This is to certify that the

thesis entitled

The Effects of Cognitive Complexity

and Task Complexity on Decision Making Behavior

presented by

Mary Lynne Doherty

has been accepted towards fulfillment
of the requirements for

M.A. degree in Psychology

Neal Schmitt
Major professor

Date 6/23/87

THE EFFECTS OF COGNITIVE COMPLEXITY AND TASK COMPLEXITY ON DECISION MAKING BEHAVIOR

By

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Psychology

1987

ABSTRACT

THE EFFECTS OF COGNITIVE COMPLEXITY
AND TASK COMPLEXITY ON DECISION-MAKING BEHAVIOR

By

Mary Lynne Doherty

The present study examined the effects of various levels of task complexity as well as individual difference variables (cognitive complexity and intelligence) on decision behavior. Students (n = 152) in an introductory psychology class completed several paper and pencil measures, and a computerized decision task which involved choosing a site in which to relocate a business. The dependent variables in this study were the proportion of information accessed in the decision problem, and the degree to which individuals used linear decision strategies to examine the decision problem. Regression analyses were used to discover if the independent variables accounted for a significant amount of variance in either of the dependent variables. The results indicated that task complexity was the major determinant of decision behavior, while the individual difference variables did not account for any significant variance in the dependent variables.

ACKNOWLEDGEMENTS

This thesis has been my greatest learning experience as well as my greatest source of frustration in my tenure as a graduate student. Without the help and support of many individuals, this project would not have been completed. I would like to take this opportunity to thank some of these individuals.

First and foremost, I am deeply grateful for the amount of advice, time and effort that Neal Schmitt gave me during this project. His door was always open and his comments most helpful. Neal - I learned so much from you - Thanks!

I would also like to thank my other committee members, Steve Kozlowski and Kevin Ford. I appreciate both the time that you spent with me as well as your insightful comments and suggestions. The help I received from my three committee members helped me to relearn how to think, organize, and write.

Many graduate students were extremely supportive and helpful during this process also. I would especially like to thank Sue Schechtman and Scott Cohen for answering a countless number of questions. Thanks to the other students, expecially Lisa Bordinat and Mike Kirsch, for being patient with me and listening when I needed to complain. I would also like to acknowledge two undergraduate students, Cheri and Doug, for the terrific amount of time and effort

they put into helping me run subjects. Finally, a special thanks to Marcy Schafer, for her support and typing assistance.

I also received assistance from E. F. Wonderlic and Associates, Inc. This company was kind enough to supply one of my measures, the Wonderlic Personnel Test. I appreciate their help in this endeavor.

The love and support that I received from my family and friends was the best motivator of all. I am very grateful to Joe Cranny for steering me in the direction of I/O Psychology. Joe - you have been a source of inspiration in my graduate career. I would also like to express my gratitude to Sharon Wachter, who in the past two years commiserated with me during slumps and rejoiced with me over passed hurdles. Sharon - thanks for your patience, encouragement, helpful comments, and typing assistance.

Finally, I would like to express my everlasting love and gratitude to my parents, and my brother and sister. Without everything you have given and taught me, I don't think I would have succeeded. Thanks to you, for all your love and support, you have made me the person I am today.

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INTRODUCTION

Decisions are an integral part of every individual's life. Students make decisions when choosing a class. Professors make decisions when assigning grades, and managers in the business world make decisions such as what to produce, who to employ, whether to relocate or expand, and so forth. Therefore, it is of interest to examine how an individual makes a decision, or the actual strategies used during the decision process.

Several variables have been shown to influence the types of decision strategies used. This study focused on two such variables; the amount of data available to an individual about a decision problem, and individual cognitive complexity. These variables were derived from an examination of the Beach and Mitchell model of decision making (which will be discussed in a later section of this paper). Previous research has shown that the amount of information available to an individual has an effect on strategies used during a decision problem (Billings & Marcus, 1983; Onken, Hastie, & Revelle, 1985; Payne, 1976; Staelin & Payne, 1978). It has an impact on the number of pieces of information examined, as well as on the order in which they are examined.

Research in the decision-making literature has not provided much information on how psychological differences between individuals affect the process used to make a decision. The few studies that have examined this construct in relation to decision making have shown that cognitively complex individuals examined more information in a decision problem (Sieber, 1964; Sieber & Lanzetta, 1964; Streufert, Suedfeld, & Driver, 1965; Streufert & Swezey, 1986) and would conceptualize such a problem from a wider variety of perspectives than would less cognitively complex people (Guilford & Merrifield, 1960). It was also of interest to discover whether individuals who were cognitively complex (or cognitively simple), performed in a similar fashion under differing amounts of information.

This paper first provides a description of one method of studying decision-making behavior (process tracing). Second, definitions of decision strategies utilized by individuals are discussed. Third, a decision-making model (Beach & Mitchell, 1978) used as a framework for this study is described. Next, the paper focuses on the effect that the amount of available information has on decision strategies and a review of relevant cognitive complexity literature is presented. Finally, a concept related to cognitive complexity, divergent thinking, is discussed.

Process Tracing

For many years, researchers studied decision making by looking at final decisions (Slovic & Lichtenstein, 1971). More recently, several authors (e.g., Payne, 1976; Svenson, 1979) have stated that the process that leads up to the final decision is important and must also be examined. To study this process, process tracing techniques were devised (Payne, 1976). These techniques examine the actual steps or strategies used by a person during the process of making a decision.

One objective of the present study was to examine the effects of different variables on decision strategies; hence a process tracing technique is appropriate for this research.

Verbal Protocols

There are several types of process tracing techniques. Verbal protocol analysis asks the subjects to "think aloud" during the decision process and the verbal statements are recorded. The subjects' statements are then broken into clusters and the content examined for evidence of different decision strategies (Payne, 1976; Herstein, 1981). According to Herstein (1981), verbal protocols provide information about ongoing processes that other methods, such as retrospective reports, do not.

Information Boards

A second type of process tracing technique is an information board. Typically, an information board is set up with alternatives listed at the top of a matrix and dimensions listed down the side. Pieces of information that belong to each alternative-dimension pair are placed in the proper cells of the matrix, and can be accessed by subjects. Researchers using an information board typically ask subjects to search and examine as much information as needed to make a decision.

There are two ways to present an information board. In the past, a mechanical information board was used. Cards with pieces of information are placed into the matrix, face down on a board or a table. Subjects are then asked to manually turn over the pieces of information that they want to examine. The order of the items and the subjects' search time is usually recorded by a researcher during these sessions. The second type of information board that is becoming more popular in process tracing research is a computerized version in which subjects interact with the computer by selecting an alternative and a dimension. The computer displays the information that is associated with that alternative and dimension pair. The subjects select information until they feel confident enough to make a decision. The computer records the subjects' search time and process. The experimenter need not be present when the computerized version of the information board is used, hence the computerized version is less time consuming for the experimenter, and less intrusive to the subject, as well as more accurate (Lantos, 1982).

A recent literature review on process tracing (Ford, Schmitt, Schechtman, Hults & Doherty, 1986) revealed that there are three types of data, or search variables, that are often recorded during process tracing research. The first type of data is depth of search, which is the proportion of information accessed by an individual. Latency of search, a second type of data, is the amount of time spent by a person examining each piece of information, as well as the total amount of time used to make a final choice. Finally, the sequence of search is the pattern (intradimensional or interdimensional) that is used by a subject when accessing information. This last search variable (sequence) has been used to decide what type of decision strategies are being utilized by subjects. In the next section, we review the definitions of several decision strategies and the results of various process tracing studies as they relate to information use in an information board or process-tracing task.

Decision Strategies

Process tracing techniques have been used to identify linear and nonlinear strategy users. According to Payne (1976), subjects that examine a constant amount of information across alternatives are using linear strategies. People who search a variable amount of information are using nonlinear strategies.

These classification rules are consistent with the definitions of the various strategies. A linear model assumes that an individual examines all of the possible information, or at least the same dimensions, across alternatives. In this type of decision strategy, a high value on one dimension compensates for a low value on another dimension. An individual mentally weights the more important dimensions, sums the positive and negative aspects of each alternative, and then chooses the alternative with the highest overall value. The possibility of a compensating dimension that would raise the value of an alternative should compel an individual who is using a linear strategy to search the majority of the information. A person who is comparing dimensions across alternatives also is more likely to examine the same dimensions for each alternative.

Research has demonstrated that people use various nonlinear strategies when making a decision. Svenson (1979) and Payne (1976) as well as other researchers have defined and labeled several of these strategies. A conjunctive strategy is found when a person sets certain criteria, all of which must be met on all important dimensions. If the value of any dimension does not meet the preset criterion, the alternative is eliminated (Payne, 1976; Svenson, 1979).

A disjunctive decision-making strategy is similar to the conjunctive one in that criterion values are again set by the individual. The value of at least one dimension must be greater than the decision maker's criterion, but a low score on one dimension is acceptable, if for the same alternative, there was a sufficiently high score on another dimension (Payne, 1976; Svenson, 1979).

A third strategy used by individuals to come to a decision is lexicographic. A person using a lexicographic decision rule selects an alternative on the basis of the dimension that is most important to him/her. The alternative that includes that important dimension with the highest, or most attractive value is chosen (Payne, 1976; Svenson, 1979).

A final strategy is the elimination by aspects rule. This strategy is a combination of the conjunctive and the lexicographic rules. In the first stage of the decision process, the most important dimension is examined. Those alternatives that do not meet the decision maker's criterion on this dimension are eliminated. This procedure is then used with the next most important dimension and continued until only one alternative is left to choose (Payne, 1976; Svenson, 1979).

By definition, an alternative can be eliminated after an examination of one dimension, two dimensions, or ten dimensions when using nonlinear strategies. The definitions of nonlinear strategies are consistent with Payne's (1976) statement that a variable amount of information is searched across alternatives by individuals using nonlinear strategies.

When the number of alternatives and/or dimensions is high in a decision task, nonlinear strategies can be utilized to simplify the decision process by reducing the amount of information an individual examines (Einhorn, 1971; Onken et al., 1985; Payne, 1976). According to Payne (1976), nonlinear strategies are often used by people to lower the amount of information processing involved in a complex decision task, thus they are considered to be simplifying strategies. A linear strategy, on the other hand, is more difficult or complex for an individual to use especially when the task is complex.

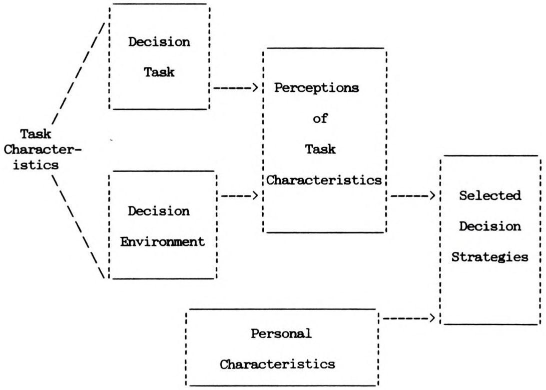
Much of the previous literature on decision making using process tracing models has been developed piecemeal, with researchers interested in the effects of only a few variables on the way people process information. Recently, Beach and Mitchell (1978) have tried to integrate this literature, and have proposed a comprehensive framework that they believe could serve as a guide for a systematic approach to examining factors which affect information processing. We now turn to a discussion of this framework being used as a model for the present study.

Model of Decision Making

Beach & Mitchell (1978) proposed a model of decision making which hypothesized that an individual's selection of a decision strategy is a function of three groups of variables: (1) characteristics of the decision environment; (2) characteristics of the decision task; and (3) characteristics of the decision maker (See Figure 1).

Figure 1

The Influence of Task Characteristics and Personal Characteristics on the Selection of Decision Strategies (Beach & Mitchell, 1978)



Beach and Mitchell (1978) state that individuals choose decision strategies that will require them to invest the least amount of time and effort, but will still allow them to benefit from the most satisfactory outcome from the decision problem. These authors discuss three types of strategies that could be selected by decision makers when working on a decision problem. The three strategies are nonanalytic, aided-analytic, and unaided-analytic.

A nonanalytic strategy is one in which little information about the decision problem is examined. Rules are applied to the situation that are routine and simple. An example of this type of decision strategy would be flipping a coin.

Aided-analytic strategies include those which require the use of tools that aid the decision process. Examples of tools that could be used are paper and pencil, a computer, or mathematics. These types of strategies require that the user be trained.

An unaided-analytic strategy is one in which the user tries to examine the dimensions of a decision problem without utilizing tools. Examples of these strategies are the ones mentioned earlier such as linear, conjunctive, and so forth. Only the unaided-analytic types of strategies will be considered in this study. Next the effect of the characteristics of the decision environment on strategy selection will be presented.

Characteristics of the Decision Environment

The model suggests that the first group of variables which affects strategy selection are characteristics of the decision environment. This category includes both the irreversibility and the importance of the decision. Time and/or money constraints are discussed in this group of variables as is the probability that the decision maker would be held accountable for the outcome of the decision.

