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THE EFFECT OF ORGANIZATIONAL, INDIVIDUAL AND ROLE-RELATED VARIABLES ON ADMINISTRATORS' EXPERIENCE OF THREE TYPES OF UNCERTAINTY

City University of New York PH.D. 1985

THE EFFECT OF ORGANIZATIONAL, INDIVIDUAL AND ROLE-RELATED VARIABLES ON ADMINISTRATORS' EXPERIENCE OF THREE TYPES OF UNCERTAINTY

by

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A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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CHAPTER ONE

A REVIEW OF THE LITERATURE AND INTRODUCTION TO THE RESEARCH MODEL

Understanding the nature of an organization's behavior with respect to its external political, social and competitive environments is an important part of the field of organizational behavior. Of particular interest to organizational researchers is the nature of the relationship between an organization's behavior in its environment and its ultimate effectiveness and survival. Why, for example, are some organizations effective in their particular environmental context while other organizations flounder in the same or similar environmental circumstances? Why do some "organizations" have a more sophisticated understanding of their environment than others and ultimately, why do some organizations survive while others, operating in the same or similar conditions, do not?

These questions and others relating to the nature of the relationship between organizations and their environments have received a good deal of attention in the organization theory literature over the the last two decades. The pioneering works on these issues by theorists such as Dill (1958), Burns and Stalker (1961), Lawrence and Lorsch (1967) and Thompson (1967) tended to be prescriptive in nature, offering the organizational administrator

recommendations for structuring their organizations so as to achieve maximal effectiveness under varying environmental conditions. Another line of theory (Duncan, 1972; Emery & Trist, 1965; Terreberry, 1968) concentrated on classifying and describing types of organizational environments and in some cases, suggested strategies for coping with these environmental types. More recent research efforts have focused on describing organizational responses to various types of environmental conditions (Leblebici & Salancik, 1981; Leifer & Huber, 1977; Pfeffer, 1972a; 1972b) and on delineating variables which may be important in understanding administrators' perceptions of their environments (Aldag & Storey, 1979; Downey, Hellriegel & Slocum, 1977).

The Role of Environmental Uncertainty in Theories of Organization-Environment Relations

A concept which has been central in the literature on organization-environment relations is the concept of "environmental uncertainty" (Duncan, 1972; Galbraith, 1977; Lawrence & Lorsch, 1967; Thompson, 1967). Organizational environments have been said to be more or less uncertain as a function of environmental characteristics such as the degree of volatility in the environment, the number and complexity of the environmental elements which must be considered, and their heterogeneity (Duncan, 1972; Emery & Trist, 1965; Lawrence &

Lorsch, 1967).

The concept of environmental uncertainty has played three major roles in the literature on organization-environment relations to date. First, it has served as a central contingency variable for structural contingency theorists in their formulations of how organizations ought to be structured to achieve effectiveness under varying environmental conditions (Burns & Stalker, 1961; Dill, 1958; Lawrence & Lorsch, 1967). Thus, it has been asserted that to be effective in complex, dynamic ("uncertain") environments, organizations need to have organic structures with few rules and regulations and high levels of decentralization of decision making (Burns & Stalker, 1961). It has also been suggested that organizations in unstable, heterogeneous environments ought to have high levels of differentiation (i.e. a large number of specialized departments) and high levels of integration (i.e. mechanisms for ensuring effective communication between these departments) to be effective (Lawrence & Lorsch, 1967).

A second line of research has viewed uncertainty as an aversive state which organizations seek to avoid or protect their operations from. Thus, organizational theorists have argued that organizations operating in uncertain environments must either structure themselves in such a way so as to minimize potentially negative effects of uncertainty on their performance (Thompson, 1967) or seek to reduce uncertainty by taking some action to lessen it (Pfeffer & Salancik, 1978). Responses of the former type include protecting the technical core (Thompson, 1967) and attempting to ensure the maintenance of

positive organizational slack (Cyert & March, 1963). Responses of the latter type include active attempts to influence the environment through coalition formation, bargaining, cooptation and forward or backward integration as well as attempts to gather information about the environment (Galbraith, 1977; Pfeffer, 1972a; 1972b; Thompson & McEwen, 1958).

A third line of research which began to develop about a decade ago has focused on the notion of perceived environmental uncertainty (PEU), and has attempted to understand the nature of the relationship between the conditions present in the organization's external environment and administrators' degree of uncertainty about that environment. This line of research developed in response to two studies (Downey, Hellriegel & Slocum, 1975; Tosi, Aldag & Storey, 1973) which failed to find consistent significant relationships between perceptions of environmental uncertainty and certain characteristics of the environment hypothesized to be related to uncertainty (e.g. volatility, complexity).

Despite the theoretical centrality of the uncertainty concept in the field of organization theory, research which has focused on environmental uncertainty has been somewhat confusing and difficult to interpret. Problems have ranged from findings of poor reliability and validity evidence for the instruments used to measure perceived uncertainty (Downey, Hellriegel & Slocum, 1975; Tosi, Aldag & Storey, 1973) to the above mentioned failure to find significant and consistent relationships between perceptions of uncertainty and

characteristics of the organizational environment which have been hypothesized to be important predictors of these perceptions (Downey et al., 1975; Pennings, 1975; Pfeffer, 1978; Tosi et al., 1973).

The Research Purpose

The primary purpose of this research is to further investigate the relationship between organizations and their environments by examining organizational, individual and role-related factors which may be important in determining how organizational administrators perceive, analyze and respond to the organization's external environment.

The concept of "environmental uncertainty" is at the core of this research as it has been at the core of much of the previous research on organization-environment relations. However, it is hypothesized here that the concept is not a unidimensional one and that several different types of uncertainty have previously been subsumed within this concept. It is suggested that many of the seemingly inconsistent findings of prior research can be explained by a failure to adequately differentiate between these types of uncertainty.

This research will seek to test empirically the validity of this hypothesis and to ascertain whether, in fact, organizational, individual and role-related variables may be important in explaining variance in the types of uncertainty proposed.

A second purpose of the research is to explore some potential outcomes of an "organization's" perception and assessment of the environment at both the organizational and individual levels. Organizational outcomes to be investigated include the types of responses the organization has made or is planning to make to its environment. At the individual level, the impact of these perceptions on organizational commitment, satisfaction with planning and role ambiguity will be investigated.

Prior to discussing the conceptual framework which underlies this research, a brief overview of the development and use of the construct of environmental uncertainty in organization theory will be given.

The Concept of Environmental Uncertainty in Organization Theory: A Review of the Literature

There has tended to be a lack of agreement among organization theorists as to how to define the concept of environmental uncertainty. One reason for the failure to agree on a conceptualization may lie, rather ironically, in the fact that the concept of uncertainty is such a commonly used one. Downey and Slocum (1975) in their review of the literature on environmental uncertainty commented that:

> Uncertainty is a term which is used daily in a variety of ways. This everyday acquaintance with uncertainty can be seductive in that it is all too easy to assume

that one knows what he or she is talking about.

The most commonly cited conceptualizations of uncertainty adopt the information theory perspective, defining uncertainty as a lack of information (i.e. Downey & Slocum, 1975; Duncan, 1972; Garner, 1962). A more specific conceptualization defines uncertainty as unpredictability or the inability to assign probabilities as to the likelihood of future events (Duncan, 1972; Pennings, 1981; Pennings & Tripathi, 1978; Pfeffer & Salancik, 1978). These two conceptualizations are clearly related in the sense that the acquisition of information may cause an individual to come to perceive a predictable pattern in events which had previously seemed unpredictable.

Environmental uncertainty has also been defined in terms of a lack of information about cause and effect relationships (Duncan, 1972; Lawrence & Lorsch, 1967) and a lack of knowledge of, or an inability to predict, the outcomes of decisions (Downey & Slocum, 1975; Duncan, 1972; Hickson, Hinings, Lee, Schneck & Pennings, 1971; Luce & Raiffa, 1957; Schmidt & Cummings, 1976).

A perceived lack of information thus is clearly integral to the definition of environmental uncertainty but there is disagreement about the specific nature of this lack of information. Some argue that it is a lack of information about the relative likelihood of future events, some that it is a lack of information about the nature of cause-effect relationships and others argue that it is a lack of knowledge of decision alternatives and their consequences that defines

uncertain situations. Still others suggest that environmental uncertainty involves a lack of information in more than one of these arenas.

An Overview of the Measurement of Uncertainty

There has also been a lack of consensus among organizational researchers as to how to operationalize and measure the construct of environmental uncertainty. A key controversy has surrounded the issue of whether uncertainty ought to be measured objectively or subjectively. Some have argued that it is necessary to measure uncertainty "objectively" either as a means of attempting to validate perceptual measures or as a substitute for these measures (Aldag & Storey, 1975; Starbuck, 1976; Tinker, 1976). The "objective" operationalizations of uncertainty utilized in past research have, however, created problems. There is also a legitimate question as to whether it is useful to attempt to measure uncertainty "objectively."

In this next section, the problems with both the objective and perceptual measures of "environmental uncertainty" will be discussed and an effort will be made to resolve the "objective vs. perceptual" measurement controversy.

Problems in the Measurement of "Objective" Environmental Uncertainty.

There is reason to question the validity of many of the "objective" indicators of uncertainty used in past research. Many studies, for example, operationalized "objective" uncertainty with various measures of environmental volatility (e.g. Downey et al., 1975; Tosi et al., 1973). However, measures of environmental volatility, as several researchers (Lawrence & Lorsch, 1973; Miles, Snow & Pfeffer, 1974; Pfeffer & Salancik, 1978) have pointed out, are inadequate as operationalizations of uncertainty. It is not change per se or even a fast rate of change that causes uncertainty about the environment, rather it is unpredictable change that generates this type of uncertainty. Thus, volatility measures are probably content-deficient measures of uncertainty about the environment.

The measurement of so-called objective uncertainty has been further complicated by the fact that many of the indicators used are invalid for another reason. Indicators such as sales or technological volatility, the number of product innovations, or the percentage of the organizational budget spent on research and development which have been used in a number of studies (e.g. Blandin & Brown, 1977; Kefalas & Schoderbek, 1977; Keller, Slocum & Susman, 1974; Tosi et al., 1973) are not really measures of "environmental" uncertainty or volatility. Rather they are measures of volatility in the organization's responses to its environment (Lawrence & Lorsch, 1973) which may or may not be caused by volatility in the organizational environment and may or may not be related to the amount of uncertainty administrators have about

the nature of the environment.

Problems in the Measurement of Perceived Environmental Uncertainty. Two scales (Duncan, 1972; Lawrence & Lorsch, 1967) have been dominant as measures of "perceived environmental uncertainty." Both scales have, however, been suggested to be psychometrically weak (Downey et al., 1975; Tosi et al., 1973). Tosi, Aldag and Storey (1973) reported low reliabilities for the subscales of the Lawrence and Lorsch measure as well as for the aggregated scale. Downey, Hellriegel and Slocum (1975), in examining the psychometric properties of Duncan's scale, found that while the total scale and two of its subscales had acceptable levels of reliability, an effort to test the scale's convergence with the Lawrence and Lorsch measure yielded an insignificant correlation. Furthermore, the authors reported no significant relationships between subscales of the Lawrence and Lorsch measure and only one sigificant correlation among the subscales of the Duncan measure.

The failure to find a significant relationship between these two measures of uncertainty, it is argued, is not surprising. Both scales have three subscales, none of which is common to the two instruments. The Lawrence and Lorsch measure (as reorganized by Downey et al., 1975 in an effort to increase the scale's reliability and validity) has items relating to three factors:

1) time span necessary for feedback on job performance,

2) clarity of job requirements, and

3) degree of difficulty involved in job performance.

Duncan's scale, on the other hand, focuses on measuring:

1) lack of information about future environmental events,
2) inability to assign probabilities as to the likelihood of future events influencing the success or failure of a decision unit, and
3) lack of knowledge of the organizational consequences of a decision if it is incorrect.

This paper will contend that not only do these instruments measure different types of uncertainty but that each of the subscales of the Duncan measure is actually measuring a different type of "environmental uncertainty." Furthermore, these types of uncertainty are not necessarily positively related to each other.

The "Objective vs. Perceptual Measurement" Issue. The issue of whether uncertainty ought to be viewed as an objective phenomenon, as a perceptual phenomenon, or as both has been the subject of much debate in the uncertainty literature. The issue is essentially an issue of whether uncertainty is perceived to be a property of the situation or of the perceiver.

Starbuck has argued that "there is a fairly strong case for saying that uncertainty is inevitably a characteristic of a perceiver rather than of a perceived situation..." (1976, p. 1087). Other researchers agree (e.g. Child, 1972; Downey & Slocum, 1975; Huber,

O'Connell & Cummings, 1975). However, several researchers (e.g. Starbuck, 1976; Tinker, 1976) suggest that it is not sufficient to study perceptions alone. Tinker (1976), for example, warns that studying perceptions alone would reduce the study of organizations to a "problem of psychoanalysis of actors."

While there is an obvious need to understand the nature of the relationship between objective characteristics of the environment and administrator perceptions of uncertainty, it is not necessary and probably not desirable to label these objective environmental characteristics "objective uncertainty." Uncertainty exists in the person-situation interaction and not in the situation itself (Pondy & Mitroff, 1979). Situational circumstances merely produce a greater or lesser potential for the experience of uncertainty by individuals perceiving those circumstances.

The insistence on labeling certain combinations of environmental characteristics "objective uncertainty," it is argued, has significantly complicated the interpretation of the results of research on uncertainty. If it is assumed that one can measure objective uncertainty, as it often is, and if there is a failure to find a strong, positive relationship between the objective and perceptual indicators of uncertainty, the perceptual measures may be assumed to be invalid and/or not useful.

An alternative explanation, however, is possible. The objective measures of the environment may be construed not as measures of

"objective" uncertainty but rather as measures of characteristics of the environment which are antecedents of a perception of uncertainty about that environment (Schuler, Jackson & Vredenburgh, 1985). A perception of uncertainty about the state of the environment thus requires that an individual not only perceive these characteristics but also experience a resultant inability to predict something about that environment.

Looking at the relationship between objective characteristics of the environment and administrator perceptions of uncertainty in this new light, many of the published findings of significant relationships between perceptions of uncertainty and individual attributes such as tolerance for ambiguity, dogmatism and anomy (Aldag & Storey, 1979; Downey, Hellriegel & Slocum, 1977; McCaskey, 1976; Storey & Aldag, 1983) as well as between uncertainty and organizational characteristics (Huber et al., 1975; Leifer & Huber, 1977) become more easily interpretable. Environmental factors such as the degree of volatility or complexity in the environment are just one of a set of factors which may explain variance in administrators' perceptions of uncertainty. Characteristics of the organization, of the role, and of the individual may also explain variance in these perceptions or act to moderate the relationship between objective conditions of the environment and administrator perceptions of uncertainty about that environment.

The three types of uncertainty discussed in this paper are considered to be perceptual phenomena and as such are likely to be

influenced not only by the nature of conditions in the organizational environment but also by characteristics of the organization, of the individual doing the perceiving and of his/her role.

Some Types of Uncertainty Involved in Environmental Information Processing: A New Conceptualization of "Environmental Uncertainty"

A General Definition of Uncertainty

Uncertainty is defined as an individual's perceived inability to predict something accurately. Uncertainty occurs because the individual perceives him/herself to be lacking information, or as unable to discriminate between relevant data and irrelevant data (Gifford, Bobbitt & Slocum, 1979). (The word "something" is used deliberately in the above definition because it is a word which can effectively encompass the wide variety of things about which one can be uncertain - ranging from things as general as "the future" to very specific things such as the amount of rain that will fall in the next day.)

This definition differs from some previous definitions of uncertainty because it allows for the recognition that while uncertainty can result from a lack of information as information

theorists have classically argued, it can also result from the receipt of conflicting data or information (Aldrich & Mindlin, 1976; Huff, 1978). The receipt of conflicting information can cause an individual to be uncertain about the relevancy and accuracy of the data she is receiving (Gifford et al., 1979) and thus uncertain about the nature of the circumstances with which she might be dealing.

In order for the construct of uncertainty to be theoretically useful in organization theory, however, it is necessary to specify what the source of the uncertainty is. The label "environmental" when attached to the term uncertainty represents an attempt to specify the source of the uncertainty as being the organization's external environment. Thus, the "something" which is unpredictable has now been specified as being located in the organizational environment. Specifying the source of the uncertainty as the organizational environment, however, may not specify the nature of the uncertainty in enough detail to make the construct a useful and important one in organization theory and research.

Other researchers (Duncan, 1972; Miles & Snow, 1978; Tosi & Slocum, 1984) have suggested that it is necessary to break down the organizational environment into its component parts (e.g. suppliers, competitors, government, distributors, consumers etc.) and study each of these as sources of uncertainty about the organization's environment.

This paper suggests that it may also be necessary to study uncertainty in terms of the type of uncertainty experienced by the

decision maker. Specification of the type of uncertainty being experienced represents an attempt to specify the nature of the "something" which is unpredictable in a somewhat different way. Specification of source identifies the domain of the environment about which one is experiencing uncertainty (e.g. competitors) while specification of type focuses on specifying the nature of the uncertainty being experienced. The model presented here identifies three types of uncertainty which may be experienced by administrators in their attempts to process information about the organizational environment.

Uncertainty about the State of the Environment

The first type of uncertainty suggested to confront organizational administrators is uncertainty about the state of the organization's environment which includes uncertainty about the actions of relevant organizations and key organizational constituencies (i.e. suppliers, competitors, consumers, the government etc.) or about general changes in states in the relevant environment (i.e. sociocultural trends, demographic shifts, major new developments in technology or even the weather).

Of the three types of uncertainty proposed here, it is this type of uncertainty which will tend to be most closely associated with variation in the objective characteristics of the environment such as the degree of environmental volatility or complexity. This type of

uncertainty is also closest conceptually to the notion of "environmental uncertainty" as it has been used and defined in the organization theory literature. The label "environmental uncertainty" has been avoided in favor of the admittedly more cumbersome "uncertainty about the state of the environment" in order to minimize confusion as all three of the types of uncertainty identified here have previously been subsumed under the former label.

Effect Uncertainty

A second type of uncertainty relates to an individual's inability to predict what the impact of an event or change in a particular environmental domain will be on his/her organization. Knowing, for example, that a hurricane is headed in the direction of your house does not mean that you know how it will affect your particular house.

Included here is uncertainty about whether an event will impact at all on the focal organization as well as uncertainty about the nature, severity and timing of the effect. While this type of uncertainty is obviously related to the conditions of the organization's external environment, it does not necessarily imply uncertainty about the nature of these conditions. In fact, in order for an administrator to experience effect uncertainty, it may be necessary for him/her to have some degree of clarity as to what the possible future states of the environment might be.

Response Uncertainty

A third way in which uncertainty can enter into processing of information about the environment is at the point of deciding upon an organizational response. Response uncertainty becomes salient when there is a perceived need to act which originates from the perception that a pending event or change will have a significant negative impact on the organization or that it will provide some unique opportunity to the organization. This type of uncertainty is associated with the decision maker's attempts to understand what responses are available to the organization and what the value or utility of each might be.

This type of uncertainty is closest to the notions of uncertainty developed by decision theorists. Conrath (1967), for example, conceptualized uncertainty as a lack of information about:

1) the alternatives or response options available,
2) the states of nature or outcomes likely to be connected with each, and
3) the value or utility associated with each alternative-s.o.n. pair

Differentiating between Types of Uncertainty: An Attempt to Reconcile some of the Confusing Results of Prior Research

What differentiates these three types of uncertainty from each other is the type of information that the administrator perceives himself to be lacking. In the case of "uncertainty about the state of the environment," the administrator is lacking information about the

future nature of the environment. The experience of effect uncertainty, on the other hand, does not necessarily involve a lack of information about environmental conditions (in fact, the administrator may have all the information she can handle), but rather the critical information shortage is in knowledge of how an environmental event, change or set of changes will affect the particular organization, if at all. Finally, in the case of response uncertainty, there is a perceived lack of information about what the organization's response options are and about the value or utility of each course of action in terms of achieving desired organizational outcomes.

These three types of uncertainty seem to be conceptually different from each other, yet they have not been well differentiated in previous research on "environmental uncertainty." The failure to differentiate between the three may partially account for some of the seemingly confusing results reported in past research.

The objective indices of environmental characteristics (e.g. those which attempt to objectively measure how changeable or volatile the organizational environment is) that have been used as criteria for evaluating the validity of the measures of "perceived environmental uncertainty" can be viewed as antecedents of a perception of "uncertainty about the state of the environment". However, only one of Duncan's three subscales measures this type of uncertainty while none of the Lawrence and Lorsch subscales appears to measure this type of uncertainty. Thus, while researchers have looked at these relationships as a test of the validity of the perceptual measures, it

has not really been a fair test of their validity, particularly for the Lawrence and Lorsch measure (1967). Not unexpectedly, Tosi et al. (1973) and Downey and his colleagues (1975; 1977) found no significant relationships between the objective indicators of "environmental uncertainty" they used and the Lawrence and Lorsch scale.

On the other hand, Downey et al. (1975) and Tung (1979) did report significant relationships between the objective measures of environmental characteristics and Duncan's measure of perceived environmental uncertainty. This latter finding probably reflects the fact that the Duncan measure does have a subscale which focuses on measuring "uncertainty about the state of the environment." An interesting further test would be to look at the relative magnitude of the correlation between the objective indicators and the total scale score compared to the correlation between the objective indicators and the subscale score alone. One might expect the latter correlation to be stronger.

The failure to find a significant correlation between the Duncan and Lawrence and Lorsch measures (Downey et al., 1975) also supports the notion that they may be measuring significantly different types of uncertainty. This lack of relationship, further suggests that these types of uncertainty may not be positively related as has been assumed but may be related in a previously unhypothesized way.

The proposed framework can also address another issue debated by organizational theorists. Several writers (Lawrence & Lorsch, 1973; Miles, Snow & Pfeffer, 1974; Pfeffer & Salancik, 1978) have pointed

out that volatility or variability in the environment is not necessarily unpredictable. They suggest that the failure of some studies to find a relationship between measures of environmental volatility and perceived environmental uncertainty may reflect the fact that though the environment may have been changing at a rapid pace, it was not changing unpredictably and thus, did not elicit perceptions of uncertainty about the state of the environment.

According to the framework offered here, if an event in the environment is highly predictable, one will not experience uncertainty about the state of the environment but it is quite possible to possess effect or response uncertainty. The predictability of an event does not convey any information as to the likely impact of that event for a particular organization or about the appropriate response to make. In fact, the more predictable an event or change is perceived to be, the more likely it may be to increase the salience of the effect and response components of uncertainty.

Another way in which the present framework could be a valuable addition to the "environmental uncertainty" literature lies in its ability to address some of the criticisms researchers have made of the concept. Hall (1980), for example, suggests that the field is paying too much attention to the notion of "environmental uncertainty." Organizations, he argues, do not seek to respond to uncertainties, rather they seek to respond only when environmental events become certainties. In the context of the model proposed here, Hall is

suggesting that organizations do not respond when there is a large amount of "uncertainty about the state of the environment," rather they seek to respond only when they are fairly certain about changes or events in their environments. However, if they do not have sufficient information about the likely nature of the effect of a change or about how to respond, there will still be uncertainty, of the effect and response uncertainty types. It may be that as an environmental change becomes increasingly certain to occur, the salience of effect uncertainty actually increases. Similarly, the more certain an organization's administrators become that an environmental event will affect the organization, the more salient their uncertainty about how to respond may become.

CHAPTER TWO

THE RESEARCH CONTEXT AND THE RESEARCH MODEL

The purpose of this research was two-fold. First, the research sought to examine empirically whether the three types of uncertainty proposed here are, in fact, differentiable types of uncertainty which may be experienced in the course of processing information about the environment, and second to test a model of the relationships between organizational, role and individual variables and administrator experience of uncertainty about the organization's relationship with its environment.

The Research Context:
Environmental Uncertainty in Higher Education

The higher education environment was chosen as the context for this study. Questionnaires were mailed to 589 upper-level administrators of a stratified, random sample of 148 private, 4-year, primarily liberal arts colleges. A more detailed description of the sampling procedures and of the sample itself appears in the methodology chapter of this dissertation.

Prior to turning to the specific hypotheses made in this study, the rationale for choosing institutions of higher education as the "industry" of focus will be briefly described.

The Higher Education Environment

In a sense, colleges and universities (especially undergraduate liberal arts colleges) are an ideal population in which to investigate the concept of uncertainty because there are numerous reasons to believe that certain demographic, social and technological trends are, or will soon be, impacting on this group of organizations. These trends can be viewed as a means of objectively operationalizing environmental change. Additionally, as some of these changes are occurring very fast, they can be seen as a way of operationalizing the notion of environmental volatility, a variable hypothesized to be positively related to the experience of uncertainty (Aldag & Storey, 1979; Downey et al., 1977; Duncan, 1972; Leblebici & Salancik, 1981; Tung, 1979). This operationalization of environmental change avoids the content contamination problems discussed previously, as these trends clearly exist in the external environment of higher education institutions and can not be attributed to the behavior of the institutions themselves.

The study focused on two important trends likely to have a major impact on four year liberal arts colleges:

1) The declining pool of college-age individuals

A decline of 25% in the number of 18-24 year olds is expected in the time period from 1982-1995 (Carnegie Council on Policy Studies in Higher Education, 1980; Crossland, 1980; Glenny, 1981; Breneman, 1982; Keller, 1983). Although educational researchers argue about the exact percentage decline in the number of college applicants likely to result from this population decline, the trend itself is documentable with data on national birth rates (National Center for Educational Statistics, 1980). The data indicate that the drop is likely to be particularly severe in the Northeast and North Central regions of the U.S. and least severe in the Southwest due to cross-region migration patterns (Crossland, 1980; Breneman, 1982).

2) Increasing Pressures towards vocational relevance in education

The liberal arts college degree is perceived to be increasingly less useful as a ticket to a good job. Government projections indicate significant shifts in the popularity of majors between 1980 and 1990 with business,

> engineering and health sciences attracting the most students while the social sciences and English experience the most severe drops in interest (American Council on Education, 1981; National Center for Educational Statistics, 1980).

Many academic researchers and commentators have written about these and other expected changes in the environment of higher education (Crossland, 1980; Frances, 1980; Riesman, 1980; Glenny, 1981; Breneman, 1982; Keller, 1983) with particular emphasis on the expected 25% drop in the number of 18-24 year olds in the country. These articles are controversial because of the differential interpretations given these data. Frances (1980) and Riesman (1980), for example, minimize the effects this trend will have on colleges, suggesting that it will be completely or partially offset by increases in the number of older students and women attending college and by increased retention rates of traditional undergraduate students. Others (Crossland, 1980; Breneman, 1982) are extremely critical of these projections, arguing that they provide college administrators with a false sense of security. Breneman (1982) in his book which is directed towards college trustees, points out the necessity for colleges to recognize the potential impact of this demographic trend and to begin formulating contingency plans for handling it, a position

that is supported by Cope (1981), Keller (1983), Kotler and Murphy (1982) and others.

Data from a survey of college presidents (reported by Breneman, 1982), however, reveal that while the vast majority of presidents knew of the demographic projections, "only 16% of the presidents expected their institutions to lose enrollments, while 42% expected their enrollments to increase" (p. 6).

