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ACCOUNTABILITY OF THE DECISION MAKER: A CLOSER EXAMINATION OF ITS ROLE IN DECISION MAKING

By

Larry Dan Marcy

A THESIS

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

MASTER OF ARTS

Department of Psychology

1990

647-2059

ABSTRACT

ACCOUNTABILITY OF THE DECISION MAKER: A CLOSER EXAMINATION OF ITS ROLE IN DECISION MAKING

By

Larry Dan Marcy

Beach and Mitchell (1978) proposed a cost/benefit contingency model for the selection of decision strategies. Based on their framework, this study examined three characteristics of the decision context hypothesized to affect how individuals search for decision relevant information. Response mode (rating vs. choice), internal accountability (none vs. high), and external accountability (none vs. high) were manipulated. Task perception and information search measures were collected. Rating tasks promoted search behaviors that are commonly associated with compensatory decision strategies. No significant main effects were found for internal or external accountability. Response Mode X Accountability interactions yielded effects that suggest that the two types of accountability do not promote similar search behaviors. Additionally, it appears that response mode itself can engender a sense of internal accountability. Limitations of the current study and directions for future research are discussed.

ACKNOWLEDGEMENTS

The completion of this thesis has been a long time coming and at times the whole task seemed insurmountable. I am now fortunate enough to have the opportunity to formally acknowledge many of those people who have been instrumental to my learning, both as a student of book, and as a student of life. In my time here, I have found the two realms to be closely intertwined and equally deserving of reflection.

Undoubtedly, the most important lesson that I have learned during my tenure as a graduate student is that life is too short to be taken lightly. Actually, I may have that backwards. Perhaps life is too short to be taken seriously. It's hard to tell sometimes, but I'm pretty sure that a balance between the two is the key ingredient to most endeavors. Perspective accounts for a ton of variance.

When I first came to Michigan, I suffered severe headaches and nausea. How was I to know that it wasn't the water? I am not devoutly religious, but I have become more spiritual since I've been here. I have every reason to believe that if not for God's intervention in the forms of Dr. Kaufman and Dr. Jacubiak, I would have suffered irreparable drain bamage or worse. Thank you for keeping me on the close side of that fine line! I literally owe my life to you.

Before I get too caught up in philosophy, I want to express my gratitude to my committee members. To my committee chair, Mike Lindell, thanks so much for your expertise and enthusiasm. You were always available to answer my never ending questions and to help me clarify my thoughts. You also taught me that in

every disaster, no matter how large, there is always something positive to be found! The two other members of my committee, Neal Schmitt and Kevin Ford, also deserve applause and many thanks. Thank you Neal for gently teaching me how to think. I never felt silly asking you for help. I will also never forget digging worms with you down by the pond. I don't think many students have the chance to interact with their professors so informally! Kevin, you were the one who lit the fire underneath me that afternoon so long ago. I was getting bogged down and you gave me a clear path to follow. I hope you have since lost those diagrams of the 'obvious' effects that I thought I would find in this experiment! Thank you all very, very much.

I have had the good fortune to meet some of the nicest people I know while here at Michigan State University. I have already mentioned several. But the unsung heroes in my life have been my fellow graduate students. You gave me moral support and unconditional positive regard when I was down and struggling. I couldn't ask for anything more (except, maybe, for some of Mickey's salsa)! It has truly been a rewarding experience getting to know you. While I can't mention all of you by name, I'm sure you know who you are. I can't get my without mentioning several of you though. Mary Doherty, I dread thinking what I would have done if you hadn't been here to shares my joys and sorrows. You've got my vote for sweetest person. Rick Harnish, thanks for taking care of my Mom when I was sick and for watching after me while I was recovering. You have a good heart and a great sense of humor. Tim Speth - hey man, let's go to Kentucky to golf a round and chow at Leroy's! Thanks for helping me keep my sanity and introducing me to the fascinating world of floating jig heads. To my arts and crafts teacher, I can only say that the time together could not have been better

spent. I'll say it one more time, thank you everyone for making my tenure here rewarding and for teaching me to keep a positive outlook on life. I will miss you.

I do want to acknowledge two more graduate students for their assistance with the scholarly portion of this endeavor. Both of these individuals have been instrumental to the success of my research. They are Stephen Gilliland and Dave McKellin. Stephen went out of his way to help me modify the process tracing program that was so essential to my study. Dave was also very generous. Because of Dave, I had access to accurate job descriptions on which I could base my decision task. This realism was integral to my research.

Lastly, I want to thank my family for their unfailing love and support. You have always had faith in my ability not only to persevere, but to succeed. Mom, I have always been able to count on you for words of wisdom and encouragement. You have taught me to listen to my Self and to speak up for my convictions. It is something I need to practice everyday. Dad, you have taught me that strength and determination come from within; there is no way to be right with others if you are not right with yourself. Gary, you have given me peace of mind and shown me how to laugh. I mentioned it before, but perspective is crucial to everything. Thanks for helping me keep a balanced perspective. I owe my best accomplishments to the three of you.

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I. Introduction

Much of the research in staffing decisions has focused on issues concerning the current workforce, i.e., issues of 'adding to', and 'movement within' a particular workforce. While selection and promotion are both of great importance to management's efforts to create and maintain a competent workforce, realities of the environment often necessitate that an organization reduce its current workforce in order to remain competitive. The prevalence of corporate mergers and organizational downsizings are potent reminders of this rather unpleasant fact of existence in today's business community. However, in spite of these realities, the management of involuntary turnover and the staffing decisions it entails have largely been ignored in the research literature (Bluedorn, 1978; Leana & Ivancevich, 1987). Once an organization recognizes the need to reduce the level of its current workforce, it is imperative that its personnel department handle employee termination decisions in a systematic and efficient manner. The need to maintain a competent workforce is ever more pressing when staff is reduced, and the organization's legal responsibility in rendering personnel decisions is no less great. Given the lack of empirical study of dismissal decisions, the unstable nature of the current employment situation, and the critical need for the best possible decision in these conditions, research in this area is both relevant and timely.

The following study is aimed at answering questions relevant to decision making of the type just described, that is, decisions concerning employment termination of job incumbents. Specifically, this investigation will examine

factors related to how individuals access job incumbent information prior to rendering termination decisions. Based on a recent investigation by Billings and Scherer (1988), we know that characteristics of the decision context influence how people attempt to render decisions. The present experiment was an attempt to elaborate on that study and to delineate what may have been somewhat confounded results. Before we introduce the current investigation, we need to review the literature relevant to decision strategies, factors influencing the choice of strategies, characteristics of the environment that affect decision making behavior, and methods of studying decision making behavior. Based on this review, a set of research hypotheses will be put forth and the methodology of investigation will be specified. Results of data analyses will then be presented and a discussion of these results and their implications on the study of termination staffing decisions will follow.

II. Decision Making Heuristics

Early research on decision making focused on identifying the structural components of decisions, i.e., the relationship between inputs (cues) and outputs (decisions) (Abelson & Levi, 1985). More recently, researchers have become interested in understanding the underlying cognitive processes that affect how individuals acquire and utilize decision relevant information (e.g., Olshavsky, 1979; Payne, 1976; Slovic, 1969; Slovic, Fischhoff, & Lichtenstein, 1977; Svenson, 1979). These perspectives represent the structural (or policy-capturing), and process modeling orientations toward decision research, respectively (Abelson & Levi, 1985; Einhorn, Kleinmuntz, & Kleinmuntz, 1979). While distinct, some researchers suggest these approaches to decision making are actually complementary and represent different phases of the decision process (e.g., Billings & Marcus, 1983; Einhorn, Kleinmuntz, & Kleinmuntz, 1979; Ford, Schmitt, Schectman, Hults, & Doherty, 1989). Regardless of orientation, the purpose of investigation has been twofold. Foremost has been the desire to understand decision making in and of itself (Beach & Mitchell, 1978). The second purpose, given some success in the former aspect of the endeavor, is to suggest ways in which decision making performance can be enhanced either through the reduction of human error or through the use of prescriptive formulas (Nisbett & Ross, 1980; Pitz & Sachs, 1984). From this work, researchers have identified six specific models representative of the types of information utilization in the decision making process.

Decision process models are often classified according to whether they are compensatory (linear additive and additive difference) or noncompensatory (conjunctive, disjunctive, lexicographic, and elimination by aspects) (e.g., Einhorn & Hogarth, 1981; Ford et al., 1989; Payne, 1976). Of the two types, compensatory models have been considered to be the more cumbersome, cognitively demanding, and complex methods of information integration (e.g., Beach & Mitchell, 1978; Billings & Scherer, 1988; Einhorn & Hogarth, 1981). In a compensatory model, a high value on one dimension can compensate for a low value on another dimension if both dimensions are considered comparable or commensurate (Abelson & Levi, 1985; Svenson, 1979). In a noncompensatory model, the attractiveness of one dimension cannot be traded-off with that of another dimension, i.e., a low value on one dimension cannot be counterbalanced by a high value on another dimension (Abelson & Levi, 1985; Ford, et al., 1989; Payne, 1976). The dimensions under consideration are not considered comparable by the decision maker.

The two types of compensatory models differ from each other in the way that information is accessed. The linear additive model implies individuals will search a constant amount of information across each alternative in turn, and make interdimensional comparisons within alternatives (Payne, 1976). That is, each accessed dimension is given a weighted value and the values are summed across dimensions for each alternative. The alternatives are then compared and the alternative with the highest summed value is selected (Ford et al., 1989). Because the linear model is compensatory, a low value assigned to one dimension can be offset by a high value on another dimension. This should encourage decision makers to search most, if not all, of the information available for each alternative

(Doherty, 1987). The additive difference model is also based on the assumption that individuals are searching a constant amount of information for each alternative (Billings & Marcus, 1983; Payne, 1976; Tversky, 1969). However, unlike the linear model, the additive difference model is based on intradimensional processing (Tversky, 1969). Alternatives are compared on each dimension of interest and a difference score based on the weighted values is generated. These difference scores are then summed and the alternative with the highest value is selected (Tversky, 1969). This type of processing model becomes increasingly complicated when the number of alternatives exceeds two. In this case, Payne (1976) suggests that individuals might compare an alternative to only the best of the preceding alternatives. This standard can then be replaced when a better alternative is identified. Again, within alternatives, a high value on one dimension can counterbalance a low value on another.

The four types of noncompensatory models also differ from one another in the way that information is accessed, although all place a substantial emphasis on intradimensional comparisons. Noncompensatory models are based on the assumption that individuals set criterion levels for each of the attributes under consideration. However, the attributes under consideration may not encompass all the attributes available to describe alternatives. The conjunctive model of noncompensatory decision making is indicated when individuals eliminate any alternatives which do not meet the criterion levels on all of the attributes under consideration (Ford et al., 1989; Payne, 1976; Svenson, 1979). The disjunctive rule is indicated when alternatives are removed from consideration as a result of a failure to exceed the criterion level on at least one attribute; any of the other dimension values may fall below the set criterion values (Svenson, 1979). In

addition to set criterion levels, the final two noncompensatory models assume decision makers have rank ordered the attributes under consideration on the basis of importance (Svenson, 1979; Tversky, 1972). The lexicographic decision rule is indicated when the alternative with the highest value on the most important dimension is selected. If two alternatives tie on this dimension, the decision will be based on the higher score of the alternatives on the second most important dimension (Svenson, 1979). In elimination by aspects, alternatives are compared to the criterion value for the most important attribute. Alternatives which surpass this criterion level are then compared to the criterion level on the second most important attribute. This process is repeated until all but one alternative has been eliminated (Tversky, 1972).

Each of the noncompensatory (nonlinear) models is characterized by the interactive use of cues and a variable pattern of search across alternatives (Payne, 1976). Nisbett and Ross (1980) have defined noncompensatory decision rules as judgmental heuristics since they reduce complex inferential tasks to more manageable cognitive operations by reducing the amount of information individuals must process when making a decision (Abelson & Levi, 1985; Einhorn, 1971; Ford et al., 1989; Payne, 1976). Studies have shown that individuals use compensatory rules when the decision task is simple and use noncompensatory rules when the task is complex (e.g., Billings & Marcus, 1983; Einhorn, 1971; Olshavsky, 1979; Payne, 1976; Payne & Braunstein, 1978; Wright, 1974). Payne (1976), Bettman and Park (1980), and Olshavsky (1979) have found that some individuals actually switched from noncompensatory rules to compensatory rules after reducing the number of alternatives in the decision task. Other researchers have also noted that individuals fail to use a single type of decision rule through

the entirety of a complex task (e.g., Bettman & Jacoby, 1976; Billings & Marcus, 1983; Ford et al., 1989; Svenson, 1979; Wright, 1974). Instead, these individuals display what might be called a simplifying "strategy" involving the use of several decision rules, any of which can be activated at any stage of the decision process depending upon individuals' perceptions of cognitive load and their attempts to manage the load (Onken, Hastie, & Revelle, 1985). In light of these findings, it should be stated that, theoretically, the six decision models are clear-cut and distinct. However, it is generally not possible to uniquely identify the use of any of these strategies. This can happen because one strategy was intended, but was applied imperfectly; because a strategy was applied that has not been identified theoretically; or because a mixture of strategies was applied. Therefore, it is probably more appropriate to consider these models as "ideal types" that can be used to guide the study of decision making rather than as well-defined and precisely measured models that can be used to assess and correct decision makers' behavior.

Even though decision models have been proposed as very general guides to understanding, (rather than specific normative models), it is informative to understand when individuals may attempt to use one set of decision rules rather than another. Lack of knowledge about the contingent nature of decision processes appears to arise, in part, from incomplete examination of decision contexts. Distinguishing among decision contexts in terms more insightful than "task complexity" might shed additional light on the issue. Knowing that individuals rely on a particular set of decision rules is useful to enhancing the decision making process only if we can specify the conditions under which they are employed. This necessitates an assessment of the contexts in which decisions are

made. Only when such an assessment has been conducted can we appreciate the complexities of the decision process and move toward the development of specific recommendations for increasing the efficiency and utility of decisions rendered. The next section of this review describes a theoretical approach to the selection of decision strategies and a framework in which to evaluate decision contexts.

III. A Framework For The Study Of Decision Making

Information processing in decision making is highly contingent upon the demands of the task and the individuals' response to these demands (Payne, 1976, 1982; Stein, 1981). This basic proposition has been demonstrated in the research cited above and will be even more apparent as this discussion proceeds. Einhorn and Hogarth (1981) note that above all, empirical results stress the fact that judgment and choice are highly sensitive to seemingly minor changes in the task and environment. Although conceptual frameworks vary in their treatment of individuals and the decision task (e.g., perceptual orientation (Tversky and Kahneman, 1981); production systems orientation (Pitz, 1977; c.f. Payne, 1982); and cost/benefit orientation (e.g., Beach & Mitchell, 1978; Russo & Dosher, 1983; O'Reilly, 1983)), most researchers agree that to account for decision making behavior, one must understand characteristics of the decision maker, the environment, and how the two interact. Of the three general orientations, perhaps the most broadly applicable is that of the cost/benefit approach. Of the cost/benefit models, the Beach and Mitchell (1978) framework has received the greatest attention and is the basis for this study.