Reversibility. The effects of the reversibility of a decision have been examined in three experiments conducted by MacAllister, Mitchell, and Beach (1979). This variable was operationalized by either allowing or not allowing the decision maker the option to change his/her mind. Subjects chose more analytical decision strategies, perceived more pressure, and rated the problem as more important when the decision was an irreversible one.

Significance. Several studies have examined the effects of the significance of a decision to the decision maker (MacAllister et al., 1979; Smith, Mitchell, & Beach, 1982; Stein, 1981; Waller & Mitchell, 1984). This variable was defined for the decision makers in two different ways in the literature. In the first group of studies, decision makers were either told that the decision was an important one to the company or were told that the decision would not affect the operation of the company (MacAllister et al., 1979; Stein, 1981; Waller & Mitchell, 1984). Another study operationalized this variable as a monetary payoff to the subject (Smith et al., 1982). Significance had an effect on several aspects of the decision process such as the selection of strategy, perceived pressure, and the rated importance of the problem (MacAllister et al., 1979; Waller & Mitchell, 1984).

Time/Money Constraints. The time constraints of a decision problem have also been found to affect the decision process. Subjects reported a decreased confidence in their ability to implement a specific strategy or in their solutions to a decision problem when they were under a higher level of time pressure (Christensen-Szalanski, 1980; Smith, et al., 1982).

Christensen-Szalanski (1980) asked subjects if they would have chosen a different decision strategy if they had not been under time constraints. All of the subjects in the high time pressure (5 minutes) group reported wanting to use a different, more complex strategy than they had used, whereas subjects in the low time pressure (45 minutes) group reported no preferences for a different strategy.

Finally, Stein (1981) conducted a correlational study which examined the effects of time pressure (along with many other variables) on the adoption of a strategic decision-making model by top managers in corporations. This study used a group of variables labeled crisis/opportunity as their time constraint measure. Time constraint was measured on a continuum which ranged from decisions made voluntarily (no time pressure) to decisions that demanded immediate actions (high time pressure). There was a significant negative correlation between the crisis/opportunity variable and the analysis stage of the decision process (included assessment of success probabilities, explicit ranking of decision strategies, and evaluation of possible consequences).

No studies were found that examined the effects of monetary constraints on the decision process.

Accountability. The accountability of the decision maker was investigated in one study (MacAllister et al., 1979). These researchers concluded that when a person perceives him/herself as more personally accountable for the results of a decision, that decision would be rated as more important. Additionally, as perceived accountability increases, so does perceived pressure and the selection of more analytic decision strategies (MacAllister et al., 1979). In the next section, the effects of task characteristics will be reviewed.

Characteristics of the Decision Task

A second group of variables that influences strategy selection are perceptions of the decision task. Included in this category are the individual's familiarity with the task (which is the degree to which the person has had past experience with the task) and the degree of ambiguity (which is the clarity of the task to the decision maker) present in the task. A third relevant task characteristic is task complexity, which Beach and Mitchell (1978) define as the number of alternatives and dimensions in a decision problem, and the degree to which the outcome of a decision task influences future decision problems. The final task characteristic is its instability, defined as the degree to which the task can change and whether the changes in the task can be predicted.

Familiarity. Several studies investigated the effect of the subject's familiarity with the decision task (Bettman & Park, 1980;

Jacoby, Chestnut & Fisher, 1978). Bettman and Park (1980) manipulated the prior knowledge and experience with a product by providing subjects with information about the product. The results showed that consumers with a moderate amount of knowledge and/or experience searched more information than did consumers with either high or low amounts of experience and/or knowledge. Similarly, Jacoby, Chestnut and Fisher (1978) found that past purchasing experience led to increased information acquisition.

Ambiguity. Stein (1981) examined the effects of the ambiguity of a task on several aspects of the decision process. He labeled this variable solvability, which included initial difficulty of the task, sufficient amount of information, and the collection of information. Unfortunately, Stein (1981) did not define these variables; he just presented the variable labels. This variable does appear to be similar to that of ambiguity. Stein (1981) found that the solvability (or ambiguousness) of a task was positively related to the search for possible solutions, but negatively correlated with the stability of problem definition.

Stability. The effect of stability on decision strategies has been examined by Waller and Mitchell (1984). Subjects were told that they would have to select a decision method that would provide them with information about their process of production. The information given to them was that their production process was either stable or unstable. These researchers found that when the process was stable, subjects tended to use unanalytic, easier strategies, but when the process was unstable, analytical and complex strategies were used more often.

Complexity. One factor that has been shown to have an effect on decision-making behavior is the amount of data available to an individual about the decision problem, or task complexity. According to Payne (1982), there are three methods of manipulating task complexity. Researchers can vary the number of alternatives in a decision task, the number of dimensions, or the amount of time available to a subject in making a decision. Payne's (1982) definition is similar to that of Beach and Mitchell (1978), except that the latter authors discuss time constraints separately from task complexity, and include in their definition any possible future outcomes of a decision task.

Payne (1982) discussed studies that varied the number of alternatives as compared to those that varied the number of dimensions. He noted that when the number of alternatives are increased, subjects tend to increase their use of nonlinear strategies. However, when the number of dimensions are increased in a study, subjects do not use different decision rules, but do make poorer choices, and examine a more variable amount of information.

According to Onken et al. (1985), when task complexity increases, the decision-making process is affected through an increase in the amount of strain brought on by the task. As the number of alternatives or attributes increase, subjects are more likely to use noncompensatory strategies (such as elimination by aspects or lexicographic) in order to simplify the task (Billings & Marcus, 1983; Onken, et al., 1985; Payne, 1976; Payne & Braunstein, 1978; Staelin & Payne, 1978). Often subjects use these simplifying strategies early in a task, and then when some of the alternatives have been eliminated, switch to using linear strategies (Onken, Hastie, & Revelle, 1985; Payne, 1976).

Research has shown that task complexity also affects two of the search variables, depth of search and response latency. As task complexity increases, depth of search, or the relative amount of information accessed by a subject, decreases (Johnson & Meyer, 1984; Payne, 1976; Payne & Braunstein, 1977, 1978; Sundstrom, 1984). The time spent by a subject looking at a piece of information (or response latency) also decreases as the complexity of the task increases (Olshavsky, 1979; Payne & Braunstein, 1977, 1978). The importance of task complexity as a determinant of decision behavior suggests that individuals who are better able to deal with large amounts of information simultaneously will exhibit different decision-making behavior. In the next section we will examine the characteristics of the decision maker.

Characteristics of the Decision Maker

The third group of variables included in the Beach and Mitchell (1978) model of decision making are the characteristics of the decision maker, or individual difference variables. The authors mention three specific individual difference variables, which are knowledge of the decision strategies that can be utilized, as well as the ability and the motivation to use them.

Only one study has been conducted that specifically explored this aspect of the Beach and Mitchell model. Christensen-Szalanski (1980) compared the decision processes of two groups of people, business students, and other students who reported not liking or not being skilled in mathematics. The mathematically unskilled group was significantly less confident in their decisions than were the business students, and tended to use more time to solve the decision problem. There were no differences in strategy selection between the two groups.

Studies using process tracing techniques have examined the effects of other individual difference variables, such as sex, education, and previous experience on the use of decision strategies. (Butcher & Schofield, 1984; Bettman & Park, 1980; Johnson, Hassebrock, Duran, & Moller, 1982). Most, if not all of these individual difference variables have been demographic in nature. Since task complexity has been found to be a determinant of strategy use, one psychological difference between people that should have an effect on the use of decision strategies is cognitive complexity. Persons who are cognitively complex should utilize more complex decision strategies (linear) during a decision problem and therefore should be better able to handle more complex tasks than could cognitively simple individuals. The relationship between cognitive complexity and task complexity has been ignored in the decision making literature.

There are two other sections of the Beach and Mitchell model that have not yet been discussed (see Figure 1). The first section involves the effect of an individual's perceptions of the decision task on the selection of a decision strategy. Beach and Mitchell (1978) stated that the effects of the characteristics of the task and of the environment are mediated by an individual's perceptions of those characteristics. This study did not examine the perceptions of the decision task, but focused on the objective differences between several tasks.

The final section of the model is the selection of the decision strategies. The type of decision strategies that are available to an individual has been sufficiently covered in an earlier section of the text. It was also mentioned earlier that individuals will choose a strategy so that the amount of time and effort necessary to successfully make a decision will be minimal. Now that the available research for each section of the Beach and Mitchell model has been presented, a discussion of what is missing in the literature will follow.

Critique of the Beach and Mitchell Model

Some of the parts of this model have been studied in great detail whereas other sections have been sorely neglected. In this critique, the major sections of the model (environment, task, personal characteristics, and perceptions) will be discussed in turn.

Decision Environment. The effects of the charateristics of the decision environment have been examined in several studies. The results of these studies have consistently shown that the characteristics of the decision environment do have an effect on strategy selection. The reversibility of a decision has only been examined by one group of researchers, and should be examined in greater detail.

Decision Task. The influence of some of the decision task characteristics on strategy selection has not been examined in much detail. Specifically, the effects of the stability, and the ambiguity of the task are lacking in research. Each of these task characteristics was only examined in one study and the operationalization of both manipulations of these variables was poor (Waller & Mitchell, 1984; Stein, 1981). Research on the other two task characteristics, task complexity and task familiarity have been examined in detail, and the studies have produced consistent results.

Decision Maker. The effects of the decision maker characteristics on strategy selection have been neglected in the literature. An individual's knowledge about the different strategies as well as the motivation to use them have not been examined in relation to strategy selection. Only one study examined the effects of ability (Christensen-Szalanski, 1980). There should be a greater focus on this section of the model in the literature.

Beach and Mitchell (1978) discuss the possibility of interactions between the three types of characteristics, but this aspect of the model has also been neglected. Several sections of the model should be examined together in one study to determine whether there is a multiplicative influence on strategy selection.

Perceptions of Environment and Task Characteristics. The perceptions of decision task and environmental characteristics have also not been examined in the literature. It would be interesting to discover if individuals perceive the characteristics differently, and whether these perceptions have an effect on decision behavior.

Sections of the Model included in this study

The present study measured and examined individual differences in cognitive complexity as a potential determinant of strategy use. Cognitive complexity was chosen because it made theoretical sense that an individual who has a high degree of cognitive complexity should be able to examine and use more information in a complex task than could a cognitively simple person. Task complexity has been shown to consistently influence the use of strategies; hence, this variable was manipulated to discover the manner in which individuals with similar degrees of cognitive complexity behave under differing levels of task complexity. Finally, in this study, the effect of the interaction of task complexity and individual cognitive complexity on decision making behavior was examined.

Because this study focused on the interaction between an individual difference variable and a task variable, other sections of the Beach and Mitchell (1978) model were held constant for the subjects. Hence, the decision task used was irreversible, of low to moderate importance, having low accountability, and without time or money constraints, across subjects. The task was also an unfamiliar, unambiguous, and stable one. Two of the decision-maker characteristics, knowledge of the strategies and motivation were not examined in this study. Many of the sections of the Beach and Mitchell (1978) model were held constant; hence any differences found could be more confidently attributed to the effect of differential cognitive complexity or the differences in task complexity. On the other hand, decisions made by individuals usually do include some of the aspects that were controlled in this study (e.g., importance, time pressure). This means that the results of this study will not be as generalizeable as one that included some of these other aspects of the model.

While task complexity has been operationalized in a relatively consistent fashion in information processing studies of decision making, there has not been much consensus regarding measures of individual cognitive complexity. In the next section, we define the concept of cognitive complexity, discuss attempts to measure this concept, and explain the choice of measures in this study.

Cognitive Complexity

The literature presents several definitions of cognitive complexity, all of which are fairly similar. According to Lundy and Berkowitz (1957), the concept of cognitive complexity stems from the work of Kelly (1955) who suggested that each individual has a construct system that is used to understand and predict his/her own world (Kelly, 1955; Bieri, Atkins, Briar, Leaman, Miller, & Tripoki, 1975; Bernardin, Cardy & Carlyle, 1982; Menasco, 1976). Additionally, this concept includes the capacity of individuals to examine behavior in a multidimensional fashion (Bieri et al.; Schneier, 1977). In other words it is the ability to use more alternative dimensions when judging or trying to understand the behavior of others (Bieri, 1968).

Cognitive complexity has been operationally defined in research as the methods used by individuals to discriminate between, or evaluate people or events (Bieri, 1955; Vannoy, 1965). Individuals who use only a few attributes when evaluating, or fail to make necessary distinctions among attributes, are said to be cognitively simple (Vannoy, 1965). Others who are more competent at making fine distinctions between attributes, or utilize many attributes during an evaluation of a person or an event can be said to be cognitively complex (Vannoy, 1965).