The Rationale for Focusing on "Predictable" Changes

The aforementioned survey data reported by Breneman (1982) are interesting as they suggest that perceiving a change as fairly certain to occur in no sense guarantees that the change will be perceived as certain to have an impact on the focal organization. Translating this finding into the terminology of this model, one could say that the degree of certainty an individual has about the occurence of changes in the state of the environment is not necessarily positively correlated with the degree of certainty the individual has about whether the changes will have an effect on a particular organization. A major focus of this research thus was on investigating the effects of certain organizational, individual and role-related variables which were hypothesized to be predictors of effect certainty/uncertainty or moderators of the relationship between perceptions of environmental changes and perceptions of certainty about the effect of environmental

changes on the organization.

The fact that the two focal trends represent changes in the environment of institutions of higher education which are fairly predictable suggests that administrators will tend to have high levels of certainty about the likelihood of these changes occurring. To the extent that this is true, the proportion of the variance in effect certainty/uncertainty explained by the degree of certainty of occurrence ought to be minimized. This ought to provide an ideal situation in which to explore the impact of other nonenvironmental variables on the perceptions of effect certainty/uncertainty. If these organizational, individual and role-related variables are indeed shown to have a significant relationship to perceptions of effect certainty and if the data yield a pattern of high scores on the perceived certainty of occurrence measures, the following deductions are possible. First, it could be deduced that these two kinds of certainty are indeed differentiable, and second the importance of nonenvironmental variables in explaining perceptions of the environment would be supported.

The Research Model: A Description of Variables and Hypothesized Relationships

In the following section, each of the variables which was examined in this research is discussed. Relevant research is reviewed

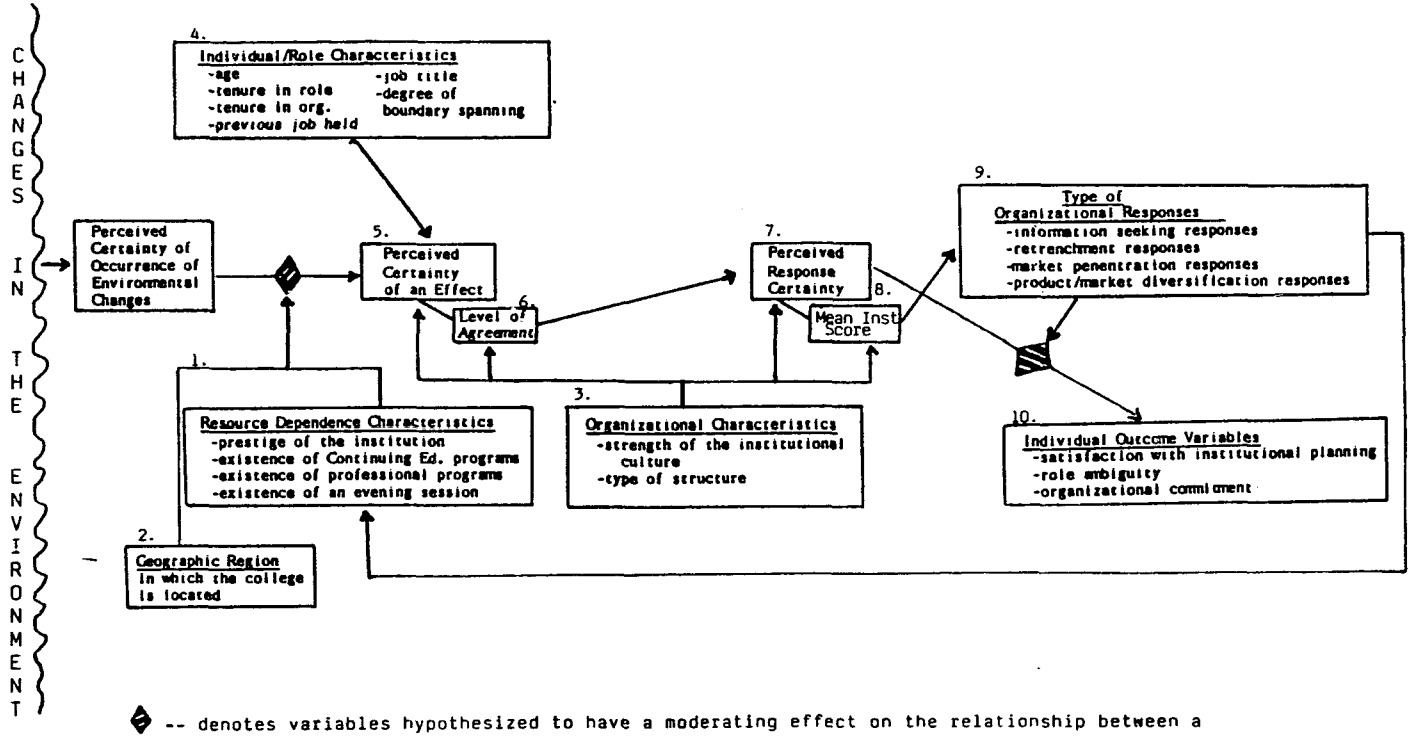
and hypotheses about the nature of the relationships between these variables are advanced and explained. Figure One outlines the complete research model, illustrating all the proposed relationships. The numbers in parantheses appearing after each of the headings in the text correspond to the numbers assigned to the variables or sets of variables in Figure One.

Perceived Certainty of Occurrence (PCO) of Environmental Changes

One of the key components of uncertainty about the state of the environment is the perceived predictability of environmental changes. The more predictable or certain environmental changes are perceived to be, the less overall uncertainty about the state of the environment. This research focused on this "predictability of change" subdimension of "uncertainty about the state of the environment" and asked respondents how certain they were that the two previously mentioned trends are occurring or are likely to occur. Uncertainty/certainty was measured by an index representing the multiplicative combination of the respondent's estimation of the probability of the trend occurring and his/her confidence (or certainty) in the estimate (Duncan, 1972). It was expected that respondents would tend to have high levels of certainty regarding the occurrence of these trends as information about these trends is widely available.

Figure One

The Effect of Organizational, Role and Individual Variables
on Administrators' Experience of Three Types Of "Environmental Uncertainty"



◆ -- denotes variables hypothesized to have a moderating effect on the relationship between a predictor and a criterion.

Perceived Certainty of an Effect (PCE) on the Focal Organization (5)

It is the uncertainty/certainty regarding the effect of changes on a particular organization, hotly debated by educational commentators (e.g. Frances, 1980, Crossland, 1980) which, according to the proposed framework, is critical because it is the motivator of the consideration of response options. One of the major focuses of this research, thus, was on the delineation of factors which may explain variance in the perception of effect uncertainty.

Effect certainty/uncertainty was defined as having two dimensions:

-certainty/uncertainty regarding the likelihood of an effect, and

-certainty/uncertainty regarding the magnitude of an effect.

The operationalization of effect certainty/uncertainty used in this study focused on these two dimensions.

The Moderating Effect of Resource Dependence Variables (1)

The relationship between the perceived probability of occurrence of an environmental event and the perceived certainty that the event will impact on the particular organization was hypothesized to be moderated by a class of variables which were broadly labeled resource dependence characteristics of the organization.

This set of hypotheses draws from the integrative framework of

organization-environment relations suggested by Aldrich and Mindlin (1976) and others (Pfeffer & Salancik, 1978; Schuler, Jackson & Vredenburgh, 1985). The fundamental assertion of this integrative framework has been that uncertainty only becomes salient when the uncertainty is associated with the actions of a constituency, organization or resource pool on which the focal organization is in some way dependent. Utilizing the same logic, it is argued that relative certainty about a change in some aspect of the environment can be ignored by an institution's decision makers unless the institution is, to a large degree, dependent on that aspect of the environment for resources critical to its survival. Thus, though a change may be perceived as highly predictable, if it is not a change which will impact on the organizational capacity for securing critical resources, there will be a low perceived likelihood of an effect on the organization.

The resource dependence characteristics of a college or university refer to factors that:

-make the college more or less dependent on the traditional pool of 18 to 22 year old recent high school graduates who want to attend college full time to earn a liberal arts college degree, or

-make the college more or less powerful in relation to its competitors in securing resources from this traditional pool

The variables considered to be resource dependence variables were: the selectivity of the school, the existence of Continuing Education programs,the number of undergraduate professional majors or degree programs and the existence of evening sessions for undergraduates. All of these factors have the effect of either increasing the college's potential to penetrate the market of traditional college age individuals or of reducing the college's degree of dependence on this traditional market.

It should be pointed out that while these resource dependence factors refer to current characteristics of an institution which serve to make the institution more or less vulnerable to these particular trends, they also represent the manifestation of previous decisions made by the college's administration about the college's mission or functions. The implementation of any decision which alters the nature of an organization's mission or functions could be said to redefine the "enacted environment" (Weick, 1969) for the organization and thus, change the nature of the organization's dependencies in its environment.

A. Selectivity of the Institution. The more selective a college is, the larger its pool of potential clients and the greater its capacity to attract students relative to less prestigious schools. Selectivity can be equated with power in the market; in a shrinking market, a selective college is likely to lose a smaller percentage of its

potential "buyers" than is a less prestigious institution. In fact, the pattern of applications in the past year seems to support this contention. Applications to highly selective colleges actually appear to be on the rise (New York Times, October 4, 1984). Thus, it was hypothesized that respondents from highly selective colleges will tend to be less certain about the effect of these trends on their institution than will respondents from less prestigious schools, even though both groups of administrators are likely to be fairly certain that the trends will occur.

Hypothesis 1:A1: There will be a significantly lower correlation between the perceived certainty of occurrence (PCO) scores and the perceived certainty of effect (PCE) scores for administrators from highly selective colleges than for administrators from colleges which are not highly selective.

B. Existence of Continuing Education Programs. Colleges which have active Continuing Education programs which are oriented towards the adult consumer will be less dependent on the traditional market of

recent high school graduates for their survival.

Hypothesis 1:B1: There will be a significantly lower correlation between the perceived "certainty of occurrence" and the perceived "certainty of effect" for colleges with continuing education programs than for those without such programs.

C. Number of Undergraduate Professional Programs. Colleges which offer applied majors such as business and health care administration, engineering and nursing are likely to be less dependent on the traditional pool of recent high school graduates who seek a liberal arts college degree than will their counterparts without such programs. Because of the increasing popularity of these applied areas, it was hypothesized that the existence of applied programs for undergraduates has an effect similar to selectivity stimulating a larger pool of college applicants interested in the institution.

Hypothesis 1:C1: There will be a significantly lower correlation between PCO and PCE for colleges with a large number of undergraduate professional programs

than for colleges with a small number of such programs.

D. Existence of Evening Undergraduate Programs. The presence of evening undergraduate courses was hypothesized to have a similar effect to the presence of a continuing education program in reducing the college's dependence on the traditional pool of recent high school graduates who want to attend college full-time. Evening programs mean that an institution can meet the needs of the so-called nontraditional adult student who may work full-time but want to pursue an undergraduate degree part-time.

Hypothesis 1D:1: There will be a significantly lower correlation between PCO scores and PCE scores for colleges which offer evening undergraduate programs than for colleges which do not.

The primary effect of these resource dependence characteristics was hypothesized to be a moderating one on the relationship between the perception of the likelihood of an event occurring and the perception of an effect of that event on the institution because resource dependence factors characterize the nature of an organization's relationship with particular segments of its

environment, and theoretically, should determine the degree to which the organization needs to attend to and understand the consequences of changes in these segments of its environment.

The Moderating Effect of Geographic Region (2)

Although not directly a resource dependence characteristic, geographic region may act in much the same manner as these other variables on administrator perceptions of the certainty of an effect of the demographic trend on their institution. Most colleges receive the vast majority of their applications from individuals living in the same geographic region as the one in which the college is located. Further, it is common to find that more than 50% of a college's enrollees come from within the state (College Board, 1984).

Government statistics reveal differences in the expected percentage decline in the 18 to 24 year old population by region with the Northeast region expected to experience the most severe declines and the Southwest expected to have the smallest declines with some states actually experiencing an increase in the number of 18 to 24 year old high school graduates (Breneman, 1982; Crossland, 1980; Evangelauf, 1984).

Hypothesis 2:1: For the demographic trend only

There will be a higher correlation

between PCO and PCE scores for administrators from colleges in the Northeast and Southeast than for college administrators from the West and Southwest.

Organizational Characteristics (3)

Two organizational characteristics were hypothesized to be important in explaining the degree of effect uncertainty perceived by administrators in relation to the environmental changes being investigated: the strength of the organizational culture and the type of organizational structure.

A. Organizational Culture. Although the concept of organizational culture has only recently begun to attract attention in the organization theory literature, it has emerged as a major construct. The popularity of the recent book by Peters and Waterman (1982) and the devotion of an entire issue of ASQ to the construct provide evidence for the concept's growing popularity. There are several theoretical reasons to believe that culture may have an important impact on how "organizations" perceive their environments. Pfeffer (1981) suggests that organizational culture may play a more important role in explaining variance in perceived environmental uncertainty

than will "objective" characteristics of the organizational environment. His argument is based on the assertion that organizational reality is to a larger degree a function of social construction processes than it is a function of objective conditions, an assertion with which other researchers (i.e. Weick) would probably agree. Pfeffer (1981) goes on to hypothesize that one will find more agreement in perceptions of uncertainty between members of the same organization than between members of two different organizations operating under the same environmental conditions.

Many educational researchers (Clark, 1972; Cope, 1981; Keller, 1983) suggest that history, "sagas" and culture may be particularly important in educational organizations. Educational organizations have been described as "loosely coupled" (Weick, 1976), organized anarchies and as a "loose collection of changing ideas" without a coherent structure (Cohen & March, 1974). Additionally, educational organizations tend to be characterized by rather fluid participation of their members; members turn over frequently and the level of participation of any particular member is likely to vary substantially across time and situation (Cohen & March, 1974). Given these characteristics of educational organizations, it is suggested that it may be the unique history of the organization which provides the glue which holds the institution together. Thus, one might expect cultural variables to be particularly important factors in explaining the behavior of educational organizations and in explaining the

administrators' perceptions of the institution's relationship to its environment.

The role of organizational culture in perceptions of the environment will be investigated in two ways. First, a questionnaire measure of the strength of organizational culture will be used to investigate the relationship between strength of culture and perceptions of the likelihood and severity of the effect of environmental changes. This study was not as concerned with the particular elements (e.g. bias for action) that serve to differentiate organizational cultures from one another as it was with how pervasive and shared the culture was within a particular institution. Two components thought to be relevant to defining the so-called strength of the institutional culture were: the degree to which organizationl members viewed the institution as unique among educational institutions and, the degree to which there was a shared knowledge of the institution's history.

Hypothesis 3:A1: There will be a negative relationship between the strength of organizational culture and the perceived certainty of effect scores.

Hypothesis 3:A2: There will be a negative relationship between the strength of organizational culture and the perceived magnitude of the effect of the environmental changes on the institution.

A strong culture, it is suggested, will make administrators perceive their institutions as relatively invulnerable to environmental changes. A strong organizational culture acts to reinforce a strong sense of history and distinctive competence which, in turn, tend to be associated with a belief in the organization's continued existence, no matter how hostile the environment. Organizations with strong cultures are thus likely to be slow in acknowledging the potential effect of environmental events. To further investigate the role of culture as a predictor of the degree of effect uncertainty, analysis of Hypothesis 3A:1 will also be done partialling out the effects of the resource dependence variables and geographic region. This will be done in order to provide a more robust test of the hypothesis.

The research will also investigate Pfeffer's (1981) hypothesis that the effect of organizational culture on perceptions of the environment will be manifested in greater levels of agreement between

members of the same organization than between individuals representing different institutions. In an attempt to ensure the similarity of the environments of these organizations, this hypothesis will be tested within subgroups of organizations which are formed so as to maintain the likely similarity of the institutions.

Hypothesis 3A:4: Institutional membership will explain a significant amount of variance in perceived certainty of effect scores, even when the institutions are matched for:

a. prestige
b. presence/absence of Continuing Ed. programs
c. presence/absence of undergraduate professional programs
d. presence/absence of an Evening session

B. Organizational Structure. Several organizational theorists and researchers have hypothesized the existence of a relationship between the degree of environmental uncertainty perceived and structural characteristics of the organization. Many have suggested that it is

PEU which affects organizational structure with several researchers suggesting that the initial reaction to uncertainty is that of tightening up or "mechanizing" the organizational structure (Khandwalla, 1976; Dewar & Duncan, 1977). Bourgeois, McAllister and Mitchell (1978) found support for these contentions in a simulation study.

An alternative view posits the opposite causal sequence; namely, that it is structural characteristics which affect the degree of uncertainty perceived. Huber, O'Connell and Cummings (1975), in a laboratory study, found that groups with more mechanistic type structures tended to perceive more uncertainty in their environments than groups with organic-type structures. On the other hand, Leifer and Huber (1977) found a positive relationship between PEU and organicness of structure. In the latter study, this relationship was found to disappear when the effects of boundary spanning activity were partialled out. The authors suggested that it was structure which influences PEU and that boundary spanning activity acted as a suppressor variable.

The true nature of the relationship between structure and perceptions of environmental uncertainty, despite considerable research, remains unclear. As the proposed research is cross-sectional in nature, causal inferences will not be possible. The relationship hypothesized to exist is one of structure influencing the degree to which administrators perceive environmental changes as

likely to impact on their organizations.

The structure of educational organizations is usually characterized as organic with few rules and regulations governing behavior and relatively high levels of participation in decision making (Meyer & Rowan, 1978; Mintzberg, 1979; Weick, 1976).

Of primary interest in this study is the degree to which the institution's structure is centralized versus decentralized. As this study deals with top-level administration and strategic decision making in institutions of higher education, the centralization dimension will be investigated primarily through looking at the degree to which the institutional structure supports and reinforces particpation by these top-level administrators in the strategic decision making for the college.

Hypothesis 3B:1: The more the organizational structure allows for participation in decision making, the more certain administrators will be that the environmental trends will affect their institution.

Hypothesis 3B:2: The positive relationship between participation in decision making and perceived certainty of effect

will continue to be significant
even when the effects of:

a. prestige
b. presence/absence of Continuing Ed. programs
c. presence/absence of undergraduate professional programs
d. presence/absence of Evening sessions

on this relationship are partialled out.

Participation in decision making was hypothesized to affect individual perceptions of effect certainty in the above way through one of two mechanisms. First, through participative meetings, administrators are exposed to the opinions of other administrators who may be more active boundary spanners or who perform functions which are likely to make them more sensitive to various aspects of the college's environment. This exposure could act to make indivduals more certain about the effect of these trends on their institutions. Secondly, participation in key decision making for the college may foster a greater sense of responsibility or accountability for that institution and thus, a more comprehensive and critical analysis of information about the

institution's environment.

The effects of the resource dependence variables will be partialled out in order to increase the similarity of the organizations and provide for a stronger test of the hypothesis.

Individual and Role-Related Characteristics (4)

The effect of several individual and role-related variables on perceived certainty of effect scores was also investigated. The rationale for these hypotheses was that attributes of the perceiver and of the role of the perceiver may predispose the individual to perceive his/her surroundings in particular ways.

A. Individual Characteristics. Previous research (Aldag & Storey, 1979; Downey et al, 1977; McCaskey; 1976; Storey & Aldag, 1983) has established fairly conclusively the relationship between several personality attributes such as locus of control, tolerance for ambiguity and anomie and perceptions of uncertainty. As the evidence for these relationships is fairly clear, this research sought to investigate the impact of another kind of individual-level variable on these perceptions, namely demographic attributes of the individual (e.g. age, tenure in the role, tenure in the organization, previous job held). It seems quite plausible to assume that individual attributes such as age and tenure in the organization are likely to affect the perceptual and decision making processes of organizational

administrators. Pfeffer (1983), in fact, suggests several hypotheses relating the distribution of demographic characteristics of an organization's top management team to the organization's behavior.

Hypothesis 4A:1: The following demographic characteristics of individuals will be significantly related to perceptions of certainty regarding the likelihood of an effect of environmental changes on the institution:

a. age of the administrator
b. tenure in the role
c. tenure in the organization
d. previous job held

Because no prior research on the relationship between individual demographics and administrator perceptions of the environment has been done to this researcher's knowledge, these hypotheses were viewed as exploratory and no specific directional hypotheses were advanced.

B. Role-Related Variables. The role that an individual occupies in an organization delimits the content of his/her job in ways which may have a significant effect on how he/she perceives environmental changes and their likelihood of impact on the particular organization.

Two role attributes were examined: the amount of boundary spanning activity involved in the role and the actual role of the perceiver.

The relationship between degree of boundary spanning and perceptions of environmental uncertainty has been previously examined (Cox et al., 1978; Leifer & Huber, 1977). Both of these studies found positive relationships between boundary spanning or boundary relevance and perceived environmental uncertainty. The present research made a prediction opposite to the findings of those studies. To understand the reason for the predictions made here, it is necessary to look at the types of uncertainty being investigated. Previous researchers have used global measures of environmental uncertainty whereas this research is looking at uncertainty as it relates to two very specific changes in the environment and as it relates to the expected impact of these two specific environmental changes.

It may be that boundary spanning results in an increased understanding of the complexity of the environmment which, in turn, breeds uncertainty about the state of the environment in general. The more complex and volatile an individual perceives the environment to be, the less likely he will be to be certain that he understands the nature of that environment. However, in the case of examining uncertainty about very specific changes and their likely effect on a particular organization, boundary spanning may actually increase certainty about the changes. The boundary spanner, by nature of his frequent interactions with individuals outside the institution, is in

a position to collect specific information about these events and their impact on other organizations. This specific information, provided it is consistent, is likely to increase the boundary spanner's certainty about the nature of the likely impact of a specific change on the institution.

Hypothesis 4B:1: Individuals with large amounts of boundary spanning activity involved in their roles will perceive the effect of the environmental changes as more certain than will less active boundary spanners.

The effects of role (job title) on perceived certainty of effect were also examined. While one of the major variables differentiating roles is the amount of boundary spanning activity involved in the role, there are also other factors which differentiate between roles and that may make individuals in different roles perceive the organization-environment relationship differently. Roles, for example, differ in the type and amount of information the individual has or needs access to in order to fulfill the requirements of the role effectively. The possession of different amounts and types of information may result in differential perceptions of the organization's vulnerability to its environment.

Hypothesis 4B:2: There will be significant differences in PCE scores as a function of the role of the administrator, specifically:

a. admissions officers will tend to have higher PCE scores about the demographic trend than will administrators in other roles.

b. provosts will tend to have higher PCE scores about the curriculum trend than administrators in other roles.

The Importance of Agreement among Administrators (6)

In a study of management perceptions of their organizations, Hrebiniak and Snow (1982) found a significant positive relationship between the level of agreement among members of top management as to what the strengths and weaknesses of the organization were and the firm's economic performance, even when the effects of variables such as previous organizational performance and degree of emphasis on long-range planning were partialled out. This finding suggests an interesting hypothesis with regard to organizational administrators'

processing of information about the environment. It may be that some level of agreement among these administrators with regard to the likelihood and severity of the effect of an environmental change is necessary before administrators can actively consider their response options and plan a strategy for handling these changes. Agreement would act to facilitate strategic planning efforts as there would be basic consensus on what environmental conditions the organization would be likely to have to plan for.

Investigation of the role that level of agreement between administrators on PCE scores may play in predicting an organization's planning and response patterns represents a movement away from the individual level of analysis towards a group level of analysis of data. Level of agreement is a variable which simply looks at the distribution of individual scores around the mean, and in so doing, changes the unit of analysis from the individual to the group. If the data allow several hypotheses of an exploratory nature will be investigated.

Predictors of Level of Agreement. Hypothesis 3A:4 (already discussed) will test Pfeffer's supposition (1981) that organizational membership and the consequent exposure to the organization's culture will result in greater levels of agreement in perceptions of the environment between administrators from the same organization than between administrators from different organizations. The following hypotheses

will also be investigated.

Hypothesis 3A:6: The stronger the organizational culture, the higher the level of agreement between administrators in their estimates of the perceived certainty of effect of environmental changes.

To the extent that a strong sense of institutional history and identity fosters an increased likelihood of strong institutional socialization and "shared values," administrators from institutions with strong cultures ought to be more homogeneous in their evaluations of the organization's relationship with its environment. It should be noted that this relationship was hypothesized to exist independently of whether the average perceived certainty of effect scores were low or high.

Hypothesis 3B:3: The more participation in decision making, the higher the level of agreement among administrators in their PCE estimates.

The greater the opportunity for participation in decision making, the

greater the exposure individuals have to the beliefs and perceptions of others and the more likely that each will be influenced by these beliefs and perceptions.

Perceived Response Certainty (7)

The third type of uncertainty hypothesized to exist is response uncertainty. Response uncertainty was conceptualized as having two dimensions: uncertainty about the response options available to the institution and uncertainty about the desirability of the outcomes resulting from each of the response alternatives.

These dimensions are similar to the dimensions of decision uncertainty suggested by Conrath (1967). Conrath, however, as previously indicated, suggested three dimensions of uncertainty: uncertainty about the alternatives available, uncertainty about what future states of nature might occur, and uncertainty about the value or utility of each s.o.n.-alternative pair. In this research, the latter two dimensions have been collapsed into one dimension to simplify the construct conceptually and operationally.

Perceived response certainty was examined at two levels of analysis in this research. At the individual level, it was operationalized as the individual's score on the measure of response certainty used here. At the institutional level, the scale scores for each administrator from a given institution were aggregated and the average institutional response certainty score was used.

The primary hypotheses about response certainty/uncertainty concerned its relationship to the type of institutional responses made or under consideration. However, several hypotheses of an exploratory nature were advanced attempting to delineate predictors of response uncertainty.

Hypothesis 3A:7: The stronger the organizational culture, the higher the average response certainty score.

The rationale for this hypothesis was that a strong culture means a strong sense of the institution and a strong awareness of the history and values of the institution. Previous research has shown a positive relationship between anomie, or a lack of overriding values, and uncertainty (Aldag & Storey, 1979; Downey et al., 1977). Others (Michael, 1973) have suggested that the presence of a strong value system may preclude a willingness to admit uncertainty. Therefore, a strong organizational culture to the extent that it is associated with a strong sense of overriding beliefs or values may act to reinforce perceptions of certainty whether or not the administrators have a clear understanding of the desirability of the various strategic options.

Hypothesis 3B:4: The more the institution's structure

supports participation in decision making, the higher the average response certainty score.

Huber et al. (1975) reported a significant negative relationship between organicness of structure and perceptions of environmental uncertainty on the part of organizational members. As the degree of involvement of organizational members in decision making is a critical dimension of organicness of structure, the hypothesis suggested here follows from the findings of this previous research.

The Relationship between Perceived Certainty of Effect and Perceived Response Certainty. According to the theoretical framework on which this research is based, a fairly high degree of certainty about an effect of an environmental change may be needed before an organization's top management group begins to consider its response options. The initial examination of response options probably involves fairly high degrees of response uncertainty which diminish as more information about strategic options is gathered and planning becomes increasingly focused. As the current research is cross-sectional rather than longitudinal, it will not be possible to investigate this hypothesis. In the absence of longitudinal data, no specific hypotheses about the nature of the relationship between individual PCE and PRC scores will be advanced.

