously or unconsciously, need to decide what kind of problem it is. In order to find out, they sometimes (consciously or unconsciously) seek information. How do they decide which information to seek?

(Choose one of the following)

- a. _____ They decide by relying chiefly on theoretical principles as a guide.
- b. _____ They decide by letting whatever comes to mind guide their choice.
- c. _____ They decide by relying chiefly on their personal preferences as a guide.
- d. _____ They decide by relying chiefly on their knowledge of other administrators' standards as a guide.

4. Having decided what kind of problem they are facing, administrators sometimes need to explore the nature of the problem further. To do this, they use information. What information do they use?

(Choose one of the following)

- a. _____ administrators consider particular pieces of information, which may or may not be immediately available.
- b. _____ administrators consider obtaining a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information may be immediately available.
- c. _____ administrators consider obtaining a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available whether immediately at hand or not.
- d. _____ administrators consider particular pieces of information which are immediately available.

As you may have noted, in Parts II and III of the questionnaire you have been considering how administrators formulate problems.

Now I would like you to think about how you personally formulate problems.

In Part IV, I would like you to think about what you would want to aim for when formulating problems.

In Part V, I would like you to think about how you actually go about formulating problems.

PART IV:GOAL BELIEFS

MY OWN GOALS WHEN FORMULATING PROBLEMS

Instructions

These statements express personal goals, (beliefs about your aims) in formulating problems.

Please read each statement carefully. Then identify the statement which most nearly characterizes your goals by placing a check mark next to it.

1. When faced with a perplexing work-situation:
(Choose one of the following)

- a. _____ my goal is to identify the single major problem which I believe is relevant to understanding the situation.
- b. _____ my goal is to identify as many major problems as possible and their relation to more specific problems, which I believe are relevant to understanding the situation.
- c. _____ my goal is to identify two or three major problems which I believe are relevant to understanding the situation.
- d. _____ my goal is to identify one or two major problems and their relation to more specific problems, which I believe are relevant to understanding the situation.

2. Problems are characterized by discrepancies between actual conditions and desired conditions. When examining the nature of these discrepancies:
(Choose one of the following)

- a. _____ my goal is to think about the discrepancies which are obvious and which are not, as the symptoms of problems to be discovered.
- b. _____ my goal is to think about all conceivable discrepancies as symptoms of particular kinds of problems to be discovered.
- c. _____ my goal is to think about several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack.

- d. _____ my goal is to think about the discrepancies which are obvious in the given work-situation as the problems to attack.

3. When faced with a problem, I consciously or unconsciously, need to decide what kind of problem it is. In order to find out, I sometimes (consciously or unconsciously) seek information. My goal when deciding which information to seek is:

(Choose one of the following)

- a. _____ to try to rely chiefly on theoretical principles as a guide.
- b. _____ to try to let whatever comes to mind guide my choice.
- c. _____ to try to rely chiefly on my knowledge of other administrators' standards as a guide.
- d. _____ to try to rely chiefly on my personal preferences as a guide.

4. Having decided what kind of problem I am facing, I sometimes need to explore the nature of the problem further. To do this, I use information. When using information:
(Choose one of the following)

- a. _____ my goal is to obtain a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available, whether immediately at hand or not.
- b. _____ my goal is to consider particular pieces of information, which are immediately available.
- c. _____ my goal is to obtain a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information may be immediately available.
- d. _____ my goal is to consider particular pieces of information which may or may not be immediately available.

PART V: BELIEFS ABOUT SELF

HOW I ACTUALLY FORMULATE PROBLEMS

Instructions:

These statements express beliefs about how you actually go about formulating problems. Respond to each statement only on the basis of what you believe is true about yourself and describes best what you actually do, and not what you would like to be true about you.

Please read each statement carefully. Then identify the statement with which you agree most by placing a check mark next to it.