Dimensionality and Measurement of Cognitive Complexity

Cognitive complexity was thought by some researchers to be a single unidimensional factor. This hypothesis was tested by using several tests thought to be measures of cognitive complexity and then examining the relationships between the subjects' responses to the various measures. Allard and Carlson (1963) used three measures to test for cognitive complexity, which included the 1) Role Construct Repertory (REP) Test (Kelly, 1955), 2) a test that required differentiation between famous people, and 3) a test requiring distinguishing between complex geometric designs. These three measures were significantly intercorrelated (correlations ranged from .57 to .67, $p < .001$), and the researchers suggested that this was evidence for a common underlying cognitive complexity factor. Bieri and Blacker (1956) demonstrated a similar degree of unidimensionality by using two tasks; the first involving personal stimuli (the grid) and the second containing nonpersonal stimuli (inkblots). All of the correlations examined were significant ($p < .05$) in the predicted direction, but they were not very high (correlations ranged from .27 to .50).

Vannoy (1965) argued that a unitary trait of cognitive complexity did not exist. His study utilized fourteen tests thought to measure cognitive complexity, including a sentence completion test, a measure of authoritarianism (items taken from the MMPI F scale), and a social distance questionnaire, as well as the Bieri Dimensional Grid. A factor analysis failed to show a large general factor, which implied that cognitive complexity is not a unitary trait. Vannoy (1965) stated that his research demonstrated that this concept could consist of several relatively independent factors. Vannoy (1965) concluded that future researchers should use batteries of tests to examine the dimensionality question, but did not suggest any specific measures.

Research on cognitive complexity has involved many different measures, but most researchers have used the Bieri Dimensional Grid (Allard & Carlson, 1963; Bernardin, Cardy, & Carlyle, 1982; Bieri & Blacker, 1956; Leventhal, 1957; Lundy & Berkowitz, 1957; Mayo & Crockett, 1964; Menasco, 1976; Sauser & Pond, 1981; Stone & Gueutal, 1985; Vannoy, 1965). One study was conducted to examine the test-retest reliability and the convergent validity of the grid. Schneier (1979) investigated the convergence of three different measures: the Bieri Rep Grid (Bieri et al., 1966), and Fiedler's (1967) least preferred co-worker score were used as well as a test in which subjects had to think of nations that were important in world affairs, and then arrange them into groups of related nations (Scott, 1962). The results showed the grid to have statistically significant reliability ($r = .82$; $p < .001$) and significant, but low, correlations with Fiedler's (1967) measure and Scott's (1962) measure. ($r = -.19$, $-.23$, respectively; $p < .05$). Negative correlations were found because low scores on the REP test and high scores on both Fiedler's and Scott's measures indicated high levels of cognitive complexity (Schneier, 1979).

Bieri and Blacker (1956) used Rorschach inkblots to measure cognitive complexity, while tests that require judgments about famous people and complex geometric designs were employed by Allard and Carlson (1963). A sentence completion task has been used to examine cognitive complexity (Sieber, 1964; Sieber & Lanzetta, 1964), and Jones and Butler (1980) utilized a technique in which the variability in individual responses was scored. As indicated above, the Bieri and Blacker (1956) and Allard and Carlson (1963) studies also used the Bieri grid. These studies used several measures in order to examine the dimensionality of this concept, not to conclude that any one measure was preferred. Because of the relative confusion found in the literature on cognitive complexity, and the lack of clear consensus on the construct validity of the various measures of cognitive complexity, three measures of cognitive complexity (see discussion of Guilford's divergent thinking below) and a measure of general intelligence were used in this study.

Besides studies designed to assess the convergence of measures of cognitive complexity, researchers have concerned themselves with two other major issues: the effect of cognitive complexity on perceptions of individuals, and the relationship between cognitive complexity and intelligence. A third area of research of direct relevance to this paper has focused on the effect of cognitive complexity on decision making behavior.

Cognitive Complexity Related to Individual Perceptions

The concept of cognitive complexity was first discussed in 1955 by Bieri in relation to its effect on the perceptions of individuals. Using both the REP test (Kelly, 1955) and a modification of the REP measure, the Bieri Dimensional Grid, Bieri concluded that "cognitive complexity relates especially to the tendency to predict accurately the differences between oneself and others" (Bieri, 1955, p. 267). Later research supported this conclusion (Leventhal, 1957; Mayo & Crockett, 1964; Vannoy, 1965). Mayo and Crockett (1964) reported that the effect of a person's cognitive structure had an effect on the way that he/she used information about others to form impressions. Leventhal (1957) concluded that cognitively complex individuals were better able to differentiate between themselves and others.

Relationships with Intelligence

Researchers often define intelligence as the ability to adapt to new situations (Brown, 1976; Haber & Runyon, 1983; Mussen & Rosenzweig, 1973), and the ability to reason (Mussen & Rosenzweig, 1973). The concepts of adapting and reasoning are similar to aspects found in the definition of cognitive complexity. An examination of the items in some measures of cognitive complexity indicates that they are similar to those used in a typical intelligence test (i.e., problem solving, discrimination between symbols or objects). However, according to Streufert and Streufert (1978), who used a variety of different types of intelligent tests, there is no relationship between cognitive complexity and intelligence except for those individuals with a low IQ. These researchers also stated that cognitive complexity may be an aspect of "intelligence" not tapped by existing intelligence tests. The results cited by Streufert & Streufert (1978) were from research that they had completed, but had not written or published (Personal Communication, 9/15/86). No published studies have examined the relationship between cognitive complexity and intelligence.

Relationship to Decision-Making Behavior

Some research has been conducted that directly examines the importance of cognitive complexity in decision-making behavior. Streufert and Driver (1969) found that cognitive complexity had an effect on decision making behavior with the use of a sentence completion test and an impression formation test as measures of cognitive complexity. These studies found that complex subjects engaged in more information search when faced with a decision task than did cognitively simple subjects (Sieber, 1964; Sieber & Lanzetta, 1964; Streufert, Suedfeld, & Driver, 1965; Streufert & Swezey, 1986). Menasco (1977) demonstrated that persons with high cognitive complexity tended to engage in possible conflict-producing decisions more often than did individuals with low cognitive complexity.

Studies have been done that are related to decision making, in which the subjects believed that they would have some effect on a future outcome of a simulation. Research has also shown that cognitively complex executives performed better at tasks where planning and strategy were necessary than did less complex executives (Streufert, Clardy, Driver, Karlins, Schroder, and Suedfeld, 1965; Streufert, Kliger, Castore, & Driver, 1967). Streufert and Swezey

(1986) also stated that individuals with high cognitive complexity were better able to plan and perform more strategic actions than were individuals with low cognitive complexity.

Cognitive complexity has also been associated with other areas less relevant to the present study (Streufert and Swezey, 1986). Cognitive complexity has been shown to be related to communication skills (Hale, 1980), the development and personality of an individual (Beagles-Roos & Greenfield, 1979), and leadership skills (Vecchio, 1979).

Although some researchers have examined the effect of cognitive complexity on different aspects of a decision task, very few studies have examined the implications of cognitive complexity on the selection of strategies used in decision making. The concept of cognitive complexity is related to problem solving, or decision strategies used during problem solving. While various decision-making researchers (i.e., Beach & Mitchell, 1978) have noted the possible relevance of individual differences in cognitive complexity, no research has assessed the importance of individuals' cognitive complexity as a determinant of the way in which they use information to make a decision.

Divergent Thinking

The concept of cognitive complexity, for the most part, has been used to explain how individuals discriminate among other people. This concept can also be used to examine the process used during a problem-solving task. Guilford and Merrifield (1960) introduced an ability called divergent thinking which appears to be the problem-solving counterpart of cognitive complexity. Divergent thinking has been defined as the ability to use several alternative methods to solve problems; i.e., a person who is able to use divergent thinking strategies is expected to examine a situation from various angles.

The ability to think in divergent ways may be useful when employing the decision strategies that were discussed earlier. In agreement with Guilford's definition, a person who has the ability to use divergent thinking strategies would most likely examine more information about a problem than would a person who could not think in divergent ways, and would use various strategies to look at more dimensions and/or alternatives. This method of problem solving implies the use of linear decision strategies rather than nonlinear ones.

In a recent pilot study with 26 subjects, Schmitt, Ford, Schechtman, Hults, & Doherty (1986) examined the relationship between the standard cognitive complexity measure, the Bieri Dimensional Grid, and eight divergent thinking measures.[1] The eight measures were combined into two composite measures. The two composites were formed because of the high intercorrelations of the items within each composite, and the low correlations between the items in separate composites. The first included four measures which asked subjects to list words that began and/or ended with specified letters of the alphabet. The four tests in the second composite required subjects to list unusual uses for common objects (brick, shoe, umbrella, hairbrush). The reliabilities of the two complexity composites were

.69 and .92, respectively. The intercorrelation between composites was .22.

The correlation between the first composite and the dimensional grid (Bieri, 1955) was -.28 ($p < .10$). The second composite correlated -.51 ($p < .01$) with the grid. Negative correlations were found because low scores on the grid indicate high cognitive complexity whereas high scores on the divergent thinking measures indicate high cognitive complexity. Correlations of this magnitude suggest that although the two complexity indices are measuring some construct similar to that measured by the grid, each composite is relatively unique. The lack of higher convergence may be due to the fact that the grid requires discrimination between people, and the divergent thinking measures ask individuals to distinguish mentally between words and uses of objects during problem-solving tasks.

The pilot study also indicated that the divergent thinking measures were related to performance on the information board. The first composite was significantly correlated with the amount of information accessed ($r = -.34$, $p < .05$) and the pattern of information use (intradimensional or interdimensional) by subjects ($r = -.39$, $p < .05$). The correlation of the second composite with the pattern used by subjects approached significance ($r = -.26$, $p < .10$). Given that each composite accounted for unique variance, and the relative lack of research consensus regarding an appropriate measure of the cognitive complexity construct, multiple measures of cognitive complexity were used in the research proposed below.

The grid is the most popular measure of cognitive complexity, although there are still some questions being raised regarding its construct validity. The Guilford divergent thinking measures are also appropriate, because of the nature of the task being used, that is, a decision problem. The definition of divergent thinking (Guilford, 1960), the ability to examine a situation or problem from various angles, is clearly similar to that of cognitive complexity, and should affect the amount of information accessed by subjects and the way in which they search for information.

The present study examined the relative importance of cognitive complexity measures on the subjects' information use. Although the pilot study indicated that subjects who were not cognitively complex accessed more information than cognitively complex individuals, the literature has repeatedly demonstrated that people who are cognitively complex should examine more information (Sieber, 1964; Sieber & Lanzetta, 1964; Streufert, Suedfeld, & Driver, 1965; Streufert & Swezey, 1986). The discrepant results of the pilot study could be attributed to the small sample size (n = 26). Hence, it was hypothesized that cognitively complex subjects will examine more information and utilize linear strategies more often under all levels of task complexity.

H1: More information will be accessed by those subjects with a high degree of cognitive complexity.

H2: Cognitively complex subjects will use linear strategies more often than individuals who are less cognitively complex.

Consistent with past research, it was hypothesized that the level of task complexity will have an effect on the amount of information acquired and the type of strategy utilized by subjects.

H3: As the complexity of the task increases, the proportion of information that is examined will decrease.

H4: More complex tasks will be associated with the increased use of nonlinear strategies. Conversely, simple tasks will be associated with the use of linear strategies.

This study also examined the possibility that there would be an interaction between task complexity and cognitive complexity. The literature indicates that cognitively complex subjects will be able to utilize more information during a complex task than will cognitively simple subjects. Hence, although the amount of information accessed by all subjects was expected to decrease as task complexity increases, it was hypothesized that the decrease will be larger for the individuals that are cognitively simple than those who are cognitively complex.

H5: As the complexity of the task increases, the amount of information accessed by subjects will decrease. This decrease will be larger for cognitively simple subjects than for cognitively complex subjects.

H6: As the complexity of the task increases, the use of linear strategies will decrease. This decrease will be larger for cognitively simple individuals than for cognitively complex subjects.

Finally, the study assessed the relationship between cognitive complexity measures and intelligence, and their relationship to decision making behavior. Questions regarding this relationship relate to the construct validity of the cognitive complexity measures.

Given previous conflicting literature and lack of theory, no hypotheses were presented.

METHOD

Subjects

Subjects in the present study included 150 students, enrolled in an introductory psychology course. Thirty nine of these subjects were males (25.7 %) and one hundred and thirteen were females (74.3 %). The ages of these subjects ranged from 17 to 33 (mean = 19.16, standard deviation = 1.94). The subjects as classified by student status included 92 freshmen, 24 sophmores, 31 juniors, and 5 seniors. Subjects received course credit for their participation in this experiment.

Procedure

Subjects were asked to attend two sessions in order to complete this experiment.

Session 1.

For the first session, 30 to 50 of the subjects met at one time in a classroom for approximately one hour. A folder that included the measures to be used was placed on desks in the classroom. A four-digit code number was written on all of the measures and on the folder. This number served as an identification for the subject.

Description of Materials. During the first session, subjects were asked to read and sign a participation consent form. Subjects then completed the Wonderlic Personnel Test, Guilford's divergent thinking measures (Guilford & Merrifield, 1960), the demographics questionnaire, and finally, the Bieri Dimensional Grid. The tests were given in this order so that the timed tests could be administered first. Subjects could then take as much time as needed to complete the untimed tests. Copies of the measures are available in Appendices A through I. What follows is a description of each measure.