The Beach and Mitchell Model for Strategy Selection

Beach and Mitchell (1978) propose a cost/benefit contingency model for the selection of decision strategies. The model views individuals as rational decision makers who base their selection of strategy on a utility analysis that weights decision task requirements and relevant personal characteristics against the

probability of successful strategy implementation. For any particular task, there are resource costs involved in reaching a decision, benefits associated with reaching a correct decision, and consequences (in addition to wasted resources) for submitting an incorrect decision. The basic premise of the cost/benefit approach is that decision makers wish to minimize resource expenditures and maximize the probability of rendering a satisfactory decision. The most satisfactory decision is one which offers the largest net gain.

Three groups of strategies have been identified by Beach and Mitchell (1978). They vary according to their analytic level. The decision strategies range from the aided-analytic strategies (highly complex processing requiring training and/or equipment), to the unaided-analytic (processing restricted to what individuals are able to calculate in their heads and dictated by decision makers' abilities and motivation), to the nonanalytic strategies (simple, preformulated rules or habit). Beach and Mitchell (1978) further distinguish strategies within categories as ranging from formal to informal. Formal strategies are more structured and require greater inputs on the part of the decision maker in comparison to simpler, more informal strategies. The inclination to select a simple strategy is tempered by what Beach and Mitchell (1978) claim is a cultural tendency to view formal strategies as more likely than informal strategies to yield a correct decision in a given situation. At this point, all decision characteristics being equal, decision makers face a compromise between minimizing costs and selecting the most efficacious strategy. The remainder of this section will describe the characteristics of the decision context relevant to decision makers' selection of strategies.

Characteristics of the Decision Context

Beach and Mitchell (1978) also identified three groups of characteristics that describe the decision context and influence decision making behavior. These are (a) characteristics of the decision problem, (b) characteristics of the decision environment, and (c) characteristics of the decision maker.

Decision problem characteristics. Decision problem characteristics are defined as those characteristics that are inherent in the decision problem itself. Although the influence of these characteristics on strategy selection is subjective, i.e. it is mediated by decision makers' perceptions of the characteristics, this portion of the discussion will not review the relationship between objective and subjective descriptions of environmental reality. For the sake of simplicity, we will describe these characteristics as objective features of the decision problem. Beach and Mitchell (1978) identify four types of decision problem characteristics. These include task complexity, task ambiguity, task unfamiliarity, and task instability.

Task complexity is defined by the number of different components of the decision task. This includes aspects of the information currently presented, such as the number of alternatives and the amount of information to be considered, as well as the degree to which future tasks are influenced by outcomes of the current task (Beach & Mitchell, 1978). Other researchers have included the number of dimensions, time allocated to make the actual decision, and information redundancy as aspects of task complexity (e.g. Einhorn, Kleinmuntz, & Kleinmuntz, 1979; Johnson, Payne, & Bettman, 1988; Olshavsky, 1979; Payne, 1982; Wright, 1974).

Task ambiguity is the degree to which the decision task is unclear to individuals (Beach & Mitchell, 1978). This ambiguity can arise from several different sources, all of which contribute to the overall ambiguity of the problem. Ambiguity can be attributable to the imprecision, or lack of decision relevant information needed by decision makers. Ambiguity can also arise from the lack of clear task parameters, e.g. the goals of the task, viable alternatives, or the process by which a decision should be rendered (e.g. Abelson & Levi, 1985; O'Reilly, 1980).

Task unfamiliarity is the degree to which the problem is novel or new to individuals (Beach & Mitchell, 1978). To the degree that the task is familiar to decision makers, past experience can be used as a guide to current strategy selection. Although not stated explicitly by Beach and Mitchell (1978), it seems reasonable to assume that unfamiliarity with the task can be due not only to the novelty of the task itself, but also to the novelty of the type of information needed to make a decision.

Lastly, task instability is the degree to which the aforementioned problem characteristics change during the course of the decision process or after a decision has been rendered (Beach & Mitchell, 1978). Instability is especially great when these changes are difficult to predict.

Each of these problem characteristics, high complexity, high ambiguity, high unfamiliarity, and high instability, imposes a demand for task clarification (Beach & Mitchell, 1978). As stated in the discussion of the relationships on which their model is based, Beach and Mitchell contend that as these task demands increase, the likelihood of success for any particular strategy decreases. This, in

turn, encourages decision makers to employ the most formal strategy possible given their preference for conserving personal resources.

Decision environment characteristics. Decision environment characteristics are situational variables that influence strategy selection by determining the consequences to decision makers for the decisions rendered. Beach and Mitchell (1978) contend that key environmental characteristics affecting decision strategy selection are task irreversibility, task significance, decision maker accountability, and time and/or money constraints.

Task irreversibility, quite simply, is the degree to which a decision can be changed after it is rendered (Beach & Mitchell, 1978). This includes the period of time after a decision strategy is selected, but before it has been implemented, as well as any time following implementation of the strategy, but before the consequences of the decision are incurred.

Significance of the task can be determined by either one of two factors. The first is the absolute magnitude of the importance of the decision outcomes and can differ from their actual importance to the decision makers. For example, a Congressman may need to decide whether to vote for a program that will cost a billion dollars over the next year. Although the magnitude of the decision is greater than the magnitude of his/her decision on where to vacation, the latter decision might be more important to him/her. The other determinant of task significance is the breadth of the decision's ramifications for other parts of decision makers' lives (Beach & Mitchell, 1978). Examples of the differing significance of decisions may be the degree to which a decision affects decision makers' lifestyles or feelings of self-worth.

Accountability refers to the degree to which decision makers feel responsible for the outcomes of their decisions. As Beach and Mitchell (1978) point out, accountability can stem from two sources. Individuals may feel personally accountable due to their own involvement with the task issues and outcomes, and/or they may feel responsible to others for the decision's results. Although Beach and Mitchell (1978) made a distinction between the two forms of accountability, most researchers examining this aspect of the decision environment have treated the two as equivalent. This characteristic has been alternately labeled as decision importance (e.g. Billings & Scherer, 1988), identifiability (e.g. Harkins & Petty, 1982), personal salience (e.g. Williams, Harkins, & Latane', 1981), task/response involvement (Chaiken, 1980), personal involvement (e.g. Petty & Cacioppo, 1984), and "public" feedback pressure (Rozelle & Baxter, 1981), to name but a few. Operationalizations of this variable have been equally numerous.

The final group of environmental characteristics identified by Beach and Mitchell (1978) is resource constraints. These include time and/or money constraints imposed on the decision making process. Many researchers differ from Beach and Mitchell on this point and classify time limitation as a decision task characteristic which contributes to task complexity by increasing information load per given unit of time (e.g. Payne, 1982; Payne, Bettman, & Johnson, 1988; Wright, 1974; Wright & Weitz, 1977).

Environmental characteristics are important for two reasons. First, some of them increase the need for a strategy that will yield a correct decision. As the levels of task irreversibility, significance, and decision maker accountability increase, the utility of a correct decision increases. Second, environmental

characteristics exert constraints that limit the extent of the decision making process (Beach & Mitchell, 1978). Thus, time and/or money constraints serve to limit the range of viable decision strategies by making some strategies infeasible. Specifically, it may not be possible to implement the more analytical and formal strategies within the resource limits imposed. Time and resource constraints may be particularly problematic when the need for a correct decision is extremely high, thus creating a significant gap between resources required by the preferred decision strategy and those that are available to the decision maker.

Decision maker characteristics. Decision maker characteristics are personal attributes, such as knowledge, ability, and motivation, that affect strategy selection. Due to their lack of reliable effects on strategy selection, personality variables are not included in this grouping (Beach and Mitchell, 1978).

The type of knowledge described in Beach and Mitchell's (1978) model is quite specific - it pertains only to knowledge of particular decision strategies. Decision makers gain knowledge of strategy use through training and experience. From this learning, individuals acquire a sense of the circumstances under which each of the strategies is effective. Although not explicitly stated by Beach and Mitchell, it seems reasonable to expect that decision makers' knowledge of the type of information to be presented in a task (subject matter expertise, as opposed to decision process expertise) might also affect their strategy selection. This hypothesis has been investigated by several researchers and has been supported in a number of studies (e.g. Bettman & Park, 1980; Lussier & Olshavsky, 1979; Russo & Johnson, 1980).

Ability refers not only to decision makers' skill in implementing a particular strategy, but also to broader aspects of cognitive capacity, e.g.

cognitive complexity, intelligence, and analytic proficiency (Beach & Mitchell, 1978). Decision makers' ability to use their knowledge concerning decision strategies is crucial to the efficacy of the decision strategy. If individuals select strategies which they are unable to implement efficiently, they obtain a lower level of return for a given amount of cognitive resources expended. If individuals are better able to use complex strategies (due to greater cognitive capacity), then for any given level of resource expenditures, these individuals can implement more highly analytic strategies than their less able counterparts.

The final characteristic likely to have a significant effect on strategy selection is decision maker motivation. Knowledge and skills are necessary prerequisites to effective strategy selection, but individuals must be willing to actually carry out the task for the influence of either characteristic to become apparent. The reverse is also true. A high level of motivation cannot compensate for a lack of knowledge, skills, and abilities.

In summary, the relationships between the three groups of characteristics identified by Beach and Mitchell (1978) are such that: (a) the need for clarification of the task increases as task demands increase, (b) the need for a correct decision increases as environmental pressures increase, (c) the cost associated with a decision increases as the probability of the chosen strategy yielding a correct decision increases, (d) decision makers are motivated to expend the smallest amount of resources possible in selecting and implementing any strategy, and (e) the way to reduce resource expenditures for any particular set of task and environmental demands is to increase knowledge and ability in strategy utilization, or to utilize a less formal (simplifying) strategy.

Investigations of the Beach and Mitchell Model

All portions of the Beach and Mitchell (1978) model have been, to differing degrees, subjected to empirical test. Several investigations have tested the model explicitly, while some investigations were performed under the rubrics of various other frameworks. This research is presented below according to the group of decision characteristics that each study addresses.

Research on Characteristics of the Decision Context

Decision problem characteristics. Problem characteristics have been the focus of most decision making studies using either structural modelling (Slovic, Fischoff, & Lichtenstein, 1988) or process tracing (e.g. Ford et al., 1989). Of the decision problem characteristics, task complexity has generated the greatest amount of research. In a recent review of process tracing research, Ford et al. (1989) noted that of the 45 studies sampled, a large majority (N=33) investigated characteristics of the decision task. Of these 33 studies, 20 examined some form of task complexity. The interest in task complexity is probably due to several factors, the more obvious of which are the ease with which this variable can be manipulated experimentally, the salience of this variable to both the experimenter and decision maker, the ability to exercise some control over this variable outside the laboratory setting, and the notion that the optimal decision model differs according to the complexity of the task. Research on task complexity has yielded fairly consistent and robust results in regard to the selection of decision strategies. As complexity increases, the tendency for decision makers to use simplifying strategies also increases. This simplifying behavior is displayed in both the structural investigations (e.g., Wright, 1974; Wright & Weitz, 1977) and in the process tracing studies (e.g., Ford et al., 1989; Olshavsky, 1979; Payne, 1976).

Olshavsky (1979) employed a verbal protocol methodology to investigate the effects of task complexity on choice. Task complexity was defined as information load and operationalized by varying the number of alternatives and dimensions, and by varying the type of information presented (dichotomous versus multichotomous attribute levels). Individuals were required to select the most desirable alternative based on the information presented to them by the experimenter. Olshavsky (1979) found that when the number of alternatives was low, subjects used a one-stage compensatory strategy, while subjects in the high alternative condition used noncompensatory strategies to simplify the task before switching to compensatory strategies for evaluation of the remaining alternatives. When the number of dimensions was high, Olshavsky (1979) found that individuals differentially weighted information such that some dimensions were ignored or used in a limited fashion. However, when the number of attributes was low, subjects examined information from almost every dimension. Subjects in the high information complexity condition tended to use a multistage screening strategy to simplify the decision more often than subjects in the low complexity condition. Finally, latency measures showed that as the number of alternatives and attributes increased, average time per unit information decreased, further support for the limited use of some types of information.

Payne (1976) used a process tracing methodology to study the effects of task complexity on decision making behavior. He manipulated task complexity by varying the amount of information available for a choice task. Payne (1976) found that decision makers were highly responsive to the demands of the task, utilizing various decision strategies contingent upon the amount of information presented. As information load increased, decision makers relied less on

compensatory strategies (e.g. linear additive and additive difference), and more on noncompensatory, simplifying strategies (e.g. conjunctive or EBA). In addition, Payne (1976) found that after implementing a simplifying strategy, some decision makers reverted to the use of more cognitively demanding compensatory strategies, further supporting the conception of the decision maker as an active, albeit cognitively bounded, processor of decision relevant information. Other investigations of the effects of information load on task complexity have confirmed these findings (e.g., Billings & Marcus, 1983; Einhorn, 1971; Johnson & Meyer, 1984; Lussier & Olshavsky, 1979; Olshavsky, 1979; Onken, Hastie, & Revelle, 1985; Payne & Braunstein, 1978).

DeNisi, Cafferty, and Meglino (1984) have suggested that prior knowledge (familiarity) can serve to limit the amount of information to which individuals actively attend. Consistent with Beach and Mitchell's position, Bettman and Park (1980) demonstrated that highly knowledgeable consumers relied more on noncompensatory strategies than on compensatory strategies. However, in contradiction to the Beach and Mitchell (1978) model, less experienced consumers also displayed a tendency to use noncompensatory decision strategies more often than compensatory strategies when making choices (Bettman & Park, 1980). The latter finding may be due in part to the lack of decision maker motivation generated by the particular task environment (Bettman & Park, 1980), or alternatively, to the lack of task demands imposed by the response mode.

Task ambiguity and stability have received limited research attention. Waller and Mitchell (1984) investigated the effects of state uncertainty as a factor contributing to task ambiguity in cost variance accounting problems. They operationalized uncertainty of the operating process as a function of both stability

at the time of the decision, and the probability that the process would remain at that level of stability throughout the time under consideration. In support of the Beach and Mitchell (1978) model, Waller and Mitchell (1984) found that as uncertainty about operating processes increased, decision makers chose more analytic strategies to determine the cause of cost variances in operating processes. In spite of the higher costs to implement these strategies, individuals perceived the benefits for a correct decision to outweigh the costs and contribute to an increase in net gain (Waller & Mitchell, 1984). Their findings support the contingency model, although it is not clear if their results were due to the manipulation of task uncertainty or task stability.