A hypothesis will, however, be offered about the relationship between PCE scores looked at in the aggregate and individual response certainty scores. If there is a high level of agreement among administrators regarding the certainty of an effect of an environmental change on the institution, administrators are more likely to have already undertaken planning efforts and thus may have more knowledge of their response options and of how these responses might affect the institution than administrators from institutions in which there is less agreement about the likelihood of an effect. Thus, administrators who are members of organizations in which there is a higher level of agreement among key administrators are likely to have higher levels of response certainty.

Hypothesis 6:1: Administrators will tend to have higher levels of response certainty when there is a high level of agreement between them in their perceptions of the certainty of an effect of an environmental change on their institution.

Response Certainty as a Predictor of Organizational Response Patterns. The examination of relationships between response certainty and organizational response patterns will employ an aggregated measure of

response certainty (in this case, a measure of central tendency) for administrators from a given institution. Like the investigation of hypotheses involving level of agreement, examination of these hypotheses necessitated receiving several questionnaire returns from each institution. Therefore, these hypotheses could only be investigated within a subsample of the total sample of colleges.

Prior to delineating the hypothesized relationships, the typology of organizational responses developed for this research needs explanation.

Organizational Response Patterns (9)

Colleges and universities can choose to make a number of responses to the demographic and curriculum trends that are occurring in the external environment. These responses range from strategies such as collecting information about the exact nature of these trends and what other institutions are doing to the creation of new programs designed to appeal to a new group of potential consumers (i.e. older adults who are working full-time and want to obtain their undergraduate degrees at night). For the purposes of this research, the responses have been classified into four types.

A. Information Gathering responses. Refer to responses that are

oriented towards the acquisition of more information about the strategic options available to the college. Responses classified into this category include:

-hiring consultants or forecasters to help the college evaluate its options,

-seeking information from administrators at other colleges about how they are responding and why,

-formation of task forces to collect information and make recommendations to the Board or President.

B. Retrenchment responses. Are responses that involve cutbacks or stabilization of resources. Retrenchment responses are designed in reaction to existing or anticipated threats to the institution's survival but have no impact on the institution's immediate relationship with its environment. Included in this category are the following responses some of which are interrelated:

-cutting back instructional budget allocations,

-cutbacks in the capital expenditure budget,

-cutbacks in the number of faculty lines,

-instituting a hiring freeze, and

-elimination of academic departments

C. Market Penetration responses. Are responses designed to increase the institution's share of the current market of consumers. In the case of colleges, these represent responses designed to increase the recognizability or attractiveness of the institution to current high school students, their parents and/or their counselors and teachers.

Responses of this type include:

-advertising in newspapers, on radio or television,

-development of brochures designed to inform HS guidance counselors about the institution,

-increasing High School recruitment efforts,and

-increasing the percentage of applicants accepted.

D. Market/Product Diversification responses. Refer to strategies the college adopts in an effort to diversify into a new market (i.e. attract a new group of consumers) or to diversify into a new product area which may appeal to both new and old consumers. The following strategies have been classified as diversification responses:

-creation of Continuing Education programs,

-establishment of an evening session,

-establishment of satellite campuses,

-creation of new degree programs in applied and professional fields, and

-creation of new academic departments or majors

E. Creation of New Programs. There is some overlap between responses in this category and responses of the Product Diversification type. Nevertheless, it was deemed important to look at this category in addition to the prior one. Responses in this category include those in the former group with the exception of the creation of an evening session and the addition of a Continuing Education program neither of which is necessarily a substantively new program of study. The

following response was also considered to be a "new program" response:

> -entering into jointly-sponsored programs with other colleges in the area.

Predictors of Organizational Response Patterns. The general hypothesis advanced here is that institutions will tend to be engaging in different responses as a function of the average level of response uncertainty among administrators. High levels of response uncertainty reflect a lack of understanding of what all the response or strategic alternatives available to the institution are as well as a lack of understanding of the relative desirability of each as a strategy for the future. It was predicted that when such a high level of uncertainty exists, two particular types of organizational responses would be more likely to occur than others. Clearly, high levels of response uncertainty are likely to be associated with information seeking responses, the outcome of which would be a reduction in the level of uncertainty over time. Also predicted was a greater likelihood of retrenchment responses under conditions of high uncertainty. Two specific hypotheses were advanced:

Hypothesis 8:1: Institutions in which administrators, on the average, have high levels of response uncertainty will be more likely to be engaging in information seeking and

retrenchment strategies than in penetration or diversification strategies.

Hypothesis 8:2: Institutions in which administrators, on the average, have high levels of response uncertainty will tend to be making more information gathering and retrenchment type responses than institutions in which the average uncertainty is low.

When there is a high level of uncertainty among the critical decision makers of an organization about the appropriate response to make, the efficacy of the various responses is not clearly known. Information gathering is a logical response under these conditions as it serves to facilitate understanding of the organization's situation. The positive relationship between uncertainty and information gathering has been hypothesized by several researchers (e.g. Aldrich & Herker, 1977; Blandin & Brown, 1977; Kefalas & Schoderbek, 1973; Thompson, 1967).

Retrenchment, although clearly an undesirable response for administrators, is also likely to be a temporary response when decision makers lack a clear understanding of their other response options. Retrenchment responses can be viewed as a reflection of

negative slack in the system resulting from a failure to adequately anticipate a threat to the organization or, as a way of ensuring the preservation of some positive slack given the expectation of some threat to the system.

Hypothesis 8:3: Market penetration and diversification type responses will be more likely in institutions in which administrators, on the average, have high levels of response certainty.

Hypothesis 8:4: Given that administrators, on the average, have high levels of response certainty, they will be more likely to pursue penetration and diversification strategies than to engage in information seeking or retrenchment type responses.

Given an understanding of the nature of the organizational environment and of the possible response options available to the organization, penetration and diversification are more effective responses in the long run because they have a direct impact on the organization-environment relationship. These two strategies alter the organization's position in its environment either by increasing its

power base or by reducing its dependence on a particular segment of the environment.

A final set of hypotheses relates to the nature of the relationship between response certainty and the stage of the institution's planning efforts. The more uncertainty existing among the administrators, the more likely they will be to be considering a large number of possible responses.

Hypothesis 8:5: Administrators from institutions in which there is a high average level of response uncertainty will be more likely to considering their response possibilities and will tend to consider a larger number of response options than administrators whose average institutional response uncertainty score is low.

Hypothesis 8:6: Administrators from institutions in which there is a low average level of uncertainty (high certainty) will be more likely to have already made responses and if considering responses, will be actively considering fewer responses than administrators whose average uncertainty score is higher.

When there is a high average level of response uncertainty, the consensus among administrators is that they are not sure of their response options nor of their likely effectiveness. Under these conditions, it seems likely that a large number of response options would be considered and evaluated and that the actual making of a response (other than information gathering) would be postponed until there was more certainty about the likely effectiveness of each of the set of possible responses. The second hypothesis reflects the same reasoning from the perspective of certainty.

Individual Outcomes (10)

Few studies have examined the impact of administrator perceptions of potentially threatening changes in the organizational environment on how these administrators feel about their roles and their institutions. Yet a connection between the two sets of variables seems quite likely to exist. In an effort to begin to explore these possible relationships, three individual-level outcomes of administrator perceptions of uncertainty were explored in this research:

a. Satisfaction with the institution's planning

b. Role ambiguity

c. Organizational commitment

A. Satisfaction with the Institution's Planning. One of the factors hypothesized to be connected to top-level administrators' attitudes about the institution for which they work was the degree to which they were satisfied with the institution's short and long-range planning. It was hypothesized that under conditions of environmental turbulence, the degree to which administrators felt satisfied that their institution's planning efforts would allow the institution to effectively handle environmental threats would be a significant factor in determining their level of commitment to the institution.

The degree of satisfaction that an administrator has with the institution's planning effort was hypothesized to be predicted by their level of effect certainty moderated by the type of responses the organization has made or is considering making to the changes in its environment.

Hypothesis 5:1: Administrators who have high certainty of effect scores and who are members of organizations which have already made penetration or diversification responses will be more satisfied with the institution's planning than will:

a. administrators who have high PCE scores who are members of organizations that are only

considering responses of these types, or

b. administrators who have high PCE scores whose institutions have made retrenchment or information gathering responses only.

The rationale for these hypotheses is that when an individual perceives with certainty that a change will impact on the institution, he/she will desire that the institution respond effectively to that change. The most effective responses in terms of the long run survival of educational organizations are ones that will have an impact on the organization's power to secure scarce resources from a particular resource supply or ones that will increase the organization's independence from any particular resource supply.

B. Role Ambiguity. The concept of ambiguity is very closely related to the concept of uncertainty (Schuler et al., 1984). The concept of role ambiguity can be said to reflect an experience of uncertainty about the nature of an organizational member's responsibilities and relationships with others in the organization.

Hypothesis 7:1: There will be a positive relationship between perceived response uncertainty and role ambiguity.

The experience of uncertainty about how to respond to changes in the

organizational environment may tend to be associated with administrator experience of ambiguity about their roles because the administrators are likely to be less clear about the nature and scope of their responsibilities under conditions of a lack of certainty as to how the organization can or should respond. Aldag and Storey (1979) found empirical support for the existence of a positive relationship between uncertainty and role ambiguity in their research with CEOs of Canadian companies.

C. Organizational Commitment. Organizational commitment is generally viewed as an attitudinal variable measuring the extent to which an individual identifies with an institution and its goals (Hall, Schneider & Nygren, 1970; Sheldon, 1971; Mowday, Steers & Porter, 1979). One of the most important and consistent findings of the research focusing on the concept has been that of a significant negative relationship between organizational commitment and turnover (i.e. Porter, Steers, Mowday & Boulian, 1974; Mowday et al., 1979).

Organizational commitment, however, has rarely been investigated among members of top management, perhaps because of the difficulty in making the concept operational for high-level employees (Hrebiniak & Alutto, 1972). The model proposed here suggests that an important set of antecedents of organizational commitment for upper management employees may be variables relating to how the organizational environment is being perceived and the perceived adequacy of the

organization's reponses. An administrator who perceives serious threats to the institution from pending environmental changes but perceives that the institution is not doing enough to plan for these changes may become frustrated. This frustration may lead to lessened commitment to the particular organization and an intention to leave the organization or to leave the position to resume a nonadministrative one in the organization. This line of thought has resulted in two hypotheses.

Hypothesis 11A:1: The lower the satisfaction with the institution's planning, the lower the commitment to the organization.

Hypothesis 11B:1: The greater the experienced role ambiguity, the lower the commitment to the organization.

The first hypothesis is stated as above under the assumption that satisfaction with planning will be related to PCE and organizational response patterns as hypothesized in Hypothesis 5:1. The second hypothesis follows from previous research showing a negative relationship between role ambiguity and job satisfaction and between role ambiguity and propensity to leave the organization (Rizzo, House & Lirtzman, 1970), both of which have been found to be significantly related to organizational commitment (Mowday et al, 1979).

CHAPTER THREE

SAMPLE, MEASUREMENT AND DATA ANALYSIS

Sample

A stratified random sample of private, four year, liberal arts colleges was chosen for participation in this study. The sample was stratified so as to be representative of the distribution of colleges by region of the country.

Questionnaires were sent to 589 top-level administrators, a sample which included an average of four administrators from each of 148 selected colleges. Roles which were sampled included: the President, the Provost or Vice President for Academic Affairs, the Dean or Vice President of Admissions, the Vice President for Institutional or Strategic Planning, the Vice President for Finance and the Vice President for Development as well as a small number of other administrative roles. The multiple sampling within each institution was undertaken for two reasons: First, to increase the probability of sampling each institution and second, to permit investigation of hypotheses relating to the role of the respondent and

to the level of agreement among respondents within institutions.

Sampling Procedures

The computer database "Discover" published by the American College Testing Service was used to select all four year, private, nonreligious-affiliated colleges and universities in the United States. A population of 437 colleges was generated, categorized into groups by region of the country in which the college was located (e.g. Northeast, Southeast, Farwest etc.).

It was necessary to supplement the use of Discover with use of the College Board's database because Discover lacked the capacity to differentiate between types of colleges--so that this original list of 437 institutions included business, technical and arts schools as well as liberal arts and mixed liberal arts/technological institutions. The College Board's College Handbook was used to check each of the schools in the population. Institutions that were not classified as liberal arts or did not have the term "liberal arts" in the College Board's classification code were dropped from the population.

At this time, the decision was also made to include religious-affiliated schools in addition to nonreligious institutions since there are a relatively equal number of religious and nonreligious colleges throughout the country and in some regions, most notably the Southeast, religious-affiliated institutions actually outnumber nonreligious ones by a ratio of 2:1. As this study sought to sample colleges proportionately to their regional distribution,

leaving out religious-affiliated institutions would have resulted in a serious underrepresentation of colleges in certain regions of the country, thus threatening the accuracy of the proportional stratification of the sample and the generalizability of the study's results.

The decision was also made to include only colleges with at least 400 full-time undergraduate students. Less than 5% of the initial group of colleges was eliminated as a result of the addition of this selection criterion.

The final population consisted of 775 institutions of higher education. All were four-year, private, primarily liberal arts or mixed liberal arts/technological colleges or universities with enrollments of 400 or more full-time undergraduates. The lefthand columns of Table One show the regional breakdown of this population as well as the relative percentage of the population located in each geographic region. The righthand columns show the number of colleges which were sampled from each region as well as their relative percentages by region.

The sampling ratio was approximately 1:5. Every college within each regional category was assigned a number from 1 to N, with N depending on the size of the regional subpopulation. Colleges were chosen to be a part of the sample via the use of a random numbers table. One hundred and forty eight colleges were chosen.

Table One

Institutional Sampling By Region

	Subpopulation Size	% of Total Population	Sample n	% of Sample Size
Northeast	259	33%	49	33.1%
Southeast	171	22%	33	22.3%
Great Lakes	138	18%	26	17.6%
Rocky Mountain States	103	13%	20	13.5%
Southwest	44	6%	9	6.1%
Far West	60	8%	11	7.4%
TOTAL	775	(100%)	148	(100.0%)

The 1984 Higher Education Directory was used to determine the names of the individuals in the roles to be sampled. As mentioned previously, 589 questionnaires were sent out. Table Two shows the relative distribution of the questionnaire mailing by region and Table Three shows the relative number of questionnaires sent by role.

In all cases, a questionnaire was sent to the individual occupying the role of President, Acting President or Chancellor. Whenever possible, questionnaires were also sent to Provosts and Directors of Admissions. This was not possible in some cases either due to a vacancy or to the apparent lack of existence of a role with that title within the university. The other roles sampled varied across institutions due to widespread differences in the titles of roles existing within the institutions.

The Sample Characteristics

Of the 589 questionnaires sent out, 211 usable questionnaires from individuals representing 122 colleges and universities were returned. This represents a response rate of approximately 36%. Table Two shows the distribution of responses by region as well as the relative percentages of the sample represented by responses from each of the regions. Comparing Table One to Table Two shows that the pattern of responses by region was fairly representative of the actual distribution of the population of liberal arts colleges by region. The largest deviations from strict proportionality being a 2% point difference in the Northeast and in the Southeast. Table Two also

Table Two

Questionnaires Sent by Region and Regional Response Rates

	Questionnaires Sent	% of Total Sample	Completed Questionnaires Received	% of Total Returns	% Resp.
Northeast	195	33.1%	66	31%	34%
Southeast	132	22.4%	50	24%	38%
Great Lakes	102	17.3%	38	18%	37%
Rocky Mountain States	80	13.6%	27	13%	34%
Southwest	36	6.1%	15	7%	42%
Far West	44	7.5%	15	7%	34%
TOTAL	589	(100.0%)	211	(100.0%)	36%

shows the regional response rates which varied from a low of 34% to a high of 42%.

Table Three illustrates the reponse rates by role, showing significantly lower response rates for Presidents and executive vice presidents than for individuals in other administrative roles. The lower response rate of Presidents and Executive Vice Presidents is not surprising given their busy schedules. It should be noted that in a few cases, Presidents apparently gave their questionnaires to their assistants to fill out. This is known because all outgoing questionnaires were coded for role as well as for institution and region. Returned questionnaires which indicated a job title different than that which had been coded thus, were questionnaires which had been delegated to others to fill out. This delegation of responsibility may, in fact, have occurred more frequently but would have been undetectable if the individual completing the questionnaire had responded to the question asking for job title by entering the role of the person for whom he was filling it out.

Table Four contains information on the characteristics of the responding institutions. A comparison of the characteristics of these institutions with those of nonresponding institutions show a few small differences, none of which appear to be significant. The sample of responding institutions thus can probably be said to be representative of the population.

Table Five provides information on the demographic and role characteristics of the responding administrators. As can be seen in

Table Three

Response Patterns and Rates
as a Function of the Role of the Respondent

ROLE	NUMBER OF QUESTIONNAIRES SENT	NUMBER RETURNED	RESPONSE RATE
President	148	34	23%
Executive VP	22	4	18%
Provost/Chief Academic Officer	129	50	39%
Director of Admissions	138	52	38%
VP, Finance	51	19	37%
VP, Development	39	14	36%
Chief Planning Officer	19	9	47%
Director, Inst'l Research	24	9	38%
Registrar	10	4	40%
Assistant to the President	3	9	N.A.***
Chief Student Officer	2	1	50%
Chief Contract Administrator	1	1	100%
Director, Student Placement	1	1	100%
Director, Personnel	1	0	0%
Dean, Liberal Arts	1	2	N.A.***
TOTAL	589	209	
(+ Others)	0	2	
	589	211	(36%)

***NOTE: The discrepancies in these cases reflect the fact that some individuals, particularly presidents, who were sent questionnaires gave them to others to fill out.

Table Four

Institutional Characteristics

	Responding Institutions (N=122)	Nonresponding Institutions (N=26)
Average Age of the College	103 years (SD=43.3)	107 years (SD=36.6)
Average Number of Full-time Undergraduate Students	1,563 (SD= 1,645)	1,754 (SD=2,725)
Average Selectivity (#applied/ #accepted)	76% (SD=18%)	76% (SD=18%)
Percentage of colleges which are Coed	96%	88%
Percentage offering Graduate Degrees	50%	40%
Location	30% urban 44% suburban 26% rural	Not Tested

Table Five

Characteristics of the Responding Administrators

- Role:

  25% Directors of Admissions

  24% Provosts/Vice Presidents for Academic Affairs

  16% Presidents/Acting Presidents

  9% Chief Business Officers

  25% Others (including Executive Vice Presidents, Directors of Strategic Planning, Vice Presidents for Development, etc.)

- Age:

  .5% 20-29

  23.7% 30-39

  32.7% 40-49

  28.9% 50-59

  12.8% 60-69

  1.4% MISSING

- Sex:

  82% Male

  18% Female

- Average Tenure in Current Position:

  68.7 months or 5.6 years (SD= 59.9 months)

- Average Tenure in the College:

  130.6 months or about 11 years (SD= 99.2 months)

- Average Tenure in College Administration:

  159.7 months or about 13 years (SD= 96.8 months)

this table, 82% of the respondents were male and the largest percentage were between the ages of 40 and 49. Respondents had an average tenure in their current roles of 5.5 years.

Measurement

Perceived Certainty of Occurrence of Environmental Changes (PCO)

This variable was measured using a modification of a technique developed by Duncan (1972). Use of this technique in this study differed in three ways from Duncan's technique. First, the focus of this research was not on components of the organizational environment or environmental factors, as Duncan called them, but rather on changes or predicted changes in a couple of these factors. Secondly, because of the environmental processing framework proposed here, the effects of perceiving environmental changes and perceiving an impact of these changes on the institution were examined separately. Finally, although the conceptual underpinnings of Duncan's measure also underlie the measure to be used in this research, the actual wording of the questions was slightly altered to more effectively address the hypotheses this research sought to test.

Perceived certainty of occurrence was operationalized through the use of a multiplicative index of the answers to two questions (1a and

1b; see Appendix A) for each of the two trends which were focused on in this research. In order to derive a certainty score, the following formula was used:

(Probability of occurrence estimate - 49) *
(Individual's certainty in the
probability estimate.)

A constant of 49 was subtracted from the probability estimate so as to maximally differentiate certainty of nonoccurrence from certainty of occurrence. The probability scale thus varied from -51 (absolute certainty of nonoccurrence) to +49 (absolute certainty of occurrence). The constant 49 was used instead of 50 to eliminate a zero point -- a zero in this portion of the formula would cause the entire PCO estimate to be zero no matter how certain or uncertain the individual was in his estimate, giving no weight to the second half of the equation.

The "certainty in the probability" question was asked using a 7-point scale with the lower end representing extreme uncertainty about the probability estimate and the upper end representing absolute certainty in the probability estimate.

It should be noted that this variable was not scored on a continuum ranging from maximum uncertainty to maximum certainty but rather on a continuum where negative scores represent certainty of

nonoccurrence and high positive scores represent certainty of occurrence. This was done so that it would be possible to differentiate between those individuals who were certain that these trends would occur and those who were equally certain that the trends would not occur. Scoring this variable on an uncertainty-to-certainty continuum would not have allowed for differentiation between these two very different types of certainty.

As the focus of this research was on the processing of information about two existing and potentially threatening trends, it was deemed more important to differentiate individals who indeed perceived these trends as certain to occur from those who thought the trend would not occur than to score this variable so that it differentiated between certainty and uncertainty. While there is a clear relationship between ability to predict the occurrence of changes in the environment and certainty/uncertainty about the nature of that environment, because of the way in which the PCO measures are derived, they do not directly measure uncertainty vs. certainty about the state of the environment.

Table Six presents the key descriptive statistics for this variable as well as for the other focal variables in this study.

Perceived Certainty of Effect (PCE)

The same technique and scoring procedure was used to measure the degree of perceived certainty of effect with two notable differences.

Table Six
Characteristics of the Measures

Variable Name	Label	Number of Items	Mean	S.D.	Skewness	Valid N	Coefficient Alpha
Perceived Certainty of Occurrence of the Demographic Trend	PCOD	1	216.3	140.23	-1.068	210	---
Perceived Certainty of Occurrence of the Increased Demand for Vocational Relevance	PCOV	1	91.7	109.01	0.371	207	---
Perceived Certainty of Effect of the Demographic Trend	PCED	1	138.8	177.85	-0.288	210	---
Perceived Certainty of Effect of the Vocational Demand Trend	PCEV	1	117.9	130.90	-0.010	205	---
Response Certainty	RESPCER	6	18.4	3.97	-0.147	202	.75
Organizational Structure (Participation in Decision Making)	PARTIC	8	33.3	5.80	-1.195	200	.89

Table Six (Cont'd)
Characteristics of the Measures (Cont'd)

Variable Name	Label	Number of Items	Mean	S.D.	Skewness	Valid N	Coefficient Alpha
Strength of Institutional Culture	CULTURE	6	24.8	3.74	-0.713	207	.79
Organizational Commitment	COMMIT	8	34.9	4.58	-0.920	205	.89
Role Ambiguity	AMBIGU	6	24.0	4.01	-0.867	203	.85
Boundary Spanning Activity	BSA	9	32.7	8.33	-0.389	208	.90
Satisfaction with Institutional Planning	PLANSAT	1	72.3	19.00	-1.350	202	---

First, the wording of the questions reflects their focus on the perceived effect of each of these trends on the institution and not on the perceived likelihood of occurrence of these trends. Secondly, effect certainty/uncertainty, unlike PCO, was conceptualized as having two dimensions:

a) uncertainty about the likelihood of impact, and

b) uncertainty about the magnitude of an impact

Questions 2a-d were designed to measure uncertainty about these two dimensions. The PCE scale score was a multiplicative index of the answers to the four questions with Question 2a coded in the same manner as Question 1a (described above). The formula used for calculating perceived certainty of effect, thus was:

(Probability of effect -49 * Certainty of estimate)
* (Expected Magnitude of effect * Certainty about this estimate)

This index was based on the assumption that the two dimensions of effect uncertainty would be strongly related to each other. This assumption was supported.

Correlations between the "probability of effect" estimate and the "magnitude of effect" estimate were .57 and .49 ($p<.001$) for the demographic and vocational trends respectively.

A brief comment on the relative weighting of the two dimensions of effect uncertainty/certainty is necessary. Questions on the perceived magnitude of effect were asked on a 5-point Likert-type scale. Thus, the probability estimate was accorded a weight approximately ten times greater than the magnitude estimate in the formula used to compute effect certainty. This unequal weighting of the two components of effect certainty reflected the theoretical assumption that the probability of effect was a more important contributor to effect uncertainty than was the magnitude.

In order to ensure that this formula for calculating effect uncertainty did not distort the data, this method of calculation was compared to two other potential methods of calculating effect certainty. These other methods were:

1) a computational formula without a magnitude estimate included in the calculation, and
2) a formula with the magnitude estimate weighted equally to the probability estimate.

Correlations between these different methods of calculating effect certainty ranged from .97 to .99. Thus, the relative weight given the magnitude estimate seems to be unimportant. In fact, these results suggest that the magnitude estimate may not be needed. In this case, however, the formula for computing effect certainty was used as originally conceptualized.

Again, it must be noted that this variable, like the PCO

variable, was not scored on an uncertainty-certainty continuum but rather on a "certainty of no effect"-"certainty that there would be a significant effect" continuum. The rationale for doing so is the same as that indicated for the decision to score the "certainty of occurrence" variable in this manner.

Perceived Response Certainty (PRC)

Response certainty/uncertainty as conceptualized in this research is very similar to the conceptualization of uncertainty utilized by decision theorists (Conrath, 1967). Aldag and Storey (1979) developed a scale utilizing this perspective as the underlying theoretical framework and administered it to a sample of Canadian chief executive officers. Their scale, however, is complicated, somewhat confusing and yielded only a mediocre reliability coefficient (α=.68). For these reasons, the decision was made to develop a new scale rather than use the Aldag and Storey (1979) instrument. The scale used here derives from a very similar conceptualization and uses some of the ideas contained in items developed by Aldag and Storey.

The original response certainty/uncertainty instrument was a 7-item scale designed to tap two dimensions of response uncertainty:

a. uncertainty about the alternatives available; and
b. uncertainty about the likely effectiveness of the alternatives available.

Three items were designed to measure the first dimension and four

items to tap the second dimension. Items 2, 3, 4 and 5 were reverse scored so that the higher the scale score, the greater the certainty about how to respond. Again, the theoretical assumption was that these two dimensions would be strongly related to each other and that their aggregation would yield a comprehensive measure of perceived response certainty.

The results of a pretest of the questionnaire with a convenience sample of college administrators (N=17) revealed that individuals thought one of the items in this scale was somewhat confusing. A measure of the scale's internal consistency was obtained for the total scale and for the scale with this item omitted. Coefficient alphas equalled .82 and .85 respectively. Because the alpha coefficient for the scale increased when this item was removed and because it was felt to be confusing, the item was dropped.

The 6-item scale used in the final questionnaire was factor analyzed in order to check on its dimensionality. Results of the factor analytic procedure revealed only one principal factor. These results are presented in Table 7. Thus, the hypothesized existence of two dimensions of response certainty was not borne out by the data. Only one dimension appears necessary to explain the scale's variance.

The assessment of the scale's reliability yielded a coefficient alpha of .75, a coefficient which suggests that the scale has an acceptable level of internal consistency (Nunnally, 1967). The average item-total correlation coefficient was found to be .49.