Informed Consent. Subjects read an informed consent statement before beginning the experiment. The statement informed the subjects that they would be asked to make business relocation/expansion decisions based on various information on possible sites, and complete some paper and pencil measures. The consent form further stated that they could refuse to participate at any time without penalty, and all responses would be kept anonymous. After the subjects had read this statement, understood and agreed with the statement, they signed it. No subject refused to sign the consent form. See Appendix E for a copy of this form.

Wonderlic Personnel Test. The Wonderlic Personnel Test was selected as the intelligence measure in this study. It was designed as a selection instrument in business and industrial settings. According to Wonderlic (1966), parallel form reliabilities ranged from .82 to .94. Dodrill (1983) also examined the test-retest reliability of this instrument, with a period of five years intervening between test administrations. He found the reliability to be uniformly high (.90 to .98) for all age groups. Split-half reliabilities (odd-even split) ranged from .88 to .94 (Wonderlic, 1966).

The validity of this measure has been demonstrated by distinguishing between good and poor performers as noted in work records over a period of five years. Although the Wonderlic Manual (1966) makes this claim, it does not present any statistical information or cite any references to substantiate the claim. Wonderlic (1966) also examined the validity of this test by reporting correlations between the Wonderlic and the Otis Self-Administering Test of Mental Ability, Higher Examination, Thirty Minutes. The resulting correlations ranged from .81 to .87. Finally, the Wonderlic has been shown to have a correlation of .93 with the Wechsler Adult Intelligence Scales (Dodrill, 1981), which is reported to be one of the most widely used measures of general intelligence (Brown, 1976).

Although this test takes only twelve minutes to complete, it covers a wide variety of abilities. According to Wonderlic (1966), the test examines the subjects' abilities to "1) understand and think in terms of words, 2) understand and think in terms of numbers, 3) think in terms of symbols, and 4) think in terms of ideas" (p. 4). This test has been given to diverse groups of employees ranging from statisticians and engineers to skilled mechanics and machine operators (Wonderlic, 1966).

Divergent Thinking Measures. Guilford's measures of divergent thinking were used. As indicated above, there were eight subscales. Each of the Guilford measures were timed. The content of the measures and time limits are presented below.

1. Guilford Task 1 - Write as many words as possible that begin with the letter D. This task had a 2 minute time limit.

2. Guilford Task 2 - Write as many words as possible that begin with the letter G. Subjects were given 2 minutes for this task.

3. Guilford Task 3 - Write as many words as possible that begin with the letter P and end with the letter N. The time limit for this task was 2.5 minutes.

4. Guilford Task 4 - Write as many words as possible that begin with the letter S and end with the letter L. The time limit was be 2.5 minutes.

5. Guilford Task 5 - List a variety of kinds of uses for a Brick. The time limit was 5 minutes.

6. Guilford Task 6 - List different peculiar uses for a Shoe. The time limit was 4 minutes.

7. Guilford Task 7 - List different peculiar uses for an Umbrella. The time limit, again was 4 minutes.

8. Guilford Task 8 - List different peculiar uses for a Hairbrush. The time limit was 4 minutes.

Demographics Questionaire. Subjects provided information on their age, sex, home state, education, major, current grade point average, and employment status. The questionnaire stated that they did not have to answer these questions.

Bieri Dimensional Grid. This questionaire lists ten people (e.g., yourself, mother, friend of same sex) as well as ten dimensions (e.g., outgoing - shy, calm - excitable). Subjects were asked to describe each of the specified individuals along each dimension. A scale from +3 to -3 was provided for the subjects. For example, a -3 rating on the outgoing - shy dimension would indicate a very shy person, whereas a +3 would represent a very outgoing person.

The Bieri grid was scored by examining the subjects' responses for each of the rated people. Scores were calculated for each rated person (ten in all) by counting the number of times each rating was used for a person. The use of the same rating for many of the dimensions of a person would result in a high score for that person. The scoring system was devised by Bieri et al. (1975). Scores are calculated as follows:

Number of times a rating was used	Score
10	45
9	36
8	28
7	21
6	15
5	10
4	6
3	3
2	1
1	0

After assigning scores for each rated person, the scores were summed, and finally totaled across the rated people. The total score can range from 40 to 450, where a low score is interpreted as being more cognitively complex.

Session 2

Subjects came back for a second one-hour session which was administered individually. Subjects that did not return for the second session were removed from the study. Nineteen subjects were removed from the study because they either did not return for a second session or were unwilling to complete the second session correctly. Each subject was randomly assigned to either a 5-dimension, 10-dimension, or a 15-dimension decision task in order to manipulate task complexity. During this session the subject completed the computerized simulation task.

Informed Consent. Subjects were asked to reread and sign the same consent form that had been read and signed in the first session. As in the first session, no subject refused to sign the form.

Computer Relocation Task. The computer simulation instructed the subjects to play the role of either a CEO or a manager who must decide on a relocation site. Instructions were presented on the computer on how to choose an alternative (state) and a dimension (information about that state) as well as how to indicate a final decision. The computer simulation included a practice relocation problem to familiarize the subjects with the task. Written definitions of the dimensions were given to the subjects so they could refer back to them if necessary. After making a relocation decision, the subjects were asked to fill out a rating of their perceptions of how difficult the task was. The task difficulty measure is described in full in the next section. The experimenter then debriefed the subject and terminated the experiment. A copy of the computer simulation and the dimension definitions can be found in Appendix A.

Task Difficulty. Because task complexity was being manipulated in this study, subjects were asked to give a rating of their perceptions of the difficulty of the task immediately after completing the relocation decision. This measure was used as a manipulation check. The subjects were asked "How difficult did you find it to collect information and come to a decision on this task?" A 5 - point scale that ranged from very easy to very difficult was provided.

There were three versions of the computer simulation; a 5-dimension, a 10-dimension, and a 15-dimension version. The dimensions chosen for each version in this study were determined by looking at the total number of times each dimension was accessed in the pilot study. The dimensions were selected so that the average usage across dimensions was approximately equal across each version of the simulation. In each set of dimensions, a mix of economic and quality of life dimensions was included. See Table 1 for a list of the alternatives and dimensions for each version. The alternatives used were the same in each version.

Summary

Independent Variables. The independent variables in this study then were the measures of cognitive complexity (the Bieri Dimensional Grid, and the Divergent thinking measures), the task complexity, and the interaction of cognitive and task complexity (represented by their product). General intelligence, as measured by the Wonderlic, was included to discover if IQ and cognitive complexity were measuring the same variables. Hence, IQ was used as a control variable in assessing the effects of cognitive and task complexity on the dependent variables.

Dependent Variables. The two dependent variables in this study were depth of search and the degree of linearity used in the decision process on the computer task. Each of the dependent variables will be discussed in turn.

Table 1

Alternatives and Dimensions used in each version

5 - Dimension Version

Alternatives	Dimensions
Georgia	Average Wage Rate
Indiana	Percent of Unionized Workers
Michigan	Construction Loan Board
North Carolina	Crime Rate
Ohio	Unemployment Insurance
South Carolina	
Texas	

10 - Dimension Version

Dimensions

Average Wage Rate
Cost of Electricity
Business Tax Rate
Climate
Individual Income Tax Rate
Worker Compensation Rate
Construction Loan Board
Tax Incentive Program
Crime Rate
Percent of Unionized Workers

15 - Dimension Version

Dimensions

Average Wage Rate
Percent of Unionized Workers
Crime Rate
Business Tax Rate
Public Education
Business Property Tax Rate
Worker Compensation Rate
Unemployment Insurance
Individual Income Tax Rate
Business Loan Board
Housing
Construction Loan Board
Tax Incentive Program
Cost of Electricity
Transportation System

Depth of Search. One measure examined in this study was the proportion of information accessed by each subject during the process tracing task. The computer recorded the number of pieces of information that were examined as each subject worked on the information board. Each computer raw score was then divided by the number of dimensions that were presented to the subject to get a proportion of information accessed.

Linearity. The second dependent variable in this experiment was the degree to which a subject used linear versus nonlinear strategies. This measure was somewhat more difficult to determine, because as of yet, process tracing researchers have not devised a continuous measure of linearity in information use. According to Payne (1976), a constant number of dimensions accessed across alternatives implies the use of linear strategies, whereas a variable number of dimensions searched meant that an individual was using nonlinear strategies. Using this criterion, the following linearity index was computed. First, the responses of each subject were charted. Next the alternative with the highest number of dimensions accessed was identified. The dimensions of this alternative then became the standard ones to which information search on other alternatives was compared. When comparing the standard dimensions to those of other "accessed" alternatives (an accessed alternative is one in which at least one dimension has been accessed), each time a standard dimension was not examined, a score of 1 was assigned to that alternative-dimension pair. In the same way, when a dimension was accessed that was not a standard dimension, a score of 1 was assigned. After all of the accessed alternatives had been examined in this fashion, the assigned scores were summed. To find the measure of linearity, the total number was then divided by the highest number of dimensions accessed (or the standard dimensions) because of the differing number of dimensions between versions. A high score on the linearity measure was indicative of nonlinear strategy use and conversely, a low score would be found when linear strategies were used. This measure was an exploratory one because a method such as this, placing individuals on a linear-nonlinear continuum, had not previously been attempted. This procedure did not discriminate between specific strategies, but did provide information on the use of linear strategies versus nonlinear strategies.

An example of this process is provided in Table 2. The reader will note that the 1's denote accessed information whereas the 0's stand for pieces of information that were not examined. In this case, South Carolina was the alternative with the highest number of dimensions accessed. With the exception of Ohio, which was not accessed at all, other alternatives were compared to South Carolina. Each time a dimension was accessed for South Carolina, but not for one of the other states, a zero was entered into the chart. After this process was completed, the zeros were summed and the total number of zeros was divided by the highest number of dimensions accessed for any alternative. In the example, the total number of zeros was 9 and the highest number of accessed dimensions was 4; hence the linearity score for this example was 9/4 = 2.25.

Table 2

Example of the Linearity Measure

	GA	IN	MI	NC	OH	SC	TX
Wage Rates	1	1	1	1	-	1	1
Unionized Workers	0	1	1	1	-	1	1
Construction Loan Board	-	-	-	-	-	-	-
Crime Rate	0	0	0	1	-	1	1
Unemployment Insurance	0	0	0	0	-	1	0
Totals	1	2	2	3	0	4	3

Linearity Score = 9/4 = 2.25

Analysis

The means, standard deviations, and intercorrelations among the variables were computed. The reliabilities of the Guilford composites were calculated to assess internal consistency. As a manipulation check, an analysis of variance was conducted to examine subjects' perceptions of task difficulty in each of the task conditions.

Regression analyses were used to examine the effects of intelligence, cognitive complexity, task complexity, and the interaction between these variables on each dependent variable. The regression equation used to test the hypotheses was the following:

Y = Intelligence (step 1)
+ Cognitive complexity measures (step 2)
+ Task complexity (step 3)
+ Interaction between task complexity and cognitive complexity (Step 4).

Intelligence was entered into the regression equation first in order to discover whether the cognitive complexity measures accounted for any additional variance after the variance was removed for intelligence. Then the cognitive complexity measures (the grid and the Guilford measures) were entered as a group. Task complexity was then entered into the equation to test for its effect on the amount of information accessed (or the degree of linearity). Finally, the interaction between cognitive complexity and task complexity was assessed.

The first four hypotheses will be tested by examining the tests of significance of the zero-order correlations between either task complexity or cognitive complexity and the dependent variables. Furthermore, these four hypotheses as well as the last two will be tested by examining the results of the regression analyses for both dependent variables.

RESULTS

Descriptive Statistics

The pilot study (Schmitt et al, 1986) suggested that the eight Guilford measures should be combined into two composite variables. The intercorrelations of the first four Guilford measures were examined as well as those for the last four Guilford measures (See Table 3 for means, standard deviations, and intercorrelations). The intercorrelations between the variables that belong in each composite were moderate to high (those in composite 1 ranged from .35 to .64, those in composite 2 ranged from .53 to .72). The intercorrelations between the Guilford measures in the first composite and those in the second composite were low. Hence, the two composites were formed; coefficient alpha for the first composite was .74; the second, .85.

Intercorrelations between the independent and dependent variables are presented in Table 4. The results indicate that the two dependent variables, the degree of linearity, and the proportion of information accessed were significantly correlated ($r = -.54$, $p < .001$). The correlation is negative because the linearity index is coded such that an individual using linear strategies would have a low score, close to zero. The proportion of information measure was constucted so that as more pieces of information are examined, the proportion of information variable increases.