Decision environment characteristics. McAllister, Mitchell, and Beach (1979) conducted a series of three experiments investigating the effects of task irreversibility and task significance on decision making behavior. The investigators found that as task irreversibility increased, i.e., as decision makers lost the option to change their decision, they chose (Experiment 1), and utilized (Experiment 2), more analytic strategies to render a decision. Individuals also felt the pressure for a correct decision to be greater, and perceived the task to be more important, when the decision was irreversible.

In the same series of experiments, McAllister et al. (1979) examined the effects of task significance on the selection of decision strategies. They operationalized task significance as the degree to which a decision is important to an organization's profitable functioning. Significant decisions had the anticipated effects on strategy selection, perceived pressure of the task, and task importance. In high significance tasks, decision strategies were more analytical, perceived pressure was greater, and the task was rated as more important than in conditions

of low significance. Other investigations of task significance have borne out similar results (e.g., Klayman, 1985; Smith et al., 1982; Stein, 1981; Waller & Mitchell, 1984).

In agreement with the contingency model, several studies have operationalized time as a resource. Beach and Mitchell (1978) also described money as a resource that can constrain the selection of some decision strategies. As strategies become more formal and analytical, they may become too costly to implement regardless of the task demands. In this sense, cost can restrict the range of viable strategies from which individuals can choose. Money constraints seem to have been ignored in this literature, although it has been examined in the related literature on information purchase decisions (Connolly & Wholey, 1988).

Smith et al. (1982) asked subjects to perform analyses of investment problems using strategies that varied according to analytic level and certainty of a correct solution. Individuals could select the analytical strategy they wished to utilize for a task. Strategies were nonanalytical (following recommendations) or aided-analytical (computations based on formulas), not unaided-analytical strategies which is the strategy group most often investigated in decision research. Tasks varied by complexity and time constraints. Smith et al. (1982) found that subjects in the low constraints conditions were more confident in their ability to implement complex strategies in the allotted time than individuals who were time constrained. They also found that confidence varied according to complexity of the strategy and time allocations.

Christensen-Szalanski (1980) asked subjects to perform administrative case study tasks under high and low time constraint conditions. The task was a within-

subjects design and individuals were required to write out their analyses for each of six tasks. Measures of confidence and preferred strategy use were collected.

Christensen-Szalanski (1980) found that under high time pressures, individuals preferred to use a strategy more complex than the one actually used, while under low time constraints, individuals did not prefer a strategy different from the one employed. In addition, when individuals were under high time constraints, they were less confident in the accuracy of their analyses and indicated more regret for possible lost benefits than when in conditions of low time constraint.

In contrast to Beach and Mitchell's approach, many investigators have examined time constraints as a contributor to task complexity rather than as a characteristic unique to the task environment (e.g., Payne, Bettman, & Johnson, 1976; Wallsten, 1980; Wright, 1974, Wright & Weitz, 1977). Payne (1982) conceptualized time pressure as a factor contributing to the information load of a decision task. For a given amount of information present in a task, the imposition of a time constraint requires decision makers to process more information per unit time than in an unconstrained condition. Simplifying the task through the use of decision rules is one method of coping with this increased information load. Wright (1974) contends that decision makers simplify time constrained tasks by 'filtering out' information that is not perceived as important to the task. The consistent finding has been that under conditions of high task complexity (high time pressure), decision makers use more noncompensatory strategies and focus on fewer pieces of information than under low complexity (low time pressure) conditions.

While time constraints may reduce the amount of time available in which to render a decision and thus contribute to increased information load, time constraints are not inherent or objective characteristics of a task as are the number of task alternatives and dimensions. For example, the task of selecting a television set may be a simple or complex decision depending upon the decision maker. However, features of the various television sets will remain constant regardless of the time in which one has to make a decision (excluding, perhaps, price). In this sense, individuals who consider many features must do so rapidly when under time constraints. However, individuals who look only at one or a few features must also do so more hurriedly when under the same constraints. The task, choose a television, has not changed; it is the environmental context, time in which to decide, that has changed. Yet regardless of the difference in frameworks and perspectives, the same relations between variables are observed - differing conceptualizations affect the interpretations of the empirical results, but do not alter the results per se.

The final environment characteristic discussed by Beach and Mitchell (1978) is decision maker accountability. As noted earlier, this characteristic has been defined in numerous ways. In a recent study, Billings and Scherer (1988) examined the effects of what they defined as personal importance on individuals' selection of decision strategies. They hypothesized that importance would moderate the effects of response mode on information acquisition strategies. Billings and Scherer (1988) operationalized personal importance as a combination of decision significance and what Beach and Mitchell (1978) would refer to as personally- and externally-imposed accountability. In the high importance (accountability) condition, individuals were led to believe that their decisions

would be used as a basis for selecting resident assistants for the University Housing System. They would also receive feedback on their performance relative to the performance of other individuals. In addition, the most accurate decision makers would have the opportunity to participate further in the selection process. Low importance (accountability) individuals were told that the subject matter of the task was incidental to the interests of the researchers. Results indicated no main effects for personal involvement on any search or strategy variable. Billings and Scherer (1988) attribute this to a relatively weak manipulation of importance. Both high and low personal involvement groups believed the task to be important.

The failure to support the contingency model may be due to less than optimal selection of task and subject. Another weakness in the study is the imprecise operationalization of personal importance. At this stage in the development of behavioral decision theory, it appears premature to group variables that may affect strategy selection when the individual contribution of these variables is not yet fully known.

McAllister et al. (1979) employed a better defined manipulation of accountability in their attempt to verify the Beach and Mitchell model. Subjects in their investigation assumed the role of organizational decision makers and made a series of decisions that had varying effects on the organization. McAllister et al. (1979) operationalized accountability as the characteristic equivalent to Beach and Mitchell's (1978) original definition of externally-imposed accountability. In low accountability conditions, individuals submitted their decisions in the form of recommendations to a committee which was responsible for the final decision, while in the high accountability conditions, decision makers were solely responsible for the decisions rendered.

Decision makers selected strategies that varied on level of analytic complexity and stated probability of yielding a correct decision; as analytic complexity increased, so did the stated probability of yielding a correct decision. As predicted by the cost/benefit contingency model, McAllister et al. (1979) found that in high accountability conditions, individuals selected and implemented more analytic strategies than in low accountability conditions. Moreover, subjects felt that the decision was more important, and that there was greater pressure to be correct when in conditions of high accountability, than when in low accountability conditions.

A study motivated by an entirely different theoretical perspective found results consistent with Beach and Mitchell's (1978) model. Petty and Cacioppo (1984) examined the effects of issue involvement on individuals' decisions concerning a persuasive message. The communication varied on both the quantity and quality of arguments presented. Petty and Cacioppo (1984) defined involvement as the degree to which an issue and its decision outcome were personally important to the decision maker. This operationalization is synonymous with personally-imposed accountability. High involvement subjects were led to believe that the decisions they rendered would directly affect them, while low involvement individuals believed their decisions would have no bearing on their immediate future. Petty and Cacioppo (1984) found that high involvement individuals thought about the quality of the information presented, whereas low involvement subjects were persuaded by the sheer number of arguments presented. In light of Beach and Mitchell's (1978) predictions, it appears that when individuals experience a sense of personally-imposed accountability, they are more

discerning in their attention to, and use of, information pertaining to the decision task.

Research on Decision Maker Characteristics

Investigations solely examining the impact of decision maker characteristics on the selection of decision strategies are almost nonexistent in the literature. This paucity may be due to the lack of significant results concerning the influence of decision maker characteristics on strategy selection. In addition, it can be very difficult to separate out what is "person" and what is "environment" in perceived characteristics of the environment (e.g. Hackman and Oldham's (1976) identity, autonomy, variety, and feedback). Several studies have examined characteristics of individuals as part of a larger investigation (e.g., Klayman, 1984; Christensen-Szalanski, 1980), or have labeled a decision maker characteristic as a task environment characteristic (e.g., Bettman & Park, 1980, who examined 'task familiarity' as opposed to 'decision maker knowledge').

Two investigations that have examined decision maker characteristics have yielded equivocal results in relation to the Beach and Mitchell (1978) contingency model. Christensen-Szalanski (1980) examined the effects of decision maker ability on strategy selection by comparing groups of individuals selected according to their level of mathematical proficiency. Using a task involving the mathematical solution of business problems, Christensen-Szalanski (1980) hypothesized that individuals of varying proficiency would incur different implementation costs when using identical strategies. Results of the experiment confirmed Christensen-Szalanski's (1980) expectations. Compared to high ability individuals, decision makers who were not mathematically proficient selected more complex strategies and invested greater amounts of time when benefits were

high, even though their costs, as a group, were higher than their more mathematically-able counterparts. Low-proficiency decision makers were also more confident in the accuracy of their decisions when using complex strategies, although actual measures of performance showed them to be less accurate than high-proficiency individuals. The Christensen-Szalanski (1980) study is supportive of the Beach and Mitchell (1978) model on several counts. Individuals believe that more complex strategies are more likely to yield correct decisions, and decision maker ability affects the level of resources individuals must commit to solving a given task.

In a recent study, Doherty (1987) examined the effects of decision makers' cognitive complexity and general intelligence on their selection of decision strategies. Cognitive complexity was indicated by scores on the Bieri Dimensional Grid (Bieri, 1955) and composites of Guilford and Merrifield's (1960) measures of divergent thinking. She hypothesized that more cognitively complex individuals would favor linear strategies and access more information than cognitively simple individuals, regardless of the complexity of the task. No hypotheses were stated concerning the relationship between intelligence and strategy selection. Doherty (1987) manipulated task complexity by varying the number of dimensions across tasks conditions. Depth and linearity measures were collected from the search.

The results indicated that neither cognitive complexity nor intelligence were related to the use of linear strategies. Cognitively complex individuals did not differ significantly from less complex individuals in their selection of decision strategies. Instead, task complexity explained the majority of variance in both search indices. Thus, task demands overpowered the influence of decision maker characteristics when individuals selected strategies.

Summary of Results Concerning the Beach and Mitchell Model

Research investigating decision problem characteristics has produced results that are, for the most part, supportive of the Beach and Mitchell (1978) contingency model. Individuals favor analytic decision strategies when faced with tasks that are high in uncertainty. Though the cost to implement these strategies is high, individuals perceive a higher probability of success when using analytic strategies. In decisions of high complexity, individuals use strategies that assist in making the task simple and tractable (Beach & Mitchell, 1978). As noted, there are several reports of data inconsistent with the hypotheses generated within the Beach and Mitchell (1978) cost/benefit framework (e.g. Bettman & Park, 1980). Further research in these aforementioned areas will help to clarify reasonable extensions and limitations of the model concerning task problem characteristics.

Research examining the effects of environment characteristics on the selection of decision strategies has also yielded strong support for the contingency model. Characteristics of the environment influence the selection of decision strategies in two ways. First, they determine individuals' level of motivation to render a correct decision. Second, some characteristics of the environment serve to constrain the selection of strategies that can be applied to a particular task. In agreement with Beach & Mitchell (1978), highly significant and irreversible tasks motivate individuals to use decision strategies that are analytical and thus perceived as having a high probability of rendering a correct decision. Decision maker accountability also serves as a motivator for the use of these cognitively demanding strategies. The effects of time constraints are extremely robust. In virtually all studies, individuals used noncompensatory strategies in conditions of high time constraint. Also, given additional time, individuals would have

preferred to use strategies more analytical than the ones employed due to the greater perceived probability of these strategies yielding a correct decision. In accordance with Beach and Mitchell's predictions, decision makers respond to environmental characteristics by trading off the desire to be correct with the constraints concerning the ability to select and implement the most efficacious strategy available.

The scarcity of research and the conflicting nature of the few results obtained highlight the need for further investigation of Beach and Mitchell's predictions concerning the effects of decision maker characteristics on the selection of search strategies. Reanalyses of studies investigating trial effects (e.g. Billings & Scherer, 1988) may yield information concerning the impact of decision maker knowledge and ability on the selection of decision strategies.

In general, research investigating the effects of various decision problem, decision environment, and decision maker characteristics on the selection of decision strategies has been supportive of the propositions made by Beach and Mitchell (1978). Discrepancies have been noted however, and in these areas further research must proceed methodically, with consistent definition and operationalization of the variables under consideration. These discrepancies also highlight the need for researchers to be cognizant of, and responsive to, the many potential influences on individuals' selection of decision strategies. The measurement of multiple characteristics is one method that may serve to account for these unexplained discrepancies. Moreover, most decision studies fail to create a setting in which decision makers experience a sense of responsibility for the decisions they make. The focus has been on decision problem characteristics,

rather than on the context of the decision and, thus, what environmental and decision maker characteristics are impinging upon it.

IV. Assessment of Decision Strategies Using Process Tracing Methodology

Process Tracing Techniques

Most decision making research conducted to date has used a structural analysis approach (c.f., Ford et al., 1989; Slovic & Lichtenstein, 1971). Researchers using this approach have inferred individuals' decision policies by relating final decisions to the attributes of the decision alternatives through regression (e.g. Hammond, Stewart, Brehmer, & Steinmann, 1975) or analysis of variance (Anderson, 1981). Individuals' implicit decision making policies are "captured" to the extent that their final judgments could be predicted in a specified decision situation (Zedeck & Kafry, 1977). More recently, researchers have become interested in the cognitive processes that lead up to the decision (i.e., how individuals go about making a decision; Payne, 1976, 1982; Svenson, 1979). These researchers have employed a process tracing methodology that allows for the analysis of predecisional behavior (e.g., Payne, 1976; Payne, Braunstein, & Carrol, 1978; Svenson, 1979). This approach views decision makers as active information gatherers and processors, sensitive to the specific demands of the task environment (DeNisi, Cafferty, & Meglino, 1984). By understanding the effects of different task characteristics on processes leading to a decision, researchers hope to also understand ways in which to increase decision efficiency and effectiveness (Ford et al., 1989). The process tracing methodology lends itself to investigating propositions of interest to this study and will be reviewed in greater detail below.

Several process tracing techniques have been employed in decision making research. Each technique attempts to assess how individuals analyze and evaluate a decision situation. Through direct observation, investigators can determine what information individuals access and in some cases utilize, to form a decision (Payne, 1976). The two process tracing techniques most frequently employed are verbal protocol analysis and explicit information search.

Verbal protocol analysis is based upon the content of individuals' statements made as they "think aloud" while performing a decision task (Bettman & Park, 1980; Payne, 1976). The statements are then decomposed into clusters according to the type of information and reasoning used to progress through the task (Bettman & Park, 1980; Biehal & Chakravarti, 1982; Payne, 1976). Thus, verbal protocols not only supply data concerning what information decision makers use, but also a sequential record of the specific combinatorial strategies individuals employ (Herstein, 1981; Doherty, 1987).