1. When faced with a perplexing work-situation:
(Choose one of the following)

- a. _____ I look for two or three major problems which I believe are essential to understanding the situation.
- b. _____ I look for as many major problems as possible and how they might be related to more specific problems, which I believe are essential to understanding the situation.
- c. _____ I look for one or two major problems which are related to more specific problems which I believe are essential to understanding the situation.
- d. _____ I look for the single major problem which I believe is essential to understanding the situation.

2. Problems are characterized by discrepancies between actual conditions and desired conditions. When examining the nature of these discrepancies:
(Choose one of the following)

- a. _____ I tend to think about several aspects of the discrepancies which are obvious in the given work-situation as the problems to attack.
- b. _____ I tend to think about the discrepancies which are obvious in the given work-situation as the problems to attack.

c. _____ I tend to think about the discrepancies which are obvious and those which are not as symptoms of problems to be discovered.

d. _____ I tend to think about all conceivable discrepancies as symptoms of particular kinds of problems to be discovered.

3. When faced with a problem, I consciously or unconsciously, need to decide what kind of problem it is. In order to find out, I sometimes (consciously or unconsciously) seek information. In deciding which information to seek:

(Choose one of the following)

a. _____ I rely chiefly on my personal preferences as a guide.

b. _____ I rely on letting whatever comes to mind guide my choice.

c. _____ I rely chiefly on my knowledge of other administrators' standards as a guide.

d. _____ I rely chiefly on theoretical principles as a guide.

4. Having decided what kind of problem I am facing, I sometimes need to explore the nature of the problem further. To do this, I use information.

(Choose one of the following)

a. _____ I tend to consider particular pieces of information which may or may not be immediately available.

b. _____ I tend to obtain a broad insight into the nature of the problem based not on particular pieces of information, but on whatever general information may be immediately available.

c. _____ I tend to obtain a broad insight into the nature of the problem based not on particular pieces of information but on whatever general information is available, whether immediately at hand or not.

d. _____ I tend to consider particular pieces of information which are immediately available.

APPENDIX D

SAMPLE LETTER TO ADMINISTRATORS

Dear

As a doctoral student in the Department of Administrative and Higher Education at U.B.C., I am undertaking a study of the beliefs of educational administrators and their relation to problem formulation behaviour, and would like to request your permission for me to ask full-time administrative personnel at your Institute to participate in this study.

The problem that I am investigating is the development and experimental testing of a Belief Scale that might be used for predicting the problem formulation behaviour of educational administrators. The study is therefore concerned with the construction and testing of the Belief Scale for assessing administrators' beliefs about problem formulation. It has been frequently suggested in the literature of educational administration that beliefs guide behaviour, but despite these claims no empirical study has been undertaken to explore this question fully.

I would like to ask you for two things:

- (1) Your consent for me to ask full-time administrators to participate as subjects in this study. The administrators will be asked to: (a) complete a questionnaire which takes about twenty minutes, and (b) to work on a problem formulation task, if they are among a sub-sample selected from the population of questionnaire respondents.
- (2) A list of personnel who are assigned as full-time administrators at your Institute.

It would be a pleasure to discuss with you the details regarding any aspect of this study and to review the findings of the study with you, if you are interested.

Thank you very much for your cooperation. I hope the enclosed response sheet will simplify your task of responding.

Yours sincerely,

Averlyn Gill
Researcher

cc. J.G.T. Kelsey
Research Supervisor
Associate Professor
Department of Administrative, Adult and Higher Education

To: Averlyn Gill

Re: Administrators' Beliefs and Problem Formulation Study

_____ Yes, you have permission to conduct research in this institution as outlined in your recent letter.

_____ Please contact me to provide further information about the study.

_____ No, I am not able to grant permission.

Additional comments:

Principal _____

Institution _____

APPENDIX E

ITEM ANALYSIS DATA FOR THE EXPLORATORY STUDY

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 1 NORM

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	41	21.7	C	-0.60	-0.51	-0.84	-0.72	9.29	36.76
C 2	2	11	5.8	C	-0.18	-0.10	-0.36	-0.21	10.27	40.55
C 3	3	32	16.9	C	-0.01	-0.02	-0.01	-0.03	11.88	43.13
C 4	4	105	55.6	C	0.58	0.49	0.73	0.61	13.14	46.41
TOTAL		189								

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	15	7.9	C	-0.48	-0.37	-0.87	-0.68	8.13	34.80
C 2	2	12	6.3	C	-0.21	-0.09	-0.40	-0.17	10.08	41.08
C 3	3	104	55.0	C	0.08	-0.02	0.10	-0.03	12.10	43.29
C 4	4	58	30.7	C	0.30	0.29	0.40	0.38	12.98	46.36
TOTAL		189								

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	33	17.5	C	-0.33	-0.24	-0.48	-0.35	10.27	39.88
C 2	2	51	27.0	C	-0.28	-0.17	-0.38	-0.23	10.84	41.45
C 3	3	21	11.1	C	-0.09	-0.07	-0.15	-0.11	11.33	42.10
C 4	4	84	44.4	C	0.56	0.38	0.70	0.48	13.38	46.33
TOTAL		189								

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION				MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT	ST	TT
C 1	1	24	12.7	C	-0.39	-0.29	-0.62	-0.47	9.54	38.17
C 2	2	9	4.8	C	-0.13	-0.17	-0.28	-0.36	10.56	38.22
C 3	3	108	57.1	C	0.08	0.09	0.10	0.11	12.08	43.93
C 4	4	48	25.4	C	0.27	0.21	0.37	0.28	13.02	45.88
TOTAL		189								

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 2 GENERAL

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	68	36.0	C	-0.60	-0.36	-0.77	-0.46	C	6.90	40.16
C 2	2	29	15.3	C	-0.10	0.04	-0.15	0.07	C	8.38	44.14
C 3	3	50	26.5	C	0.15	0.08	0.21	0.10	C	9.62	44.30
C 4	4	42	22.2	C	0.61	0.29	0.86	0.41	C	11.93	47.14
TOTAL		189									

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	90	47.6	C	-0.63	-0.26	-0.79	-0.32	C	7.26	41.56
C 2	2	41	21.7	C	0.07	-0.03	0.10	-0.05	C	9.32	42.98
C 3	3	30	15.9	C	0.26	0.18	0.39	0.27	C	10.50	46.20
C 4	4	28	14.8	C	0.54	0.22	0.82	0.34	C	12.29	47.07
TOTAL		189									

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	52	27.5	C	-0.26	-0.10	-0.35	-0.14	C	7.87	42.27
C 2	2	87	46.0	C	-0.15	-0.11	-0.18	-0.14	C	8.55	42.59
C 3	3	25	13.2	C	0.16	0.09	0.25	0.15	C	10.00	45.08
C 4	4	25	13.2	C	0.40	0.21	0.64	0.33	C	11.64	47.04
TOTAL		189									

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	33	17.5	C	-0.18	-0.12	-0.27	-0.18	C	7.94	41.61
C 2	2	70	37.0	C	-0.46	-0.15	-0.59	-0.20	C	7.40	42.04
C 3	3	42	22.2	C	0.40	0.08	0.55	0.11	C	10.88	44.43
C 4	4	44	23.3	C	0.30	0.21	0.42	0.29	C	10.39	46.00
TOTAL		189									

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 3 GOALS

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	36	19.0	C	-0.57	-0.40	-0.82	-0.58	C	9.03	37.69
C 2	2	23	12.2	C	-0.25	-0.19	-0.40	-0.30	C	10.22	39.96
C 3	3	27	14.3	C	-0.02	-0.09	-0.03	-0.13	C	11.70	41.96
C 4	4	103	54.5	C	0.62	0.50	0.78	0.63	C	13.17	46.57
TOTAL		189									