Table 3

Means, Standard Deviations, and Intercorrelations

of the 8 Guilford Measures

	X	SD	1	2	3	4	5	6	7
1. Guilford 1	20.13	4.43							
2. Guilford 2	18.05	4.60	.64						
3. Guilford 3	6.24	2.35	.35	.43					
4. Guilford 4	7.59	3.45	.36	.45	.35				
5. Guilford 5	12.17	5.27	.03	.11	.10	-.01			
6. Guilford 6	10.07	3.95	.13	.17	.08	.11	.53		
7. Guilford 7	9.19	3.62	.13	.14	.09	.04	.53	.71	
8. Guilford 8	8.07	3.90	.02	.00	.01	.05	.54	.72	.67

$r = .14, p < .05$

$r = .35, p < .01$

Table 4

<u>Means, Standard Deviations, and Intercorrelations between</u>

<u>the Independent and Dependent Variables</u>

	X	SD	1	2	3	4	5	6	7	8	9
1. Linearity Index	2.10	1.56									
2. Prop. of Info	4.46	3.05	-.54								
3. Guil Comp 1 (GC1)	52.07	11.48	-.10	.08							
4. Guil Comp 2 (GC2)	39.36	13.98	-.10	.20	.12						
5. Bieri Grid (BG)	180.93	55.53	-.06	-.03	-.14	-.12					
6. IQ	23.11	4.73	-.14	.06	.28	.07	-.20				
7. Task Comp (TC)	2.01	0.82	.30	-.35	-.04	-.04	.09	.04			
8. GC1 X TC	104.11	47.83	.20	-.29	.42	.03	.01	.12	.87		
9. GC2 X TC	78.68	43.77	.15	-.13	.04	.63	.00	.07	.71	.65	
10. BG X TC	367.01	203.69	.16	-.25	-.10	-.07	.65	-.03	.78	.63	.52

$r = .12,\ p < .10$

$r = .14,\ p < .05$

$r = .20,\ p < .01$

Subjects were randomly assigned to task complexity conditions, hence task complexity and the individual variables should be uncorrelated. The results in Table 4 confirm this. The correlations between task complexity and the two Guilford composites, the Bieri Grid and IQ range from -.04 to .09.

Manipulation Check

A check on the manipulation of task difficulty involved subjects' reports of the difficulty of the task. An analysis of variance was conducted to examine the relationship between the reported task difficulty and the objective task difficulty for each of the task complexity conditions. The results indicate that the relationship was marginally significant ($F = 2.7$, $p < .10$) (see Table 5). This finding suggests that in the 15 dimension condition, many subjects did perceive the task as being more complex than did the subjects in the 10 or 5 dimension condition.

Tests of the Hypotheses

The first hypothesis predicted that more information would be accessed by subjects with a high degree of cognitive complexity. The zero order correlations in Table 4 indicate that the relationships between the proportion of information acquired and the three cognitive complexity measures are low (r's = .08, .20, and -.03). The cognitive complexity measure that had the highest correlation with this dependent variable was the second Guilford composite ($r = .20$, $p < .01$). The relationship between cognitive complexity and proportion of information searched can also be found in Table 6. When the cognitive complexity measures were entered into the regression

Table 5

Cell Means (M) and Standard Deviations (SD)

for Perceptions of Task Difficulty

for the three Task Complexity Conditions

Condition	Prop of Info Accessed	
5 Dimension	(M)	2.53
	(SD)	1.03
10 Dimension	(M)	2.64
	(SD)	1.18
15 Dimension	(M)	3.00
	(SD)	1.00

Table 6

Regression Analysis with Proportion of Information as the Dependent Variable

Variables entered in regression equation	Multiple R	Beta[1]	R^2 Change	F of Change
Step 1.				
Intelligence Quotient	.060	.029	.004	.55
Step 2.				
Cognitive Complexity				
Guil Comp 1 (GC1)		.128		
Guil Comp 2 (GC2)		.220		
Bieri Grid (BG)	.212	-.183	.042	2.11[2]
Step 3.				
Task Complexity (TC)	.407[3]	-.392	.121	20.95[3]
Step 4.				
Interaction Terms				
GC1 X TC		-.210		
GC2 X TC		-.054		
BG X TC	.419[3]	.367	.010	.57

[1] Betas are those reported after all variables have been entered into the equation.

[2] $p < .10$

[3] $p < .001$

analysis, they accounted for a small amount of variance (R^2 change = .042, F of R^2 change = 2.11, $p < .10$). In this analysis, the second Guilford composite also accounted for most of the variance. The results of these tests indicate that the first hypothesis received marginal support.

The second hypothesis predicted that the proportion of information accessed would decrease as the complexity of the task increased. The zero-order correlations in Table 4 indicate that the relationship between task complexity and proportion of information accessed was -.35 ($p < .001$). This correlation as well as the results in Table 6 support this hypothesis. When task complexity enters the regression equation, it accounts for a significant amount of variance (R^2 change = .121, F of R^2 change = 20.95, $p < .001$).

The results of a regression analysis provide information on whether a hypothesis was supported, but do not indicate support for the magnitude of the differences across levels of task complexity. To provide this information, the cell means and standard deviations for each task complexity condition were computed and are presented in Table 7. As the complexity of the task decreased, the proportion of information accessed increased and mean differences (relative to the standard deviations) were quite large.

The third hypothesis stated that the complexity of the task would have an effect on the use of linear/nonlinear strategies. Specifically, more complex tasks would be associated with the use of nonlinear strategies, whereas simple tasks would be associated with the use of linear strategies. In Table 4, the zero-order correlation

Table 7

Cell Means (M) and Standard Deviations (SD) of the Proportion of Information Accessed for the three Task Complexity Conditions

Condition	Prop of Info Accessed	
5 Dimension	(M)	5.93
	(SD)	4.04
10 Dimension	(M)	4.03
	(SD)	2.01
15 Dimension	(M)	3.39
	(SD)	2.01

between task complexity and the use of linear strategies is .30 ($p < .01$), which supports this hypothesis. Table 8 also indicates that this hypothesis is supported. Task complexity explains a significant amount of variance when entered into the regression analysis ($R^2 = .095$, F of R^2 change = 15.90, $p < .001$).

Again, cell means were examined to assess the practical importance of task complexity differences. Table 9 shows the cell means and standard deviations for each task complexity condition. As can be seen in Table 9, an increase in task complexity resulted in relatively substantial increases in the linearity score.

The complexity of an individual's cognitive structure was predicted to have an effect on the use of linear strategies in hypothesis 4. Cognitively complex subjects were hypothesized to utilize linear strategies more often, whereas individuals with a low degree of cognitive complexity would more often use nonlinear strategies. The zero-order correlation between the cognitive complexity measures and the use of linear strategies in Table 4 ranged from -.06 to -.10. The low correlations that were found as well as the results of the regression analysis (Table 8) indicate that this hypothesis was not supported. The cognitive complexity variables did not account for a significant proportion of variance (see Table 8).

The fifth hypothesis predicted an interaction between task condition and the cognitive complexity variables on the proportion of information accessed. More specifically, it was thought that although the proportion of information would decrease as task complexity increased, the decrease would be larger for individuals with a low

Table 8

Regression Analysis with Degree of Linearity as the Dependent Variable

Variables entered in regression equation	Multiple R	Beta[1]	R^2 Change	F of Change
Step 1. Intelligence Quotient	.139[2]	-.156	.019	2.94[2]
Step 2. Cognitive Complexity				
Guil Comp 1 (GC1)		.149		
Guil Comp 2 (GC2)		-.083		
Bieri Grid (BG)	.206[3]	.019	.023	1.17
Step 3. Task Complexity (TC)	.370[4]	.911	.095	15.90[4]
Step 4. Interaction Terms				
GC1 X TC		-.449		
GC2 X TC		-.012		
BG X TC	.384[3]	.269	.011	.63

[1] Betas are those reported after all variables have been entered into the equation.

[2] $p < .10$

[3] $p < .05$

[4] $p < .001$

Table 9

Cell Means (M) and Standard Deviations (SD)

of the Linearity Index for the three Task Complexity Conditions

Condition	Degree of Linearity	
5 Dimension	(M)	1.44
	(SD)	1.31
10 Dimension	(M)	2.30
	(SD)	1.55
15 Dimension	(M)	2.56
	(SD)	1.60

degree of cognitive complexity. This hypothesis was not supported. All three interaction terms in Table 6 were nonsignificant.

An interaction was again predicted in the last hypothesis between task condition and cognitive complexity on the use of linear strategies. It was thought that as task complexity increased, the use of linear strategies would decrease, but the decrease would be larger for cognitively simple individuals. The interactions did not account for any significant variance in Table 8; hence this hypothesis was not supported.

Summary

The results of this study indicate that task complexity did account for a major portion of the variance both dependent variables. (see Tables 6 and 8). Conversely, the cognitive complexity measures did not account for much unique variance (a nonsignificant portion) beyond that accounted for by task complexity when examining the use of linear strategies (see Table 8). The cognitive complexity variables did account for a marginal amount of variance beyond that accounted for by task complexity when the dependent variable was proportion of information accessed (see Table 6).

No specific hypotheses were presented for the relationship between IQ and other predictor variables, or for the effect of IQ on decision-making behavior. This variable was included as a control variable to discover if the cognitive complexity variables and IQ were measuring the same construct. The correlations presented in Table 4 suggest that the measures of IQ and cognitive complexity were not assessing the same construct. Table 4 shows the relationship between

IQ and the other independent and dependent variables. There is a low but significant correlation between IQ and the first Guilford composite ($r = .27$, $p < .01$) as well as with the Bieri Grid ($r = -.20$, $p < .01$). IQ was not correlated with the second Guilford composite.

IQ did not account for any significant variance in the analyses in which proportion of information accessed was the dependent variable (see Table 6). In the analyses that predicted the use of linear strategies (see Table 8), IQ did explain a marginal amount of variance ($R^2 = .019$, F of the R^2 change was 2.94 $p < .10$).

DISCUSSION

Summary of Results

The most striking finding in the results section was the effect of task complexity on decision-making behavior. In both regression analyses, task complexity explained the major portion of variance in decision behavior. This finding supports what past researchers have found; that task complexity is a major determinant of decision-making behavior. Specifically, complex tasks were associated with the increased use of nonlinear strategies, and a decrease in the proportion of information accessed by subjects. Conversely, individuals used more linear strategies and accessed more information when working with less complex tasks.

The individual difference variables were also hypothesized to have an effect on decision-making behavior. The cognitive complexity measures only accounted for a small (marginally significant) amount of variance in explaining how individuals used information. These measures did not explain any variance in the extent to which individuals used linear strategies.

IQ was the second individual difference variable that was examined in relation to decision-making behavior. IQ also did not account for any significant amount of variance in explaining the way in which information is acquired, but did account for a small (marginally significant) amount of variance in explaining how individuals used linear strategies.

It was thought that cognitive complexity and task complexity would interact to affect decision-making behavior. The interactions between task complexity and cognitive complexity did not have any measurable influence on decision behavior.

In summary, it appears that the difficulty of the task was the major determinant of decision-making behavior in this study. The individual difference variables did not play an important role in explaining decision behavior, nor did the interactions between task complexity and cognitive complexity.

Implications of the Present Study

The major implication of this study is that the complexity of a task is a major determinant of decision behavior. It was found that as the complexity of the task increased, the proportion of information examined decreased as well as the the use of linear strategies. This type of information could be useful to individuals who are making important decisions. If they realized that a complex decision task resulted in a decreased use of information and linear strategies, they might make a conscious effort to examine a greater proportion of information and/or use a decision strategy that is appropriate to each particular decision.

The present study did result in a finding discrepant from past research on task complexity. According to Payne (1982), studies that varied the number of dimensions did not find subjects using different decision rules, but did find subjects making poorer decisions, and

examining a more variable amount of information when faced with a complex task. The present study showed that an increase in the number of dimensions in a task did result in an increased use of nonlinear strategies. Hence, the present study does provide further information about the effect of task complexity on decision-making behavior.

A second implication is the support found for sections of the Beach and Mitchell model (1978). The finding that task complexity was the most important determinant of decision-making behavior is evidence that the task complexity variable in the Beach and Mitchell model is important and should be retained in the model. The relationship between cognitive complexity measures and decision behavior was marginally significant. The fact that cognitive complexity did not play a major role in decision-making behavior in this study does not mean that cognitive complexity is not an important variable. The individual difference variables might have played a more important role had the type of decision problem been different. This possibility will be discussed later in the text.

The interactions between task complexity and cognitive complexity were also examined in this study but did not play a role in explaining decision behavior. Further study is needed before deciding that interactions are not important. For example, other individual difference variables could be examined (e.g., motivation, compulsivity). The model should be examined for interactions between other individual difference variables as well as cognitive complexity and other sections of the model (e.g., familiarity). Finally, the manipulation check that examined the relationship between the objective difficulty of the task and the subjects' perceptions of task difficulty was also marginally significant. Although perceptions were not examined in relation to decision behavior, this finding suggests that perceptions of the task or environment may be important. A more direct investigation of this relationship should be conducted by using the subjects' perceptions of task complexity as predictors instead of the objective conditions.

Limitations of the Beach and Mitchell (1978) Model

Payne (1982) labels the Beach and Mitchell (1978) model a cost/benefit model in that individuals will choose decision strategies that will require them to invest the least amount of time and effort, but will still allow them to benefit from the most satisfactory outcomes from the decision problem. Payne (1982) discusses two unresolved issues in the Beach and Mitchell (1978) model. The first issue is a measurement one. As of yet, it has not been determined how the various costs and benefits weighed by the subjects when choosing a decision strategy could be measured. Perhaps verbal protocol analysis could be used to answer this question.