Explicit information search requires the use of an information board. The information board consists of a decision matrix that describes the score of each alternative on each dimension. Individuals are presented with a decision task and allowed to search the board for any information they feel is necessary to complete the task. As individuals proceed through the task, the information they access is recorded and later used to determine their particular decision strategy (Payne, 1976; Jacoby, Chestnut, Weigl, & Fisher 1976).

Two types of information boards have been used - manual (or mechanical) boards, and computerized information boards. The current trend is toward the use of the latter for several reasons, one of which is ease of use. Computerized

information boards are also less intrusive and less likely to create performance demands.

The typical computerized information board presents a list of alternatives and dimensions from which to select. Individuals access a piece of information by designating the alternative of interest, then selecting a dimension from that alternative. The information from the selected cell of the decision matrix then appears on the screen. At this point, individuals are prompted to either continue the search or render a decision. Decision makers wishing to continue their search repeat the process of selecting cells from the matrix until they have reached a search limit or are ready to make a decision. The process tracing program records the type of information searched, the amount of information searched, the latency of each item searched, and the final decision rendered. In addition to this raw data, researchers are often interested in the variability of search, the sequence of search, search mode, and search linearity, each of which can be calculated from the raw data.

While the literature has identified six distinct decision models, in practice, the ability to discriminate among these models has been limited by the availability of precise measurement techniques. In general, it is not possible to uniquely identify the use of any of these strategies. This lack of specificity stems not only from shortcomings in measurement techniques, but also from possible imprecisions in decision makers' execution of these models. However, these models do serve as guides to the study of decision making and thus warrant attempts to identify them. In the least, search process measures offer an approximation of the decision models that individuals employ as they perform decision tasks.

Search Variables

The content or type of information searched may be of interest when researchers have specific hypotheses regarding the information necessary to make particular decisions (Ford et al., 1989). These hypotheses may extend to the specific decision rendered in a particular phase of the decision making process (Bettman & Park, 1980; Jacoby, Chestnut, & Fisher, 1978). Search latency (response time) is defined as the amount of time individuals use to examine an individual cell of the decision matrix or to render a decision (Ford et al., 1989; Payne & Braunstein, 1978).

Search strategy is often the dependent variable of primary interest in an investigation. Researchers rely on several search variables as indicators of strategy. Depth of search refers to the amount of information individuals access from the decision matrix prior to rendering a decision and is most commonly expressed as a percentage of the total number of pieces of information available for the task. Search variability is calculated as the standard deviation (across alternatives) of the percent of information searched within each alternative in the matrix (Billings and Marcus, 1983). Dimensionality of search, or search sequence, is an index of the temporal pattern in which information is accessed (Payne, 1976). The index is calculated by comparing the type of information accessed at each step in the search process with the information that was accessed in the prior step. Individuals who search largely within dimensions before switching to another dimension display an intradimensional search pattern, while those who search within alternatives display an interdimensional pattern (Payne, 1976).

Search variability and search dimensionality are often examined in combination to determine search strategy (e.g., Billings & Marcus, 1983; Billings

& Scherer, 1988; Payne, 1976). By categorizing search variability (variable versus constant) and dimensionality (interdimensional versus intradimensional), four conditions are created. Each combination is indicative of the search strategy, or search mode (Billings & Scherer, 1988), used by individuals as they proceeded through the decision task. For example, compensatory strategies are indicated when variability is constant (interdimensional/constant search indicates a linear additive strategy; intradimensional/constant search indicates an additive difference strategy), while noncompensatory modes are indicated when variability is high (interdimensional/variable search indicates a conjunctive strategy; intradimensional/variable search indicates an EBA strategy).

Linearity of search has also been of interest to researchers. Compensatory strategies are quite often referred to as linear strategies, while noncompensatory strategies are considered nonlinear. Payne (1976) contends that individuals searching a variable number of dimensions within an alternative are using a nonlinear strategy, while those using a linear strategy will search the same dimensions within each alternative.

Until recently, available indices of search linearity suffered from a number of deficiencies (Doherty, 1987; Payne, 1976). However, Gilliland (1989) has proposed an index of nonlinearity that addresses the shortcomings of the other indices. In short, Gilliland's (1989) index is continuous and ranges from a value of 0.00 (indicating complete linearity) to 1.00 (indicating complete nonlinearity). The value ranges of previous linearity indices (e.g. Doherty, 1987) were dependent upon the actual number of alternatives and dimensions in the decision matrix and thus not comparable across matrices of different configurations.

Gillilands's formulation of the nonlinearity index will be explained in detail in the discussion of methods. (See also, Appendix A.)

V. Decision Response Mode

As indicated in previous discussion, it is possible to direct the attention of decision makers by altering the characteristics of the task, environment, and/or the decision makers themselves. Individuals utilize decision strategies that allow them to expend the smallest amount of resources to reach a decision that is 'acceptable'. An acceptable strategy and decision in one situation may not be adequate under a different set of circumstances. One task characteristic that affects how individuals select an information processing strategy is task response mode.

Types of Response Modes

Response mode refers to the type of decision required in a particular task. The two basic types of response modes are judgment and choice. A basic choice task requires individuals to select an alternative and reject all other alternatives. A basic rating task requires individuals to assign alternatives to categories based on the alternatives' varying levels of suitability. Other types of response modes do exist, for example, the multiple category choice decisions that are performed to determine graduate school admission status (Billings & Scherer, 1988). In these tasks, admission committee members typically sort applications into categories of acceptance with funding, acceptance without funding, and invitation denied (rather than the basic choose or reject categories commonly associated with a choice task).

Until recently (e.g. Billings & Scherer, 1988), the two basic response modes have not been investigated concurrently. Moreover, Beach and Mitchell

(1978) did not discuss response mode as a characteristic that might influence decision makers' cost/benefit analyses. However, past research has shown that individuals tend to search for information differently when performing choice and rating tasks (Payne, 1982).

Rating Tasks

In typical rating tasks, individuals are presented with a decision matrix and asked to designate some value of fitness (whether that fitness be deservedness, aptitude, desirability, attractiveness, etc.) for each of the alternatives presented. Individuals access the information they believe is relevant in assigning appropriate values to the alternatives. These values are typically interval level measures.

Individuals tend to search for, and utilize, more information when performing ratings than choice tasks (Payne, 1982; Tversky, 1977). Decision makers also tend to use more compensatory decision strategies in rating tasks. A closer examination of rating tasks will reveal several reasons why this type of task promotes the use of complex decision strategies.

First of all, a rating decision must be performed for every alternative presented (Bettman, 1986). In order to meet the demands of the rating scale, the numerical rating assigned to a particular alternative must be consistent with the ratings of the other alternatives. Meeting these constraints is, of course, a significant challenge for the decision maker. One method of proceeding with the rating task is to choose one particular characteristic and base the rating on that alone. However, all alternatives may not be distinguishable on this single dimension, or the dimension for comparison may not best represent the criterion on which an object's fitness is being assessed. A method of making more thorough evaluations of the alternatives would involve accessing as much information as

possible concerning an alternative. This procedure requires a considerable commitment of cognitive resources, especially if it is repeated for each alternative presented. A less burdensome, and perhaps equally efficacious strategy might be to access only those cells of the decision matrix which correspond to the N most important traits. However, to submit ratings that are both optimal and comparable (in the sense that they are each based on commensurate information), individuals must acquire the same types and amounts of information across alternatives.

The cognitive operations underlying the process of categorization (Eiser & Strobe, 1972) also contribute to the tendency to use compensatory strategies in tasks requiring a rating response. According to Upshaw (1984), individuals rate objects by taking three factors into account: (a) the stimulus value of the object, (b) the individuals' own psychological representation of the range of values for the object on a given dimension, and (c) the actual number of response categories available. For a given psychological range of values, an increase in the number of response categories forces individuals to make finer discriminations between alternatives. This is especially true when the stimulus values of objects presented fall within a narrow range and/or the number of alternatives is large. In order to make fine discriminations, individuals must search the available information until they have some basis to conclude that alternatives are either equal and deserving of the same categorization value, or are in some way dissimilar. Effort to access and utilize information increases as the amount of information required for the task increases. Thus, decision effort increases both as a function of an increase in the number of categories and the number of alternatives.

Due to the multiplicity of cognitive operations involved in rating tasks, as well as the multiple discriminations that are implicit in the categorization of alternatives required in this type of decision, individuals must search for information that is confirmatory (Tversky, 1977). In addition, searches tend to be thorough and low in variability (Billings & Scherer, 1988).

Choice Tasks

Information demands in choice tasks differ from those in rating tasks. In the simplest choice task, individuals are presented with a decision matrix and required to select one alternative from the set based on some criterion of fitness. Decision makers access information until a selection can be made, or resource limitations have been reached. In simple choice tasks, individuals tend to search for, and utilize, information that is distinctive and unique (Payne, 1982; Tversky, 1972). Decision makers favor noncompensatory strategies in choice decisions, although Payne (1976) and others have noted that some individuals do use compensatory strategies after having simplified the task. The amount of information searched per alternative is variable and the depth of search is usually not as great as in rating tasks. The most common strategies employed utilize EBA, lexicographic, or conjunctive rules.

To continue the discussion of categorization in decision making, a choice response mode requires only that individuals discriminate alternatives into very gross, albeit distinct categories. Effort expenditures should be reduced since the number of categories is small, "accept" and "reject" in the simplest choice task. Consequently, unlike a judgment task where each distinction (rating) should be metrically comparable to the others, categorization in the choice mode need not be made on the basis of an alternative's relation to all other objects in the task. That

is, different objects can receive the same categorization (reject), but be quite dissimilar to other objects in the same category. The task requires only that the selected alternative be distinguished from the rejected alternatives.

A cost/benefit analysis of choice tasks predicts that individuals will favor the use of noncompensatory strategies. Most choice tasks have a fixed benefit level associated with a correct selection. Because individuals strive to maximize the ratio of benefits to costs for a given task, this ratio can only be increased by reducing the denominator. The most economical means to minimize resource expenditures is to reduce the amount of information searched. Noncompensatory strategies and the use of few categories allows individuals to terminate their search for information concerning a particular alternative as soon as it becomes clear that the alternative under consideration cannot meet a particular criterion level.

Response Mode Research

As mentioned previously, research specifically investigating response mode effects on decision strategies has been limited. The studies that have examined judgment and choice concurrently have yielded results that are mixed - supportive of the relationships just discussed, less than supportive, and even contradictory to these relationships. Three studies serve to illustrate the lack of consistent effects for response mode when judgment and choice are examined concurrently (Billings & Marcus, 1983; Billings & Scherer, 1988; Williams, DeNisi, Blencoe, & Cafferty, 1985).

Billings and Marcus (1983) were interested in validating several statistical techniques often used to infer compensatory and noncompensatory decision strategies. To do this, they examined the convergence of these multiple measures and the representation of decision making processes generated by each when the

task varied in information load. This study examined data from process tracing choice tasks (variability of search and search pattern), policy capturing judgment tasks (linear and nonlinear regression modeling, ANOVA analysis of interactive use of cues), and an analysis of the curvilinear use of cues.

To maintain comparability with the existing literature, Billings and Marcus (1983) used separate rating and choice tasks, rather than alter the typical procedures used to generate data for these measures. As they noted, the distinction between judgment and choice should be investigated empirically, but only after any procedural differences in the typical "judgment" and "choice" tasks have been eliminated. To date, direct comparisons of the effect of response mode type on each measure employed had not been possible due to the operationalization of decision tasks. (The recent work by Billings and Scherer (1988) has amended this problem and will be reviewed below.)

Billings and Marcus (1983) used a within-subjects design in which individuals performed both judgment and choice tasks under varying levels of information load. Information load was manipulated by varying the number of alternatives in the choice tasks and by imposing time constraints in the judgment tasks.

Individuals were presented with the same information content in each type of task. In the judgment task, individuals rated the desirability of apartments based on data that was presented to them, while in the choice tasks, individuals were required to search an information board before making a selection.

Billings and Marcus (1983) found that in choice tasks, individuals used compensatory strategies when information load was low, and noncompensatory strategies when information load was high. This effect was due to the greater

variability of search in the high load condition. Search pattern was not affected significantly by changes in information load. In the rating task, contrary to expectations, individuals did not use conjunctive strategies more often when information load was high. However, ANOVA indices did indicate that individuals exhibited greater interactive and curvilinear use of cues when load conditions were high.

To test the convergence of measures, Billings and Marcus (1983) correlated the various indices. Under low load conditions, search measures were not related to each other or to the rating measures. In the high load condition, individuals were more reliant on variable and intradimensional search patterns, suggestive of an EBA strategy. Some convergence of the measures of rating tasks was indicated; the correlation between conjunctive models and the interactive use of cues was positive in the low load condition, while the correlation between conjunctive models and curvilinearity was positive in high load conditions. The ANOVA measures of curvilinear and interactive cue use were negatively correlated in both load conditions.

Taken together, these correlations indicate that individuals do not use cues interactively and curvilinearly in the same task as is implied by conjunctive models. Likewise, the absence of curvilinear cue use does not preclude a decision maker from using cues interactively (or vice versa) as implied by linear additive models (Billings & Marcus, 1983). The authors conclude that there is little evidence of convergence between choice and rating indices for noncompensatory behavior, suggesting as have others (e.g., Einhorn, Kleinmuntz, & Kleinmuntz, 1979; Svenson, 1979), that process tracing and policy capturing represent different phases of the decision process.

Billings and Scherer (1988) took a more direct look at the effect of response mode on decision strategies. Rather than comparing statistical measures generated from tasks that differed in procedural aspects as well as response mode (as did Billings and Marcus, 1983), Billings and Scherer (1988) used the same procedure, a manual information board, to investigate the effects of judgment and choice on information acquisition strategies. This enabled them to eliminate the nonessential procedural differences in tasks which may have confounded Billings and Marcus' (1983) results.

The Billings and Scherer (1988) study was a between-subjects design on response mode and importance, with decision trials as a within-subject factor. The task required individuals to consider applicants for the position of resident assistant. High involvement subjects were told their decisions may qualify them to participate in the actual selection process, while low involvement subjects were told the task was incidental to the interests of the researchers. Search measures included depth of search, variability of search, search pattern, and search mode, a combination of search variability and search pattern (Billings & Marcus, 1983; Payne, 1976).

Results showed a main effect for response mode on depth, variability, and pattern of search. The rating response encouraged a greater depth of search, a less variable search, and a more interdimensional search than that in the choice mode. Decision importance interacted with response mode to affect depth of search. While importance did not affect depth of search in the judgment condition, individuals in the high importance condition searched for more information when required to make a choice than did those in the low importance condition. Further analysis indicated that an intradimensional/variable search mode (suggestive of

EBA) was more likely under choice than judgment conditions. The results support prior research suggesting that when task demands are low, individuals are likely to use simplifying strategies. In conditions of high demand, individuals are likely to undertake a more extensive search for information.