Table Seven

Results of a Factor Analysis of the Response Certainty Scale

Factor Matrix Using Principal Factor with Iterations

	Factor 1
Resp1	.42441
Resp2	.68829
Resp3	.67842
Resp4	.54565
Resp5	.73800
Resp6	.42265

Factor	Eigen-value	Pct. of Variance	Cumul. Variance
1	2.13	100.0	100.0

Variable	Communality
Resp1	0.18013
Resp2	0.47374
Resp3	0.46025
Resp4	0.29774
Resp5	0.54465
Resp6	0.17863

Descriptive statistics for this scale and all others are contained in Table Six.

Resource Dependence Characteristics

Selectivity of the college was operationalized using data from the Annual Survey of Colleges database (College Board, 1984) as the ratio of the number of accepted applicants to the number of applicants. The smaller the ratio, the more selective the college was said to be. This ratio was then reverse scored to aid in ease of interpretation so that the larger the number, the more selective the college was.

Respondents were directly asked about the existence of Continuing Education programs as well as about the availability of evening courses for undergraduates. Data on the number of professional or applied programs were obtained from the ASC database (College Board, 1984).

Boundary Spanning Activity

The degree of boundary spanning activity involved in a role was measured using a modification of a subscale developed by Miles (1976) to measure the degree of boundary spanning and integration activities required by a role. The results of factor analyses and correlational relationships reported by Miles (1976) offered tentative evidence for

the reliability and construct validity of the subscale.

Miles' original boundary spanning and integration activity scale contained 11 items, five of which related to integrative functions within the organization as opposed to boundary spanning activities involving interaction with individuals or organizations outside the focal organization's boundaries. As the focus of this study was on perceptions of the external environment, the items addressing integration activities were judged to be not relevant to this research. Four of these items were dropped and one was revised to reflect a boundary spanning function. The remaining six items were used with minor revisions in wording. Three original items were added, making the measure a 10-item scale (see Appendix A). The three original items, statements 8, 9 and 10, were designed to tap types of boundary spanning activity thought to be particularly relevant to the roles of college administrators.

Results from the pretest suggested that respondents had no particular problems with the scale. The coefficient alpha for the scale was found to be .94.

A coefficient alpha of .87 was found for the scale for the primary research sample. One item, "preparing reports for governmental agencies of any type", however, was found to have a negative relationship to the total scale score. Given the sample composition, this item is probably not a good measure of boundary spanning activity. It seems likely that many colleges have

specialized roles or functions which handle government relations and thus, this is not likely to be an important component of the roles of the college administrators who were sampled here. The item was discarded. The resulting 9-item measure of boundary spanning yielded a coefficient alpha of .90 and an average item-total correlation of .68.

Strength of Organizational Culture

As no survey measure of the strength of organizational culture exists to this researcher's knowledge, a scale was developed for use in this research. The scale was designed to measure two factors thought to be particularly relevant to defining and measuring the strength of an organization's culture. The first factor related to the history of the organization. It was hypothesized that a strong sense of history would tend to increase the likelihood that a shared understanding of the mission of the institution would develop (Clark, 1972). A sense of history can be manifested symbolically and verbally, through pictures and symbols as well as through organizational "sagas" and stories.

The second factor thought to be relevant to the strength of organizational culture was a sense of the organization's uniqueness (Martin, Feldman, Hatch & Sitkin, 1983) or competency. As these authors point out, the concern is not so much that the cultures really

are unique or that the organization is indeed competent but that administrators perceive it to be that way. Martin et al. (1983) point out that many of the "uniqueness" claims made in organizational stories are not, in fact, accurate as other organizations often have similar stories conveying the same or a similar theme.

The scale which was originally designed to measure the strength of organizational culture was an 8-item scale with four items designed to tap the history dimension and four others to tap the uniqueness dimension (see Appendix A). Items 1 and 5 were scored in reverse.

Results of the pretest yielded a somewhat low, but minimally acceptable, coefficient of internal consistency (alpha = .71). The scale was not subjected to a factor analysis at that time because the sample size was too small to ensure factor stability. A few items were reworded in response to comments received from pretest subjects.

Results of the factor analysis procedure conducted for this measure with the final research sample yielded the factor structure presented in Table 8. Four items loaded cleanly on the first factor. All four of these items were the items originally designed to tap the "sense of uniqueness" dimension of culture. One other item (#1) loaded .42 on this factor and might have been assigned to this factor had the size of the difference between the factor loading for this item and the previous four not been so large. Additionally, this item, as well as item #7 did not load cleanly on this factor or on the second factor. Item #3, a "sense of history" item was the only item

Table Eight

Results of the Factor Analysis of the Strength of Organizational Culture Measure

Varimax Rotated Factor Matrix

	Factor 1	Factor 2
Culture 1	.42254	.23805
Culture 2	.66518	.19707
Culture 3	.00584	.42449
Culture 4	.62695	.21584
Culture 5	.75318	-.05193
Culture 6	.08492	.23707
Culture 7	.39448	.48416
Culture 8	.72675	.23897

Factor	Eigenvalue	% of Var.	Cum. Pct.
1	2.55	86.4	86.4
2	0.40	13.6	

	Communality
Culture 1	.23521
Culture 2	.48130
Culture 3	.18023
Culture 4	.43965
Culture 5	.56997
Culture 6	.06341
Culture 7	.39003
Culture 8	.58527

to load cleanly on the second factor but the loading was below the generally accepted factor loading criterion of .50. Item #6 did not appear to load on either factor.

Analysis of the eigenvalues for these factors revealed a large difference between them. Only factor 1 meets the generally recognized criterion for significance (i.e. greater than or equal to 1.00).

Because of the difficulty in interpretation of the factor analysis for four of the items of this scale, the inter-item correlation matrix was carefully examined. Analysis of the intercorrelation matrix revealed that the inter-item correlations for items 3 and 6 ranged from -.01 to .22 whereas the inter-item correlations for the other items ranged from a low of .27 to a high of .58. Nunnally (1967) suggested that inter-item correlations of .30 or greater could be interpreted as indicating that an item indeed contributed significantly to the scale's variance. Due to the low inter-item correlations for items 3 and 6 and their unclean factor loadings, these two items were omitted.

As the results of the factor analysis suggested that the second factor was not a strong factor, the remaining six items of this scale were treated as a one-factor scale. An assessment of internal consistency yieled a coefficient alpha of .79. The average item-total correlation coefficient was found to be .55. Descriptive statistics for this scale appear in Table 6.

Organizational Structure/Decentralization of Decision Making

The structural variable of primary interest in this study was the degree of centralization/decentralization of decision making perceived to exist in the institution. The Management System Questionnaire (MSQ) designed by Keller et al. (1974) was used as the basis for developing a measure of perceived centralization/decentralization. The MSQ was originally designed to measure the degree of "organicness" of an organization's structure and was found to have three factors, the first of which explained 53% of the variance and was labelled "impersonal hierarchy" by the authors. All of the items loading on this factor measured aspects of how decisions were made in the organization with the focus on the degree to which subordinates were either consulted with or directly involved in the decision making process. The items seem to represent a blend of purely structural items and "leadership style" items although these latter items are not focused on the leadership style of a particular individual but rather on the style characterizing the organization. Eleven items were found to load on this factor with an average factor loading of .70.

Nine of the items found to load on the "impersonal hierarchy" dimension were used with slight rewording to make up the measure of participation in decision making to be used in this study. The items were reworded so as to be more representative of the decisions in which top-level college administrators might or might not be involved.

Two of the items found by Keller et al. (1974) to load on the "impersonal hierarchy" dimension were omitted from the scale to be used here. One of these items was dropped because of redundancy with another item and the other was dropped because it failed to make sense in the current context. The scale was scored so that higher scores reflect higher levels of decentralization. Items 4 and 8 were reverse scored.

Analysis of pretest data yielded a coefficient alpha of .77 for the nine-item scale. One item was dropped as a result of the pretest because the item was found to have an extremely restricted range of responses. A coefficient alpha of .82 was found for the revised 8-item scale.

Analysis of this scale with the actual research sample yielded a coefficient of internal consistency of .89 and an average item-total correlation of .67.

Organizational Commitment

The short form of the Organizational Commitment Questionnaire (Mowday et al, 1979) was used as the measure of organizational commitment in this study. The reliability and validity of both the short and long forms of this questionnaire are well documented (Cook, Hepworth, Wall & Warr, 1981). Factor analyses of the items have generally resulted in one-factor solutions, the internal reliabilities have been found to be consistently high (coefficient alphas ranging

from .80 to. 93), the test-retest reliabilities have been reported to be between .53 and .75 and finally, the validity of the scale has been supported by findings of significant negative correlations between the scale scores and turnover (Mowday et al., 1979). Two items were slightly altered for use in this study.

This shortened form of the Organizational Commitment Questionnaire was found to have good reliability (alpha = .85) in the pretest and subjects indicated no problems in filling out the scale items. The scale was also found to have good reliability (again, alpha = .85) in the primary research sample. However, in coding the data, it was found that one item did not seem to covary very highly with the others. Analysis of the data indicated that removal of this item resulted in the scale having an internal consistency coefficient of .89. Analysis of the item-total correlations revealed that correlation betweeen this item and the scale total was .22 whereas the average item-total correlation for the other items was .66. Additionally, the inter-item correlations between this item and the other items in the scale averaged .16 whereas the inter-item rs for the other items ranged from .28 to .68 with an average inter-item r of .50.

While it is undesirable to tamper with an established measure, in this case, the decision was made to drop item #8. The low covariation of this item with the other items of this scale may be a reflection of the unique nature of the sample used here. Unlike many other studies

using this scale, the subjects here were top-level administrators who might be less willing to "accept any type of position in order to keep working for this organization." Several subjects in this study, in fact, wrote in the margin "even a janitorial position?".

Role Ambiguity

A 6-item scale developed by Rizzo, House and Lirtzman (1970) was used to measure role ambiguity. The authors reported internal consistency reliabilities of .78 and .80 for this scale. The scale has been used extensively since with good reliabilities reported (Cook et al., 1981).

Respondents in the pretest reported no significant problems with understanding and interpreting items in this scale. Coefficient alphas of .81 and .85 were found for the pretest and actual research samples, respectively.

Satisfaction with the Institution's Planning

Satisfaction with the institution's planning was measured by asking the respondents to choose the rating from 0 to 100 which best characterized how satisfied they were with the institution's planning efforts. The descriptive statistics for this variable, shown in Table 6, reveal an average satisfaction rating of 72 on the 100 scale. The measure of skewness shows that the data collected on this variable

were skewed so that high scores were more likely than low scores. This may reflect the existence of a social desirability bias in that administrators did not want to publicly admit dissatisfaction with their institution's planning efforts. The skewed nature of the distribution of scores on this variable may distort slightly the nature of the relationship between this variable and others.

Level of Agreement among Administrators

The level of agreement as to the likelihood of environmental changes impacting on the organization was assessed using a methodology suggested by Hrebiniak and Snow (1982). The mean "certainty of effect" (PCE) score was calculated for each of the two environmental changes being investigated for all individuals within an institution who responded to the questionnaire. The level of agreement was considered to vary inversely with the standard deviation around the mean PCE score. Perfect agreement would thus be manifested in a standard deviation of zero.

Organizational Response Patterns

How the college was planning on responding (or had already responded) to trends in its environment was measured using a 23-item checklist of possible responses. Respondents were asked to place a check in the approporiate column, indicating for each response whether it:

a. had never been considered

b. had been considered but was rejected

c. was currently under consideration

d. had already been made (within the last 5 years)

Data Analysis

Descriptive statistics were calculated for all variables for which they are appropriate. Frequency distributions were examined for all other variables. Many of these have already been reported in the Sample and Measurement sections of this chapter (see Tables 3,4,5 and 6). Pearson product-moment correlations between variables were calculated (as appropriate) and examined for multicollinearity between predictors. Appendix B contains a display of the intercorrelation matrix showing the relationships between all the major interval-level variables explored in this research. As can be seen from this table, no multicollinearity problems were found when the standard criterion of $r \geq .80$ was used.

The predominant types of statistical analyses used in the testing of the study's hypotheses included: subgroup analyses, t tests, analysis of variance and covariance, correlations, partial correlations and multiple regression. An alpha level of .05 was set as

the required level for claims of statistical significance to be made. The statistical techniques used to test each set of hypotheses are outlined below.

Resource Dependence Variables and Geographic Region. The relationship between "perceived certainty of occurrence" (PCO) scores and "perceived certainty of effect" (PCE) scores is hypothesized to be moderated by each of these variables. Analysis of this set of hypotheses employed subgroup analysis. Independent sample t-tests were used to test the significance of the differences in the size of the correlation coefficients calculated for each of the subgroups. Additionally, analyses of differences in subgroup regression equations were conducted.

Organizational Characteristics. Hypotheses 3A1 and 2 and 3B1 and 2 which deal with the relationship between organizational characteristics and perceived certainty of effect scores were investigated through the use of Pearson product-moment correlation coefficients and first-order partials where indicated, controlling for the effects of the resource dependence variables.

The hypotheses dealing with the effects of organizational membership on perceptions of effect certainty were tested through the use of a one-way analysis of variance procedure to test for the significance of differences between mean institutional PCE scores. If

feasible and if the F statistic generated is statistically significant, analyses of covariance will be used to test for differences between institutions while controlling for the effects of each of the resource dependence variables and geographic region in which the institutions are located.

Individual Characteristics. Hypothesis 4A:1 is an exploratory hypothesis concerning the relationship between certain demographic characteristics of individuals and perceived certainty of effect scores. It was tested through the use of Pearson product-moment correlation coefficients, or analysis of variance depending on the nature of the predictor variable.

Role-Related Variables. The relationship between the amount of boundary spanning activity involved in a role and the perceived certainty of effect scores (4B:1) was assessed through the use of a Pearson product-moment correlation coefficient. The hypothesized differences in PCE scores as a function of the specific role of the perceiver (4B:2) was tested through the use of a one-way analysis of variance procedure to test the signficance of role as a predictor of PCE.

Level of Agreement. Hypotheses 3A:6 and 3B:3 deal with the relationship between organizational characteristics and the level of

agreement among administrators as to the likelihood that their institution will be affected by the focal trends in its environment. LOA measures were the standard deviations for each institutional group. Spearman rank-order correlations were calculated to measure the strength of the relationship between the mean institutional score on the organizational characteristics and these standard deviation measures.

Response Certainty. All hypothesized relationships with perceived response certainty as the criterion except those with level of agreement as a predictor were tested by calculation of Pearson product-moment correlation coefficients. A Spearman rank-order correlation coefficient was used to test the significance of the relationship between LOA and response certainty.

Organizational Response Patterns. All hypotheses involving this set of variables as the criterion were examined through the use of t-tests.

Individual Outcomes. Satisfaction with the institution's planning was hypothesized to be predicted by the individual's perceived certainty of effect score as moderated by the type of responses the organization has made. Subgroup analyses and t-tests of differences in mean satisfaction ratings were used to test these hypotheses. All other

hypotheses dealing with individual outcomes were assessed via the use of Pearson correlation coefficients.

CHAPTER FOUR

RESULTS

An Examination of the Relationships among the Proposed Types of Uncertainty

Although no specific hypotheses about the nature of the direct relationships between the uncertainty types were advanced in this research, it was necessary to examine and understand the pattern of these interrelationships before the more complex relationships hypothesized by the research model could be explored.

Table Nine is a display of the intercorrelation matrix for the different types of uncertainty using both the individual perceiver and the institution as the unit of analysis. Except where otherwise indicated, the mean score for all respondents from the same institution was used as the measure of variables at the institutional level of analysis. Institutional correlations were calculated only in cases in which there were at least two respondents from the institution on each of the variables. Using this criterion, data from 64 institutions were analyzable. This represents a sample size approximately one-third the size of the individual sample (N=211).

Table Nine

Intercorrelations between the Types of Uncertainty

A. Individual Level of Analysis (n=199)

	PCOD	PCOV	PCED	PCEV	RESPCER
PCOD		.11	.27***	.17**	.01
PCOV			.10	.59***	.07
PCED				.40***	-.19**
PCEV					-.16**

B. Institutional Level of Analysis (n=64)

	PCOD	PCOV	PCED	PCEV	RESPCER
PCOD		.15	.13	.16	.00
PCOV			.22*	.75***	.11
PCED				.53***	-.17
PCEV					-.27*

*p≤.05 **p≤.01 ***p≤.001

The Individual as the Unit of Analysis. Table Nine reveals that a significant positive relationship was found between an individual perceiver's degree of certainty about whether a change would occur (PCO) and the respondent's degree of certainty about whether the change would affect the institution (PCE). The size of the relationship, however, varied across trends ($r = .58$, $p < .001$ for the vocational trend, and $r = .28$, $p < .001$ for the demographic trend). In the case of the demographic trend, perceived certainty of occurrence (PCOD) explains only 8% of the variance in perceivers' ratings of how certain they were that the trend would affect their particular institution (PCED), whereas 33% of the variance in certainty of effect of the vocational trend (PCEV) is explained by the perceiver's ratings of the trend's certainty of occurrence (PCOV).

The correlation between individuals' certainty of occurrence ratings for the two trends was found to be insignificant, indicating that individuals were able to assess their certainty about the occurrence of each of these two trends independently. Additionally, there was no significant correlation between the perceived certainty of occurrence scores (PCO) and ratings of response certainty (RESPCER) where response certainty refers to how certain the individuals were that the institution's key decision makers were aware of all the response options available to them and of the likely utility/effectiveness of each option.

Individuals' certainty of effect scores were, however, found to bear a significant relationship to individuals' response certainty

scores, but the direction of the relationship was negative ($r = -.18$, $p < .01$ and $r = -.17$, $p < .01$ for the demographic and vocational trends respectively). In conceptual terms, this finding suggests that the more certain an individual was that his institution would be affected by an environmental change, the less certain he tended to be that the administration was aware of all its response options and capable of making an effective response to the change.

Two interesting and unexpected relationships among the different types of uncertainty also emerged. Individual evaluations of "certainty of effect" were found to be positively related for the two trends studied ($r = .39$, $p < .001$). Also, individual ratings of the certainty of occurrence of the demographic trend were found to bear a small but significant positive relationship to individual ratings of the likelihood that their institutions would be affected by the vocational trend ($r = .17$, $p < .01$).

The Institution as the Unit of Analysis. The intercorrelations among the three types of uncertainty, when computed using the institution as the unit of analysis, reveal a similar pattern of relationships among the uncertainty types with a couple of notable exceptions. At the institutional level of analysis, the relationship between the perceived certainty of occurrence of the vocational trend (PCOV) and the perceived certainty of effect of the demographic trend (PCED) emerges as statistically significant when it had been found to be insignificant at the individual level. Somewhat paradoxically, the

relationship between PCOD and PCED which had been found to be statistically significant using individuals as the analysis unit was found to drop in absolute size and to be no longer statistically significant when the individual data were aggregated by institution. Thus, certainty of occurrence scores for the vocational trend seem to explain a significant amount of variance in certainty of effect scores for the demographic trend while certainty of occurrence scores for the demographic trend do not. There is no obvious explanation for these differences in the patters of significance except for the possibility that there are problems with the method of aggregation used in this study.

The magnitudes of the other correlations among the uncertainty types tend to remain approximately the same or to increase slightly when the data are examined using institutions as the unit of analysis rather than individuals. Despite this fact, many of the institution-level correlations fail to achieve statistical significance because of the significantly smaller sample sizes.

Interpretation of these Results in Light of the Proposed Model. The conceptual framework on which this research was based proposed that previous attempts to measure environmental uncertainty were inadequate because they generally failed to differentiate between types of uncertainty. The pattern of correlations between the types of uncertainty within trends offers some, but by no means complete, support for this proposal. The insignificant relationships between

perceived certainty of occurrence of an event (PCO) and perceived certainty about how to respond (RESPCER) suggests that these two types of uncertainty are indeed independent. Similarly, the small negative relationships between perceived certainty of effect (PCE) and response certainty suggest that the experience of these two types of uncertainty may be inversely, not positively, related to each other.

The nature of the relationships found between perceived certainty of occurrence and perceived certainty of effect within trends suggests that while these two types of certainty/uncertainty may be positively related, the magnitude of this relationship may vary significantly.

The finding of a statistically significant relationship between certainty of effect scores for the demographic trend and certainty of effect scores for the vocational trend is understandable although it was not predicted. Two somewhat related explanations are possible. The first is that the effects of these two trends are not unrelated--some colleges may be particularly vulnerable to the effects of both trends while other colleges may not be especially vulnerable to either. For example, colleges with a strong emphasis on liberal arts programs, which are not highly selective in their admissions, and which have not made accomodations to the special needs of the older, so-called nontraditional student (e.g. by establishing an evening session) are likely to be particularly vulnerable to the effects of both the decline in the number of 18-24 years and the increased demand for vocational/career relevant education.

In fact, an analysis of the differential magnitude of subgroup

correlation coefficients reveals that the correlations between the certainty of effect scores for each of the two trends tend to be lower for highly selective than for nonselective colleges (r= .18 and r= .40 respectively), for colleges with a large number of undergraduate professional majors than for colleges with a small number of professional majors (r= .31 and r= .44 respectively) and for colleges with evening sessions than for colleges without evening programs (r = .34 and r = .53 resectively. None of these differences, however, achieve statistical significance using the methodology suggested by Cohen and Cohen (1975) for testing the difference between two independent correlation coefficients.

A second, not unrelated explanation for the finding of a significant correlation between the certainty of effect scores for the two trends could lie in the notion of a generalized expectancy for being affected by change.

Leavitt, Dill and Eyring (1980) in a conceptual article on organizational reactions to their environments suggested that organizations are likely to vary in the degree to which they pay attention to the conditions in their external environments. They suggest that some organizations are impervious to their environments while others are proactively involved in scanning and attempting to formulate responses to the environment. Miles and Snow (1978) present a similar typology of organizational types based on the manner in which the organization responds to its environment (e.g. slow reacting analyzers versus quick acting prospectors).

It could be that the more active an organization is in monitoring its external environment and its internal effectiveness, the more sensitive it becomes to environmental changes and to their effects on the organization's effectiveness. Scanning and monitoring thus might have the effect of lowering the threshold for recognizing changes and their effects on the institution. Thus, whether administrators perceived effects of a change would be a function of the level of the organization's threshold for perceiving effects. Scanning and monitoring the environment would lower this threshold and make administrators of institutions which were active scanners mor likely to perceive changes as likely to have an effect on the institution.

One of the factors affecting this expectancy for an effect of changes could be the organization's perception of its own vulnerability to changes in its environment. Perceived vulnerability could lead to a perceived need to actively monitor the environment which in turn, could lead to a heightened sensitivity to perceiving changes as potentially threatening to the organization.

Possible Explanations for Some Unexpected Findings. Two relationships in particular were unexpected. These were:

1) The finding of a significant relationship between PCOD and PCEV at the individual level, and

2) The finding of a significant relationship between PCOV and PCED at the institutional level of analysis.

These relationships are somewhat problematic because they are unexpected cross-trend relationships between certainty of occurrence and certainty of effect. Therefore, an effort was made to further understand why these results were found.

One possible explanation for the existence of these cross-trend relationships between the different types of uncertainty lies in a possible confounding effect of common methodology in the framing of the questions. All questions about perceived certainty of occurrence and perceived certainty of effect were asked at the same time using the same methodology for both trends.

A second possibility is that complex interactions between certainty of occurrence and certainty of effect for the two trends are involved. It may be, for instance, that it is only when the vocational trend is seen as certain to occur that an effect of the demographic trend comes to be perceived as highly probable also. Individuals who do not perceive the vocational trend as certain to

occur may be less certain that the demographic trend will affect their institutions because they think that their institutions may be able to survive the demographic decline effectively. Individuals, on the other hand, who perceive the increase in interest in vocational training to be certain to occur and who represent colleges with few vocational programs may perceive the impact of the demographic trend as more certain and more severe because of their lack of ability to attract the vocationally-interested student. In fact, an analysis of the subgroup correlation coefficients reveals that the PCOV-PCED relationship is statistically significant only for colleges with a small number (less than 10) of professional majors ($r = .39$, $p < .05$). The relationship is insignificant for colleges with a large number (greater than 20) of professional majors ($r = .24$, $p = .15$). A similar interactive explanation might explain the PCOD-PCEV relationship found at the individual level.

Moderators of the Certainty of Occurrence-Certainty of Effect Relationship

The Resource Dependence Characteristics. The relationship between perceived certainty about the occurrence of an environmental change and perceived certainty that the change will indeed have an effect on the particular institution was hypothesized to be moderated by a class of variables which were broadly labeled the resource dependence

characteristics of the organization. The resource dependence characteristics of a college were defined as factors affecting the degree to which the college was dependent on the traditional pool of 18 to 22-year-old recent High School graduates who wanted to earn a liberal arts degree. Included in this group of variables were:

-the prestige of the school, which was operationalized through the use of the selectivity ratio (#accepted/ #applied).

-the degree of professional/vocational emphasis at the undergraduate level, which was operationalized as the the number of undergraduate professional/vocational majors offered.

-the existence of a Continuing Education program, and

-the existence of an evening undergraduate session.

These hypotheses were initially tested using subgroup analysis and tests of significance of the difference between two independent correlation coefficients (Cohen & Cohen, 1975). Table Ten outlines the results of these analyses.

The only significant result to emerge from these analyses was that of a significant moderating effect of the existence of Continuing

Table Ten

The Moderating Effects of the Resource Dependence Characteristics of the School on the Perceived Certainty of Occurence-Perceived Certainty of Effect Relationship Tested through Subgroup Analysis

A. Selectivity of the School

Highly Selective (n=24) (<50% of applicants accepted)	Nonselective (n=62) (>87% of applicants accepted)
$r_{PCOD-PCED} = -.006$	$r_{PCOD-PCED} = .255$
Z = 1.03 Not Significant	
$r_{PCOV-PCEV} = .742$	$r_{PCOV-PCEV} = .505$
Z = 1.34 Not significant	

B. Number of Undergraduate Professional Majors

High Professional Orientation (n=43) (>20 prof. majors)	Low Professional Orientation (n=80) (<10 prof. majors)
$r_{PCOD-PCED} = .548$	$r_{PCOD-PCED} = .264$
Z = 1.77 Not Significant	
$r_{PCOV-PCEV} = .399$	$r_{PCOV-PCEV} = .550$
Z = .20 Not Significant	

C. Existence of Continuing Education Programs

Continuing Education (n=143)	No Continuing Ed. (n=46)
$r_{PCOD-PCED} = .355$	$r_{PCOD-PCED} = .164$
Z = 1.18 Not Significant	
$r_{PCOV-PCEV} = .649$	$r_{PCOV-PCEV} = .360$
Z = 2.29** ($p \leq .01$)	

D. Existence of an Evening Session

Evening Session (n=131)	No Evening Session (n=46)
$r_{PCOD-PCED} = .369$	$r_{PCOD-PCED} = .346$
Z = .153 Not Significant	
$r_{PCOV-PCEV} = .615$	$r_{PCOV-PCEV} = .528$
Z = .73 Not Significant	

Education program on the PCOV-PCEV relationship ($z = 2.29$, $p < .01$). In fact, the moderating nature of a Continuing Education program on the certainty of occurrence-certainty of effect relationship was in the opposite direction from that predicted. The results revealed that there was a higher correlation between certainty of occurrence and certainty of effect ratings for the vocational trend for colleges with Continuing Education programs than for colleges without such programs. A possible explanation for this finding may highlight a significant flaw in the design of this research.