A second unresolved issue is more of a theoretical one. Payne (1982) notes that strategy selection could be a process which is conscious, unconscious, or somewhere in between the two extremes. This question again might be answered by using verbal protocols, or possibly with the use of a post-experimental questionnaire.

Payne (1982) also mentions two other theoretical frameworks that could be used to examine decision making processes. The first is a perceptual one of decision making in which the subject is basically unaware of a choice of strategies, but focuses on the attractiveness of the alternatives (Tversky & Kahneman, 1981). A second framework has been labeled production systems. In this framework, an individual uses "rule based theories" which are unconscious, to make a decision. These rule based theories, or sets of productions, are said to be stored in long term memory. When an individual is faced with values for two alternatives, the production system in memory directs him/her to compare the values for the two alternatives and note which value is the most attractive (Pitz, 1977).

Payne (1982) mentions one final unresolved issue, which is how these three frameworks could be integrated. It is possible though, that the frameworks should not be integrated. Instead, maybe each of the frameworks are appropriate for different types of problems. The Beach and Mitchell (1978) model was selected for the present study, however if one of the other frameworks had been chosen, the structure of the study would probably not have been much different because of the types of variables studied. The present study examined the effects of the complexity of the task and individual differences on several dependent measures. The other two frameworks appear to be appropriate for this study also. However, if using one of the other two frameworks (i.e., the perceptual one, or the production systems), an additional measure of the attractiveness of each alternative and possibly each dimension would be included, because these two frameworks do incorporate a component of attractiveness.

Other Implications of the Present Study

The results of this study also have implications for the theoretical study of decision making. One of the dependent variables, the degree of linearity was developed in this study. As mentioned earlier, no researcher had attempted to place individuals on a continuum of linearity ranging from linear at one end of the continuum to nonlinear at the other end. It has been repeatedly shown in the literature that as task complexity increases, the use of linear strategies decreases. A similar relationship was found between this degree of linearity measure and task complexity, which provides support for the construct validity for this new linearity measure.

One final outcome of this study was the low but significant correlations between IQ and two of the cognitive complexity measures (first Guilford composite and the Bieri Grid). It was discussed in the introduction that Streufert and his collegues found no correlation between IQ and cognitive complexity, with the exception of individuals with low IQs. The results of this study are in agreement with Streufert et al. The relationship between these two constructs was very low.

Limitations of the Present Study

One limitation of the current study was the result of the paper and pencil measures used. It took subjects approximately one hour to complete these measures, and working on the Guilford measures was very repetitive work. After completing the paper and pencil session, many subjects reported (unasked) that they had been bored with the process. The use of shorter measures might have alleviated this problem.

A second potential limitation in this study was the questionable nature of the cognitive complexity constructs. The pilot study discussed in the introduction (Schmitt et al., 1986) indicated marginal to moderate correlations between the Bieri grid and the first and second composite (r's = -.28, -.51), but the correlations found in this study were much lower (r's = -.14, -.12; see Table 4). There are several possible explanations for the discrepant results. The method used to obtain these measures were different in the pilot study. As mentioned, in this study, the measures were administered in a group session, whereas in the pilot, the measures were individually obtained. Measures of cognitive complexity seem to have a motivational aspect to them. Not only must subjects have the ability to do well on these tasks, but they also must want to do well; they have to be motivated to try. It might be that subjects react differently in a group session (be less motivated and put forth less effort) than they would in an individual session to paper and pencil measures. If motivation is part of the cognitive complexity measure, then individual differences on ability would most likely be minimized. If the subjects in the present study were not motivated to do well because of the method of measurement (i.e., group session), this problem might explain why no results were found for the cognitive complexity construct. It would be interesting and informative to conduct a study similar to this one, and include a measure of the subjects' motivation level during the completion of the cognitive complexity measures.

Another possible reason for the discrepancy in results between the two samples is that the results found in the pilot could have been unique to that sample. The Guilford measures of divergent thinking were thought to be similar to the cognitive complexity construct. It is possible that the divergent thinking composites and the Bieri grid are measuring different constructs, which would mean that there were four individual difference variables in this study (cognitive complexity, two measures of divergent thinking, and IQ).

A final explanation for the low correlations was mentioned by Vannoy (1965) who argued that a unitary trait of cognitive complexity did not exist. He stated that this concept could consist of several relatively independent factors. It is possible that the correlations were low because this study was attempting to measure different aspects of cognitive complexity.

A related limitation of the present study is the level of specificity of the cognitive complexity measures as compared to the level of specificity of task complexity measure. The complexity of the task was situation specific whereas the measures of cognitive complexity were general measures. The relationship between a general ability measure and the behavior on a specific task may account for the results found between cognitive complexity and the dependent measures. The relationship might have been stronger if a situation specific measure of cognitive complexity had been used. For example, subjects could have responded to a question such as "Think of as many factors that you feel would be important in a relocation decision".

Another problem in the present study was the subjects' perception of task complexity (i.e., the manipulation). The manipulation check was used to insure that individuals in the complex decision condition perceived the task as being complex, whereas those in the less difficult conditions would report the task as being less complex. The difference in responses across task conditions was only marginally significant, so the measure did not work fully as intended. One explanation for this failure could be that the measure of task complexity was a poor one. A more likely explanation though, is that the subjects had no standard of comparison. If the design used had been a within-subjects design, the results of the manipulation check probably would have been different. However, the results for task complexity did indicate that most individuals did perceive the complexity of the task correctly and behaved accordingly.

Another possible limitation of this study was that the sample used consisted totally of students. This could be problematic for several reasons. Using a student sample usually produces a restriction in age range. With two exceptions, all of the ages of the subjects in this sample ranged from 17 to 24. Although there is no empirical evidence that shows that one's age has an effect on decision behavior, there is evidence to support the premise that experience has an effect on decision making. It is a logical assumption that as most people age, they have a broader range of opportunities to gain experience. Further, students would not have had much experience on relocation tasks. Hence, if a sample that did not have a restriction in age range had been used, the results of this study might be different.

There was also a small range of IQ scores for a majority of the sample. A transformation developed by Dodrill (1981) was used to convert Wonderlic raw scores to IQ scores similar to those obtained by using the Wechsler Adult Intelligence Scales (Wechsler, 1981). Although the range of IQ scores was from 80 to 126, 75% of the sample had scores that ranged from 97 to 116. One selection criteria used by colleges is intelligence, so a restriction in IQ scores should be found in any college sample. Again, if the sample had been more representative of the general population, the study might have resulted in different outcomes.

A final potential limitation is the nature of the computer task. A relocation decision is probably not one that would be of much interest to many undergraduate students. Some students expressed interest in using the computer, but none reported either interest or disinterest in the task itself. Hence, if a different, more applicable, decision task had been used, it is possible that the subjects' decision behavior would have also been different.

Future Research Directions

The first area that needs further research is the Beach and Mitchell model itself. As mentioned in the introduction, several sections of the model have been neglected to date. Individuals who are interested in decision-making research should investigate the sections of the model that are lacking research at the present, as well as possible interactions between the different sections of the model.

The individual difference section of the model especially needs more examination. As mentioned earlier, cognitive complexity, as well as other individual difference variables should be examined, and in conjunction with other parts of the Beach and Mitchell model, to determine if individual difference variables do play a role in decision behavior when task complexity is not a factor.

Individual difference variables might have had more of an effect on decison behavior if the type of decision problem had been different. Abelson and Levi (1985) distinguished between two types of problems. The first, a well-defined decision problem, is one in which an individual must access and use information about fixed alternatives. There is very little uncertainty in a well-defined problem. The second type of problem is an ill-defined one in which the main feature is uncertainty. The definition of uncertainty used by Abelson and Levi (1985) is "the inability to assign specific probabilities to outcomes" (Luce & Raiffia, 1957). This definition is very similar to the definition of one of the task characteristics in the Beach and Mitchell (1978), instability. Instability is defined as the degree to which the task can change and whether the changes in the task can be predicted. When working on an ill-defined, or an unstable task, individuals have to impose a structure on the problem in order to handle the uncertainty (Abelson & Levi, 1985). Individual difference variables should have more of an effect on decision behavior when the problem is ill defined.

As mentioned above, other individual difference variables should be investigated. One such variable, mentioned in the Beach and Mitchell (1978) model, is motivation, which could be an important determinant of decision behavior. An individual who is motivated to make the best decision would probably use different methods than would an individual who did not care about the outcome of the decision.

Although this study did not show cognitive complexity as being a major determinant of decision making behavior, it is possible that individuals who are more cognitively complex would make better decisions. The quality of the decision choice, not examined in this study, might warrant further investigation in conjunction with individual difference variables such as cognitive complexity.

In conclusion, the results of the task complexity measure in this study were similar to past research findings, but there were only a few marginally significant results for the individual difference measures. This lack of conclusive results instead lead to more questions regarding individual difference variables. Researchers interested in the decision-making area should consider these questions, and address them in order to further develop the theoretical frameworks of decision making.

LIST OF REFERENCES

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Footnotes

[1] This pilot study was conducted by N. Schmitt, K. Ford, S. Schechtman, B. Hults, & M. L. Doherty at Michigan State University during Spring quarter of 1986.

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APPENDIX A

Business Relocation Computer Program

15 - Dimension Version

APPENDIX A

Business Relocation Computer Program

15 - Dimension Version

WELCOME

This exercise is a simulation of a particular type of decision faced by Chief Executive Officers (CEOs) in some organizations. Today, you will be taking the role of a CEO and will be required to make a series of decisions regarding the potential relocation or expansion of your organization to another location.

When an organization plans to change its site of location or expand its production facilities (e.g., Illinois to California; Detroit to Traverse City), several factors may be taken into account. For example, the decision to relocate may be influenced by energy costs, unemployment insurance, tax rates, or quality of life issues associated with the new location. As CEO, your task will involve researching a number of different locations on a number of different dimensions or factors and then choosing the location which would be best for your organization to relocate or expand.

If you have any questions, reread the previous page or ask the experimenter for help. If you do not have any questions, press the RETURN button and you will receive more specific instructions about your task.

To aid you in the search process, you will be presented two lists. One list contains a number of different locations in which you might want to relocate or expand your organization and is labeled ALTERNATIVES. The second list contains a number of different factors that you might want to consider in evaluating the different locations and is labeled DIMENSIONS. For example, you might encounter a screen of information such as:

ALTERNATIVES	DIMENSIONS
1=MICHIGAN	1=WAGE RATES
2=CALIFORNIA	2=UNEMPLOYMENT INSURANCE
3=ILLINOIS	3=ENERGY COST
4=TEXAS	4=TAX RATES

As you can see, each alternative and each dimension are identified by a number. To begin searching for information, you will be asked two questions: (1) the alternative number about which you would like information and (2) the dimension number about which you would like to receive information. Using the number keys on the row above the typewriter keypad, simply type the number corresponding to the alternative you would like and then type the number corresponding to the dimension you would like.

PRESS THE RETURN BUTTON TO CONTINUE

CONFUSED? Let's go through the site selection procedure in detail.

ALTERNATIVES	DIMENSIONS
1=DETROIT	1=UNIONIZATION
2=KALAMAZOO	2=WAGE RATES
3=ANN ARBOR	3=ENERGY COST
4=TRAVERSE CITY	4=QUALITY OF LIFE

To begin the search process, you will choose one alternative and one dimension of information describing that alternative. You will continue this procedure until you have enough information to choose the site for the relocation or expansion of your organization. At that time, you will type the number corresponding to the appropriate location.

PRESS THE RETURN BUTTON TO CONTINUE

To see how this procedure works, let's begin with the following lists:

ALTERNATIVES	DIMENSIONS
1=DETROIT	1=UNIONIZATION
2=KALAMAZOO	2=WAGE RATES
3=ANN ARBOR	3=UNEMPLOYMENT INSURANCE
4=TRAVERSE CITY	4=TAX RATES

The following message will appear below the alternatives and dimensions:

ENTER THE NO. OF THE ALTERNATIVE AND HIT RETURN ?

ENTER THE NO. OF THE DIMENSION AND HIT RETURN ?

Let's assume that you are interested in DETROIT'S TAX RATES. You would press -1- FOR DETROIT, the RETURN button, and then -4- for TAX RATES and the RETURN button. The present screen will disappear and the requested information will be shown on the next screen as follows:

PRESS THE RETURN BUTTON TO CONTINUE

THE OVERALL BUSINESS TAX RATE IN DETROIT IS RANKED 210TH OUT OF 379 MAJOR CITIES BY THE RAND-MCNALLY PLACES RATED ALMANAC.

PRESS THE RETURN BUTTON TO CONTINUE

At this point, the computer will print the following message:

ENTER 1: IF YOU WANT MORE INFORMATION

2: IF YOU WANT TO MAKE A FINAL DECISION

Let's assume that you are not ready to make a decision and would like more information. You would press -1- and the RETURN button. The computer will then reprint the original menu on the next screen.