Williams et al. (1985) conducted two experiments to investigate the effects of performance appraisal purpose and outcome on raters' information integration and acquisition processes. The study was based on Kelley's (1971) covariation principles in attribution theory. Kelley (1971) suggested that people make causal attributions based on three types of information: (1) the consistency of the focal individual's behavior in the same setting across occasions, (2) the distinctiveness of the focal individual's behavior as compared to his/her behavior in other settings, and (3) the consensus of how others behave in that particular setting (c.f. Williams et al., 1985). Williams et al. (1985) hypothesized that individuals would seek and utilize different types of information depending upon rating purpose and decision outcome.

Williams et al. (1985) defined rating purpose as the reason for appraising performance (salary increase, promotion, recommendation/referral to remedial training). Appraisal outcomes were conceptualized as either designation (which one person should be promoted, or sent to training, or determining the size of salary increase for each person), or deservedness (i.e., how worthy is each ratee of a promotion, training recommendation, or a 6% salary increase). The designation and deservedness outcomes appear to be equivalent to choice and rating decisions, respectively, although it should be noted here that their operationalization of designation was quite problematic. For this reason, the study is described in detail below.

In Experiment 1, (Williams et al., 1985), subjects within each cell of the experimental design were presented with eight vignettes describing ratees' performance. Each vignette represented one cell of the matrix created by crossing high and low levels of consistency, distinctiveness, and consensus information. Subjects read all of the vignettes prior to making their ratings of deservedness or designation.

Williams and his colleagues hypothesized that raters would use distinctiveness and consistency information in the same way that observers utilize this information in other attribution decisions. That is, performance ratings would vary according to consistency and distinctiveness information, while consensus data would have little effect on ratings. When good performance is consistent and indistinctive, it will be rated higher than when that same performance is described as inconsistent and distinctive. However, poor performance will be rated higher when it is attributed to inconsistent and distinctive behavior than when that same performance is attributable to consistent and indistinctive behavior. Williams et al. (1985) anticipated no differences in the reliance on consistency or distinctiveness information across purpose or outcome conditions, although they posited that consensus information should be utilized more often in the designation conditions than in the deservedness conditions.

In describing designation and deservedness outcomes in their procedures section, Williams et al. (1985) reported an operationalization of the designation outcome that is arguably inconsistent with their conceptualization. Specifically, in the designation condition for remedial training and promotion purposes, decision makers were to indicate how they would feel if each particular ratee was the one person to receive the training referral or promotion. In other words, individuals

were instructed to rate how deserving they feel ratee X_1 is of being promoted, ratee X_2 is of being promoted, or ratee X_3 is of being promoted.

Results indicated main effects for outcome and purpose on the level of individuals' ratings. Individuals gave higher ratings in the deservedness conditions than in designation conditions. Raters also gave higher ratings in the training conditions than either the salary increase or promotion conditions. Consistent and indistinctive behavior was rated more highly than behavior that was inconsistent or distinctive.

Williams et al. (1985) conclude that the differences in ratings reflect a change in decision makers' evaluation standards. The authors claim this change is caused by individuals' perceptions of the ratings' consequences. However, all results are questionable and alternative explanations for the purpose and outcome main effects are apparent. Given the reservations stated below, information effects are also suspect.

The problem with the conclusions drawn by Williams and his collegues is that in submitting designations for training and promotion purposes, individuals' were required to reconsider all ratees after having read the performance vignettes with the supposed purpose of selecting a single ratee for designation. Research has shown that information is encoded differently under different purposes and that after encoding, information that is relevant for one purpose may not be accessible for other purposes (e.g., Lichtenstein & Slovic, 1971; Srull, 1983; Tetlock, 1983, 1985a, 1985b; Wyer, Srull, Gordon, & Hartwick, 1982). Raters in the designation condition assumed they would be submitting a choice at the conclusion of their participation. Instead, they were required to submit what was basically a rating of fitness for each ratee after having processed the information for a

different purpose. Consequently, ratings submitted under the designation condition are likely to have differed from those under the deservedness condition due to the lack of memory for, or lack of access to, different performance behaviors rather than actual consideration of the different types of performance information.

In addition, it should be noted that the designation conditions for training and promotion purposes, while requiring rating-type appraisals for each ratee, were not comparable to the basic rating task of the corresponding purposes in the deservedness outcome conditions. Specifically, the designation and deservedness outcome tasks differed in the way they were framed and the way the scales were anchored. In the deservedness condition, raters were asked to consider how worthy each ratee was of being placed into the promotion or training category. In the designation condition, it appears raters were asked to consider how deserving a ratee was of being taken out of the promotion or training category. While this may seem a small distinction, Kahneman and Tversky (1979) have demonstrated the powerful effects that seemingly insignificant changes in the framing of a decision can exert on decision making.

In addition to the previously mentioned problems, the Williams et al. (1985) operationalization of the designation outcome for salary increase purposes suffered from a further inconsistency between the rating scales for salary increases across the two outcome conditions. To make a designation, each ratee was evaluated with respect to the question, "How much of a salary increase would you give this employee?" This rating was to be based on a 7- point scale representing a range of increases from 0% to 12%. Thus, the task is actually a rating of each appraisee's deservedness of a particular level of salary increase, rather than a task

where the rater must decide which ratee is/is not the employee who should definitely receive a raise. Deservedness ratings for salary increases were also based on a 7-point scale. However, in this condition subjects were asked to assign a rating based on a ratee's worthiness of a 6% salary increase. A problem arises from the lack of conceptual equivalence between identical rating values for salary increase ratings in the two outcome conditions. Specifically, individuals in the designation condition who assigned a rating of '4' were actually recommending that the ratee should receive a 6% raise, while raters in the deservedness condition who gave a '4' rating were saying that the ratee was neither deserving nor undeserving of a 6% raise! Given this problem and those mentioned previously, the results of Experiment 1, Williams et al. (1985) should be interpreted very cautiously.

In Experiment 2, Williams et al. (1985) attempted to build upon their findings in Experiment 1, suggesting that while appraisal outcome and purpose may have a limited effect on how raters use different types of information, these variables may affect the types of information sought when raters have insufficient performance data. They posited that the most informative performance data is distinctiveness information, since it tells raters how ratees perform in other situations - a form of behavior generalizability. Overall performance can then be inferred without explicitly searching for consistency information. For this reason, distinctiveness information should be sought most often regardless of condition. They also hypothesized that decision makers would access consensus information more often in designation decisions, even though they ought to search for consistency data more in deservedness decisions.

The experiment was a between-subjects design. As in Experiment 1, Williams et al. (1985), subjects were assigned to one of six conditions that crossed 3 levels of purpose with 2 levels of outcome. Individuals were required to make one type of decision (deservedness or designation) about a set of four alternatives (ratees). Subjects used a computerized information board to access the data necessary to make their decision. The data was presented in a 4(ratees) X 4(tasks) X 4(task performance) array such that raters could acquire information regarding consistency, distinctiveness, and consensus behavior depending upon how they searched the matrix. There was no time limit for the task. The modified procedure used in Experiment 2 rectified the shortcomings in the operationalization of promotion and training designations. In accordance with others' operationalizations of a choice task, subjects in the training and promotion designation conditions assigned only one person to the promotion or training category, rather than rating the fitness of each worker for these categories. However, the problems with the salary increase - designation condition were not corrected.

Williams et al. (1985) found no main effects for mean number of information requests. However, a Purpose X Outcome interaction was found such that more information was accessed by individuals in the designation - salary increase condition than individuals in the deservedness - salary increase condition.

Analysis of information types showed that distinctiveness information was accessed most often, followed by consensus and consistency information, respectively. All differences were statistically significant. A Purpose X Outcome interaction was found. Requests for each type of information did not differ significantly between outcomes in the promotion or training conditions. However,

in the salary increase conditions, individuals requested a significantly different pattern of distinctiveness and consensus information. For designation decisions, consensus information requests were greater, and distinctiveness requests fewer, than in deservedness decisions.

Williams et al. (1985) concluded that distinctiveness information is the most parsimonious data source to utilize since from it, raters can deduce ratees' average task performance. From a cost/benefit perspective, a search consisting primarily of distinctiveness information would require the smallest overall resource expenditures. This tendency toward the use of distinctiveness information has already been suggested by Payne (1982) and Tversky (1972). Williams et al. (1985) found that raters used more distinctiveness than consistency information in all conditions except the designation - salary condition, where distinctiveness information was actually requested less often than consensus information. What is confusing about this result is that prior research would have predicted the opposite effect for the use of distinctiveness information. As will be shown below, the results of other studies suggest that the amount of distinctiveness information would be higher than the amount of consensus information in the designation condition, and lower in the deservedness condition.

The inconsistencies in the relation of information type and outcome condition can perhaps be made clearer by reconceptualizing the Williams et al. (1985) decision task in terms of its formal, rather than substantive characteristics. If we disregard consistency information (looking at the same person performing the same task at different times), we are left with a basic two-dimensional decision matrix consisting of ratees and their task behaviors (alternatives X dimensions). Consensus information is dimension based (i.e., intradimensional -

different alternatives, same dimension) and distinctiveness information is alternative based (i.e., interdimensional - same alternative, different dimensions). The decision making literature suggests that an intradimensional search pattern is most often used in choice decisions, while an interdimensional pattern is most often used in rating decisions (e.g. Payne, 1976; Billings & Marcus, 1983). Since "intradimensional search" is equivalent to the selection of consensus information and "interdimensional search" is equivalent to the selection of distinctiveness information, the results reported by Williams et al. appear to be the opposite of those of other studies. In summary, the results of this study are intriguing, but difficult to interpret. On the one hand, they found a result that conflicts with the outcomes of other studies of information search. However, as noted earlier, problems with the operationalization of the designation - salary increase condition in their first experiment cast doubt on the interpretation of the results of this portion of their study.

The conclusions that can be drawn from their second experiment are also problematic since they depend upon the degree to which the results may have been affected by the use of rating scales with anchors that were not comparable in meaning across the two salary increase conditions. Finally, as discussed earlier, even had ratings been appropriate, the differences between the salary increase - designation and salary increase - deservedness conditions in terms of the framing of the task, and the anchoring of the response scale are likely to have affected the way in which the task was approached and information encoded. While subjects in Experiment 2 were asked to submit ratings, these values were not used as dependent measures in their analyses. Because the ratings were used only to motivate the information search process, the basic differences in results between

the two outcome - salary increase cells are due solely to the conditions surrounding the tasks. The tasks themselves are the same. Thus the measured results indicating variable amounts and types of information accessed between the two cells may be nothing more than context effects (or sampling error). Consequently, all results in which the designation - salary increase condition is involved are suspect.

Conclusions from Response Mode Investigations

It has been suggested by several researchers that policy capturing and process tracing techniques be used in conjunction in multimethod investigations of decision making. Einhorn, Kleinmuntz, and Kleinmuntz (1981) and Svenson (1979) have recognized that these methodologies do tap into different phases of decision behavior, with process tracing yielding data concerning predecisional search behavior and policy capturing yielding data on how information is utilized. Yet recent work by Billings and Marcus (1983) indicates for the most part, that outcome measures generated by these two methodologies do not converge. The differences in these results may be due to fundamental differences in the techniques. Alternately, differences in results may be an outcome of artifactual differences in the tasks commonly employed in the studies utilizing these techniques, since policy capturing studies typically employ rating tasks, while process tracing studies typically employ choice tasks.

Billings and Marcus (1983) were concerned with proving the validity of different measures used to describe decision making behavior. Although they did examine response mode, the comparisons were only on the level of the measures generated by the respective techniques, not on the same measures generated by different tasks. This issue was subsequently addressed by Billings and Scherer (1988).

The results of the Williams et al. (1985) study are discussed with great reservation. The study contained a number of operationalization, framing, and anchoring problems. Perhaps the strongest interpretation of their results is that decision makers seem to prefer different types and amounts of information depending upon the context and characteristics of the task. One task characteristic to which individuals are apparently sensitive is response mode. In spite of the interpretational problems identified above, their results do provide some support for the contingency model of decision making - individuals are sensitive to the demands of the task. Perhaps of greater importance than the empirical results per se, Williams et al. (1985) demonstrated the powerful influence that framing can exert on how individuals render decisions. As indicated in Experiments 1 and 2 (Williams et al., 1985), not only is it very important to consider what is being asked of decision makers, but also how those questions are being asked. The issue of selecting into a category versus selecting out of a category, while requiring the same response mode, may yield different results. This issue is addressed later in the discussion of the task used in this research proposal.

The investigation of response mode effects on decision making processes requires researchers to examine comparable phases of judgment and choice tasks. In that respect, it appears that Billings and Scherer (1988) are the only researchers who have begun to address this issue in such a way as to allow for direct and unambiguous comparison of response mode effects. Their study offers support for the hypothesis that response modes promote different types of decision processes and that these differences are evident in the information acquisition phase.

VI. Decision Maker Accountability

A decision maker's selection of a decision strategy is influenced not only by characteristics of the decision problem, but by characteristics of the decision environment. Beach and Mitchell (1978) state that while decision problem characteristics define the need for a strategy that will help clarify the decision task, environmental characteristics determine the demands for selection of a strategy that will produce a correct decision. One of the key environmental characteristics affecting decision strategy selection is the accountability of the decision maker.

Accountability has been alternately defined as an internal disposition of decision makers (e.g., Beach & Mitchell, 1978; Chaiken, 1980; Gabrenya & Arkin, 1979; Petty & Cacioppo, 1984), and as an external pressure on decision makers imposed by the decision environment itself (e.g., Adelberg & Batson, 1978; Beach & Mitchell, 1978; Hagafors & Brehmer, 1983; Klimoski & Ash, 1974; McAllister et al., 1979; Tetlock, 1985a), although researchers have used a variety of different labels for this variable in both conditions. In practice, these alternate forms of accountability may have somewhat different influences on individuals' decision making behavior. Thus, research involving personally-imposed accountability and externally-imposed accountability will be reviewed separately in the following sections.

Accountability as an Internal Disposition

Beach and Mitchell (1978) define accountability as the "degree to which the decision maker is to be [held responsible] for the results of the decision", and go on to state that accountability can result from, "personal involvement with the decision and the outcomes related to it" (p. 445). Chaiken (1980) points out that decisions can be of personal import to decision makers, and thus personally involving, at two levels - the topic level and the response level. Topic involvement occurs when decision makers believe the issues underlying the decision are personally important to them. Response involvement occurs when the actual decision and its consequences are personally important to the decision makers. As noted by Billings and Scherer (1988), these consequences can be monetary (e.g., Christensen-Szalanski, 1980; Johnson, Payne, & Bettman, 1988), social (Gabrenya & Arkin, 1979), educational (Petty & Cacioppo, 1984), political (e.g., O'Reilly, 1983), or intrinsic. Decision makers are not always involved with the issues surrounding the decision or its implications, once the decision has been made. In any case, this type of accountability is due solely to the dispositions of decision makers (or private commitment to the task, as Rozelle and Baxter, 1981, call it) and is quite independent of externally-imposed accountability.