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	12	6.3	C	-0.36	-0.36	-0.71	-0.71	C	8.50	33.83
C 2	2	21	11.1	C	-0.28	-0.22	-0.46	-0.36	C	9.95	39.24
C 3	3	87	46.0	C	-0.05	-0.05	-0.07	-0.07	C	11.68	43.01
C 4	4	69	36.5	C	0.42	0.38	0.54	0.49	C	13.13	46.87
TOTAL		189									

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	36	19.0	C	-0.27	-0.17	-0.39	-0.25	C	10.50	41.00
C 2	2	50	26.5	C	-0.36	-0.31	-0.49	-0.42	C	10.38	39.86
C 3	3	28	14.8	C	-0.03	-0.10	-0.05	-0.16	C	11.64	41.75
C 4	4	75	39.7	C	0.56	0.49	0.71	0.62	C	13.47	47.57
TOTAL		189									

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	32	16.9	C	-0.36	-0.18	-0.53	-0.27	C	9.94	40.63
C 2	2	14	7.4	C	-0.27	-0.24	-0.50	-0.46	C	9.57	37.50
C 3	3	85	45.0	C	0.19	0.11	0.25	0.14	C	12.33	44.28
C 4	4	58	30.7	C	0.23	0.17	0.30	0.22	C	12.64	45.12
TOTAL		189									

LERTAP 2.0

SUMMARY ITEM STATISTICS (Achievement Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 4 SELF

ITEM NUMBER 1					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	37	19.6	C	-0.47	-0.42	-0.68	-0.61	C	8.43	37.51
C 2	2	28	14.8	C	-0.19	-0.17	-0.30	-0.27	C	9.61	40.57
C 3	3	45	23.8	C	-0.03	-0.07	-0.04	-0.10	C	10.58	42.53
C 4	4	79	41.8	C	0.55	0.53	0.69	0.67	C	12.25	47.70
TOTAL		189									

ITEM NUMBER 2					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	42	22.2	C	-0.48	-0.40	-0.67	-0.55	C	8.57	38.33
C 2	2	29	15.3	C	-0.14	-0.10	-0.21	-0.15	C	9.93	41.79
C 3	3	84	44.4	C	0.19	0.15	0.24	0.19	C	11.23	44.60
C 4	4	34	18.0	C	0.40	0.33	0.59	0.48	C	12.76	48.18
TOTAL		189									

ITEM NUMBER 3					COEFFICIENTS OF CORRELATION					MEANS	
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	37	19.6	C	-0.24	-0.19	-0.34	-0.27	C	9.57	40.84
C 2	2	70	37.0	C	-0.27	-0.19	-0.34	-0.25	C	9.89	41.69
C 3	3	35	18.5	C	0.06	-0.04	0.09	-0.06	C	11.03	42.86
C 4	4	47	24.9	C	0.46	0.42	0.63	0.58	C	12.62	48.45
TOTAL		189									

ITEM NUMBER 4					COEFFICIENTS OF CORRELATION				MEANS		
OPTION	WT	N	P		PB-ST	PB-TT	B-ST	B-TT		ST	TT
C 1	1	35	18.5	C	-0.32	-0.14	-0.46	-0.20	C	9.14	41.46
C 2	2	29	15.3	C	-0.37	-0.36	-0.57	-0.55	C	8.62	37.59
C 3	3	70	37.0	C	0.20	0.14	0.26	0.17	C	11.34	44.63
C 4	4	55	29.1	C	0.35	0.26	0.47	0.34	C	12.02	46.20
TOTAL		189									

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 1 NORM

ITEM NUMBER 1				ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	41	21.7	3.063	1.219	0.205	0.566	
2	2.0	11	5.8					
3	3.0	32	16.9					
4	4.0	105	55.6					
TOTAL		189						