PRESS THE RETURN BUTTON TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=DETROIT	1=UNIONIZATION
2=KALAMAZOO	2=WAGE RATES
3=ANN ARBOR	3=UNEMPLOYMENT INSURANCE
4=TRAVERSE CITY	4=TAX RATES

ENTER THE NO. OF THE ALTERNATIVE AND HIT RETURN ?

ENTER THE NO. OF THE DIMENSION AND HIT RETURN ?

Now let's suppose you want to know the TAX RATE in ANN ARBOR.

You would type in a 3 for ANN ARBOR and a 4 for TAX RATES.

PRESS THE RETURN BUTTON TO CONTINUE

Now the computer prints the following message:

THE OVERALL BUSINESS TAX RATE IN ANN ARBOR IS RANKED 250TH OUT OF 379 MAJOR CITIES BY THE RAND-MCNALLY PLACES RATED ALMANAC.

PRESS THE RETURN BUTTON TO CONTINUE

At this point, the computer will print the following message:

ENTER 1: IF YOU WANT MORE INFORMATION

2: IF YOU WANT TO MAKE A FINAL DECISION

Again, let's assume that you are not ready to make the final site selection. After pressing the -1- key for more information, the computer will reprint the original menu on the next screen.

PRESS THE RETURN BUTTON TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=DETROIT	1=UNIONIZATION
2=KALAMAZOO	2=WAGE RATES
3=ANN ARBOR	3=UNEMPLOYMENT INSURANCE
4=TRAVERSE CITY	4=TAX RATES

ENTER THE NO. OF THE ALTERNATIVE AND HIT RETURN ?

ENTER THE NO. OF THE DIMENSION AND HIT RETURN ?

Now let's assume you want to get the average WAGE RATES in KALAMAZOO.

You would type a 2 for KALAMAZOO and a 2 for WAGE RATES.

PRESS THE RETURN BUTTON TO CONTINUE

The information that you request will always be typed on the printer next to you as soon as you request it. You may refer back to this information at any point during this simulation.

Again, the computer will print the following message at this time:

ENTER   1: IF YOU WANT MORE INFORMATION

2: IF YOU WANT TO MAKE A FINAL DECISION

At this point, let's assume that you are ready to make a final decision. You would type a 2 and then hit the RETURN button.

PRESS THE RETURN BUTTON TO CONTINUE

The computer will now reprint the set of alternatives as follows:

ALTERNATIVES

1=DETROIT
2=KALAMAZOO
3=ANN ARBOR
4=TRAVERSE CITY

ENTER <N> IF YOU ARE NOT READY TO MAKE A DECISION
ENTER <Y> IF YOU ARE READY TO MAKE A DECISION

Since you are ready to make a decision, you would press the -Y- key. The computer will then ask you to enter your decision in the following manner:

ENTER THE NO. OF THE ALTERNATIVE YOU WISH TO CHOOSE AND HIT RETURN ?

Let's assume that you have decided to relocate/expand in KALAMAZOO. You would type in a 2 and hit the RETURN button.

PRESS THE RETURN BUTTON TO CONTINUE

The computer will now print the following message:

YOUR FINAL DECISION IS KALAMAZOO

Are you now ready to continue and make your own responses? If you are ready, press the RETURN button to continue. If you are not ready, ask the experimenter to clarify any questions you may have.

PRESS THE RETURN BUTTON TO CONTINUE

Now that you are familiar with the search procedure, you will be given an opportunity to practice your new skills prior to conducting the actual site selection. For this practice selection, you will be presented with a choice of four cities in which to relocate or expand your organization. These four cities will be described by four different dimensions. You can search for as little or as much information as necessary to make your selection. The alternatives and dimensions are as follows:

ALTERNATIVES	DIMENSIONS
1=PHILADELPHIA	1=HEALTH CARE
2=CHICAGO	2=CULTURAL EVENTS
3=NEW YORK	3=RECREATIONAL FACILITIES
4=LOS ANGELES	4=ECONOMIC OUTLOOK

Remember to choose one alternative and one dimension at a time. Type in the number corresponding the desired alternative, hit RETURN, and then type the number corresponding to the desired dimension and hit RETURN. Continue this procedure until you are ready to make a final site selection. GOOD LUCK!

PRESS THE RETURN BUTTON TO CONTINUE

Listed below are the definitions of the dimensions you will be using in the practice session. Please note that you have been given a paper copy of this information. The ratings were obtained from the 1985 Rand McNally Places Rated Almanac. You may refer to this copy at any time during the experiment.

1. Health Care. This is a rating of the health care facilities in a given city.

2. Cultural Events. This is a rating of the opportunities to attend artistic and cultural events in a given city.

3. Recreational Facilities. This is a rating of the restaurants, athletic facilities, and the number of collegiate and professional sports teams in a given city.

4. Economic Outlook. This is a rating of the cost of living, income growth, and job growth in a given city.

PRESS THE RETURN BUTTON TO BEGIN THE PRACTICE

ALTERNATIVE	DIMENSION
1: PHILADELPHIA	1: HEALTH CARE
2: CHICAGO	2: CULTURAL EVENTS
3: NEW YORK	3: RECREATIONAL FACILITIES
4: LOS ANGELES	4: ECONOMIC OUTLOOK

```
ENTER NO. OF ALTERNATIVE  FROM 1 TO  4  THEN RETURN   ?
ENTER NO. OF DIMENSION    FROM 1 TO  4  THEN RETURN
```

THE HEALTH CARE IN PHILADELPHIA IS POOR.

```
ENTER   1: IF YOU NEED MORE INFORMATION
        2: IF YOU WANT TO MAKE A FINAL DECISION
      ?
```

Now that you have done an example, you should be ready to begin the experiment. You will be presented with a choice of seven states (alternatives) described along seventeen dimensions (attributes). You may examine as much information as you like before making your decision. Listed below are the definitions of the objective and quality of life data you will be using in this task. Please note that you have been given a paper copy of this information. You may refer to this copy as often as you like during the course of the experiment.

1. Average Wage Rate. This is the average wage paid to employees in a given state, in dollars per hour.

2. Percent of Worker Unionization. This is the percent of the workforce that is unionized in a given state.

3. Cost of Electicity. This is the average amount paid for electricity by businesses in the given state, in dollars per kilowatt hour.

4. Business Tax Rate. This is the average state tax paid by businesses in a given state, as a percent of sales.

PRESS THE RETURN BUTTON TO CONTINUE

5. Business Property Tax Rate. This is the average property tax paid by businesses in a given state, as a percent of real assets.

6. Individual Income Tax Rate. This is the average income tax paid by individuals in a given state, as a percent of total income.

7. Worker Compensation Rate. This is the average amount paid by businesses for worker compensation in a given state, per $100 of wages.

8. Unemployment Insurance Rate. This is the average amount paid by businesses for unemployment insurance in a given state, per $100 of wages.

9. Business Loan Board. This item indicates whether a state has a board that provides loans to businesses.

10. Construction Loan Board. This item indicates whether a state has a board that provides loans to businesses for construction or for purchasing equipment and machinery.

11. Tax Incentive Program. This item indicates whether a state provides tax incentives to businesses.

PRESS THE RETURN BUTTON TO CONTINUE

12-15. Quality of Life Ratings. Metro cities were ranked on several categories (Places Rated Almanac, Rand McNally, 1985). 329 cities were ranked on 4 categories (housing, crime rate, public education, and their transportation systems). The ranks ranged from 1 to 329, with 1 being the best possible ranking on a category. In presenting the quality of life data, we have used the state capital as the representative city for each state.

IF YOU HAVE ANY QUESTIONS, PLEASE ASK THE EXPERIMENTER TO CLARIFY THEM.

IF YOU HAVE ANY QUESTIONS DURING THE EXPERIMENT, ASK THE EXPERIMENTER.

PRESS THE RETURN KEY TO BEGIN THE EXPERIMENT.

```
   ALTERNATIVE                     DIMENSION
1: TEXAS                       1: HOUSING
2: GEORGIA                     2: BUSINESS PROPERTY TAX RATE
3: INDIANA                     3: INDIVIDUAL INCOME TAX RATE
4: MICHIGAN                    4: WORKER COMPENSATION RATE
5: NORTH CAROLINA              5: UNEMPLOYMENT INSURANCE RATE
6: OHIO                        6: PUBLIC EDUCATION
7: SOUTH CAROLINA              7: CONSTRUCTION LOAN BOARD
                               8: TAX INCENTIVE PROGRAM
                               9: CRIME RATE
                              10: BUSINESS LOAN BOARD
                              11: TRANSPORTATION SYSTEM
                              12: BUSINESS TAX RATE
                              13: AVERAGE WAGE RATE
                              14: PERCENT OF UNIONIZED WORKERS
                              15: COST OF ELECTRICITY


ENTER NO. OF ALTERNATIVE  FROM 1 TO  7  THEN RETURN   ?
ENTER NO. OF DIMENSION    FROM 1 TO 15  THEN RETURN
```

APPENDIX B

Business Relocation Computer Program

Dimension Definitions

15 - Dimension Version

APPENDIX C

Business Relocation Computer Program

Dimension Definitions

10 - Dimension Version

This is your copy of the definitions of the data you will be using in this experiment. You may refer to this copy as often as you like during the experiment.

1. Average Wage Rate. This is the average wage paid to employees in a given state, in dollars per hour.
2. Cost of Electricity. This is the average amount paid for electricity by businesses in a given state, in dollars per kilowatt hour.
3. Business Tax Rate. This is the average state tax paid by businesses in a given state, as a percent of sales.
4. Percent of Unionized Workers. This is the percent of the workforce that is unionized in a given state.
5. Individual Income Tax Rate. This is the average income tax paid by individuals in a given state, as a percent of total income.

6. Individual Income Tax Rate. This is the average income tax paid by individuals in a given state, as a percent of total income.

7. Worker Compensation Rate. This is the average amount paid by businesses for worker compensation in a given state, per $100 of wages.

8. Unemployment Insurance Rate. This is the average amount paid by businesses for unemployment insurance in a given state, per $100 of wages.

9. Business Loan Board. This item indicates whether a state has a board that provides loans for businesses.

10. Construction Loan Board. This item indicates whether a state has a board that provides loans to businesses for construction or purchasing equipment and machinery.

11. Tax Incentive Program. This item indicates whether a state provides tax incentives to businesses.

12-15. Quality of Life Ratings. Metro cities were ranked on several categories (Places Rated Almanac, Rand McNally, 1985). 329 cities were ranked on 9 categories (climate and terrain, housing, health care and environment, crime, transportation, education, arts, recreation, economics, and an overall ranking). Some of these categories are present in this study. The ranks ranged from 1 to 329, with 1 being the best possible ranking on a category. In presenting the quality of life data for states, we have used the state capital as the representative city for each state.

APPENDIX D

Business Relocation Computer Program

Dimension Definitions

5 - Dimension Version

APPENDIX D

Business Relocation Computer Program

Dimension Definitions

5 - Dimension Version

This is your copy of the definitions of the data you will be using in this experiment. You may refer to this copy as often as you like during the experiment.

1. Average Wage Rate. This is the average wage paid to employees in a given state, in dollars per hour.
2. Percent of Unionized Workers. This is the percent of the workforce that is unionized in a given state.
3. Construction Loan Board. This item indicates whether a state has a board that provides loans to businesses for construction or purchasing equipment and machinery.
4. Unemployment Insurance. This is the average amount paid by businesses for unemployment insurance in a given state, per $100 of wages.
5. Quality of Life Ratings. Metro cities were ranked on several categories (Places Rated Almanac, Rand McNally, 1985).

329 cities were ranked on 9 categories (climate and terrain, housing, health care and environment, crime, transportation, education, arts, recreation, economics, and an overall ranking). Some of these categories are present in this study. The ranks ranged from 1 to 329, with 1 being the best possible ranking on a category. In presenting the quality of life data for states, we have used the state capital as the representative city for each state.

APPENDIX E

Consent Form

APPENDIX E

Consent Form

The purpose of this project is to discover if the complexity of a decision task affects the way people examine information about the decision problem. We will also look to see if there are any individual predictors of peoples' search processes during a decision problem. I understand that I will be participating in a project in which I will be asked to make business relocation/expansion decisions on a computer based on various pieces of information about possible sites. I also realize that I will be asked to answer some paper and pencil measures, and that the whole project will take no longer than two hours. I realize that I can refuse to participate now or at any point during the collection of data without penalty. All my responses will be available only through a coded identification number. These responses as well as my participation will remain strictly anonymous. Reports of the results of the study will not identify any participant.

1st Experimental Session: ______________________________
Signature

____
Date

2nd Experimental Session: ______________________________
Signature

____
Date

APPENDIX F

Demographics Questionnaire

APPENDIX F

Demographics Questionnaire

It would help us if we knew something about you. For each question below, please write in the appropriate information. Please check the accuracy of the information you have written in before moving to the next question. You do not have to answer these questions. If you would like to skip a question, just leave it blank.