Petty and Cacioppo (1984) investigated the effects of personal involvement on subjects' responses to argument quantity and quality. They conducted two experiments in which they defined personal involvement as the degree to which an issue and its decision outcomes were personally important to decision makers. Decision makers in the high involvement condition were faced with issues that were personally relevant and whose resolutions would directly affect them in the near future (tuition increase at your university; comprehensive examinations for

seniors to be implemented the following year). The low involvement subjects rendered decisions on issues which were less relevant and pressing (tuition increase at another university; academic recommendations to take effect in 10 years). The number and quality of arguments was varied for both the tuition and comprehensive examination studies. Outcome measures were attitude ratings and thought generation indices.

In both experiments, Petty and Cacioppo (1984) found that under high involvement conditions, individuals were motivated to think about the quality of issue-relevant information presented, whereas low involvement individuals were persuaded merely by the quantity of arguments presented, regardless of the argument quality. The results indicate that when subjects are personally involved with the issues and outcomes surrounding a decision task, they are more discerning in their attention to, and use of, decision relevant information.

Gabrenya and Arkin (1979) examined the effects of personal importance on the decision to voluntarily participate in interracial behaviors. Subjects in the high involvement condition were asked to commit themselves to their decisions concerning the actual performance of these behaviors prior to volunteering for any decision-related behavior. That is, subjects in the high involvement condition were told prior to the decision that they would be committed to eventually perform some of the behaviors for which they volunteered. Subjects in the low involvement condition were asked to consider what behaviors they would perform if later requested to do so. After subjects indicated their behavior preferences, measures of attitudes toward the behaviors, personal norms, and social norms were collected.

Gabrenya and Arkin (1979) found that when choosing behaviors for which to volunteer, committed subjects placed greater weight on personal norms and behavior-specific attitudes than on social norms, while low commitment subjects based their decisions to volunteer on personal and social normative beliefs. The investigators concluded that high personal involvement (prior commitment) influenced subjects to search for, and consider, decision-relevant information more carefully than subjects who were less personally involved. Furthermore, they noted that the use of specific, decision-relevant information by personally involved subjects suggests complex or vigilant processing (Janis & Mann, 1977), compared to a simpler, heuristic-based decision making process employed by low involvement subjects.

Chaiken (1980) conducted two experiments that differentiated personal importance at the response level from personal importance at the issue level and examined the effects of each type of personal involvement on opinion change. Experiment 1, examined the effects of perceived consequences on opinion change. Perceived consequences were outcomes of the decision that would directly affect decision makers. Subjects read a persuasive message and were asked to state their thoughts and opinions concerning the message and the person who had stated the particular position presented in the message. Response involvement (e.g., perceived consequences), message topic, quantity of arguments, and communicator likability were manipulated. High response involvement subjects were told that a second session would be scheduled during which they would be required to discuss their opinions on a topic identical to the message topic which they had just read, while low perceived consequence subjects were told they would discuss an alternate topic at their second meeting.

Results indicated that high involvement subjects expressed a greater desire to be well-informed on the message topic than did low involvement subjects (Chaiken, 1980). In addition, high involvement subjects' opinion change was most responsive to argument quantity, while low involvement subjects were more likely to change their opinions in response to a likable communicator. Furthermore, high involvement subjects spent more time considering a communicator's arguments and recalled more of these arguments than did low involvement subjects.

In Experiment 2, Chaiken (1980) examined the effects of issue involvement or personal relevance on opinion change. Individuals read a message concerning an upcoming change in the academic system at their university. Personal relevance was manipulated by informing subjects that a decision on the message topic (changing from a two semester system to a three semester system at the university) would be implemented at the university in the next academic year versus implementation in five years. Persuasive messages were presented in two forms, a likable communicator/one argument condition, and an unlikable communicator/five argument condition.

Results indicate that subjects who were faced with the possibility of an early implementation of change judged the issue to be significantly more relevant than did subjects who believed implementation would not take place in the near future. A Relevance X Source/Argument interaction emerged, with low involvement subjects displaying a greater opinion change in the likable communicator/one argument condition than in the unlikable communicator/five argument condition. The opposite relationship was found for the high involvement subjects, although the effect was not statistically significant.

When taken together, the pattern of results from the two experiments (Chaiken, 1980) suggests that when individuals must make decisions, they will do so differently contingent upon their level of personal involvement with the task itself and its underlying issues. Specifically, decision makers who are personally involved will carefully and systematically process available, decision-relevant information. Less personally involved decision makers will rely on effort saving information processing strategies to make decisions, basing their decisions on information that may have little relevance to the issues and decision at hand. Further support of these differences in information processing comes from measures that indicate high involvement individuals (perceived response consequences) are able to recall more decision relevant information, especially in high information conditions, than their low involvement counterparts. Information is processed systematically rather than automatically, thus requiring greater cognitive effort to encode the stimuli and store it in memory. By contrast, automatic processing relies on general cognitive categorization based on preexisting categories. Recall measures are often used as indicators of these different types of information processing. When processing is effortful and purposeful, specific information is stored and can be recalled later with greater ease than information that is poorly encoded (or perhaps completely ignored) through automatic processing.

Christensen-Szalanski (1978, 1980) conducted two studies to investigate the validity of the Beach and Mitchell (1978) contingency model as a guide to describing problem solving in general. In each study subjects were paid according to their performance on problem solving tasks. Moreover, variation in personal involvement was manipulated by assigning different pay scales ("benefits"

(Christensen-Szalanski, 1978, 1980)) to different problems. Thus, Christensen Szalanski (1978, 1980) manipulated internally-imposed accountability by varying the levels of decision maker benefit.

In Study 1, Christensen-Szalanski (1978) conducted two experiments examining the selection and use of problem solving strategies. In Experiment 1, individuals selected their strategies from a list of several methodologies that included aided-analytic strategies (which varied in formality) and nonanalytic strategies. In Experiment 2, subjects were assigned problem/problem solving strategy pairs. Measures of subjects' confidence in their problem solution and the accuracy of the solution were collected in both experiments. Benefits were calculated based upon a combination of subjects' confidence, and the difference between the estimated and true value of solutions. In addition, time to reach a solution was measured in

Experiment 1.

The results of Experiments 1 and 2 indicate that as the benefits of rendering a correct decision increase, decision makers are more confident in that decision and, from Experiment 1, take more time to reach a solution. Furthermore, the increase in decision makers' confidence is due to their use of more analytical problem solving strategies (which subjects also perceived as being more accurate). As the perceived importance of the problem increased (as measured by the increase in benefits for correct answers), so too did the willingness to use analytical strategies.

Christensen-Szalanski (1980) conducted two additional experiments concerning the cost and benefit functions involved in the selection and use of problem solving strategies. Again, due to the nature of "benefits", we are using

this term interchangeably with personal involvement. In Experiment 1, a within-subjects design was used to examine the effects of time deadlines on decision makers' selection and use of problem solving strategies. Subjects were required to solve a set of problems, each of which had a high or low time allowance for solution. Individuals were free to choose any type of strategy to render a decision.

Results of Experiment 1 indicate that in comparison to subjects in high time pressure conditions, those in low time pressure conditions had greater confidence in their analyses, had greater increases in confidence as a function of personal involvement, used more analytic, time consuming strategies, had no regrets using the strategy selected, and preferred the strategy selected (Christensen-Szalanski, 1980). Individuals in the high time pressure conditions displayed low confidence in their analyses regardless of the personal involvement of the problem, regretted the time imposition (especially as benefits increased), and preferred strategies more analytic than the ones employed.

In Experiment 2, Christensen-Szalanski (1980) replicated Experiment 1 of the Christensen-Szalanski (1978) study to determine if personal characteristics of decision makers impact their selection and use of problem solving strategies. Subjects were selected based on the limited nature of their analytical proficiency. It was hypothesized that these individuals would incur greater costs when implementing strategies than did their more analytically adept counterparts in Experiment 1, Christensen-Szalanski (1978).

The results of Experiment 2 showed that nonmathematical subjects chose more formal, analytical problem solving strategies as personal importance increased and that implementation of these strategies required accordingly greater investments of time. Subjects were also more confident in their analyses as they

moved from less to more formal analytical strategies. Comparing these data with those from Experiment 1 of his earlier study, Christensen-Szalanski found that mathematically less-proficient individuals were less confident in their analyses, used greater amounts of time to implement a given strategy, and were also less accurate in their solutions than more proficient individuals (Christensen-Szalanski, 1980).

Results indicate that regardless of aptitude, as personal involvement increases, individuals prefer to use more formal and analytically complex strategies, will expend greater resources in the solution of problems, and will be more confident in the analyses rendered. In addition, regardless of the actual accuracy of those analyses, individuals will have greater confidence in their solutions as strategy complexity and personal involvement increase.

Billings and Scherer (1988) investigated the effects of response mode and the personal importance of decision issues and outcome on information search behavior. As reviewed in the previous section describing response mode effects, the task for this study required the recommendation of candidates for the position of resident assistant (RA). The study was a between-subjects design employing a process tracing methodology. Personal involvement, which they referred to as decision importance, was manipulated in the following way: High importance subjects were told that their decisions would be used as the basis for subsequent selection decisions of RAs in the University's housing system. In addition, subjects were told that for the purpose of feedback, their decisions would be compared to the decisions of the average subject and to experts' decisions. The most accurate decision makers would have the opportunity for further participation in the selection process. In the low importance condition, subjects

were told that their decisions were solely for the purpose of theory testing and that the decision concerning RAs was incidental to the interests of the researchers. All subjects were either current residents in the housing system participating as part of the requirements for a psychology class, or were students currently employed in the housing department that were directly recruited for the experiment.

Billings and Scherer (1988) found that personal involvement had no significant main effects on any of the dependent variables measuring the search process. However, two significant interactions and two trends involving personal relevance did emerge. A Response Mode X Relevance interaction showed that when required to make a choice, individuals in the high relevance condition searched for significantly more information than did the individuals in the low relevance condition. However, individuals required to make a rating decision did not differ in depth of information search across levels of personal relevance. A Relevance X Trial interaction indicated that, in the low importance condition, as the number of trials increased, the amount of interdimensional searches decreased. In the high importance condition there were no significant search pattern changes over trials. In addition to these two interactions, two nonsignificant trends in the data emerged. An interdimensional search pattern was more likely under high personal involvement condition than in the low involvement condition. Also, the search mode under low personal involvement was more likely to be intradimensional/variable than in the high personal involvement condition.

The Billings and Scherer (1988) study indicates that personal involvement does moderate the impact of response mode on the amount of information searched. As expected, when individuals perceive a decision to be personally important, they will search for a greater amount of information than the actual

response mode itself might necessitate. Also, individuals faced with a personally important decision favored a search pattern that was more methodical (interdimensional) than used by individuals who were making a decision of low importance. Somewhat consistent with this finding, decision makers tended to use a search mode that was intradimensional and variable under conditions of low importance. When taken together, a decision which is personally involving to decision makers will motivate their search for information to make an accurate decision. These findings indicate that decision makers are responsive not only to the characteristics of the decision task, but also to characteristics of the decision environment.

However, one should be cautious in interpreting Billing and Scherer's (1988) results concerning the effects of personal importance on decision process variables, especially the absence of main effects. The operationalization of importance and the subjects employed in this study are potentially problematic. Subjects reported that this was an important task, regardless of the importance condition. In fact, both condition groups scored above the midpoint of the scale. This may be due in part to the population from which the subjects were recruited. All subjects came from the housing department and as such, any decisions concerning their place of living and/or employment might be perceived as relevant. It is also important to note that a manual information board was used in this study. This means that an experimenter was present throughout all eight trials. Demand characteristics may have influenced subjects' perceptions of importance which would help to explain the elevated ratings for the importance check. Lastly, Billings and Scherer (1988) employed an importance manipulation that created both personal involvement of decision makers, as well as decision

maker accountability due to external characteristics of the task environment. This, of course, makes it impossible to estimate the separate effects of each type of accountability.

Accountability as an External Imposition

Decision maker accountability may also arise from characteristics of the decision environment which may be quite unrelated to the individuals' dispositions toward the decision task and issues. Although the existence of this feature of decision making has long been recognized in work and organizational settings, decision making research has largely ignored the impact of external accountability on decision processes. (See Hagafors and Brehmer (1983) and McAllister et al. (1979) for exceptions.) Katz and Kahn (1978) claim this disregard for realism is a major threat to the external validity of judgment and decision making.

External accountability has been defined as the evaluation of the performance of a helping agent by someone other than the agent (Weiss, 1974), responsibility to make a choice (McAllister et al., 1979), performance evaluation or "public" feedback pressure (Rozelle & Baxter, 1981), the openness with which discussions are carried out (Klimoski & Ash, 1974), and the need to justify one's view to others (e.g., Hagafors & Brehmer, 1983; Tetlock, 1983, 1985a, 1985b, 1987). The common denominator for all of these definitions is the implication that any individual's performance of a task will be open to review by others, and that the performance will be directly attributed to that individual alone. This, in turn, implicitly or explicitly, makes the decision maker vulnerable to criticism (with its attendant threats to self-esteem) or to retaliation.

A common problem in distinction between the two basic types of accountability stems from the nature of response involvement. In internally-

imposed accountability, individuals want to make a good decision, regardless of whether their interests are intrinsic, social, monetary, etc. The involvement is one of approaching the task. In externally-imposed accountability, individuals feel they must make a good decision. The involvement arises from consequences that are mediated by others, rather than consequences being experienced directly by the decision maker. The consequences of poor performance may be more extreme and/or aversive in these situations.

When decision makers are held accountable, the demands for a correct decision are high (Beach & Mitchell, 1978). It might be expected that, due to the effects of evaluation apprehension, this demand would be greater for accountability to others (Adelberg & Batson, 1978). With internally-imposed accountability there is no evaluation apprehension. However, the different sources of motivation to respond to task demands are expected to yield similar results in terms of decision making behavior.

Much of the earliest work on external accountability was directed toward attempts to understand the factors involved in negotiation situations which might aid or hinder the resolution of intergroup conflicts. In one such study, Klimoski and Ash (1974) examined the effects of various levels of accountability and methods of negotiator selection on negotiating behaviors and outcomes. The levels of negotiator accountability examined by Klimoski and Ash (1974) were: (1) terminal accountability - the negotiator would report to the group after settling negotiations and the other group members could discuss the outcomes at this time, (2) continuous accountability - the negotiator would be watched through a one-way mirror by group members as negotiations proceed, and at regular intervals throughout the negotiation session, the negotiator would report the group's

progress (all in addition to meeting with the group at the close of negotiations), and (3) no accountability - the negotiator would not meet with the group after negotiations.