Continuing Education programs tend to be vocationally and/or avocationally-oriented. Given this, it seems likely that individuals from colleges with these programs who thought the increased demand for vocational relevance was likely to continue may have been more certain than their counterparts that the trend would affect them -- but probably expected the effect to be a positive one. Many institutions added Continuing Education programs to their program offerings in the past few years precisely because of the perceived increase in the demand for vocationally-relevant education. These institutions may already have been positively affected by this trend as evidenced through increased enrollments because of their Continuing Education programs. The questionnaire, however, did not ask individuals to indicate whether they thought the effect of the trends would be positive or negative. Future research would clearly benefit from the addition of this question.

This unexpected finding regarding the nature of the moderating

effect of Continuing Education programs not only points to the need to more carefully construct questions about the nature of the expected effect on an institution (i.e. by asking whether the effect is expected to be positive or negative) but also points to a potential problem with the use of cross-sectional research designs as methodologies for testing hypotheses such as those of this research study. It seems likely that many feedback loops exist in models of organizational information processing. In this case, it seems likely that the addition of Continuing Education programs represents a response to past environmental conditions which, in turn, has influenced the perception of current environmental conditions.

A Further Test of the Moderating Effects of the Resource Dependence Variables on the PCO-PCE Relationship. Using the analytic technique of subgroup analysis to test differences in the size of correlation coefficients is a somewhat problematic test of moderator hypotheses when subgroup sample sizes are small, as they were in many cases in this study. Additionally, subgroup analysis forces categorization of the moderator variable and can result in lessened statistical power when the moderator is, in fact, continuous in nature. Finally, the conclusiveness of subgroup correlational

techniques as a test of moderator hypotheses has been questioned by some researchers who suggest that these tests may be unduly affected by unequal variances across subgroups (Finney, Mitchell, Cronkite & Moos, 1984; Zedeck, 1981).

For these reasons, an attempt was made to further test the hypothesized moderating effects of selectivity and professional emphasis through the use of a moderated regression procedure. A moderated regression analysis was undertaken as a test of the modertaing effect of selectivity and degree of professional emphasis as these were the only interval-level moderators. Use of the moderated regression technique, however, proved inadvisable because of findings of multicollinearity ($r \geq .80$) either between the interaction term and the predictor or between the interaction term and the moderator.

Thus, a more statistically sound although less powerful test of the potential moderating effect of these variables was undertaken. Regression equations were derived for subgroups which were composed of individuals with like values on the moderator variable. These regression equations were then analyzed for similarity using the Chow test, a technique for assessing whether two or more regression equations are statistically different from each other (Dillon & Goldstein, 1984, pages 246-250).

This test is a less powerful test than moderated regression because it forces the moderator variables to be collapsed into categorical variables. It does, however, provide a more rigorous test

of moderator hypotheses than analysis of differences in subgroup correlation coefficients (Finney et al., 1984) and is a useful technique when multicollinearity prohibits use of the moderated regression technique. The formula for the Chow test is as follows:

$$Q = \frac{SSE\ (5)/k}{SSE\ (4)/(n_1 + n_2 - 2k)}$$

where,

SSE (5) = SSE (1) - SSE (4) and

SSE (4) = SSE (2) + SSE (3) where SSE (2) and SSE (3) refer to the residual sum of squares from each of the subgroup regression equations.

SSE (1) = the residual sum of squares from the pooled regression equation.

(Dillon & Goldstein, 1984)

It should be noted that because of the relatively large correlation between individual ratings of the certainty of effect of the demographic trend and their certainty ratings regarding the effect of the vocational trend, it was decided to form the hierarchial regression equations with the certainty of effect score for the other trend entered first. This, in effect, serves as a means for analyzing the nature of the PCO-PCE relationship while controlling for any potentially confounding effect of "generalized vulnerability" as evidenced by the PCED-PCEV relationship.

The results of these analyses are presented in Table 11 through Table 14. The results reveal that the only subgroup regression

Table Eleven

The Moderating Effect of Selectivity of the College on the Certainty of Occurrence-Certainty of Effect Relationship

A. DEMOGRAPHIC TREND - predicting Perceived Certainty of Effect

Selective Colleges (n=24)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.306	.32	.91	N.S.
PCOD	-.095	.22	.18	N.S.
(Constant)	58.530			

Nonselective Colleges (n=62)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.600	.18	11.52**	$p \leq .01$
PCOD	.280	.13	4.44*	$P \leq .05$
(Constant)	36.540			

Selective and Nonselective Colleges Pooled (n=86)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.56	.15	14.92**	$p \leq .01$
PCOD	.13	.12	1.26	N.S.
(Constant)	58.86			

RESULTS OF CHOW TEST comparing these regression equations:

$Q = 2.50$ $\quad F_{.10}(3,80) = 2.18$

$F_{.05}(3,80) = 2.76$

Table Eleven (Cont'd)

B. VOCATIONAL TREND - predicting Perceived Certainty of Effect

Selective Colleges (n=24)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.03	.11	.08	N.S.
PCOV	.85	.18	22.17**	p≤.01
(Constant)	-54.20			

Nonselective Colleges (n=62)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.278	.06	18.99**	p≤.01
PCOV	.579	.11	29.02**	p≤.01
(Constant)	28.600			

Selective and Nonselective Colleges Pooled (n=86)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.276	.06	23.72**	p≤.01
PCOV	.658	.01	43.60**	p≤.01
(Constant)	1.27			

RESULTS OF CHOW TEST comparing these regression equations:

$Q = 6.15^{**}$ $\quad F_{.01}(3,80) = 4.13$

CONCLUSION: The regression equations should not be pooled.

Table Twelve

The Moderating Effect of Degree of Professional/ Vocational Emphasis on the Certainty of Occurrence-Certainty of Effect Relationship

A. DEMOGRAPHIC TREND - predicting Perceived Certainty of Effect

Colleges with a High Degree of Prof./Voc Emphasis (n=43)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.292	.20	2.07	N.S.
PCOD	.647	.17	14.36**	p<.01
(Constant)	-37.030			

Colleges with a Low Degree of Prof./Voc. Emphasis (n =80)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.477	.13	14.27**	p<.01
PCOD	.168	.12	1.83	N.S.
(Constant)	57.13			

High/Low Colleges Pooled (n=123)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.408	.11	14.47**	p<.01
PCOD	.334	.10	10.92**	p<.01
(Constant)	21.8			

RESULTS OF CHOW TEST comparing these regression equations:

Q= 1.83 N.S.

Table Twelve (Cont'd)

B. VOCATIONAL TREND - predicting Perceived Certainty of Effect

Colleges with a High Degree of Prof./Voc. Emphasis (n=43)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.212	.09	5.68*	p<.05
PCOV	.509	.17	9.11**	p<.01
(Constant)	60.220			

Colleges with a Low Degree of Prof./Voc. Emphasis (n=80)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.313	.07	18.68**	p<.01
PCOV	.616	.11	33.25**	p<.01
(Constant)	-1.61			

High/Low Colleges Pooled (n=123)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.274	.06	23.50**	p<.01
PCOV	.584	.09	41.93**	p<.01
(Constant)	20.598			

RESULTS OF CHOW TEST comparing these regression equations:

Q= 1.64 N.S.

Table Thirteen

The Moderating Effect of Continuing Education Programs
on the Certainty of Occurrence-Certainty of Effect Relationship

A. DEMOGRAPHIC TREND -- predicting Perceived Certainty of Effect

Colleges with Continuing Education Programs
(n = 143)

Variable	B	Std. Error B	F-ratio	Sig.
PCEV	.515	.099	27.00	p< .01
PCOD	.385	.092	17.62	p< .01
(Constant)	.772			

Colleges without Continuing Education Programs
(n = 46)

Variable	B	Std. Error	F-ratio	Sig.
PCEV	.503	.211	5.17	p< .05
PCOD	.131	.190	.71	N.S.
(Constant)	40.21			

Pooled Colleges
(n = 189)

Variable	B	Std. Error B	F-ratio	Sig.
PCEV	.518	.090	32.85	p< .01
PCOD	.327	.083	15.71	p< .01
(Constant)	9.41			

Results of Chow Test:

Q = .53 Not Significant

Table Thirteen (Cont'd)

B. VOCATIONAL TREND -- predicting Perceived Certainty of an Effect

Colleges with Continuing Education Programs
(n =143)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.245	.043	32.29	p< .01
PCOV	.690	.067	105.63	p< .01
(Constant)	20.71			

Colleges without Continuing Education Programs
(n = 46)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.218	.086	6.44	p< .05
PCOV	.422	.158	7.15	p< .05
(Constant)	38.04			

Pooled Colleges
(n = 189)

Variable	B	Std. Error B	F-ratio	sig.
PCED	.242	.039	38.95	p< .01
PCOV	.639	.062	105.78	p< .01
(Constant)	24.89			

Results of Chow Test:

Q = 1.12 Not Significant

Table Fourteen

The Moderating Effect of Evening Programs on
the Certainty of Occurrence-Certainty of Effect Relationship

A. DEMOGRAPHIC TREND -- predicting Perceived Certainty of an Effect

Colleges with Evening Sessions
(n = 131)

Variable	B	Std. Error B	F-ratio	Sig.
PCEV	.44	.107	17.29	$p < .01$
PCOD	.42	.093	20.33	$p < .01$
(Constant)	4.52			

Colleges without Evening Sessions
(n = 46)

Variable	B	Std. Error B	F-ratio	Sig.
PCEV	.64	.195	10.81	$p < .01$
PCOD	.20	.192	1.07	N.S.
(Constant)	44.81			

All Colleges Pooled
(n = 177)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.47	.090	27.67	$p < .01$
PCOD	.38	.082	21.62	$p < .01$
(Constant)	10.26			

Results of Chow Test:

Q = .518 Not significant

Table Fourteen (cont'd)

B. VOCATIONAL TREND -- predicting Perceived Certainty of an Effect

Colleges with Evening Sessions
(n = 131)

Variable	B	Std. Error B	F-Ratio	sig.
PCED	.22	.047	21.69	$p < .01$
PCOV	.68	.075	84.23	$p < .01$
(Constant)	29.40			

Colleges without Evening Sessions
(n = 46)

Variable	B	Std. Error B	F-ratio	Sig.
PCED	.33	.088	14.23	$p < .01$
PCOV	.46	.158	8.86	$p < .01$
(Constant)	6.14			

All Colleges Pooled
(n = 177)

Variable	B	Std. Error B	F-ratio	Sig.
PCED	.25	.042	35.13	$p < .01$
PCOV	.65	.067	95.07	$p < .01$
(Constant)	22.86			

Results of Chow Test:

$Q = 1.56$ Not significant

equations which are significantly different from each other are those involving the prediction of perceived certainty of effect of the vocational trend with selectivity as the variable determining the subgroup composition. The effect of selectivity on the prediction of the perceived certainty of effect of the demographic trend approaches significance ($p < .10$, see Table 11). The results of the other analyses suggest that degree of professional emphasis, the existence of Continuing Education programs and the existence of an evening session have no significant effect on the prediction of perceived certainty of effect for either trend (see Tables 12, 13 and 14 respectively). It should be noted that in the case of Continuing Education, these results contradict those found for the vocational trend when subgroup correlation coefficients were compared. This is probably attributable to the fact that the regression equations were formed with PCED entered as the first variable in the equation.

Interestingly, the moderating effect of the selectivity variable appears to differ across trends. Perceived certainty of occurrence of the demographic trend is a significant predictor of perceived certainty of effect for nonselective colleges but not for highly selective colleges. This finding supports the research hypothesis that there would be a smaller relationship between PCOD and PCED for highly selective colleges than for nonselective colleges. However, the Chow statistic does not quite achieve the .05 level of significance.

In the case of the vocational trend, the predictive value of

perceived certainty of occurrence appears to be equally strong for selective and nonselective colleges. The Chow statistic, however, suggests that these regression equations are significantly different from each other. In this case, it appears to be the predictive value of perceived certainty of effect of the demographic trend which differentiates between the regression equations. PCED is not a significant predictor of PCEV for selective colleges but it is a highly significant predictor for nonselective colleges. This finding conforms with the pattern of subgroup correlations mentioned previously which showed that the PCED-PCEV relationship was stronger for nonselective colleges than for selective colleges. Apparently, individuals from selective colleges perceive no necessary connection between the effects of the two trends. Thus, their certainty of effect evaluations for the two trends are not highly related.

Region in which the College is Located. Region was considered to be a potential moderator of the relationship between perceived certainty of occurrence and perceived certainty of effect for the demographic trend only. The rationale for this hypothesis built on the fact that there are expected to be large differences across regions in the severity of the decline in the number of 18-24 year olds (Brenemann, 1982). There is no reason to believe, on the other hand, that the increased demand for vocational relevance in education would have a differential impact on colleges as a function of their geographic location.

Analysis of variance revealed that region was a significant

predictor of PCED ($F = 2.91$, $P < .01$). An analysis of the differences in mean PCED scores, using Duncan's test, revealed that individuals from institutions in the Southwest were significantly less certain that their institutions would be affected by the demographic trend than were individuals from other regions. This finding is consistent with demographic forecasts which suggest that because of migration into the region, the Southwest is expected to be unaffected by the decline in the number of 18-24 year olds.

It was also hypothesized that there would be significant differences in the predictive value of perceived certainty of occurrence scores in explaining variance in certainty of effect across regions of the country. A Chow test which assessed the similarity of the regression equations derived for each region, revealed that, in fact, the regression equations should not be treated as though they were the same and pooled. The results of this analysis are outlined in Table 15.

Table Fifteen

The Moderating Effect of Region in which the College is Located on the Perceived Certainty of Occurrence-Perceived Certainty of Effect Relationship for the Demographic Trend

NORTHEAST
(n=64)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.223	.139	2.59	N.S.
PCOD	.327	.134	5.92*	$p < .05$
(Constant)	48.654			

SOUTHEAST
(n=47)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.448	.282	2.51	N.S.
PCOD	.344	.197	3.05	N.S.
(Constant)	-4.044			

GREAT LAKES
(n=35)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.662	.163	16.38**	$p < .01$
PCOD	.247	.161	2.33	N.S.
(Constant)	44.205			

ROCKY MOUNTAIN STATES
(n=27)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.783	.182	18.41**	$p < .01$
PCOD	.376	.174	4.69*	$p < .05$
(Constant)	1.811			

Table Fifteen (Cont'd)

SOUTHWEST
(n=14)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.842	.28	9.08**	p<.01
PCOD	-.268	.224	1.43	N.S.
(Constant)	-14.086			

FARWEST
(n=15)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.405	.322	1.58	N.S.
PCOD	.657	.619	1.12	N.S.
(Constant)	-35.663			

ALL REGIONS POOLED
(n=203)

Variable	B	Std. Error B	F-ratio	sig.
PCEV	.494	.088	31.54**	p<.01
PCOV	.282	.081	12.09**	p<.01
(Constant)	23.179			

RESULTS OF CHOW TEST comparing these regression equations:

$Q = 7.69^{**}$ $\quad F_{.01}(3,185) = 3.95$

Organizational Characteristics as Predictors of "Certainty of Effect"

Two organizational characteristics were hypothesized to be important in explaining how certain administrators would be that the two trends would indeed affect their particular organization.

Organizational Culture. It was hypothesized that the effect of a strong institutional culture would be one of decreasing the likelihood that administrators would be certain of an effect of the demographic and vocational trends on their particular institution. This hypothesis was tested using zero-order and first-order partial correlation coefficients, the latter as a means for testing the strength of the association while controlling for the separate effects of the resource dependence characteristics.

The results of these analyses are presented in Table 16. As can be seen from this table, the strength of the institutional culture (or, alternatively the degree to which the institution is perceived to be unique) is significantly negatively related to the certainty of effect scores for the demographic trend except when the relationship is examined at the individual-level with selectivity of the school partialled out. On the other hand, the relationship between culture and the perceived certainty of effect of the vocational trend is insignificant at the individual level of analysis but significant,

Table Sixteen

The Effects of Institutional Culture on Administrator Certainty about the Effect of the Demographic and Vocational Trends on their Institutions

	Unit of Analysis= Individual	Unit of Analysis= Institution
Culture-PCED (Perceived Certainty of Effect of the Demographic Trend)	r = -.14* (n=206)	r = -.27* (n=64)
Culture-Magnitude of Effect of the Demographic Trend	r = -.17** (n=206)	Not tested
Culture-PCEV (Perceived Certainty of Effect of the Vocational Trend)	r = -.10 (n=201)	r = -.26* (n=64)
Culture-Magnitude of Effect of the Vocational Trend	r = -.13*	Not Tested
A. With Selectivity of the College Partialled Out		
Culture-PCED	r = -.11 (n=183)	r = -.26* (n=64)
Culture-PCEV	r = -.06 (n=183)	r = -.26* (n=64)

*p < .05
**p < .01
***p < .001

Table Sixteen (Cont'd)

	Unit of Analysis= Individual	Unit of Analysis= Institution
B. With the Number of Professional Majors partialled out		
Culture-PCED	r= -.14* (n=202)	r= -.25* (n=64)
Culture-PCEV	r= -.08 (n=198)	r= -.24* (n=64)
C. With the Existence of Continuing Education programs partialled out		
Culture-PCED	r= -.20* (n=141)	Not tested
Culture-PCEV	r= -.10 (n= 141)	Not tested
D. With the Existence of an Evening Program partialled out		
Culture-PCED	r= -.20* (n=141)	Not tested
Culture-PCEV	r= -.11 (n=141)	Not tested

*p ≤.05
**p≤.01
***p ≤.001

again in the expected direction, when institutional-level data are analyzed. Interestingly, the relationship between strength of institutional culture and estimates of the likely magnitude of the effect of the two trends is significant for both trends. This suggests that the component of PCED and PCEV most influenced by culture is the evaluation of the expected severity of the effect not the evaluation of perceived likelihood of an effect.

Institutional membership. This research also sought to preliminarily test Pfeffer's hypothesis that the effect of a strong institutional culture would be manifested in greater intra-institutional agreement in perceptions than inter-institutional agreement. This hypothesis could only be explored in a very tentative way in this study because of the pattern of respondents. It was thought that testing this hypothesis when there were only two respondents from an institution would not yield a meaningful result because of the instability of standard deviations obtained on the basis of two data points and because there would be 64 categories of institutions. The decision was made, therefore, to use the data from the 14 institutions which had three or more respondents to the questionnaire. The agreement across institutions was examined only after these 14 institutions had been further broken down into subcategories (e.g. by geographical location).

The meaningfulness of this as a test of Pfeffer's hypothesis is, however, questionnable as a more appropriate test would require more individuals within institutions and fewer institutions. The results of these restricted analyses are presented in Table 17.

The results of the analyses of variance procedures (see Table 17) reveal between-institution variances in PCE scores which are significantly larger than the within group variances in two out of 10 cases. On the basis of chance, one would expect only one out of 20 tests to be significant. The fact that two out of 10 tests of this hypothesis were found to be significant suggests that there may be some validity to Pfeffer's hypothesis. While the results of this study are somewhat encouraging, these results are a rather weak test of the hypothesis and further empirical work is clearly needed to test the hypothesis.

Organizational Structure/Participation in Decision Making. Decentralization of decision making, or what is sometimes referred to as the "organicness" of the institution's structure, was hypothesized to have a positive impact on administrators' degree of certainty about whether their institutions would be affected by the demographic and vocational trends. Involvement in the strategic decision making process for a college, it was reasoned, may enhance individuals' sense of responsibility for the fate of the institution and perhaps, leads to more active attempts to understand the institution's environment

Table Seventeen
The Effects of Institutional Membership
on Perceived Certainty of Effect Scores

Predicting Perceived Certainty of Effect of the Demographic Trend						Predicting Perceived Certainty of Effect of the Vocational Trend					
A. NORTHEAST											
Source	S.S.	D.F.	M.S.	F	Sig.	Source	S.S.	D.F.	M.S.	F	Sig.
Between Groups	10,208	3	3,402	.16	.918	Between Groups	54,392	3	18,130	.73	.56
Within Groups	166,090	8	20,761			Within Groups	197,935	8	24,742		
B. SOUTHEAST											
Source	S.S.	D.F.	M.S.	F	Sig.	Source	S.S.	D.F.	M.S.	F	Sig.
Between Groups	149,980	2	74,990	2.11	.20	Between Groups	42,169	2	21,084	9.36	.01
Within Groups	213,185	6	35,530			Within Groups	13,518	6	2,253		
C. GREAT LAKES											
Source	S.S.	D.F.	M.S.	F	Sig.	Source	S.S.	D.F.	M.S.	F	Sig.
Between Groups	91,260	4	22,815	1.01	.45	Between Groups	51,943	4	12,986	1.49	.29
Within Groups	226,917	10	22,691			Within Groups	69,927	8	8,741		

Table Seventeen (Cont'd)

Predicting PCED						Predicting PCEV					
D. ROCKY MOUNTAIN STATES											
Source	S.S.	D.F.	M.S.	F	Sig.	Source	S.S.	D.F.	M.S.	F	Sig.
Between Groups	164,995	3	54,998	2.17	.17	Between Groups	59,298	3	19,766	1.87	.21
Within Groups	202,360	8	25,295			Within Groups	84,424	8	10,553		
E. SOUTH WEST AND FAR WEST STATES											
Source	S.S.	D.F.	M.S.	F	Sig.	Source	S.S.	D.F.	M.S.	F	Sig.
Between Groups	420,283	2	210,117	35.12	.001	Between Groups	144,068	2	72,034	4.08	.075
Within Goups	35,902	6	5,984			Within Groups	105,935	6	17,656		

and to analyze its likely impact on the institution. Zero-order and partial correlations were used to test the hypotheses.

Table 18 outlines the results of these analyses. The findings outlined in that table show that the hypotheses were not supported at either the individual or institutional level of analysis.

At the individual level of analysis, the results indicate that there is no significant relationship between decentralization of decision making and certainty of effect scores while, at the institutional level of analysis, the zero-order and partial correlation coefficients reveal significant negative relationships between participation in decision making and certainty of effect.

The differences between the results found at the individual level and those found at the institutional level probably reflect the fact that because such a wide diversity of roles was sampled, there was a high degree of variance in the amount of decentralization of decision making perceived to exist. In fact, role was found to make a significant difference in the degree to which the administrators perceived the structure to be participatory in nature ($F= 9.44$, $p< .001$; see Table 19). Roles were grouped together by level in the institutional hierarchy and the results revealed that presidents and executive vice presidents tended to perceive the structure as more participatory than did provosts and vice presidents. These administrators, in turn, perceived the structure to be more

Table Eighteen

The Effects of Institutional Structure on Administrator Certainty about the Effect of the Demographic and Vocational Trends on their Institutions

	Unit of Analysis= Individual	Unit of Analysis= Institution
Participation in Decision Making-PCED (Perceived Certainty of an Effect of the Demographic Trend)	r= -.03 (n=199)	r= -.24* (n=64)
Participation in Decision Making-PCEV (Perceived Certainty of an Effect of the Vocational Trend)	r= -.02 (n=195)	r= -.24* (n=64)
A. With Selectivity of the College partialled out		
Participation-PCED	r= -.03 (n=178)	r= -.23* (n=61)
Participation-PCEV	r= -.02 (n=178)	r= -.28* (n=61)
B. With the number of Professional Majors partialled out		
Participation-PCED	r= -.04 (n=195)	r= -.22* (n=61)
Participation-PCEV	r= -.00 (n=192)	r= -.21* (n=61)

*p≤.05
**p≤.01
***p≤.001

Table Eighteen (Cont'd)

	Unit of Analysis= Individual	Unit of Analysis= Institution
C. With the Existence of Continuing Education partialled out		
Participation-PCED	r = -.04 (n=183)	Not tested
Participation-PCEV	r = -.03 (n=183)	Not tested
D. With the Existence of an Evening Session partialled out		
Participation-PCED	r = -.03 (n=173)	Not tested
Participation-PCEV	r = -.02 (n=173)	Not tested

Table Nineteen

The Relationship between Role and Perceived Participation in Decision-Making

Role	Mean	Std. Deviation	N
Level 1	35.87	3.66	30
Level 2	34.53	4.58	90
Level 3	31.42	6.76	64

Level 1 = Presidents, Acting Presidents, Executive Vice Presidents

Level 2 = Provosts, Treasurers, Vice Presidents for Finance, Vice Presidents for Development, Directors of Strategic Planning

Level 3 = Directors of Admissions, Associate Directors of Admissions, Assistants to Presidents, Directors of Grants, Directors of Institutional Research and Undergraduate Deans.

ANALYSIS OF VARIANCE

Source	S.S.	D.F.	Mean Square	F	Significance
Between groups	535.3	2	267.7	9.44	.0001
Linearity	501.5	1	501.4	17.68	.0000
Dev. from Linearity	33.9	1	33.9	1.19	.2761

participatory than did those below them in the hierarchy (e.g. directors of admissions, school deans, directors of institutional research etc.).

Interestingly, the same phenomenon may be responsible for the institution-level results being in the opposite direction from that which was predicted. To reiterate, it was thought that participation would increase certainty on the average but the opposite relationship was found. High decentralization was found to be associated with greater uncertainty about the nature of the impact of the trends studied. It may be that participation in decision making allows for greater heterogeneity of opinions being expressed, causing greater uncertainty on the average rather than greater certainty.

Individual Characteristics as Predictors of Perceived "Certainty of Effect"

The following individual demographic variables were hypothesized to be significantly related to the degree of uncertainty administrators would have about the effect the two trends studied would have on the institution:

-length of time (tenure) in the role

-tenure in the institution

-tenure in education

-age of the administrator

-previous role held

As these hypotheses were viewed as exploratory, the direction of these relationships were not specified. All of these hypotheses were tested, depending on the nature of the predictor variable, through analysis of variance or through the use of Pearson product-moment correlation coefficients.

In general, these hypotheses were not supported when tested via these techniques. These hypotheses were further analyzed using analysis of covariance and partial correlational techniques as a means of controlling for the effects of organizational characteristics such as strength of culture, level of participation, selectivity and professional emphasis and for the possible confounding effects of other individual demographic variables. Generally, controlling for these variables had little or no effect on the relationship between individual demographics and the perceived certainty of effect scores.

Tenure in the Role. As Table 20 reveals, no significant relationship was found between role tenure and perceived certainty of effect scores for either trend (r= -.01 and

Table Twenty

The Relationship between Three Types of Tenure and Perceived Certainty about the effect of Trends in the Educational Environment

	Position Tenure	Institutional Tenure	Administration of Higher Ed. Tenure
PCED	-.01	-.06	.10
PCEV	-.05	-.03	-.01

PCED = Perceived Certainty about the Effect of the Decline in the Number of 18-24 year olds between 1983 and 1997..

PCEV = Perceived Certainty about the Effect of the Increased Demand for Vocational Relevance in Education

-.05 for, the demographic and vocational trends respectively). Table 21 shows that the nature of these correlations was not changed by the partialling out of variance due to strength of culture, participation, selectivity or degree of professional emphasis.