1. Age:____________________________

2. Sex (M for males, F for females):________________

3. In what state have you spent the most time in the past five: years:________________________________

4. College Major:___________________________

5. Current grade point average:______________________

6. Circle the number that corresponds to the highest degree you have obtained:

1 = High School Diploma
2 = Associate of Arts
3 = BA or BS
4 = MBA, MS, or MA
5 = Ph.D

7. Circle the number that corresponds to your current student status:

1 = Freshman
2 = Sophmore
3 = Junior
4 = Senior
5 = Graduate Student

8. Are you currently employed:

1 = Yes
2 = No

9. If you answered yes to #9, what type of job do you have?:

APPENDIX G

Bieri Dimensional Grid

APPENDIX G

DIMENSIONAL GRID

At the bottom of this page is a grid that can be used in describing people. Along the top of the grid are ten individuals for you to describe (e.g., yourself, person you dislike, mother, etc.). Along the side of the grid are the ten dimensions that you will be using to describe these individuals. Each of these dimensions is arranged on a scale from +3 to -3. For example, the first dimension is measured from VERY OUTGOING (+3) to VERY SHY (-3). For each person listed along the top of the grid, please place a rating of +3, +2, +1, -1, -2, or -3 in the box corresponding to a particular dimension. Since there are 10 people for you to rate along all ten dimensions, when you have completed this task all the boxes of the grid should be filled in with a rating (100 ratings in all).

1. Yourself	2. Person you dislike	3. Mother	4. Person you'd like to help	5. Father	6. Friend of same sex	7. Friend of opposite sex (or spouse)	8. Person with whom you feel most uncomfortable	9. Boss	10. Person difficult to understand	+3 +2 +1	−1 −2 −3
										outgoing	shy
										adjusted	maladjusted
										decisive	indecisive
										calm	excitable
										interested in others	self absorbed
										cheerful	ill humored
										responsible	irresponsible
										considerate	inconsiderate
										independent	dependent
										interesting	dull
										+3 +2 +1	−1 −2 −3

APPENDIX H

Wonderlic Intelligence Test

APPENDIX H

WONDERLIC

PERSONNEL TEST

FORM I

NAME..Date...
(Please Print)

READ THIS PAGE CAREFULLY. DO EXACTLY AS YOU ARE TOLD. DO NOT TURN OVER THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.

PROBLEMS MUST BE WORKED WITHOUT THE AID OF A CALCULATOR OR OTHER PROBLEM-SOLVING DEVICE.

This is a test of problem solving ability. It contains various types of questions. Below is a sample question correctly filled in:

REAP is the opposite of

1 obtain, 2 cheer, 3 continue, 4 exist, 5 sow .... [5]

The correct answer is "sow." (It is helpful to underline the correct word.) The correct word is numbered 5. Then write the figure 5 in the brackets at the end of the line.

Answer the next sample question yourself.

Paper sells for 23 cents per pad. What will 4 pads cost? .... [___]

The correct answer is 92¢. There is nothing to underline so just place "92¢" in the brackets.

Here is another example:

MINER MINOR — Do these words have

1 similar meaning, 2 contradictory, 3 mean neither same nor opposite? .... [___]

The correct answer is "mean neither same nor opposite" which is number 3 so all you have to do is place a figure "3" in the brackets at the end of the line.

When the answer to a question is a letter or a number, put the letter or number in the brackets.
All letters should be printed.

This test contains 50 questions. It is unlikely that you will finish all of them, but do your best. After the examiner tells you to begin, you will be given exactly 12 minutes to work as many as you can. Do not go so fast that you make mistakes since you must try to get as many right as possible. The questions become increasingly difficult, so do not skip about. Do not spend too much time on any one problem. The examiner will not answer any questions after the test begins.

Now, lay down your pencil and wait for the examiner to tell you to begin!

Do not turn the page until you are told to do so.

CATALOG #P-3 (I)

Form 1

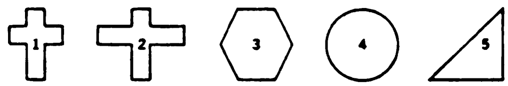
1. The Eleventh month of the year is
   1 October, 2 May, 3 November, 4 February .... [___]
2. SEVERE is the opposite of
   1 harsh, 2 stern, 3 tender, 4 rigid, 5 unyielding .... [___]
3. In the following set of words, which word is different from the others?
   1 certainty, 2 dubiousness, 3 assuredness, 4 confidence, 5 sureness .... [___]
4. Answer by printing YES or NO. Does B.C. mean "before Christ"? .... [___]
5. In the following set of words, which word is different from the others?
   1 sing, 2 call, 3 chatter, 4 hear, 5 speak .... [___]
6. PURE is the opposite of
   1 immaculate, 2 indecent, 3 incorrupt, 4 innocent, 5 classical .... [___]
7. Which word below is related to chew as smell is to nose?
   1 sweet, 2 stink, 3 odor, 4 teeth, 5 clean .... [___]
8. How many of the five pairs of items listed below are exact duplicates? .... [___]

Sharp, M. G.	Sharpe, M. G.
Fiedler, E. H.	Fiedler, E. H.
Connor, M. J.	Conner, M. J.
Woesner, O. W.	Woerner, O. W.
Soderquist, P. E.	Soderquist, B. E.

9. CLEAR is the opposite of
   1 plain, 2 obvious, 3 explicit, 4 distinct, 5 dim .... [___]
10. A dealer bought some T.V.'s for $3500. He sold them for $5500, making $50 on each T.V. How many T.V.'s were involved? .... [___]
11. ADOPT ADEPT — Do these words have
    1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]
12. Lemon candies sell at 3 for 15 cents. How much will 1½ dozens cost? .... [___]
13. How many of the six pairs of items listed below are exact duplicates? .... [___]

5296	5296
66986	69686
834426	834426
7354256	7354256
61197172	61197172
83238324	83238234

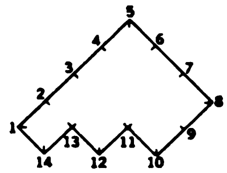
14. FAMILIAR is the opposite of
    1 friendly, 2 old, 3 strange, 4 aloof, 5 different .... [___]
15. Which number in the following group of numbers represents the smallest amount?
    6 .7 9 36 .31 5 .... [___]
16. Suppose you arranged the following words so that they made a true statement. Then print the last letter of the last word as the answer to this problem.
    of salt the life Love is .... [___]
17. One of the numbered figures in the following drawings is most different from the others. What is the number in that drawing? .... [___]



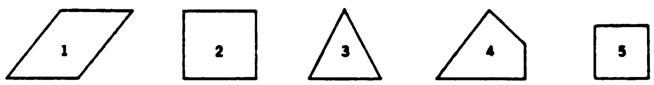
18. Two men caught 36 fish; X caught 8 times as many as Y. How many fish did Y catch? .... [___]
19. REFLECT REFLEX — Do these words have
    1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]
20. Suppose you arrange the following words so that they make a complete sentence. If it is a true statement, mark (T) in the brackets, if false, put an (F) in the brackets.
    moss A stone gathers rolling .... [___]
21. Assume the first 2 statements are true. Is the final one: (1)true, (2)false, (3)not certain?
    Most progressives are business men. Most progressives are Republicans. Some business men are Republicans. .... [___]
22. Two of the following proverbs have similar meanings. Which ones are they? .... [___]
    1. Straws show which way the wind blows.
    2. An empty sack can't stand straight.
    3. No doctor at all is better than three.
    4. All is not gold that glitters.
    5. Too many cooks spoil the broth.
23. Look at the row of numbers below. What number should come next?
    73 66 59 52 45 38 ? .... [___]
24. The hours of daylight in SEPTEMBER are nearest equal to the hours of daylight in
    1 June, 2 March, 3 May, 4 November .... [___]
25. Assume the first 2 statements are true. Is the final one: (1)true, (2)false, (3)not certain?
    Bill is the same age as Mary. Mary is younger than John. Bill is younger than John [___]
26. A train travels 75 feet in ¼ second. At this same speed, how many feet will it travel in 5 seconds? .... [___]
27. Five pounds of feed sells for $2.00; how many pounds can you buy for 80 cents? .... [___]
28. STRETCH SPREAD — Do these words have
    1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]

Form I

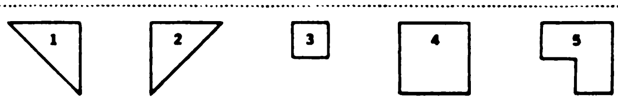
29. This geometric figure can be divided by a straight line into two parts which will fit together in a certain way to make a perfect square. Draw such a line by joining two of the numbers. Then write the numbers as the answer. .... [___]



30. Assume the first 2 statements are true. Is the final one: (1)true, (2)false, (3)not certain?
Fred greeted Mary. Mary greeted Ned. Fred did not greet Ned. .... [___]
31. An automobile that costs $2490 has decreased 33⅓% in value by the end of the year. What is its value at that time? .... [___]
32. One of the numbered figures in the following drawings is most different from the others. What is the number in that drawing? .... [___]



33. A skirt requires 2⅓ yards of material. How many can be cut from 42 yards? .... [___]
34. Are the meanings of the following sentences: 1 similar, 2 contradictory, 3 neither similar nor contradictory? No doctor at all is better than three. The more doctors, the more sickness. [___]
35. ENLARGE AGGRANDIZE — Do these words have
1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]
36. Are the meanings of the following sentences: 1 similar, 2 contradictory, 3 neither similar nor contradictory? It is always well to moor your ship with two anchors. Don't put all of your eggs in one basket. .... [___]
37. For $3.60 a grocer buys a case of fruit which contains 12 dozen pieces. He knows that two dozen pieces will spoil before he sells them. At what price per dozen must he sell the good ones to gain ⅓ of the whole cost? .... [___]
38. PRETENSIONS PRETENTIOUS — Do these words have
1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]
39. When wire is selling at $.0125 a foot, how many feet can you buy for fifty cents? .... [___]
40. One number in the following series does not fit in with the pattern set by the others. What should that number be? 1/4 1/8 1/8 1/4 1/8 1/8 1/4 1/8 1/6 .... [___]
41. IMAGE IMAGINARY — Do these words have
1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? .... [___]
42. How many square yards are there in a floor which is 6 feet long by 21 feet wide? .... [___]
43. Are the meanings of the following sentences: 1 similar, 2 contradictory, 3 neither similar nor contradictory? All good things are cheap, all bad things very dear. Goodness is simple; badness is manifold. .... [___]
44. A soldier shooting at a target hits it 12½% of the time. How many times must he shoot to be certain he will register 100 hits? .... [___]
45. One number in the following series does not fit in with the pattern set by the others. What should that number be? 1/4 1/6 1/8 1/9 1/12 1/14 .... [___]
46. Three men form a partnership and agree to divide the profits equally. X invests $4500, Y invests $3500, Z invests $2000. If the profits are $2400, how much less does X receive than if the profits were divided in proportion to the amount invested? .... [___]
47. Two of the following proverbs have similar meanings. Which ones are they? .... [___]
1. Perfect valor is to do without witnesses what one would do before all the world.
2. Valor and boastfulness never buckle on the same sword.
3. The better part of valor is discretion.
4. True valor lies in the middle between cowardice and rashness.
5. There is a time to wink as well as to see.
48. Are the meanings of the following sentences: 1 similar, 2 contradictory, 3 mean neither similar nor contradictory? After the event even a fool is wise. No man ever became wise by chance. .... [___]
49. Three of the following 5 parts can be fitted together in such a way to make a triangle. Which 3 are they? .... [___]



50. In printing an article of 24,000 words, a printer decides to use two sizes of type. Using the larger type, a printed page contains 900 words. Using the smaller type, a page contains 1200 words. The article is allotted 21 full pages in a magazine. How many pages must be in the smaller type? .... [___]

APPENDIX I

Guilford Divergent Thinking Measures

APPENDIX I

Guilford Measures

1. Write as many words as possible that begin with the letter D .

2. Write as many words as possible that begin with the letter G .

3. Write as many words as possible that begin with the letter P and end with the letter N .

4. Write as many words as possible that begin with the letter S and end with the letter L .

5. List a variety of kinds of uses for a Brick .

6. List different peculiar uses for a Shoe .

7. List different peculiar uses for an Umbrella .

8. List different peculiar uses for a Hairbrush .

APPENDIX J

Debriefing Form

APPENDIX J

Debriefing Form

In this study, we are been interested in decision making processes. We are examining different types of decision making strategies by having subjects make a decision regarding a business relocation. For example, under some conditions, people might look at all the possible dimensions for each alternative before making a decision. Other people might look at only a few dimensions for each alternative, and based on this information, eliminate some possible alternatives. A combination of these strategies could also be used to make a decision. We recorded your responses to see what types of strategies you use to make decisions.

The paper and pencil tasks that you completed measured what we believe are two different constructs, intelligence and cognitive complexity. Cognitive complexity is the ability to look at problems and people in different ways. A person with a high degree of cognitive complexity would probably use more complex search strategies. We are also interested in the relationship between cognitive complexity and intelligence.

Do you have any questions?

Thank you for participating in our experiment!

Mary L. Doherty Phone: 353-5324