The results indicated that when negotiators were selected at random, those in the continuous and terminal accountability conditions had the most difficulty in the actual negotiations. It took these people longer to reach an agreement and they encountered more deadlocks than their no accountability counterparts. A surprising result was that, counter to expectation, there were no significant differences in performance between any of the levels of accountability. In comparison to elected negotiators, those who were selected by the experimenter and were continuously or terminally accountable perceived the greatest pressure, difficulty, and frustration during their negotiations.

One interpretation of these results is that negotiators who were elected to their position did not feel constrained by the accountability conditions due to a mandate put forth by the group when they were elected (Klimoski & Ash, 1974). Negotiators felt the group had given them their vote of confidence and thus were able to make concessions freely in their negotiations (i.e., negotiators' actions had been pre-justified by the group so there was no apprehension about the need to justify their behaviors later in the task). Negotiators who were selected by the experimenter and who were also accountable had no such mandate so they believed that the consequences of "giving in" during negotiations would have been much higher. In Beach and Mitchell's terms, the costs of giving in to the other negotiator were greater for this group, while the benefits for reaching an early resolution were minimized.

Rozelle and Baxter (1981) examined the influence of message source and message content on person perception under conditions of judge accountability. Rozelle and Baxter (1981) defined accountability as performance evaluation or "public" feedback pressure. The task was to rate candidates' fitness for graduate school admission based on a videotaped interview. In the high accountability condition, subjects were informed they would be required to attend a later session to discuss their ratings with other students, faculty, and selection committee members. They were also informed that their ratings would be available to the applicants and that these ratees invariably examined the rating forms. Low accountability subjects were not told of the need to discuss their ratings - their decisions would be confidential.

The results confirmed the researchers' hypothesis that judges under high accountability would produce descriptions of target persons that more reliably reflect characteristics of the target than the perceptual idiosyncracies of the perceiver (Rozelle & Baxter, 1981). In the high accountability condition, the single-target, between-judge agreement increased, while the overlap of descriptives used by any one judge to rate two targets decreased. However, when generating lists of target descriptive words, the high accountability subjects agreed less than the low accountability subjects. Rozelle and Baxter (1981) attribute this last finding to a conservative bias displayed by the high accountability subjects. These individuals actually produced fewer descriptive words than did the low accountability subjects.

The finding of greatest interest to this study is that when a rating form was supplied, high accountability subjects agreed on target descriptive words more often than did low accountability judges. This suggests that decision makers are

more careful and systematic in their attention to, and utilization of, evaluative information when they are under high external accountability.

Hagafors and Brehmer (1983) investigated the effects of justification on decision makers' application of judgment policies under varying conditions of task predictability and feedback. They hypothesized that the need to justify ones' judgment policies would change the nature of the task from a quasi- rational mode to an analytical mode. The task was a multiple cue learning task in which subjects predicted the level of the criterion based on the level of two cues. External accountability was manipulated by requiring subjects in the justification condition to explain their predictions during the task. The low accountability subjects were not required to justify their predictions at any time during the task.

Hagafors and Brehmer (1983) found a significant Feedback X Justification interaction for consistency of predictions and cue utilization. In conditions of no feedback, when compared with individuals not required to justify their decisions, individuals who were required to justify their decisions showed a significantly higher level of consistency in their predictions and utilization of information cues. There were no significant differences in the consistency of predictions and utilization of information cues for subjects in the feedback conditions.

Hagafors and Brehmer (1983) also found a significant Feedback X Justification X Task Predictability interaction for consistency of predictions and cue utilization. In tasks of low predictability, when compared with subjects who received feedback and were required to justify their decisions, no feedback subjects required to justify their predictions were more consistent in their predictions. There were no significant differences in conditions of high task predictability. They concluded that individuals who are not aware of their task

performance will employ a decision strategy that is consistent in its utilization of cues. In this way, justification for decisions rendered can be based on methodological consistency and the analytical strategy of cue use.

Tetlock (Tetlock, 1983, 1985b; Tetlock & Kim, 1987) examined the effects of decision maker accountability on the utilization of task relevant information. Tetlock (1983) investigated the effects of subjects' accountability on their complexity of thought concerning controversial issues. It was hypothesized that subjects who expected to justify their opinions to an individual with unknown attitudes would generate more cognitively complex and evaluatively inconsistent interpretations of issues than subjects who did not expect to justify their opinions, or who expected to justify their views to another person whose attitude was known in advance. Evaluative inconsistency was defined as the absolute value of the difference between the number of pro and con arguments individuals offered on an issue such that a score of zero indicated high inconsistency. Tetlock (1983) used four conditions of accountability: (1) no accountability, (2) accountability to a person with unknown opinions, (3) accountability to a person with consistently liberal views, and (4) accountability to a person with consistently conservative views. In addition, all subjects in the accountability conditions were told that their (anticipated) discussions would be audiotaped for later analysis. Subjects were asked to report their thoughts and feelings concerning three issues and then respond to three semantic differential scales concerning each issue. Their verbal responses were coded and scored according to the two structural components of integrative complexity (differentiation and integration) and according to political bent.

The results showed that accountable individuals expressed attitudes that were more consistent with the views of the person to whom they felt accountable. Subjects who were accountable to a person with unknown views were more integratively complex than subjects in the other three conditions. These subjects also generated thoughts that were balanced between the two extremes, i.e., they offered arguments for each side of an issue and were less evaluatively consistent. In post-hoc analyses, Tetlock (1983) also discovered that subjects who expected to be in relative disagreement with the person to whom they were accountable were more integratively complex and evaluatively inconsistent than those subjects who expected to be in relative agreement.

Tetlock (1985b) examined whether or not making individuals accountable would enable them to avoid common attributional errors. Specifically, it was hypothesized that accountability would reduce or eliminate the overattribution effect (the tendency to draw conclusions about the internal dispositions of individuals when plausible external causes of behavior exist). Subjects read an essay said to be authored by someone who either chose to take the stance put forth in the writing (high choice), or to whom the topic had been assigned (low choice). Individuals were assigned to one of three accountability conditions. In the preexposure condition, subjects were informed, prior to being presented with the essay, that they would be asked to justify their impressions of the essay writer to an associate experimenter. In the postexposure condition, subjects were not informed of the need for justification until after they had read the essay and the circumstances surrounding its authorship. Subjects in the no accountability condition were told that their impressions would be kept confidential.

Results indicated that preexposure accountability moderated the overattribution effect. In the high-choice essay condition there were no significant differences between the attribution ratings made by subjects in the three accountability conditions. However, in the low choice condition, individuals who were not accountable made strong attributional inferences about the attitudes of the essay writer, whereas subjects who had expected to justify their judgments before reading the essay made less extreme attributions about the author's attitudes. Subjects who were informed of their accountability after being exposed to the essay materials displayed attributions similar to the no accountability subjects. As Tetlock (1985b) notes, the timing of the accountability manipulation was only able to reduce the overattribution effect; it could eliminate, but not reverse, overattribution.

Tetlock and Kim (1987) investigated the "social pressures to justify one's views to others" (p. 700), on cognitive processing in a personality prediction task. Subjects were presented with one-half of a test taker's responses to a personality inventory, then asked to predict the remaining responses. The accountability conditions were similar to those in Tetlock (1985b), i.e., preexposure accountability, postexposure accountability, and no accountability.

The results of this study replicated those of the previous study by indicating that preexposure accountability subjects displayed more integratively complex impressions of the test takers than did postexposure and no accountability subjects. They also made more accurate predictions and the between-group differences in accuracy remained even after controlling for integrative complexity. Furthermore, preexposure accountability subjects showed less overconfidence in their ratings compared to postexposure and no accountability subjects. These

effects also remained significant after controlling for integrative complexity. Preexposure accountability subjects also had better calibrated confidence ratings than did the other subjects. Again, these differences remained after controlling for integrative complexity.

The authors drew several conclusions from these studies. First, individuals cope with the pressures for accountability by considering available information in complex and multidimensional ways. By doing so, individuals are better prepared for arguments counter to their opinions. Tetlock (1983,1985b) views this strategy as being adaptive in maintaining ones' social image and self-esteem. An awareness of the weaknesses in ones' own arguments allows individuals to bolster their arguments at those very points of weakness. Tetlock (1983) calls this type of awareness "preemptive self-criticism" and states that it is a functional response to situations where individuals are accountable.

Second, Tetlock (1985b), and Tetlock and Kim (1987) interpret the pattern of results in these studies to be indicative of the more complex and multidimensional processing found by Tetlock (1983). Preexposure accountability did not affect the way in which individuals utilized information to reach a decision, rather it influenced the way in which individuals encoded and processed information to begin with. The processing was more controlled rather than automatic. This is evidenced by the finding that while preexposure subjects made less extreme attributions of the essay writer who was assigned a topic than did the subjects in the other conditions, accountability had little effect on the assignment of attributions when the essayist chose the topic about which he/she wrote. The fact that preexposure accountability individuals were also more accurate and less overconfident in their predictions than other individuals points to what Tetlock

and Kim (1987) describe as more vigilant, thorough, and self-critical information processing. These findings are due partially to the greater integrative complexity displayed by the preexposure condition individuals, but the effects remain significant even after controlling for this factor. Preexposure accountability not only influenced the way individuals processed information, it affected how individuals considered their decision after it had been reached. When their decisions were compared to an objective standard for the task, preexposure accountability subjects indicated more realistic levels of decision confidence than did subjects in the other conditions. From this, Tetlock and Kim (1987) concluded that after information has been utilized to render a decision, accountability also "functions as a social brake on judgmental biases that occur in our less reflective moments" (p.708) - accountability motivates further thought.

McAllister et al. (1979) conducted a series of experiments that focused on the effects that certain environment characteristics (decision reversibility, decision significance, and decision maker accountability) might have on strategy selection. The tasks involved role playing the part of different decision makers in a variety of organizations. Each of three experiments involved manipulations of each of the three variables. For the accountability manipulation in Experiments 1 and 2, subjects assumed the role of organizational decision makers who were either solely responsible for decisions (high accountability), or who merely made recommendations to a committee (low accountability). In Experiment 1, subjects were required to select a problem solving strategy based on two characteristics: (a) stated probability of a correct response using the strategy, and (b) cost to implement the strategy. Experiment 2 was identical to Experiment 1 except that subjects were required not only to select, but implement the chosen strategy and

use the generated data as the basis for their decision. Each subject evaluated eight decision cases, each case representing one cell of the Reversibility X Significance X Accountability matrix. The measures collected were strategy selection, ratings of importance, and ratings of felt pressure.

The results for Experiment 1 and 2 were nearly identical. The perceived decision importance, together with the selection (in Experiment 1), and use (in Experiment 2) of analytic decision strategies was greater when individuals were in the high, versus the low, accountability conditions. Also, in Experiment 2, when decision makers were accountable, individuals perceived the pressure to make an accurate decision to be greater than when they were in the low accountability conditions.

In Experiment 3, McAllister et al. (1979) asked subjects to rate the marketability of two groups of products and decide which product in each group had the best market potential. Individuals had four strategies which they could use in their computations. The strategies varied according to ease of use, amount of information used, and the strategy's past record of accuracy. Decision maker accountability was manipulated by informing subjects that they would be required to defend their decisions on one of the two tasks. The experimenters collected data on the subjects' predictions of the time necessary to complete the first task, the strategy selection, and the actual time to complete the task.

The results indicated that subjects in the accountability condition anticipated needing more time to complete the task, selected strategies which were more complex, and did, in fact, take more time to complete the task than subjects in the no accountability condition.

The final investigation to be examined in this review of external accountability was conducted by Adelberg and Batson (1978). The authors were interested in the effects that varying levels of resources would have on helping behavior when individuals offering assistance are accountable to various external constituencies. Adelberg and Batson (1978) defined accountability as an external evaluation of performance and predicted that accountability would increase subjects' apprehensions about their actions. Subjects were asked to assist a student financial aid organization in making decisions concerning applicant need and deservedness. Individuals reviewed the students' applications and were told that any amount of assistance below the requested amount would be of no benefit to the recipients. In conditions of accountability, subjects were told that they would report their assistance decisions to different constituencies. Three forms of accountability were employed: (1) accountability to the applicants (recipient accountability), (2) accountability to the program director (provider accountability), and (3) no accountability. Resource levels were manipulated such that in the high resource condition, the funding would be adequate to meet the needs of all worthy applicants. In the low resource condition, the funding was inadequate, even for the needy students. The measures of interest were the amount of money used effectively and the amount of money wasted.

The results indicate that accountability can have detrimental effects on decision making as evidenced by the ineffective allocation of resources. Specifically, main effects for resource waste were found in accountability and resource adequacy conditions with accountable subjects and subjects with inadequate resources being the most wasteful. Subjects in the recipient accountability conditions favored a policy of assisting all applicants a little bit.

Provider accountable subjects utilized a significantly smaller portion of their resources than recipient accountable subjects only in the adequate resource condition.

Adelberg and Batson (1978) interpreted these results to be indicative of two different types of motivation in the decision making process corresponding to the two respective accountability conditions. Both accountability conditions contributed to subjects' ineffective use of resources, but for different reasons. In the recipient accountable condition, subjects appear to be motivated by a sense of fairness to their constituents. Provider accountable subjects appear to want to spend as little as possible as evidenced by the small resource allocations to applicants in the high resource condition. Subjects appear to have been motivated to save money and be thrifty in the eyes of the provider. Adelberg and Batson (1978) concluded that accountability aroused evaluation apprehension, which in turn caused these subjects to focus their attention on themselves, rather than on the needs of others. In both conditions subjects attempted to reach a solution they felt would be easily justifiable to those that they expected to face later.

Conclusions Concerning Accountability

Investigations of internally-imposed accountability show that it has strong and consistent effects on the way in which individuals utilize task information, and that these effects are fairly uniform across individuals of various aptitude levels. People who are internally accountable are more discerning and consistent in their attention to, and use of information, than individuals who are not personally involved with the decision. Individuals are motivated to process the information in complex and effortful ways, rather than processing the information automatically, with little thought to the relevance of the information on which

they were basing their decisions. This is most apparent in the opinion change (Chaiken, 1980; Petty & Cacioppo, 1984) and attitude-behavior studies (Gabrenya & Arkin, 1979). In these studies, individuals relied on decision relevant information on which to base their decisions, rather than on such irrelevant information as speaker likability or prejudiced social norms. Individuals also employed more complex and time consuming strategies when making decisions under conditions of high internal accountability. While none of the studies reviewed in this section required explicit information searches, there is no reason to expect that motivation induced by accountability would operate only at the information utilization phase of decision making. It seems reasonable to expect that individuals would be equally motivated to focus any information search on the information that they believed to be most relevant to a task.