Tenure in the Institution. Again, no significant relationships were found (r= -.06 and -.03 for the demographic and vocational trends, respectively). Partialling out the organizational characteristics mentioned above was found to have no effect on these relationships (see Table 20).

Tenure in higher education administration. Tenure in educational administration was also found not to be significantly related to administrator's certainty of effect scores for either trend (r=.10 and -.01 for the demographic and vocational trends respectively). Partialling out organizational characteristics again had no effect on the nature of these relationships (see Table 20).

Table Twenty One

The Relationship between Demographic Characteristics of Individuals and Perceived Certainty of Effect Controlling for the Effect of Organizational Characteristics

	Position Tenure	Institutional Tenure	Admin. Tenure	Boundary Spanning Activity
CONTROLLING FOR....STRENGTH OF CULTURE (n = 166)				
PCED	.01	-.08	.10	.02
PCEV	-.05	-.07	-.04	-.12
CONTROLLING FOR....PARTICIPATION IN DECISION MAKING (n = 166)				
PCED	.00	-.08	.12	.00
PCEV	-.06	-.06	-.02	-.13
CONTROLLING FOR....SELECTIVITY OF THE COLLEGE (n =166)				
PCED	.00	-.07	.12	.00
PCEV	-.07	-.05	-.02	-.13
CONTROLLING FOR....DEGREE OF PROFESSIONAL ORIENTATION (n =166)				
PCED	.00	-.08	.11	-.01
PCEV	-.06	-.08	-.03	-.15*

*$p \leq .05$

Age of the Administrator. As Table 22 reveals, age was found to have no significant relationship to PCE scores for either the vocational or demographic trends (F= .52 and .61 respectively).

Previous role held. The results of an analysis of variance procedure presented in Table 23 revealed that the previous role held by the administrator had no effect on "certainty of effect" scores (F= .38 and 2.24 for the demographic and vocational trends respectively).

Role Characteristics as Predictors of "Certainty of Effect"

The role that an individual occupies in an organization places boundaries on the content of his/her job--and these boundaries may have a significant impact on how that individual perceives the institutional environment. The effect of two role-related variables on certainty of effect scores were explored; these variables were the degree of boundary spanning involved in the role and the role itself (i.e. job title).

Table 22

The Relationship between Age of the
Administrator and His/Her Certainty of Effect Evaluations

PCED BY AGE OF THE RESPONDENT

Age	Mean PCED score	S.D.	N
20-29	8.0	0.0	1
30-39	168.4	169.0	50
40-49	127.1	189.9	68
50-59	130.5	160.6	61
60-69	127.3	206.9	27

F = .61 (p = .66)

PCEV BY AGE OF THE RESPONDENT

Age	Mean PCEV score	S.D.	N
20-29	50.0	0.0	1
30-39	132.9	115.8	48
40-49	105.0	150.8	67
50-59	115.2	120.9	59
60-69	136.1	129.0	27

F = .52 (p = .72)

Table 23

The Relationship between Previous Role Held by the Respondent and Perceived Certainty about the Effects of Trends in the Higher Education Environment

PCED BY PREVIOUS ROLE HELD

Type of Role Held	Mean PCED score	S.D.	N
Level 1 College Admin.*	104.8	259.1	11
Level 2 College Admin.*	113.2	179.3	61
Faculty member and/ or dep't chair	131.7	159.2	30
Other	45.0	205.6	6

F = .38 (p = .767)

PCEV BY PREVIOUS ROLE HELD

Type of Role Held	Mean PCEV score	S.D.	N
Level 1 College Admin.*	100.8	123.0	11
Level 2 College Admin.*	130.8	117.1	58
Faculty member and/ or dep't chair	119.8	126.6	30
Other	-1.0	118.9	6

F = 2.24 (p = .088)

*NOTE: Level 1 Administrator roles were considered to include Presidents, Executive Vice Presidents, Provosts and Treasurers. Level 2 Roles included Directors of Admissions, Directors of Planning, Directors of Research and Associate Directors of Admissions.

Boundary-Spanning Activity. It was thought that individuals who were more active boundary spanners would have more information regarding the effect of the two trends on other institutions and thus, would be more certain about the likelihood of an effect of these trends on their particular institutions.

This hypothesis was not supported. The correlations found in this study were -.06 between boundary spanning and certainty of effect of the demographic trend and -.07 between boundary spanning and PCEV (n= 196).

Given that previous research had uncovered significant relationships between boundary spanning and "environmental" uncertainty (Cox et al., 1978 Leifer & Huber, 1977), it was decided to explore the relationship between BSA and all of the three types of uncertainty investigated here.

Table 24 displays the matrix of correlations between boundary spanning and all three types of uncertainty. The only significant relationship to emerge from this analysis was between boundary spanning and response certainty.

The relationship between boundary spanning and perceived certainty of effect was also examined via the use of partial correlations to control for the effects of organizational characteristics. These results are displayed in the right-hand column of Table 21. They indicate that controlling for organizational

Table 24

The Relationship between Boundary Spanning and Three Types of "Environmental Uncertainty"

	Boundary Spanning Activity (n =196)
PCOD	-.04
PCOV	-.00
PCED	-.06
PCEV	-.07
Response Certainty	.16**

*p≤.05

**p≤.01

***p≤.001

characteristics served to increase the magnitude of the relationship between boundary spanning and PCE but for the vocational trend only, and the increments did not generally result in a significant correlation coefficient. This relationship only reaches significance when the effects of degree of professional emphasis are partialled out.

Job title. It was hypothesized that individuals involved with the admissions function would have higher PCED scores than individuals in other roles. Table 25 shows that this hypothesis was not supported ($F = 1.27$, $p = .26$). It was also hypothesized that provosts, because of their academic overview function, might be more certain about the effect of the vocational trend than their administrative colleagues in other roles. This hypothesis was also not supported ($F = .16$, $p = .69$). In fact, an analysis of certainty of effect scores for both trends revealed no significant differences by role.

Table 25

Perceived Certainty of Effect Scores
By Role of the Respondent

PCED SCORES BY RESPONDENTS' ROLE
ADMISSIONS OFFICERS VERSUS OTHERS

	Mean PCED Score	S.D.	N
Admissions Officers	159.4	165.5	53
Other Roles	127.4	180.0	141

F = 1.27 (p = .26)

PCEV SCORES BY RESPONDENTS' ROLE
PROVOSTS VERSUS OTHERS

	Mean PCEV score	S.D.	N
Provosts/Chief Academic Officers	119.8	128.0	50
Other Roles	111.3	130	133

F = .16 (p = .69)

Predictors of Response Certainty

The third type of uncertainty which was hypothesized to exist was labeled response certainty. Response certainty/uncertainty was defined as the degree to which the individual felt that the institution's key decision makers were aware of all the possible response options available and of the likely effectiveness of each of the response alternatives. Several possible predictors of the degree of response certainty/uncertainty were explored.

Level of Agreement. Prior research has suggested that the level of agreement among managers may be a determinant of important organizational outcomes, including profitability (Hrebiniak & Snow, 1982). This study sought to develop further the work of Hrebiniak and Snow (1982) by investigating the effect of this potentially important variable on administrators' degree of certainty about how to respond to a change in the relevant environment of the organization. Specifically, it was level of administrator agreement regarding the likelihood of environmental changes affecting the institution which was of interest.

This study also sought to extend Hrebiniak and Snow's work with the level of agreement variable by attempting to specify variables which might be important in its prediction. In this next section, the hypotheses regarding the prediction of level of agreement (LOA) will be examined first and then the role of level of agreement as a predictor of response certainty will be discussed.

Predictors of Level of Agreement. The major predictors of level of agreement were hypothesized to be the organization-level factors of strength of culture and type of structure. It was hypothesized that the stronger the organizational culture, the more agreement there would be among administrators about the likelihood of an environmental change affecting their particular institution. Level of agreement was operationalized through the use of the standard deviation around the mean certainty of effect score. The larger the standard deviation, the lower the level of agreement among that group of respondents. LOA was calculated only for colleges which had more than two respondents who answered the certainty of effect question. Because of the felt need to have three or more responding administrators to meaningfully examine a within-institution standard deviation, these hypotheses were examined within a rather small subset of the responding institutions (institutional n=14).

As the distribution of standard deviations is often not normal, a nonparametric statistic, the Spearman rank-order correlation coefficient, was used so as to avoid any potential violation of the

assumptions required for the valid use of parametric statistics.

As is illustrated in Table 26, the relationship between strength of culture and level of agreement was found to be highly significant for both trends but it was in the opposite direction from that which was predicted. The stronger the organizational culture, the more disagreement there was among administrators as to whether their institution would be affected by the changes in the higher education environment studied here. One explanation for these findings is that colleges and universities which have a strong sense of their identity and thus a strong culture are colleges which thrive on the ethic of independent thought. In other words, it may be that one of the components of a strong collegiate culture is tolerance of, and even encouragement of, disagreement among their constituencies. Disagreement and argument is often regarded as the essence of academia. This may also be a critical dimension which differentiates institutions of higher education from other types of organizations which are more likely to place a high value on consensus and for which a strong culture is likely to be a homogenizing force rather than a force which facilitates conflict.

It was also hypothesized that the level of administrator agreement about the likely effect of changes in the environment would be influenced by how participatory the institution's structure was. It was thought that participation would result in greater agreement because it would allow administrators to be exposed to and influenced by the opinions of others--resulting in a sort of regression towards

Table 26

The Effects of Institutional Culture and Type of Structure on the Level of Agreement among Administrators as to the Likelihood of an Effect of a Pending Environmental Change

	Level of Administrator Agreement about the Certainty of an Effect of the	
	Demographic Trend §	Vocational Trend §
STRENGTH OF CULTURE	r= .61** (n=14)	r= .49* (n=14)
PARTICIPATION IN DECISION MAKING	r=-.08 (n=14)	r=-.02 (n=14)

*p≤.05
**p≤.01
***p≤.001

§NOTE: As the Level of Agreement variable was operationalized through the use of a standard deviation, the correlations in the above matrix reflect the relationship between the independent variables and the standard deviation on the certainty of effect measure. To interpret these correlations in terms of level of agreement, simply change the sign of the coefficient.

the mean effect.

This hypothesized relationship between degree of participation and level of agreement, also tested via use of the Spearman rank-order correlation coefficient, was not supported for either trend. Administrators from colleges with highly participatory decision making modes were not more likely to be in agreement with each other regarding the likelihood of an effect of the two environmental changes studied here than were administrators from colleges with less participatory structures.

Participation, then, appears to be an irrelevant factor in the prediction of both the absolute amount of certainty an administrator has about the likelihood of an effect as well as of the amount of agreement across administrators in their respective evaluations of environmental impact. On the other hand, participation was found to be related to the institutional mean "certainty of effect" score for both trends but in a negative direction. Thus, the more participatory the structure was, the lower the average institutional "certainty about the effect" score was for both trends.

One explanation for these findings could be that the provision of opportunities to participate in strategic decision making does not change an individual's personal certainty estimates and does not bear a significant relationship to the agreement among administrators. Because of these two phenomena, participation may have the effect of

making whatever disagreements that do exist more salient, thus resulting in lower average certainty levels at the institutional level. Huff (1978) suggested that perhaps the ultimate uncertainty might actually occur under conditions in which people disagreed about how certain "something" was to occur or to impact on them.

Level of Agreement as a Predictor of Response Certainty. It was hypothesized that the more agreement there was among administrators in their perceptions of how likely it was that their institutions would be affected by the two trends studied, the more certain they would be, on the average, that the institution would be capable of responding effectively. This hypothesis was not supported. The results revealed that there was a negative relationship between agreement about an effect and response certainty for the demographic trend ($r = .47$, $p < .05$) and no significant relationship between the two variables when tested using the data collected on the vocational trend ($r = -.02$, $n=14$, $p=.48$).

Perhaps when an environmental event is perceived as particularly likely to be threatening and those with decision making reponsibility agree that an effect is likely, the increased pressure to find a satisfactory response to counteract the threat acts to make these administrators, on the average, less certain about their ability to respond effectively. Integrating the pattern of results discussed

here with this potential explanation suggests that college administrators, on the average, may perceive the demographic trend as potentially threatening but may not perceive a significant threat from the vocational trend, perhaps because the large majority of colleges have already added more vocationally-relevant courses over the last decade. Unfortunately, due to limitations in the research design of this study, it is not possible to ascertain the relative magnitude of the threat to the institution each trend is perceived to possess.

Strength of Culture as a Predictor of Response Certainty. It was hypothesized that one of the ways in which effect certainty/uncertainty and response certainty could be differentiated from each other was through an examination of the role of institutional culture in their respective prediction. It was hypothesized that culture would be negatively related to certainty of effect and positively related to response certainty. The previously discussed results have indicated that, for the most part, the first hypothesis was supported and the results in Table 27 reveal that the second hypothesis was also supported. The stronger the institutional culture was, the more certain administrators were that they would be capable of responding effectively to the changes in the higher education environment. This relationship holds using both individual and institutional data.

Table 27

The Relationship Between
Organizational Characteristics and
Administrator Certainty about How to Respond
to Pending Environmental Changes

	DEGREE OF RESPONSE CERTAINTY	
	Unit of Analysis= Individual	Unit of Analysis= Institution
STRENGTH OF INSTITUTIONAL CULTURE	r= .23*** (n= 193)	r= .39*** (n= 64)
PARTICIPATION IN DECISION MAKING	r= .13* (n= 193)	r= .24* (n= 64)

*p≤.05
**p≤.01
***p≤.001

Organizational Structure as a Predictor of Response Certainty. Hypothesis 3B:4 proposed that the more participatory the organization's structure was, the more certain administrators would be about the institution's ability to respond effectively to changes in its environment. Table 27 reveals that this hypothesis was supported for both individuals and for institutions.

Interestingly, while the relationship between the degree of participation and response certainty was positive, the relationship between participation and effect certainty was negative and significant in the negative direction when institutions were used as the analysis unit. This finding suggests that the role of structure as a predictor differs depending on the type of uncertainty/certainty being predicted, offering more tentative evidence that these uncertainty types are indeed different. This finding also suggests a potentially important implication; namely, that high levels of participation in the "institutional" or "strategic" decision making process may, in some conditions, have positive outcomes and in others, have potentially negative outcomes (e.g. in situations where turf protection, denial of threat and politics might be likely).

The Prediction of Institutional Response Patterns. It was hypothesized that the choice of organizational responses might vary as a function of how certain the institution's top-level administrators were of their ability to formulate an effective response to changes in

the relevant environment. It was hypothesized, for example, that administrators, on the average, would have to be fairly certain of their response options and of their likely utility in order for the institution to engage in the potentially costly strategies of marketing, creating new programs or diversifying into new markets. Logical strategies for administrators who were still uncertain about how to respond include information gathering and retrenchment (e.g. cutting costs, cutting low-enrollment programs etc.). It was also hypothesized that institutions whose administrators remained uncertain about tneir response options would tend to be in the stage of considering or planning responses while institutions whose administrators were more certain would have already made, or be in the process of making responses to these environmental changes.

Analysis of the data collected on institutional response patterns, however, revealed significant problems with the data. Analysis of the responses to the survey items revealed that there was little agreement between respondents from the same institution as to what the institution had already done, was planning to do, or had considered and rejected as an alternative. One respondent might, for example, indicate that the college had lowered its admissions requirements while another indicated that this response alternative had been considered and rejected.

There are a number of possible explanations for this lack of agreement among respondents from the same institution. One

possibility is that the instructions for this part of the questionnaire may have been confusing or inadequate. Another possible explanation is that individuals may simply not be aware of what the institution is doing in areas outside their particular domain but felt a need to appear knowledgeable about their institution's behavior even when they were not. This desire to appear knowledgeable would seem to be a manifestation of a social desirability bias expressed, in this instance, by respondents' answering questions as though they knew the answer when they, in fact, did not.

This lack of agreement among respondents created problems in testing the hypotheses which related to institutional reponse choices. Averaging respondents' answers to these questions was clearly an inappropriate strategy as the data were not interval-level or continuous data. The data were nominal in nature and could only be treated as frequencies within categories. A decision was made, therefore, to only examine the data generated by the individual who was most likely to have an overview of the behavior of the institution. Institutional response data from presidents, therefore, were used in cases where the president had responded to the questionnaire. In cases in which the president had not responded, if an executive vice president, director of strategic planning or executive assistant to the president with strategic planning responsibilities had responded, his/her responses were used. In many cases, because of this restriction on roles sampled and because there

was a large amount of missing data in this part of the questionnaire, sample sizes became quite small.

Hypotheses 8:1 through 8:4 proposed that there would be significant differences in institutional response patterns as a function of the average amount of response certainty/uncertainty administrators within the institution possessed. These hypotheses were tested through the use of independent sample t-tests. Table 28 presents the results of these analyses in the right-hand column. Although the patterns of responses are in the hypothesized direction in all response categories except information gathering (e.g. institutions with more certain administrators were engaged in more market penetration, diversification and new program-type responses than institutions with less certain administrators), none of the differences in the "Already Done" column of Table 28 were significant.

Hypotheses 8:5 and 8:6 suggested that the average level of response uncertainty possessed by the institution's administrators would be predictive of the institution's predisposition towards consideration of response alternatives versus taking action. Hypothesis 8:5 was a two-part hypothesis. One part of the hypothesis suggested that institutions in which administrators were, on the average, fairly uncertain about how to respond would tend to be considering a larger number of response options than institutions in which administrators were more certain about how to respond. Table 28 shows that this part of the hypothesis was supported. Institutions

Table 28

Institutional Response Patterns
(Considering vs. Taking Action)
as a Function of Institutional Average
Response Certainty/Uncertainty Scores

	Responses Being Made		Responses Being Considered	
	Low Certainty	High Certainty	Low Certainty	High Certainty
Information Gathering Responses	1.9615	1.9615 (N.S.)	.6154	.5000 (N.S.)
Retrenchment type Responses	2.1538	1.6923 (N.S.)	2.8462	2.2692 (N.S.)
Market Penetration Responses	2.5000	2.5385 (N.S.)	.8462	.5000 (N.S.)
Diversification Responses	2.9231	3.4615 (N.S.)	1.8462[a]	.9615[a]
Creation of New Programs	2.1154	2.6923 (N.S.)	1.5385[a]	.8462[a]
All Types of Responses	11.6538[b]	12.0769[c]	6.8846[a,b]	4.7692[a,c]

[a]The differences between the means are significant at the .05 level. Ts equal 2.49, 2.36 and 2.40 respectively, in all cases, these are greater than the t-value of 2.00 required for significance at the .05 level using a two-tailed test.

[b,c]The differences between the means are significant at the .001 level. Ts equal 4.78 and 8.07 respectively. Both are greater than the t-value of 3.46, required for significance at the .001 level using a two-tailed test.

with "uncertain" administrators were considering an average of 6.88 responses while institutions whose administrators were more certain about how to respond were considering an average of 4.77 responses (t= 2.40, d.f.=50, p .05). The significant differences in the number of responses under consideration were in the Diversification and Creation of New Programs response categories.

The second part of Hypothesis 8:5 proposed that institutions whose administrators were uncertain about how to respond would be more likely to be considering their response options than actually taking action on them. The bottom row of Table 28 shows that this part of the hypothesis was not supported. In fact, these institutions were making significantly more responses than they were considering (Xs = 11.65 and 6.88 respectively, t= 4.78, d.f.=25, p .001 two-tailed).

Hypothesis 8:6 was also a two-part hypothesis, parallel in construction to Hypothesis 8:5. It was proposed that institutions in which administrators were fairly certain about how to respond would be making more responses than were under consideration. The bottom row of Table 28 shows support for this hypothesis (Xs equal 12.08 and 4.77 respectively, t= 8.07, d.f.=25, p .001, two-tailed). The second part of the hypothesis was redundant with the first part of Hypothesis 8:5 which was supported.

The Prediction of Individual-Level Outcome Variables

Three individual-level outcome variables were explored in this research.

Satisfaction with Institutional Planning. Satisfaction with the institution's planning was hypothesized to be a function of the administrator's level of certainty about the effect of a change moderated by the type of responses the institution was making. Specifically, it was hypothesized that individuals with a high level of certainty that their institutions would be affected by the two trends who were members of institutions which were making market penetration responses or diversification responses would be more satisfied with the institution's planning than administrators who were certain of an effect but belonged to institutions only considering these types of responses. This hypothesis was not supported ($t= 1.03$, $d.f.=7$, $p=.34$). Also not supported was the hypothesis that individuals with high PCE scores would be more satisfied if the college had made diversification or market penetration responses as opposed to information gathering or retrenchment responses ($t= -1.27$, $d.f.=5$, $p=.33$).

There was some evidence, however, for direct relationships between effect certainty and satisfaction with planning as well as

between response certainty and satisfaction with planning and they were in the opposite direction. These results are shown in Table 29. The more certain individuals were that the demographic trend would affect the organization, the less satisfied they tended to be with the institution's planning efforts (r= -.20, n= 183). This relationship, however, did not generalize to the vocational trend (r= -.02). On the other hand, not surprisingly, the more certain they were about how to respond, the more satisfied they were with the institution's planning efforts (r= .18).

Role Ambiguity. It was hypothesized that the less certain an administrator was about how the institution ought to respond to changes in its environment, the more role ambiguity she would perceive. This hypothesis was supported (r= -.26, n= 183).

Organizational Commitment. While organizational commitment is a frequently studied individual-level outcome variable, it is usually studied with nonmanagerial samples. This study sought to examine the potential predictors of organizational commitment for an administrative sample in the context of an analysis of how institutional administrators perceive and respond to their environments.

Two specific hypotheses were advanced, both of which were supported by the data. It was hypothesized that the more satisfied

Table 29

The Relationship among Individual Attitudinal Variables and between these Variables and the Three Types of "Environmental Uncertainty"

	Role Ambiguity	Satisfaction with Planning	Organizational Commitment
PCOD	.06	-.02	.08
PCOV	-.14*	.11	-.00
PCED	.12*	-.20**	-.16*
PCEV	.07	-.02	-.10
Response Certainty	-.26***	.18**	.11
Role Amiguity	---	-.49***	-.47***
Satisfaction with Planning	---	---	.54***
Organizational Commitment	---	---	---

*p≤.05

**p≤.01

***p≤.001

administrators were with the institution's planning efforts, the more committed they would be to the organization. The rationale for this hypothesis was that satisfaction with the institution's planning efforts, particularly under conditions of a potentially threatening environment, would be a potentially important predictor of a top-level adminsitrator's commitment to the institution. If the institution was perceived to have inadequate planning in a potentially hostile environment, the reaction of an administrator might be one of abandoning a ship she perceived to be sinking. In fact, a significant positive relationship between satisfaction with planning and commitment to the institution was found ($r = .54$). For similar reasons, it was also hypothesized that organizational commitment would be negatively related to role ambiguity, an aversive state to many individuals. This relationship was also found to be significant in the predicted direction ($r = -.47$).

CHAPTER FIVE

DISCUSSION

The discussion which follows focuses on analyzing the results of this study in light of its goals. Both the significance and limitations of this study in fulfilling the intended purposes are addressed and suggestions are made for improving future research on "environmental uncertainty" and organizational information processing in general. Some potentially important implications of the results for future research and theory in organizational behavior are also discussed.

Prior to discussing the findings and their potential implications, it is important to note a caveat about generalizing from the results of this study to the study of organizations in general. Colleges have been said to be a unique type of organization by virtue of their highly organic structures, the dynamic nature of members' participation and their highly professional and educated staffs (Cohen & March, 1974; Weick, 1976). Therefore, while the results of this study can be generalized to other four year, private, primarily liberal arts colleges due to the random nature of the sample selection

process, the degree to which these results can be generalized to organizations in general is less clear. Researchers (i.e. Weick, 1976) have asserted that the aforementioned characteristics of colleges and universities may render them unrepresentative of the population of organizations but there has been little or no empirical work to support these assertions. The degree to which colleges are representative of the population of organizations thus remains an empirical question.

In several cases attempts are made to draw implications from the results of this study to the study of organizations in general. These implications should be viewed with caution as the phenomena and processes uncovered here may not hold true across the entire population of organizations. The more similar the organization is to those sampled here in terms of characteristics such as those just mentioned and others (i.e. size, function), the more likely it is that the relationships uncovered here will have implications for that organization.

An Analysis of the Results in Light of the Research Purposes

This research had several fundamental purposes. First, the research sought to examine the manner in which organizational administrators perceive and react to changes in the nature of the

organization's external environment. Specifically, the research sought to examine the nature of the types of uncertainty experienced by administrators in the course of their efforts to interpret and make sense of an organization's external environment.

The research also sought to explore the effects of certain nonenvironmental variables on perceptions of uncertainty about the external environment. The assumption underlying this latter research purpose was that characteristics of the organization, of the individual perceiver, and of his/her role would be important in understanding these perceptions as well as in understanding the relationships between the types of uncertainty studied here.

Finally, the research sought to explore how organizations were responding to changes in their external environment and whether these responses might vary as a function of the amount of uncertainty administrators had about the likely effect of these changes and as a function of their confidence in the organization's response strategies. Also of interest was the relationship between administrators' perceptions of uncertainty and their attitudes about their institutions and roles.

The findings of this study will be examined in this next section in light of these purposes.

The Nature of an Administrator's Uncertainty about the Organizational Environment.

The results of this research can probably be best characterized as offering tentative support for the idea that the three types of uncertainty which have previously been subsumed under the label "environmental uncertainty" might be independent types of uncertainty. Of the three types examined in this study, it is uncertainty about how to respond that is most clearly differentiable from the other two types, bearing no relationship to "uncertainty about the state of the environment" and a small negative relationship to "uncertainty about the effect of a change on the organization."

On the other hand, "uncertainty about the state of the environment" and effect uncertainty were found to be positively related although the magnitude of the relationship was found to vary across trends and to be influenced by at least one of the resource dependence variables studied here; namely the selectivity of the institution.

This finding of a significant relationship between "uncertainty about the state of the environment" and "effect uncertainty" is not necessarily contradictory to the proposed model of the relationship between the uncertainty types. As was suggested in the introduction, one may actually need to be fairly certain about what the possible future states of the environment might be before one can sensibly begin to analyze potential effects on an institution. Thus, as Hall (1980) suggested, it may be that it is only when an "organization" is

fairly certain that a change or event will take place that attempts can be made to estimate what the effect on the organization will be. In terms of planning, this finding suggests that elaborate strategic planning programs may not be necessary or useful to an organization's administrators unless these administrators are fairly certain about what changes might be occurring in the organization's environment. Liedtka (1985), in fact, has made a similar suggestion in her contingency model of the utility of different types of strategic planning systems.

An interesting aspect of the finding of a significant relationship between "certainty of occurrence" and "certainty of effect" was the fact that the size of the relationship was found to vary substantially across the trends studied here. The magnitude of the relationship between these two types of uncertainty may be a function of a number of factors worth future study. One factor that may influence the degree of association between these uncertainty types may be the perceived significance of the change which may be occurring in the environment. A highly significant change, if it were to occur, might tend to be associated with high levels of certainty about an effect even if the change is not perceived to be certain to occur. Another factor which may influence the magnitude of the relationship between these two uncertainties is the length of time since discovery of the possibility of a change in the environment.