ITEM NUMBER 2				ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	15	7.9	3.085	0.827	0.219	0.428	
2	2.0	12	6.3					
3	3.0	104	55.0					
4	4.0	58	30.7					
TOTAL		189						

ITEM NUMBER 3				ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	33	17.5	2.825	1.179	0.059	0.380	
2	2.0	51	27.0					
3	3.0	21	11.1					
4	4.0	84	44.4					
TOTAL		189						

ITEM NUMBER 4				ITEM STATS			CORRELATIONS	
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	24	12.7	2.952	0.901	0.076	0.358	
2	2.0	9	4.8					
3	3.0	108	57.1					
4	4.0	48	25.4					
TOTAL		189						

LERTAP 2.0.

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 2 GENERAL

ITEM NUMBER	1				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	68	36.0	2.349	1.183	0.376	0.378	
	2	2.0	29	15.3					
	3	3.0	50	26.5					
	4	4.0	42	22.2					
	TOTAL		189						

ITEM NUMBER	2				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	90	47.6	1.979	1.111	0.375	0.317	
	2	2.0	41	21.7					
	3	3.0	30	15.9					
	4	4.0	28	14.8					
	TOTAL		189						

ITEM NUMBER	3				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	52	27.5	2.122	0.963	0.102	0.227	
	2	2.0	87	46.0					
	3	3.0	25	13.2					
	4	4.0	25	13.2					
	TOTAL		189						

ITEM NUMBER	4				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	33	17.5	2.513	1.035	0.086	0.246	
	2	2.0	70	37.0					
	3	3.0	42	22.2					
	4	4.0	44	23.3					
	TOTAL		189						

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 3 GOALS

ITEM NUMBER	1				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	36	19.0	3.042	1.198	0.270	0.528	
	2	2.0	23	12.2					
	3	3.0	27	14.3					
	4	4.0	103	54.5					
	TOTAL		189						

ITEM NUMBER	2				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	12	6.3	3.127	0.847	0.228	0.508	
	2	2.0	21	11.1					
	3	3.0	87	46.0					
	4	4.0	69	36.5					
	TOTAL		189						

ITEM NUMBER	3				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	36	19.0	2.751	1.170	0.075	0.439	
	2	2.0	50	26.5					
	3	3.0	28	14.8					
	4	4.0	75	39.7					
	TOTAL		189						

ITEM NUMBER	4				ITEM STATS		CORRELATIONS		
	OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
	1	1.0	32	16.9	2.894	1.026	0.003	0.272	
	2	2.0	14	7.4					
	3	3.0	85	45.0					
	4	4.0	58	30.7					
	TOTAL		189						

LERTAP 2.0

SUMMARY ITEM STATISTICS (Affective Test)

TEST NO 1 ADMINISTRATORS' BELIEFS

SUBTEST 4 SELF

ITEM NUMBER	1	ITEM STATS				CORRELATIONS		
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	37	19.6	2.878	1.158	0.167	0.571	
2	2.0	28	14.8					
3	3.0	45	23.8					
4	4.0	79	41.8					
TOTAL		189						

ITEM NUMBER	2	ITEM STATS				CORRELATIONS		
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	42	22.2	2.582	1.026	0.197	0.480	
2	2.0	29	15.3					
3	3.0	84	44.4					
4	4.0	34	18.0					
TOTAL		189						

ITEM NUMBER	3	ITEM STATS				CORRELATIONS		
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	37	19.6	2.487	1.070	0.041	0.397	
2	2.0	70	37.0					
3	3.0	35	18.5					
4	4.0	47	24.9					
TOTAL		189						

ITEM NUMBER	4	ITEM STATS				CORRELATIONS		
OPTION	WGT	N	P	MEAN	S.D.	ST	TT	EC
1	1.0	35	18.5	2.767	1.066	0.069	0.333	
2	2.0	29	15.3					
3	3.0	70	37.0					
4	4.0	55	29.1					
TOTAL		189						