Yet another factor likely to influence the strength of the

association between these two types of uncertainty is the perceived relevance of the change to the organization. It seems likely that as Weick (1969) suggested with his notion of "enacted environments" that administrators only perceive certain aspects of the environment as relevant to them and ignore aspects of the environment that fall outside the boundaries of the so-called enacted environment.

This study tried to operationalize relevancy by looking at the extent to which the institution was dependent on the constituencies in its environment whose composition was changing. This effort met with somewhat limited success. Other factors may be more important in understanding perceptions of relevance than the resource dependence characteristics investigated here. An organization's recent peformance history or definition of its mission, for example, may be important factors in determining the strength of the association between certainty of occurrence and certainty about an effect of a change in the environment.

Understanding the factors which might determine the perceived relevance of an environmental change for a particular organization is clearly a topic deserving of more theoretical and empirical attention.

The Effect of Organizational Characteristics: Further Evidence for the Differentiability of Types of Uncertainty. Other evidence that the uncertainty types examined here are different lies in the nature of their association with the organizational characteristics studied

here. Participation in decision making, for example, was found to bear a negative relationship to certainty about an effect when institutional-level data were examined but was found to be positively related to certainty about how to respond. Likewise, the strength of the institution's culture was negatively related to individuals' ratings of effect certainty (for the demographic trend only) but positively related to response certainty.

These findings are significant for two reasons. First, they are significant in view of the goals of this research as they provide further evidence for the differentiability of the types of "environmental uncertainty" hypothesized to exist. The findings, however, are also significant because they suggest that organizational characteristics not only affect administrator perceptions of the organization-environment interface but may, in fact, have different effects on the processing of information about the environment depending on the type of information being analyzed.

The findings relating to the effect of participation in decision making on perceptions of certainty, for example, have potentially important implications in terms of the design of organizations. If certainty about an effect is necessary to motivate the search for appropriate responses, the implication of the finding here is that participation in the analysis of potential effects of environmental trends or changes perhaps ought to be limited. High levels of participation at this stage in environmental processing may make

achieving certainty about the existence of a significant threat or opportunity more difficult either because of a diffusion of responsibility phenomenon which can occur in group decision making situations (Janis, 1959) or because of differences in opinion. Differences in opinion may occur because of differences in interpretation of information or they may result from political considerations such as an administrator's perceived need to protect her turf or to not admit previous errors in judgment. On the other hand, participation seems to be a positive force in achieving certainty about how to respond perhaps because once a problem has been identified, the need to respond appropriately takes precedence over political concerns.

Thus, an organization's leadership may want to formulate task forces and other types of participation-encouraging mechanisms only after a potential threat or opportunity in the environment has been identified. These task forces would then be charged with brainstorming the organization's possible strategic alternatives for handling the threat/opportunity.

Implications for the Conceptualization and Measurement of "Environmental Uncertainty"

The finding of tentative support for the types of uncertainty studied here has potentially important implications for future theory and research with the "environmental uncertainty" construct. The

findings suggest that some of the confusing results of prior research with the "environmental uncertainty" construct may indeed be attributable to a failure to adequately differentiate between these types of uncertainty at both the conceptual and operational levels.

This study's results suggest, for example, that future efforts to measure "perceived environmental uncertainty" probably ought not to treat PEU as a unidimensional construct nor treat the types of uncertainty studied here as simple subdimensions of a larger construct of "perceived environmental uncertainty" as has been done in the past (e.g. Duncan, 1972). Duncan's (1972) PEU scale, for example, measures each of these types as subdimensions of "perceived environmental uncertainty," aggregating the subscales to produce a global measure of PEU. In light of the results of this study, this strategy may be inadvisable. The aggregation of scores for each of the types of uncertainty studied here into a global measure of "environmental uncertainty" may not yield a meaningful or useful measure.

Given the confusion in the definition and measurement of "environmental uncertainty" and the findings of this research, an interesting issue revolves around the question of whether or not the construct of "perceived environmental uncertainty" remains a useful one.

It seems clear that insufficient attention has been paid to the conceptualization of this popular construct and to the construct

validity of indices of uncertainty used in research. Yet, the literature on environmental uncertainty is replete with prescriptions as to how administrators ought to cope with uncertainty in their environment. If we cannot as a field agree about what "environmental uncertainty" is or about how to measure it validly, how can we offer meaningful prescriptions to administrators? This problem is a manifestation of a unfortunate tendency in the field of organizational behavior to sometimes put application and research before theory. Without careful conceptualization and a well-thought out theoretical framework, application can create many problems not the least of which is identifying the circumstances in which application is warranted. Similarly, a stream of research which develops without a clear and agreed-upon conceptualization of major variables is of questionnable utility.

The concept of "environmental uncertainty" is fundamentally a useful and important construct but we need to pay closer attention to its definition and measurement. The label "environmental uncertainty" probably ought to be used to refer only to uncertainty about what is going on in the organization's external environment. Other labels such as those developed here (or others) should be used to refer to other types of uncertainty which can be experienced about the effect of the environment on the organization or about how the organization ought to respond.

More research, however, will clearly be needed to replicate the

findings of this study, to further explore the nature of the relationships betweeen these types of uncertainty and perhaps, to generate finer categories of uncertainty types.

A few comments and suggestions for future research based on an analysis of the strengths and limitations of this research follow.

Specific Issues in Measurement. An important issue in the measurement and conceptualization of uncertainty about the environment lies in the design of measures of each of the types of uncertainty. A limitation of this study lay in the manner in which uncertainty/certainty about an effect of an environmental change was measured. The primary concern in this study was on differentiating between the types of uncertainty. This focus resulted in the development of an exploratory measure of effect uncertainty which unfortunately was incomplete. Future efforts to measure effect uncertainty should attempt to measure whether anticipated effects are perceived to be positive (opportunity) or negative (threat) and should allow for a more detailed examination of uncertainty in relation to the specific nature of the effect on the institution and not just uncertainty about whether or not an environmental change will have an effect.

Issues in Research Methodology. Another limitation of the current research was its cross-sectional, rather than longitudinal, research design. One cannot reasonably infer causality from this study and

argue, for example, that high levels of certainty about the occurrence of a change causes high levels of perceived certainty about a potential effect. Second, it seems quite likely that as with most models of information processing, there are feedback loops such that as an organization responds, and evaluates the outcomes of its responses, its evaluation and interpretation of the environment changes. The results of this research because of its cross-sectional nature, however, only allow for speculation about the nature of potential feedback processes.

To avoid these limitations, future research which seeks to explore the process by which administrators perceive and make sense of their environments and/or to study the relationship between types of "environmental uncertainty" should make use of longitudinal designs or alternatively make extensive use of archival data. Two methodologies seem particulary well-suited to understanding the complex and dynamic relationships between these types of uncertainty and to understanding organizational information processing and decision making in general.

One possible methodology would involve tracking a set of organizations, perhaps in the same industry to avoid unnecessary contamination by industry characteristics (Hrebiniak & Snow, 1980), from the time a potential change in the environment first becomes even remotely probable or is initially noticed (T_1) through a time (T_{1+n}), probably a number of years later, after the change has

taken place and has had its effect, or lack of effect, on the organizations.

Another similar methodology would rely on the use of archival data to get a sense of the flow of information processing and decision making in reponse to an environmental change or set of changes. Miles (1982) conducted an industry case study like this in the cigarette industry, tracking manufacturers' responses to studies on the hazards of smoking and to the threat of, and actual introduction of, federal regulations.

In the context of the higher education environment, a researcher might seek permission to review the internal documents of a college (e.g. memos, internal reports, clipping files etc.) and perform a content analysis of these documents focusing particularly on how information was conveyed, the level of certainty that was conveyed about what was happening in the institution's environment and about what the likely impact on the college might be. One could also analyze these documents to see not only what actions were recommended for coping with an environmental change but also when they were recommended, how certain the communicator seemed to be about their efficacy, whether or not they were implemented, and the latency from recommendation to implementation. A particularly interesting approach to looking at environmental information processing might be to look at two (or more) cases, one of which might be a college on the verge of closing down and another a college which was thriving in its

environment.

The Insignificance of Individual and Role Characteristics in Explaining Variance in Uncertainty Perceptions

The results of this study, as previously mentioned, suggest that organizational characteristics do play a role in influencing administrator perceptions of the environment and, in fact, influence perceptions of the effect and response types of uncertainty in different ways. Characteristics of the individual and of the role, on the other hand, were not found to be significantly related to uncertainty perceptions. There are several potential explanations for the insignificant nature of these findings.

Kanter (1977) has suggested that there is often very little variance in the characteristics of top-level organizational administrators because of self-selection. She argues that administrators tend to choose as colleagues people who they perceive to be like themselves and then apply subtle pressures for social conformity which results in individuals at the "top" of an organization being relatively homogeneous both in terms of demographic and psychological characteristics.

In fact, the administrators sampled in this research tended to be rather homogeneous in their demographic make-up. Most of the

administrators in this study had served in administrative roles for over five years. The administrators sampled tended to be in the age range from 40 to 59 years of age with few younger than 30 or older than 60. The vast majority were males and very few had had administrative experience in the profit making sector of the economy. Most had been faculty members prior to taking on their administrative roles.

This limited variance in the demographic make-up of the respondents could have acted through one of several means to suppress the importance of individual variables in explaining variance in certainty perceptions. First, this restriction of range could have had an effect from a statistical point of view. The existence of a restricted range for a particular variable can often act to decrease the likelihood of obtaining statistical significance when looking at the relationship between that variable and other variables. Second, it could be that when individuals have the same or similar demographic make-up, they tend to perceive their environments in a similar way. A third possibility is that whatever differences in perceptions which might have existed as a function of demographics had been effectively wiped out by the socialization process at the institution.

While the results of this study suggest that the demographic characteristics of individuals are not important in explaining variance in perceptions of environmental uncertainty, findings of previous research have revealed significant relationships between

personality characteristics such as locus of control, dogmatism, anomie and tolerance for ambiguity and perceptions of "environmental uncertainty" (Downey et al., 1977; McCaskey, 1976; Storey & Aldag, 1983). The discrepancy between the findings of those research efforts and the findings of this study are interesting and merit some attempt at explanation. The first and most obvious explanation is that personality characteristics are important in explaining variance in perceptions of uncertainty while demographic characteristics such as age and job history are not. However, the discrepancies in the findings could also have resulted from differences in the way uncertainty about the environment was measured. Perhaps when uncertainty is measured in a global way as it was in these previous studies, both personality and demographic characteristics are relevant predictors but when it is measured very specifically in relation to two existing environmental trends, both sets of factors become unimportant as predictors. People, for example, who are high in tolerance for ambiguity or who actually seek ambiguity may be predisposed to see the world as a complex and uncertain place but it is less likely that a personality characteristic such as this would influence probability and certainty estimates about very specific phenomena. Thus, global measures of "perceived environmental uncertainty" may be confounded with personality predispositions to perceive the world as an uncertain place.

Another possibility is that personality and individual

characteristics are relevant predictors only of certain types of uncertainty. In this study, they were only examined in terms of their relationship to effect uncertainty but it may be that these characteristics are related not to effect uncertainty but to "uncertainty about the state of the environment" or to response uncertainty. Recent studies by Aldag and Storey (1979) and Storey and Aldag (1983), for example, used a measure which focused primarily on response uncertainty (although they called it "environmental uncertainty") and found that anomie was an important predictor of this type of uncertainty.

More research would be needed to understand both how characteristics of the individual might be related to perceptions of uncertainty of different types and which characteristics are important and which are not. Such research could have important implications for strategic planning as it would suggest which characteristics were most likely to influence the scanning and information processing behavior of administrators and under what conditions a significant influence of indiviudal-level variables might be particularly likely. If, for example, older administrators in conditions of environmental turbulence tended to be certain that they knew how to respond, one might want to build in brainstorming or dialectical planning techniques which facilitated the generation of as broad a range of strategic response options as possible and forced evaluation of each of these alternatives.

In this study, role characteristics, like individual demographics, were found to have little value in explaining variance in the types of uncertainty studied here. The degree of boundary spanning an individual did, for example, had no effect on his/her perception of two of the types of uncertainty and only a small association with response uncertainty. Again differences in the way "environmental uncertainty" was operationalized may explain the discrepancy between these findings and those of previous research (Cox et al., 1978; Leifer & Huber, 1977). It is also possible that because the concept of boundary spanning is a general one, it bore no relationship to the perception of uncertainty about very specific changes in the environment. It may be that people with high levels of boundary spanning involved in their roles are exposed to a wide diversity of somewhat superficial information about the environment but not necessarily to detailed information about particular environmental phenomena.

Organizational Outcomes and Individual Attitudes

Although this study sought to explore the relationship between administrator perceptions of uncertainty and the institution's response patterns, problems in the measurement of the institution's response patterns preclude drawing any firm conclusions from these analyses. The finding of a lack of agreement among administrators within an institution regarding organizational responses suggests that

the data on response patterns used in this research might be distorted and not representative of the actual behavior of the institution. Although this lack of agreement caused problems for the analysis of hypotheses relating to organizational responses, it is an interesting finding in and of itself and will be the focus of another section of this discussion. Analysis of response patterns was further complicated by the fact that there was a lot of missing data in this part of the questionnaire, perhaps because administrators found responding to questions about the institution's strategic behavior threatening. The result of these two problems was that data were analyzed only for individuals in certain roles and that sample sizes were often too small to have any real confidence in the results.

The results, however, did suggest that there may be differences in institutional response patterns based on levels of response certainty, particularly in terms of the absolute number and types of institutional responses reported as being under consideration.

Further work in this area could have important implications for improving our understanding of the strategy formulation process. A change in the environment which represents a potential threat or opportunity for a particular organization can, in most cases, be responded to in a number of ways. Understanding what factors might have an impact on the strategic decision making process as well as how these factors might affect this process is an important area for future research. An interesting approach to studying these research

questions would be through the use of a longitudinal, case study analysis of the members of a top-management team charged with strategy formulation for an institution. One could study administrator levels of different types of uncertainty over time and look at how these levels are affected by the acquisition of information and opinions of different types, by the nature of the group discussions and processes and by institutional responses made. Findings of reliable and valid connections between levels of uncertainty and organizational response patterns might have potentially important implications for the development of strategic planning interventions designed to change levels of uncertainty and ultimately to change the organization's response choice.

The results of this study regarding the connection between institutional response patterns and the attitudes of individual administrators were not significant but these attitudes did seem to be connected to the amount of uncertainty of different types these administrators perceived. Generally, the more certain an administrator was that his institution would be affected by the demographic trend, the less committed he tended to be to the institution, the less satisfied he tended to be with the planning efforts and the more role ambiguity he reported experiencing. These findings, however, did not generalize to the vocational trend, suggesting perhaps that the demographic trend is perceived as more of a threat to the institution by these individuals than the vocational

trend.

On the other hand, certainty about how to respond was positively associated with planning satisfaction and negatively associated with role ambiguity. Certainty about how to respond may ease role ambiguity perhaps because the administrator's role is usually fairly clear once strategic responses are decided upon.

The fact that perceptions of certainty regarding the effect of these trends and the utility of various response options were related to administrator attitudes is significant as it suggests that the manner in which changes in the environment are processed may not only have implications for an organization's short-term responses but also may have implications for the attitudes and allegiance of their leaders. A "shake-up" in an organization's leadership in times of turbulence in the environment has the potential to derail an organization's sense-making and strategy formulation processes at a critical time. Alternatively, it is possible that administrative turnover during these times could actually facilitate strategic planning if the new leaders were certain of the potential threats and opportunties in the organization's environment.

Some Broad Implications for Future Theory and Research

Lack of Agreement about Organizational Responses: The Potential Importance of Level of Agreement as a Variable in Organization Theory

One of the more interesting findings of this research was a totally unexpected one; namely that administrators from the same institution did not seem to be in agreement with one another about how the organization had responded or was planning on responding to changes in its environment. As was alluded to in the Results Chapter, this may have occurred because of problems in the instructions or measurement, causing administrators to become confused in answering the questions. If, however, poor measurement was not the cause of this phenomenon, it is a very interesting problem and one which bears further discussion as it has some potentially important implications for the future study of organizations.

When one measures individual attitudes, one expects individual differences and, in fact, one studies these differences in an effort to understand what factors are important in explaining these differences. Similarly when one looks at responses to survey or interview questions about characteristics of an organization or of its environment, one is obtaining data about individual perceptions of these phenomena and not necessarily about the phenomenon itself.

Again, there may be individual differences in perceptions and it is important to understand the factors which may contribute to these differences in perceptions.

The results of this research suggest that this recognition of the subjectivity of data needs to be extended even into the situation in which one is asking questions about an organization's "objective" behavior. There are many reasons why answers to seemingly straightforward, behavioral-type questions may differ within an organization. First, individuals may lack knowledge of what the organization is doing in domains outside their own but not want to admit they lack knowledge. Individuals, in fact, may also lack knowledge even within their domain of responsibility due to the sheer volume of work done within their units. One would expect that pressures to appear knowledgeable would be even stronger in the latter situation.

A second reason for a lack of agreement about organizational response patterns could lie in differences in how an organizational response is interpreted by individuals. Another reason is that individuals in positions of leadership may not want to admit that the institution has made what some in the industry might view as an undesirable response (e.g. in the case of colleges, lowering admissions standards) while others in the organization are more willing to admit to such responses. Finally, there may be legitimate differences between divisions of an organization such that individuals

in these different domains would answer the same question in different ways.

While the latter issue can be effectively addressed through careful construction of questions, biases in the data caused by lack of knowledge, differences in interpretation or social desirability cannot be completely eliminated by careful questionnaire construction. The existence of these biases suggest that data obtained from individuals even when the subject matter is an organization's "objective" behavior should be viewed as perceptual and not objective data.

One implication of this finding for future research in organizational behavior is that researchers who choose to study organizational performance phenomena should be very clear about what they are studying and how. One probably cannot, for example, survey CEOs and interpret data received from them on the organization's response patterns as though they were objective data on the organization's behavior. If objective, unbiased data on organizational-level responses is desired, data from archival or external sources should probably be the data of choice. An interesting approach to data collection on organizational response patterns would be to use both archival and subjective means for obtaining data and compare the data obtained from the two sources.

Alternatively, obtaining data from several administrators as was done in this study provides the opportunity to look at the amount of

agreement between administrators and test hypotheses about what factors might be important predictors of level of agreement and about the consequences of a lack of agreement. One might hypothesize, for example, that a lack of agreement on fundamental aspects of the organization (e.g. its strategy, its recent actions, etc.) might be reflective of poor communication and integration which might, in turn, come to be reflected in poor performance.

The results of this study (both in terms of the lack of agreement about organizational response patterns and in terms of the significance of agreement about an effect for predicting response certainty) taken in combination with the findings reported by Hrebiniak and Snow (1982) suggest that the level of agreement among an organization's top-level administrators may be a very important variable to consider in organization theory. Given that many models of organizational decision making and strategy formulation rely on notions of coalitions or top management teams (Cyert & March, 1963; Hrebiniak & Snow, 1982), we need models and methodologies that allow for the investigation of agreement phenomena. It is important to understand both the predictors and consequences of agreement or the lack thereof, particularly in terms of the potential relationship between level of agreement and organization-level outcomes.

The Interface between the Individual and the Organization: "Nonrational" Influences on Environmental Scanning and Organizational Decision-Making

One of the purposes of this research was to bridge the expanse between the sociological and economic paradigms which tend to dominate in organization theory and the psychological paradigm which dominates in organizational behavior. Several writers (Miller, Kets de Vries & Toulouse, 1982; Staw, 1984) have suggested that there has tended to be too much specialization in the OB/OT disciplines such that researchers adopt either a sociological perspective on organizations or a psychological perspective but not both. Miller et al. (1982) argue that viewing these as alternative perspectives on organizations limits theory development. "It is not a matter of determining the relative advantages of the sociological versus the psychological approach" (p. 238) but rather of using the two integratively to arrive at a more complete understanding of organizational processes.

Perhaps, because of the dominance of the sociological and economic paradigms in organization theory, there has tended to be an assumption of rationality underlying many theories of organization-environment relations (Staw, 1980). Many of these theories depict an organization's strategic and design behavior as though it was, or could be, solely a function of a logical analysis of

conditions in the external environment. The strategic and design behavior of an organization is, however, fundamentally the result of perceptions and interpretations of the organizational environment made by the organization's top-level administrators. These perceptions and interpretations are likely to be as strongly influenced by history, values, organizational characteristics and perhaps, individual characteristics, as they are by the objective conditions of the environment (Pfeffer, 1978; Weick, 1969). Furthermore, an organization's ability to respond or to implement a particular strategy once decided on, is also likely to be strongly influenced by factors within the organization. Staw (1980) suggests that "organizations, like individuals, are intendedly rational and operate under norms of rationality. However, organizations, even more than individuals, possess very limited information processing and learning capabilities" (p.64).

One of the fundamental purposes of this research was to examine organizational information processing in a group of organizations faced with a potential threat to their survival and to investigate the effect of certain organizational, individual and role characteristics on top-level administrators' perceptions of these changes and their likely significance for their institutions. While this research was exploratory and was found to be limited in some ways, the results suggest that organizational characteristics do have a significant effect on administrator perceptions of the environment while the

individual and role characteristics examined in this study were not found to significantly affect these perceptions.

If the field of organization theory seeks to better understand the nature of organization-environment relations and particularly, inter-organizational differences in reactions to the environment, the field needs more research focused on furthering our understanding of what the important influences on the environmental sense-making processes might be. Also needed is research which delineates the conditions under which so-called "nonrational" factors, such as individual and organizational characteristics, are important to the information processing and strategic decision making processes in organizations.

To better understand the behavior of organizations and of organizational members, we must recognize the importance of operating at this interface between the individual and the organization at both the theoretical and empirical levels. The recognition that it is people who are at the helm of organizations and who determine an organization's direction will increase the richness and explanatory power of our theories of how organizations behave.

APPENDIX A

Dear Administrator:

As part of the dissertation requirements for my doctoral work at the City University of New York, I am conducting a major study of the effects of changes in the higher education environment on the perceptions and attitudes of college and university administrators.

I am asking you to participate in this study which I believe will prove useful to college administrators such as yourself in helping you to develop a better understanding of what factors affect planning and decision making in institutions of higher education.

I would be grateful if you could take a half hour out of your schedule to complete this questionnaire. Please be assured that your responses will be kept completely confidential. The data gathered here will be reported in aggregated form only. The numerical codes on the questionnaires will be used for purposes of classifying institutions into categories only.

I have provided a stamped, self-addressed envelope for your convenience in returning the questionnaire. I ask that you return the questionnaire at your earliest convenience but before December 1, 1984. I would be happy to provide you with a compilation of the results of this research should you be interested. If you are interested in receiving such a summary, please indicate your name and address on a separate sheet of paper and return it with the survey or under separate cover.

I thank you in advance for your time and cooperation, they are sincerely appreciated.

Sincerely,

Frances J. Milliken

Frances J. Milliken
Ph.D. Candidate in
Organizational Behavior,
The City University of
New York

Some educational commentators have said that institutions of higher education are entering a transitional period in their history while others say that there is no reason to believe that institutions of higher education will change significantly in the next decade. Listed below are two apparent trends in the environment of higher education institutions accompanied by a few questions. We are interested in your opinion about these trends.

TREND A:
A 15-25% decline in the number of 18-24 year olds in this country has been predicted for the time period from 1983-1997.

1a. If you had to assign a probability as to the likelihood that this trend will occur, what would it be (circle below):

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

1b. How certain are you of your estimate? (circle below)

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

2a. How likely is it (in your estimation) that your institution will be affected by this trend (circle below):

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

2b. How certain are you of this estimate? (Circle below)

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

2c. How much of an impact this trend will have on your institution? (Circle below)

1	2	3	4	5
No impact at all		A moderate impact		A critical impact

2d. How certain are you of this estimate? (Circle below)

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

==========

TREND 8:
Some sources predict that there will continue to be a significant shift towards the undergraduate selection of majors more directly relevant to vocations and professions (e.g. computer science, engineering, business etc.) during the next decade.

1a. If you were to assign a probability as to the likelihood that this trend will continue to occur, what would it be (Circle below):

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

1b. How certain are you of your estimate? (circle below)

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

2a. How likely is it (in your estimation) that your institution will be affected by this trend (circle below):

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

2b. How certain are you of this estimate? (circle below)

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

2c. How much of an impact this trend will have on your institution? (circle below)

1	2	3	4	5
No impact at all		A moderate impact		A critical impact

2d. How certain are you of this estimate?

1	2	3	4	5	6	7
Extremely Uncertain		Somewhat Uncertain		Somewhat Certain		Absolutely Certain

Statements in the following section ask you about the degree of difficulty involved in reaching a decision about how your institution ought to respond to the demographic and curricular trends mentioned above.

Please indicate the degree to which you agree with each of the following statements by circling the appropriate number to the right of the statement.

1	2	3	4	5
Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree

1.	I feel confident that we are aware of all the response alternatives available to us as an institution.	1	2	3	4	5
2.	When weighing the various alternatives for responding to these trends, it is hard to decide which of these alternatives is likely to be most effective in the long run.	1	2	3	4	5
3.	One cannot accurately assess the relative effectiveness of various alternatives because there are so many unknowns that could influence the effectiveness of each alternative.	1	2	3	4	5
4.	In the face of these curricular and demographic trends, to some extent administrators just have to guess which strategy will produce the most desirable outcome for the college.	1	2	3	4	5
5.	It is difficult to determine exactly what alternatives are available for responding to these trends.	1	2	3	4	5
6.	Once the alternatives have been narrowed down, it is relatively easy to evaluate the relative desirability of each for the long run well-being of the institution.	1	2	3	4	5

The following is a list of some of the responses colleges could make to the previously discussed demographic and curricular trends in their environments. In answering these questions, please respond on the basis of your own knowledge

Please place a check in the appropriate column indicating whether:

1) the action has never been considered.
2) the action has been considered but was rejected.
3) the action is currently being considered.
4) the action has already been taken (within the last 5 years)
0) I am not sure.

PLEASE NOTE THAT IN SOME CASES MORE THAN ONE CATEGORY MAY APPLY. IN THESE CASES, PLEASE PLACE CHECKS IN ALL COLUMNS THAT APPLY.

	Never Considered	Considered but Rejected	Under Consider-ation	Already Done	Not Sure
1. Developing a comprehensive, long-term (5 years +) strategic plan for the college.					
2. Undertaking or increasing marketing efforts: a. Advertising -newspapers, broadcast media, periodicals b. Brochures on the college -for guidance counselors, -for prospective students					
3. Cutting the number of faculty lines.					
4. Instituting a hiring freeze: a. faculty b. support staff					
5. Establishing Continuing Education programs.					
6. Establishing an evening session					
7. Seeking information from administrators at other colleges about how they are responding and why.					
8. Cutting instructional budget allocations: a. salaries b. other (i.e. equipment, supplies)					
9. Increasing student recruitment efforts					
10. Establishing "satellite campuses."					
11. Formation of administrative task forces to collect information and make recommendations to the President or Trustees.					
12. Cutbacks in the capital expenditure budget					
13. Increasing the % of applicants accepted.					
14. Creating new degree programs (In the space below, please indicate the type of program)					

	Never Considered	Considered but Rejected	Under Consider-ation	Already Done	Not Sure
15. Creating new undergraduate majors (please indicate type of major)					
16. Creating new departments (Please indicate the names of these departments)					
17. Hiring consultants/forecasters to help the college evaluate its options					
18. Entering into jointly-sponsored programs with other colleges in the area					
19. Eliminating academic departments (Which?)					
20. Improving the college's computing capabilities or making low-cost computers available to students.					

==========

This part of the questionnaire asks you to indicate the extent to which you perceive your college to have certain characteristics. Please indicate the extent to which you agree with each of the statements by circling the appropriate number to the right of the statement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree

==========

1. Administrators such as you are encouraged to make suggestions when a major institutional decision has to be made. 1 2 3 4 5

2. People in this organization are likely to openly express their reactions to policy suggestions. 1 2 3 4 5

3. Administrators have a good deal of say in determining the strategies and plans for the college. 1 2 3 4 5

1 Strongly Disagree	2 Disagree	3 Neither Agree or Disagree	4 Agree	5 Strongly Agree

4.	The president or board of trustees usually make the strategic decisions for the college without consultation with other administrators.	1 2 3 4 5
5.	When the institution is facing a tough problem, administrative task forces are often convened to study potential solutions to the problem and to make recommendations to the president.	1 2 3 4 5
6.	The board of trustees or president will usually seek the advice of administrators such as you before making major resource allocation decisions.	1 2 3 4 5
7.	Administrators such as you are encouraged to speak their minds even if it means disagreeing with the president.	1 2 3 4 5
8.	Administrators really do not play an active role in the decision making process at this college.	1 2 3 4 5
9.	The institution does not seem to have a strong sense of its history.	1 2 3 4 5
10.	There is a strong sense of pride in the college's goals and mission among the administrators here.	1 2 3 4 5
11.	There are stories about previous presidents, administrators, trustees or graduates of this college that every administrator has heard at least once.	1 2 3 4 5
12.	The administrators here think that this college has carved out a unique place for itself in the higher education community.	1 2 3 4 5
13.	The college does not have a well-defined set of goals or objectives for itself.	1 2 3 4 5
14.	Many of the buildings or common rooms on campus are named after previous presidents, trustees or faculty members.	1 2 3 4 5
15.	Administrators in this institution tend to be knowledgeable about the institution's history.	1 2 3 4 5
16.	When administrators, faculty or students talk about the college to outsiders, it is usually with great enthusiasm.	1 2 3 4 5

To what extent are the following characteristics typical of the undergraduate portion of this college? Please mark the appropriate response using the scale immediately below:

1	2	3	4	5	6	7
Very untrue or highly atypical of this institution			Neither typical or atypical			Very true or highly typical of institution

_____ 1. This college is able to obtain needed financial resources in order to provide a high quality educational program.

_____ 2. When hiring new faculty members, this college can attract the leading people in the country in their respective fields.

_____ 3. This college enrolls the leading high school graduates in the country.

_____ 4. This college has a good ability to obtain the resources it needs to be effective.

For the following questions, please indicate the appropriate response using the following scale:

1	2	3	4	5	6	7
Almost None	A small minority	Less than half	About half	More than half	A large majority	Almost All

_____ 5. How many faculty members would you say have national reputations in their respective academic fields?

_____ 6. Approximately what percentage of the faculty members and administrators at this college attended a conference or workshop specifically oriented towards professional and/or personal development last year?

_____ 7. How many of the faculty members at this college would you say published a book or an article in a professional journal last year?

_____ 8. What proportion of the faculty members would you estimate teach at the "cutting edge" of their field--i.e. require current journal articles as reading, revise syllabi at least yearly, discuss current issues in the field, etc.?

_____ 9. How many faculty members at this college would you say have at some time received an academic award or honor such as a teaching, research or professional award?

_____ 10. How many faculty members at this college are now actively engaged in professional development--i.e., doing research, writing a book, etc.?

_____ 11. Colleges may be rated on the basis of their relative "drawing power" in attracting top high school students In relation to other colleges with which it directly competes, what proportion of the top students attend this college rather than the competition?

1	2	3	4	5	6	7
Almost None	A small minority	Less than half	About half	More than half	A large majority	Almost All

____ 12. How many administrators at this college would you say are personally satisfied with their employment?

_____ 13. How many administrators would you say are personally satisfied with the way things are done around this school?

_____ 14. If given an acceptable job alternative, how many administrators do you think would opt for leaving this school rather than staying?

The following items ask you about how you feel about your job and about certain characteristics of your job. For each of the items listed below, please indicate the extent to which you agree with each, using the following scale:

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1.	I feel certain about how much authority I have in my current position at the college.	1	2	3	4	5
2.	I have clear, planned objectives for my job.	1	2	3	4	5
3.	I know what my job responsibilities are.	1	2	3	4	5
4.	I know that I have allocated my time properly among my job responsibilities.	1	2	3	4	5
5.	I know exactly what is expected of me in my job.	1	2	3	4	5
6.	I receive clear explanations as to what has to be done in my job.	1	2	3	4	5
7.	I am willing to put in a great deal of effort beyond that normally expected in order to help this college be successful.	1	2	3	4	5
8.	When I talk to friends, I generally describe this college as a great institution to work for.	1	2	3	4	5
9.	I find that my values and this institution's values are very similar.	1	2	3	4	5
10.	I am proud to tell others that I am a part of this institution.	1	2	3	4	5
11.	This organization really inspires the very best in me in the way of job performance.	1	2	3	4	5

12. I am extremely glad that I chose to work for this organization instead of others I was considering at the time. 1 2 3 4 5

13. I really care about the fate of this college. 1 2 3 4 5

14. I would accept almost any type of position in order to keep working for this institution. 1 2 3 4 5

15. This organization comes close to being the ideal place for me to work. 1 2 3 4 5

The statements below are concerned with the nature of your position at the college and the kinds of activities involved in your job. Please rate each of them by circling the number which best corresponds to your answer to the question:

To what degree is the activity a significant part of your job?

1	2	3	4	5
Definitely not a part of my job		An occasional or somewhat important part of my job		A most significant part of my job

---

1. Representing the college to outsiders. 1 2 3 4 5

2. Reviewing the college's strategies or plans with outsiders (i.e. consultants, lawyers, administrators from other colleges or universities). 1 2 3 4 5

3. Traveling at least 30 days a year as a representative of your college. 1 2 3 4 5

4. Preparing reports for governmental agencies of any type. 1 2 3 4 5

5. Preparing and/or making several statements to media (print or broadcast) each year. 1 2 3 4 5

6. Writing at least 10 business letters a week to individuals outside the college. 1 2 3 4 5

7. Acting as the college's liaison to other organizations. 1 2 3 4 5

8. Hearing outsiders' opinions of your college. 1 2 3 4 5

9. Interacting with individuals who could have a significant impact on how the college is perceived (i.e. politicians, philanthropists, school guidance counselors). 1 2 3 4 5

10. Attending meetings with administrators from other colleges (i.e. educational conferences, regional or national associational meetings). 1 2 3 4 5

We are also interested in your personal satisfaction with the college. In particular, we are interested in how satisfied you are with the quality of the institution's planning efforts.

If satisfaction could be represented by a continuum from 0 to 100 with 0 representing complete dissatisfaction and 100 representing complete satisfaction with the institution's planning efforts, using a number from 0 to 100, indicate how satisfied you are with the institution's planning efforts.

RATING OF PERSONAL
SATISFACTION WITH INSTITUTIONAL PLANNING:_____
(fill in as specified above)

PERSONAL DATA

1. What is your present job title?_____.

2. How long have you held your current position? (in years)_____.

3. How long have you been employed by this college? (in years)_____.

4. If you have been employed in other positions at this college, what is the title of the job you held immediately prior to moving into your current position?
_____.

5. For how many years have you worked as an administrator in an institution of higher education, including ones other than the one for which you are currently working?_____.

6. Have you ever held an administrative position in a profit-making company?

   1) No_____
   2) Yes_____

7. Are you an alumnus of this college or university?

   1) No_____
   2) Yes_____

8. Age: (on last birthday)

   1) 20-29_____
   2) 30-39_____
   3) 40-49_____
   4) 50-59_____
   5) 60-69_____
   6) over 70____

8. Sex:

   1) Female_____
   2) Male_____

APPENDIX B

Intercorrelations Among The Study's Major Variables

	PCOD	PCOV	PCED	PCEV	RESPCER	SELECT	PROF. MAJ.	CULTURE	PARTIC	TENURE IN POSITION	TENURE IN COLLEGE
PCOD	---	.10	.28***	.17**	.00	-.05	-.04	.06	.18**	-.03	.06
PCOV	---	---	.10	.58***	.08	-.04	.02	-.07	.01	.04	-.03
PCED	---	---	---	.39***	-.18**	-.20**	-.02	-.14*	[illegible]	.01	.04
PCEV	---	---	---	---	-.17**	-.24***	.11*	-.10	-.02	-.05	-.04
RESPCER	---	---	---	---	---	.08	-.07	.23***	.13*	.00	-.03
SELECTIVITY	---	---	---	---	---	---	-.30***	.14*	-.00	-.03	.11
NUMBER OF PROF. MAJORS	---	---	---	---	---	---	---	-.07	-.12*	-.02	.04
CULTURE	---	---	---	---	---	---	---	---	.39***	.09	.04

*p < .05 **p < .01 ***p < .001

Intercorrelations Among the Study's Major Variables (Cont'd)

	PARTIC	POSITION TENURE	COLLEGE TENURE	TENURE IN ED. ADMIN.	BOUNDARY SPANNING	ROLE AMBIGUITY	SATISFACTION W/ PLANNING	ORG. COMMITMENT
PARTIC	---	.03	.07	.12*	.16**	-.36***	.45***	.51***
POSITION TENURE	---	---	.61***	.55***	.08	-.11*	.18**	.17**
COLLEGE TENURE	---	---	---	.37***	-.03	.02	.07	.12*
TENURE IN ED. ADMIN.	---	---	---	---	.29***	-.26***	.21**	.24***
BOUNDARY SPANNING	---	---	---	---	---	-.34***	.29***	.27***
ROLE AMBIGUITY	---	---	---	---	---	---	-.48***	-.45***
SATISFACTION W/ PLANNING	---	---	---	---	---	---	---	.55***

*p < .05 **p < .01 ***p < .001

Intercorrelations Among the Study's Major Variables
(Cont'd)

	PCOD	PCOV	PCED	PCEV	RESPCER	SELECT-IVITY	PROF. MAJ.	CULTURE
TENURE IN ED. ADMIN.	.05	.04	.12*	-.00	.15*	.00	.01	.03
BOUNDARY SPANNING	-.03	.01	-.04	-.08	.16*	.00	.07	.18**
ROLE AMBIGUITY	-.02	-.14*	.11	-.09	-.27***	-.01	.12*	-.39***
SATISFACTION W/ PLANNING	-.02	.11	-.18**	-.02	.17*	-.02	.02	.39***
ORGANIZAT. COMMITMENT	.05	-.01	-.14*	-.11	.12*	.15*	-.05	.53***

*p < .05 **p < .01 ***p < .001

REFERENCES

Aldag, R.J. and Storey, R.G. Environmental uncertainty: Comments on objective and perceptual indices. Proceedings of the 35th Annual Meeting of the Academy of Management, 1975, 203-205.

Aldag, R.J. and Storey, R.G. Perceived environmental uncertainty: Measurement and correlates. Paper presented at the Annual Meeting of the Academy of Management, August, 1979.

Aldrich, H. and Herker, D. Boundary spanning roles and organization structure. Academy of Management Review, 1977, 2, 217-230.

Aldrich, H. and Mindlin, S. Uncertainty and dependence: Two perspectives on environment. In L. Karpik (Ed.), Organization and Environment. Beverly Hills, Ca.: Sage Publications, 1978, pgs. 149-170.

American College Testing Service. Discover. (A Computer Database). American College Testing Service, 1984.

American Council on Education. Fact Book for Academic Administrators. Washington, D.C.: American Council on Education, 1981.

Blandin, J.S. and Brown, W.B. Uncertainty and management's search for information. IEEE Transactions on Engineering Management, Vol. EM-24, No. 4, November 1977, 114-119.

Bourgeois, L.J., McAllister, D.W. and Mitchell, T.R. The effects of different organizational environments upon decisions about organizational structure. Academy of Management Journal, 1978, 21, 508-514.

Breneman, D.W. The Coming Enrollment Crisis: What Every Trustee Must Know. Washington, D.C.: Association of Governing Boards of Universities and Colleges, 1982.

Burns, T. and Stalker, G.M. The Management of Innovation. London:Tavistock Institute, 1961.

Carnegie Council on Policy Studies in Higher Education. A Summary of Reports and Recommendations. San Francisco: Jossey-Bass, 1980.

Child, J. Organizational structure, environment and performance: The role of strategic choice. Sociology, 1972, 6, 1-22.

Clark, B.R. The organizational saga in higher education. Administrative Science Quarterly, 1972, 17,178-184.

Cohen, J. and Cohen, P. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. New York: John Wiley & Sons, 1975.

Cohen, M.D. and March, J.G. Leadership and Ambiguity: The American College President. New York: McGraw-Hill, 1974.

Cohen, M.D., March, J.G. and Olsen, J.P. A garbage can model of organizational choice. Administrative Science Quarterly, 1972.

College Board, The College Handbook, 1983-1984. New York: The College Entrance Examination Board, 1983.

Conrath, D.W. Organizational decision making behavior under varying conditions of uncertainty. Management Science, 1967, 13, 487-500.

Cook, J.D., Hepworth, S.J., Wall, T.D. and Warr, P.B. The Experience of Work: A Compendium and Review of 249 Measures and Their Uses. New York: Academic Press, 1981.

Cope, R.G. Strategic Policy Planning: A Guide for College and University Administrators. Littleton, Co.: The Ireland Educational Corporation, 1978.

Cox, J.A., Hitt, M.A. and Stanton, W.W. An examination of the relationship of boundary relevance to hierarchial level, perceived enironmental uncertainty and the role stress variables. Proceedings of the Annual Meeting of the Academy of Management, 1978, pgs. 175-179.

Crossland, F. Learning to cope with a downward slope. Change. July-August 1980, 12, 18 & 20-25.

Cyert, R.M. and March. J.G. A Behavioral Theory of the Firm. Englewood Cliffs, N.J.: Prentice-Hall, 1963.

Dewar, R.D. and Duncan, R.B. Implications for organizational design of structural alteration as a consequence of growth and innovation. In E.H. Burack and A.R. Negandhi (Eds.), Organization Design: Theoretical Perspectives and Empirical Findings. Kent, Ohio: Kent State University Press,

1977, pg. 203-223.

Dill, W. Environment as an influence on managerial autonomy. Administrative Science Quarterly, 1958, 2, 409-443.

Dillon, W. and Goldstein, M. Multivariate Analysis: Methods and Applications. New York: John Wiley & Sons, 1984.

Downey, H.K., Hellriegel, D. and Slocum, J.W. Environmental uncertainty: The construct and its applications. Administrative Science Quarterly, 1975, 20,613-629.

Downey, H.K., Hellriegel, D. and Slocum, J.W. Individual characteristics as sources of perceived uncertainty variation. Human Relations, 1977, 30, 161-174.

Downey H.K. and Slocum, J.W. Uncertainty: Measures, research and sources of variation. Administrative Science Quarterly, 1975, 18, 562-577.

Duncan, R.B. Characteristics of organizational environments and perceived environmental uncertainty. Administrative Science Quarterly, 1972, 17, 313-327.

Emery, F.E. and Trist, E.L. The causal texture of organizational environments. Human Relations. 1965, 18, 21-32.

Finney, J.W., Mitchell, R.E., Cronkite, R.C. and Moos, R.H. Methodological issues in estimating main and interactive effects: Examples from the coping/ social support and stress field. Journal of Health and Social Behavior, 1984, 25, 85-98.

Fiske, E.B. Unexpected increase in students puzzles colleges. New York Times, October 4, 1984, p. A19.

Frances, C. Apocalyptic vs. strategic planning. Change. July-August 1980, 12, 19 & 38-44.

Galbraith, J. Designing Complex Organizations. Reading, Ma: Addison-Wesley, Inc., 1977.

Garner, W. Uncertainty and Structure as Psychological Concepts. New York: John Wiley, 1962.

Gifford, W.E., Bobbitt, H.R. and Slocum, J.W. Message characteristics and perceptions of uncertainty by organizational decision makers. Academy of Management Journal, 1979, 22, 458-481.

Glenny, L. Demographic and related issues for higher education in the 1980s. Journal of Higher Education. July-August 1980, 31, 363-380.

Glick, W.H. and Roberts, K.H. Hypothesized interdependence, assumed independence. Academy of Management Review, 1984, 9, 722-735.

Hall, R.H. Effectiveness theory and organizational effectiveness. Journal of Applied Behavioral Science, 1980, 16, 536-545.

Hall, D.T. Schneider, B. and Nygren, M.T. Personal factors in organizational identification as a function of career pattern and organizational type. Administrative Science Quarterly, 1970, 15, 176-189.

Hickson, D.J., Hinings, C.R., Lee, C.A., Schneck, R.E. and Pennings, J.M. A strategic contingencies' theory of intraorganizational power. Administrative Science Quarterly, 1971, 16, 216-229.

Higher Education Publications. 1983 Higher Education Directory. Washington, D.C.: Higher Education Publications, 1983.

Hrebiniak, L.C. and Alutto, J.A. Personal and role-related factors in the development of organizational commitment. Administrative Science Quarterly, 1972, 17, 555-572.

Hrebiniak, L.G. and Snow, C.C. Industry differences in environmental uncertainty and organizational characteristics related to uncertainty. Academy of Management Journal, 1980, 23, 750-759.

Hrebiniak, L.G. and Snow, C.C. Top-management agreement and organizational performance. Human Relations, 1982, 35, 1139-1158.

Huber, G.P., O'Connell, M.J. and Cummings, L.L. Perceived environmental uncertainty: Effects of information and structure. Academy of Management Journal, 1975, 18, 725-739.

Huff, A.S. Consensual uncertainty. Academy of Management Review, 1978, 3, 651-655.

Janis, I.L. Victims of Groupthink. Boston: Houghton Mifflin, 1972

Kantor, R.M. Men and Women of the Corporation. New York: Basic Books, Inc., 1977.

Kefalas, A. and Schoderbek, P. Scanning the business environment - Some empirical results. Decision Sciences, 1973, 4, 63-74.

Keller, G. Academic Strategy: The Management Revolution in American Higher Education. Baltimore: The Johns Hopkins University Press, 1983.

Keller, R.J., Slocum, J. and Susman, G. Uncertainty and type of management system in continuous process organizations. Academy of Management Journal, 1974, 17, 56-68.

Khandwalla, P.N. The Design of Organizations. New York: Harcourt Brace, 1977.

Kopp, D.G. and Litschert, R.J. A buffering response in light of variation in core technology, perceived environmental uncertainty and size. Academy of Management Journal, 1980, 23, 252-266.

Kotler, P. and Murphy, P.E. Strategic planning for higher education. Journal of Higher Education, 1982, 32, 470-489.

Lawrence, P.R. and Lorsch, J.W. Organization and Environment. Boston: Harvard Graduate School of Business Administration, 1967.

Lawrence P.R. and Lorsch, J.W. A reply to Tosi, Aldag and Storey. Administrative Science Quarterly, 1973, 18, 397-398.

Leavitt, H.J., Dill, W.R. and Eyring, H.B. Strategies for survival: How organizations cope with their worlds. In H.J. Leavitt et. al. (Eds.), Readings in Managerial Psychology. 3rd Edition. Chicago: University of Chicago Press, 1980, pgs. 720-731.

Leblebici, H. and Salancik, G.R. Effects of environmental uncertainty of information and decision processes in banks. Administrative Science Quarterly, 1981, 26, 578-596.

Leifer, R. and Huber, G.P. Relations among perceived environmental uncertainty, organization structure and boundary-spanning behavior. Administrative Science Quarterly, 1977, 22, 235-247.

Liedtka, J. Linking strategic management processes to organizational environments: A theory. Proceedings of the 45th Annual Meeting of the Academy of Management, 1985, 21-24.

Luce, R.D. and Raiffa, H. Games and Decisions. New York: John Wiley, 1957.

March, J.G. and Simon, H.A. Organizations. New York: John Wiley, 1958.

Martin, J., Feldman, M.S., Hatch, M.J. and Sitkin, S.B. The uniqueness paradox in organizational stories. Administrative Science Quarterly, 1983, 28, 438-453.

McCaskey, M.B. Tolerance for ambiguity and the perception of environmental uncertainty in organizational design. In R. Kilmann, L. Pondy and D. Slevin (Eds.), The Management of Organizational Design, vol. II. New York: North-Holland, 1976.

Meyer, J.W. and Rowan, B. The structure of educational organizations. In M. W. Meyer and Associates (Eds.), Environments and Organizations. San Francisco: Jossey-Bass, 1978, pgs. 78-109.

Michael, D.N. On Learning to Plan and Planning to Learn, San Francisco: Jossey-Bass, 1973.

Miles, R.H. Role requirements as sources of organizational stress. Journal of Applied Psychology, 1976, 61, 172-179.

Miles, R.E. Coffin Nails and Corporate Strategies. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1982.

Miles, R.E. and Snow, C.C. Organizational Strategy, Structure and Process. New York: McGraw-Hill, 1978.

Miles, R.E., Snow, C.C. and Pfeffer, J. Organization and environment: Concepts and issues. Industrial Relations, 1974, 13, 244-264.

Miller, D., Kets de Vries, M.F. and Toulouse, J. Top executive locus of control and its relationship to strategy-making, structure and environment. Academy of Management Journal, 1982,25, 237-253.

Mintzberg, H. The Structuring of Organizations. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1979.

Mowday, R.T., Steers, R.M. and Porter, L.W. The measurement of organizational commitment. Journal of Vocational Behavior, 1979, 14,224-247.

National Center for Educational Statistics. Projections of Education Statistics to 1988-89. Washington, D.C.: U.S. Government Printing Office, 1980.

National Center for Educational Statistics. Projections of Education Statistics to 1990-91. Volume I. Washington, D.C.: U.S. Government Printing Office, 1982.

Nunnally, J.C. Psychometric Theory. New York: McGraw-Hill, 1967.

Pennings, J.M. The relevance of the structural-contingency model for organizational effectiveness. Administrative Science Quarterly, 1975, 20, 393-410.

Pennings, J.M. Strategically interdependent organizations. In P.C. Nystrom and W.H. Starbuck (Eds.), Handbook of Organizational Design, Volume One. New York: Oxford University Press, 1981, pgs. 433-455.

Pennings, J.M. and Tripathi, R.C. The organization-environment relationship: Dimensional versus typological viewpoints. In L. Karpik (Ed.), Organization and Environment. Beverly Hills, Ca.: Sage Publications, 1978, pgs. 171-195.

Peters, T.J. and Waterman, R.H. In Search of Excellence. New York: Harper & Row, 1982.

Pfeffer, J. Size and composition of corporate boards of directors: The organization and its environment. Administrative Science Quarterly, 1972, 17, 218-228. (a)

Pfeffer, J. Merger as a response to organizational interdependence. Administrative Science Quarterly, 1972, 17, 382-394. (b)

Pfeffer, J. Organizational Design. Arlington Heights, Ill.: AHM Publishing Company, 1978.

Pfeffer, J. Management as symbolic action: The creation and maintenance of organizational paradigms. In L. L. Cummings and B. M. Staw (Eds.), Research in Organizational Behavior, Volume 3. Greenwich, Ct.: JAI Press, 1981, 1-52.

Pfeffer, J. Organizational demography. In B.M. Staw (Ed.), Research in Organizational Behavior. Greenwich Ct.: JAI Press, Inc., 1983.

Pfeffer, J. and Salancik, G.R. The External Control of Organizations: A Resource Dependence Perspective. New York: Harper & Row, 1978.

Pondy, L.R. and Mitroff, I.I. Beyond open systems models of organization. In B. M. Staw (Ed.), Research in Organizational Behavior. Greenwich, Ct.: JAI Press, 1979, 3-39.

Porter, L.W., Steers, R.M., Mowday, R.T. and Boulian, P.V. Organizational commitment, job satisfaction, and turnover among psychiatric technicians. Journal of Applied Psychology, 1974, 59, 603-609.

Riesman, D. On Higher Education: The Academic Enterprise in an Era of Rising Student Consumerism. San Francisco: Jossey-Bass, 1980.

Rizzo, J., House, R.J. and Lirtzman, S.I. Role conflict and ambiguity in complex organizations. Administrative Science Quarterly, 1970, 15, 150-163.

Schmidt, S.M. and Cummings, L.L. Organizational environment, differentiation and perceived environmental uncertainty. Decision Sciences, 1976, 7, 447-467.

Schuler, R.S., Jackson,S.E. and Vredenburgh, D.J. A definition and model of uncertainty in the organizational sciences. Unpublished paper, 1985.

Sheldon, M.E. Investments and involvements as mechanisms producing commitment to the organization. Administrative Science Quarterly, 1971, 16, 142-150.

Starbuck, W.H. Organizations and their environments. In M. Dunnette (Ed.), Handbook of Industrial and Organizational Psychology. Chicago: Rand McNally, 1976, pgs. 1069-1124.

Staw, B.M. Rationality and justification in organizational life. In B. Staw and L.L. Cummings (Eds.), Research in Organizational Behavior, Volume 2. Greenwich, Ct.: JAI Press, 1980, pgs., 45-80.

Staw, B.M. Organizational behavior: A review and reformulation of the field's outcome variables. In M. Rosenzweig and L.W. Porter (Eds.), Annual Review of Psychology, Volume 35. Palo Alto: Annual Reviews, Inc., 1984, pgs. 627-666.

Storey, R.G. and Aldag, R.J. Perceived environmental uncertainty: A test of an integrated explanatory model. Paper presented at the Annual Meeting of the Academy of Management, Dallas, Tx, 1983.

Terreberry, S. The evolution of orgaanizational environments. Administrative Science Quarterly, 1968, 12, 590-613.

Thompson, J.D. Organizations in Action. New York: McGraw-Hill, 1967.

Thompson, J.D. and McEwen, W.J. Organizational goals and environment: Goal-setting as an interaction process. American Sociological Review, 1958, 23, 23-31.

Tinker, A.M. A note on "environmental uncertainty" and a suggestion for our editorial function. Administrative Science Quarterly, 1976, 21, 506-508.

Tosi, H., Aldag, R. and Storey, R.G. On the measurement of the environment: An assessment of the Lawrence and Lorsch environmental uncertainty scale. Administrative Science Quarterly, 1973, 18, 27-36.

Tosi, H. and Slocum, J.W. Contingency theory: Some suggested directions. Journal of Management, 1984, 10, 9-26.

Tung, R. Dimensions of organizational environments: An exploratory study of their impact on organizational structure. Academy of Management Journal, 1979, 22, 672-693.

Weick, K.E. The Social Psychology of Organizing. Reading, Ma.: Addison-Wesley, 1969.

Weick, K.E. Educational organizations as loosely coupled systems. Administrative Science Quarterly, 1976, 21, 1-19.

Weick, K.E. Enactment processes in organizations. In B. M. Staw and G. R. Salancik (Eds.), New Directions in Organizational Behavior. Chicago: St. Clair Press, 1977, pgs.

Zedeck, S. Problems with the use of "moderator variables." Psychological Bulletin, 1971, 76, 295-310.