Research investigating the effects of externally-imposed accountability has yielded results that are very similar to those induced by internally- imposed accountability. Individuals are motivated to process information actively, rather than relying on simplifying or automatic processing strategies. Encoding of information is more systematic and based more closely on the stimulus value of the information (Petty & Cacioppo, 1984; Tetlock & Kim, 1987) as evidenced by subjects displaying greater rating agreement, more discerning descriptions of objects, and greater accuracy in attributions. Individuals used more formal and analytic strategies in high accountability conditions and formed more integratively complex impressions of the stimulus objects.

A summary statement relating the complex and systematic encoding of information in conditions of high accountability as compared to low accountability conditions would be difficult to dispute. High accountability, whether internally-

or externally-imposed, promotes a more thorough use of relevant information. However, there are some performance irregularities indicated by the results of Tetlock and Kim (1987), Adelberg and Batson (1978), Klimoski and Ash (1974), and Rozelle and Baxter (1981) that point to a conclusion that internally-and externally-imposed accountability should be considered separately.

The performance differences appear to stem from three aspects of the situation - the individuals to whom the decision makers are accountable, what the decision makers think is a justifiable response in light of those to whom they are accountable, and how a good decision can be translated into concrete terms relevant to the decision task. It is possible that in some instances, the influence of external accountability may be based on three elements: (1) observation -the decision is attributable to the decision maker, (2) confrontation - the "victim" can challenge the decision maker, and (3) retaliation - the "victim" can take counter-actions against the decision maker to "even the score". Although the first two elements of external accountability are readily apparent in most studies of this environmental characteristic, the study by Adelberg and Batson (1978) provides an especially illuminating example of the differing effects of accountability and a piece of evidence against the common (mis)conception that accountability invariably improves the quality of decision making. As these investigators found, accountability does serve as a way to arouse and direct attention, but it is easy to see that the quality of the decision depends on what grounds decision makers attempt to justify their judgments and how that judgment is related to outcomes that are important for those to whom he or she is accountable. When accountable to the assistance provider, individuals tried to be thrifty with the financial aid. In this way, they would have money left over - a positive consequence for the

provider - and could successfully avoid the possibility of an unpleasant confrontation. When individuals were accountable to the needy students, the relevant outcome was the number of people assisted. Even though helping everyone would lead to waste, a uniform allocation of funds would be easy to justify. Again, by deciding to help everyone a little, decision makers could avoid confrontations where their decisions would be difficult to explain since no one person would be selected at the expense of any one other person. When individuals were not accountable to others, their waste was reduced. There were no threats or pressures from observation or confrontation. Under the circumstances investigated in the Adelberg and Batson (1978) study, accountability actually hindered performance.

Finally, the Rozelle and Baxter (1981) study is an example of the type of improved performance commonly associated with accountability. Since accountability was not to any single person, a strategy of thorough information utilization as the basis for decisions could be justified to all.

VII. Hypothese Regarding the Effects of Response Mode, Internally-Imposed Accountability, and Externally-Imposed Accountability on Search Strategy

This study will examine the effects of response mode, internally-imposed accountability, and externally-imposed accountability on search strategies in a personnel selection task. Measures of search strategy to be investigated will consist of the principal variables employed in prior process tracing studies: depth of search, search latency (for entire task, as well as per item searched), variability of search, search dimensionality, search mode, and linearity of search. Variation in the independent variables - response mode, internally imposed accountability, and externally imposed accountability - is expected to affect the use of strategies that have a higher perceived benefit - or anticipated probability of yielding a correct decision. Following Beach and Mitchell (1978), this means more reliance on compensatory strategies. Use of a compensatory strategy will be inferred when individuals display: (1) a greater depth of search, (2a.) an overall increase in the time for search, (2b.) an increase in the latency per unit information searched, (3) a decreased variability of search, (4) a more interdimensional search, (5) a less variable/intradimensional search mode, and (6) a more linear search strategy. Specific hypotheses about the effects of response mode and the accountability manipulations on the process tracing measures are presented below.

Hypotheses About Main Effects

Response Mode

Research in decision making has devoted much more attention to the characteristics of the decision matrix (e.g., the alternatives, attributes, and their values) than to the type of response mode required of the decision maker. However, research has shown (albeit sometimes indirectly) that response mode does affect strategy selection. The two response modes addressed here, rating and choice, impose very different levels of task demand upon the decision maker. Rating tasks require the assignment of a single, scale-based, numerical value to each alternative. Therefore, rating tasks require large expenditures of resources and are highly demanding - each alternative in a rating task must be assigned a value, there is a need for comparability of ratings, and multiple categorizations are necessary to perform the task. Choice tasks require the assignment of a category value to each alternative. Therefore, choice tasks require small expenditures of resources and are much less demanding than rating tasks - alternatives are assigned to one of a small number of categories (typically the two categories, "accept" and "reject"). Moreover, choice tasks impose no need for comparability within or between categories. Thus, variations in response mode can create task problems that require individuals to process information in cognitively demanding ways.

> **Hypothesis 1:** The greater demands inherent in a rating task will promote the use of strategies that produce greater depth of search, longer search latency (at both the item and task level), decreased variability of search, greater interdimensional search, less variable/intradimensional search, and more linear search, than strategies promoted in a choice task.

Internally- and Externally-Imposed Accountability

The distinction between internally-imposed and externally-imposed accountability is subtle but important. Accountability is important because different levels and types of accountability elicit different levels of decision maker motivation to do well on the task. Internally-imposed accountability is defined here as "the personal involvement of individuals at the topic and/or response level of the decision." This type of accountability is due solely to the internal dispositions of decision makers and arises from what Deci and Ryan (1980) propose is peoples' intrinsic motivation to be competent and self-determining. Alternately, externally-imposed accountability is defined as the "responsibility for decision making performance that is determined by the evaluation of others", i.e., behavior that is motivated by the valence of external contingencies of the situation (Vroom, 1964). In the condition of internally-imposed accountability, people will want to do well to meet the norm of reciprocity (Gouldner, 1960) and avoid feeling unfair. In the condition of externally-imposed accountability, people will want to do well to gain the approval of those to whom they are accountable and to avoid appearing ignorant. Thus, accountability can create a task environment where individuals want to do well, and from Beach and Mitchell (1978), this desire is translated into information processing that is cognitively demanding.

In spite of the differences in the source of motivation between internally- and externally-imposed accountability, both are expected to yield similar decision strategies.

Hypothesis 2: The higher levels of motivation inherent in conditions of high internally-imposed accountability will promote the use of strategies that produce greater depth of search, longer

search latency (at both the item and task level), decreased variability of search, greater interdimensional search, less variable/intradimensional search, and more linear search, than strategies promoted in conditions of low internally-imposed accountability.

Hypothesis 3: The higher levels of motivation inherent in conditions of high externally-imposed accountability will promote the use of strategies that produce greater depth of search, longer search latency (at both the item and task level), decreased variability of search, greater interdimensional search, less variable/intradimensional search, and more linear search, than strategies promoted in conditions of low externally-imposed accountability.

Hypotheses About 2-Way Interactions

In addition to the three main effects, two 2-way interactions are anticipated - a Response Mode X Internally-Imposed Accountability interaction and a Response Mode X Externally-Imposed Accountability interaction. The rating response mode and both of the high accountability conditions all impose strong demands upon decision makers' information processing capacities. In these conditions, individuals process information in cognitively demanding ways, rather than heuristic processing in tasks which involve choice or no accountability. It is hypothesized that any of these factors - a rating response mode, high internal accountability, or external accountability - is sufficient to produce highly compensatory strategies.

Hypothesis 4: Individuals in the choice - high internally-imposed accountability conditions will use more compensatory strategies than those individuals in the choice - low internally-imposed accountability conditions. However, no significant differences are expected between low and high accountability in the rating response mode.

Likewise,

Hypothesis 5: Individuals in the choice - high externally-imposed accountability conditions will use more compensatory strategies than those individuals in the choice - low externally-imposed accountability conditions. However, no significant differences are expected between low and high accountability in the rating response mode.

The two forms of accountability, internally-imposed and externally-imposed, are expected to show the same type of interaction with response mode. It is anticipated that low accountability - choice will be lower on measures related to compensatory search strategies than any of the other three conditions (low accountability - rating; high accountability - choice; high accountability - rating) which should not differ significantly. No interaction is anticipated between the two accountability conditions.

VIII. Method

Overview

The purpose of this study was to investigate the effects of a decision problem characteristic and two decision environment characteristics on individuals' selection of decision strategies. The characteristics were response mode, and internally-imposed accountability and externally-imposed accountability, respectively. A process tracing methodology was employed to examine the predecisional behavior of individuals as they acquired information with which to complete the task.

The decision task proposed here differed from those commonly employed in prior studies. While most decision research employing personnel tasks has focused on decisions concerning the suitability of alternatives for addition to, or movement within a set (i.e. selection of the best applicant, or rating employees on their deservedness of a promotion), natural trends in business cycles currently highlight the need for decision research investigating the exclusion of alternatives from a set. Downsizings and organizational mergers dictate the necessity for staffing decisions that involve the selection of employees to be dropped from the current workforce. The objective tasks may be equivalent, although the nature of the decision task may be different due to perceptual framing.

Sample

The number of subjects needed for this study was determined through a power analysis according to the methodology suggested in Cohen (1977). A

medium effect size was anticipated for response mode, and the internally-, and externally - imposed accountability conditions. In order to reach a power coefficient of .80, a minimum sample size of 136 subjects was required (8 cells X 17 subjects per cell) for this experiment. (See Appendix B for the power analysis.)

The individuals participating in the study (N=143) were students enrolled in Introductory Psychology courses at a large, Midwestern university. Participation was on a voluntary basis and subjects received extra credit points for their assistance in the experiment. Females comprised the majority of the sample (N=90, 63%, compared to males, N=53, 27%) and a breakdown of subjects by class standing indicates that the majority of students were Sophomores (N=56), followed by Freshmen (N=52), Juniors (N=26), and Seniors (N=9).

To ensure at least a minimal level of task information familiarity, only students with past and/or current work experience at McDonald's (N=82), Wendy's (N=24), or Burger King (N=35) were permitted to participate. These individuals had been employed in a fast food restaurant for an average of 8.48 months (SD=8.70 months, range=1 month to 46 months) and had worked an average of 24.9 hours per week (SD=8.9 hours per week, range=6 hours per week to 45 hours per week). The majority of individuals described their position as one of the following: 1. cashier (N=41), 2. general crew worker (N=35), or 3. cook (N=31), with the remainder of the subjects having filled a variety of positions less easily categorized (N=36).

Although Beach and Mitchell (1978) claimed that increased familiarity would lead to the selection of less analytic strategies, the influence that this variable might have had was, in essence, being controlled for. All subjects were familiar, to varying degrees, with the information with which they were

presented. Additionally, any effects would appear in each condition which, at worst, would serve to depress all baseline search indices to the same extent. The desire for task realism and plausibility far outweighed any effects that may have arose from familiarity. Moreover, given their familiarity with the work setting from which the information came, it should have been easier for these subjects to assume the role of a knowledgeable decision maker.

Design

The experimental design of this study was a 2 (response mode: rating or choice) X 2 (internally-imposed accountability: none or high) X 2 (externally-imposed accountability: none or high) between-subjects design with a minimum of 17 subjects per cell.

Task

Subjects performed a computerized decision making task that involved either choosing a fast food employee for termination or rating these same employees on their deservedness for dismissal. Information regarding the performance of these hypothetical incumbent employees (alternatives) was grouped in job dimensions based on the work of McKellin (1989). The computerized information display board and process tracing program recorded the amount and type of information a decision maker accessed prior to rendering his/her decision. The computer also recorded the time spent per unit of information accessed.

Task Information

McKellin (1989) used job descriptions and performance rating materials supplied by two of the three fast food chains, as well as onsite observations and interviews to select six job dimensions which were similar across all three fast food

restaurants. Within each dimension, McKellin (1989) identified seven job tasks which were equivalent across the restaurants. As part of his investigation, McKellin (1989) asked subjects to indicate which job behaviors were most important to success on the job. The two most important behaviors within each job dimensions were be used in the present study. The decision was made to use two pieces of information per matrix cell for the reason of increased realism for the study participants. Realism was enhanced in two ways. First, the dimensions used in McKellin (1989) were collections or sets of behaviors that were organized around work stations within the restaurant. As such, the behaviors within a dimension were interrelated, but not commensurate. Performance on a single behavior would not capture the variance within a dimension; two behaviors would be more meaningful in that respect. Secondly, using two pieces of information allowed us to vary the level of performance exhibited by the 'job incumbents.' Three levels of performance were used: (1) good performance (both behaviors were indicative of success on the job), (2) mixed performance (good performance on the most important behavior within a dimension and poor performance on the second most important behavior within the dimension), and (3) poor performance (poor performance on both behaviors within the dimension). Again, it was expected that this would add realism to the task. (See Appendix C.)

Process Tracing Program

This study used the Michigan State University (MSU) process tracing program to record subjects' information search. Experience with the MSU process tracing program has proven it to be reliable and easy to operate. The program was also selected due to the availability of local, expert, programming support.

The MSU process tracing program displays a list of alternatives and a list of dimensions from which subjects access decision relevant information. Subjects select a cell of the decision matrix by pressing the numbered key corresponding to the desired alternative, pressing the RETURN key, pressing the numbered key corresponding to the desired dimension information, then pressing the RETURN key once more. Thus, to select Alternative 2, Dimension 3, the subjects press the following sequence of keys: 2 - RETURN - 3 - RETURN. This allows subjects to select the information in this cell of the decision matrix. The process is repeated throughout the search until individuals view all the information they wished to access.

Procedure

Two subjects were scheduled to attend each experimental session. During that time, the pair of subjects were asked to sign participation consent forms. (See Appendix D for consent forms.)

After the subjects read and signed their consent forms, the experimenter administered the filler task. (The Job Security Threat task was used as the filler task and is described below.) After subjects finished the filler task, they were placed in separate rooms, and asked to take a seat in front of a personal computer. The experimenter 'reviewed' each individual's measure to determine the subject's performance and then presented the experimental manipulations. Following a brief review of the operation of the computerized decision making program as displayed by the program itself, the experimenter asked the subject if he/she had any questions concerning the operation of the program. The subject was then started on the tutorial program which illustrated the basic operation of the process

tracing program and the type of response mode that was required of the subject in that particular condition. (See Appendix E for the computer task tutorial.)

Following completion of the tutorial task, subjects were again asked if they had any questions concerning the operation of the computerized decision program. If they had no questions, they were allowed to begin the actual decision making task. This task required individuals to search the decision matrix and render a decision based on the information acquired in that search. (See Appendix F for the task introduction.)

Upon completion of the computerized decision making task, subjects were presented with a questionnaire regarding their assessment of dimension importance and a questionnaire designed to check the efficacy of the response mode and accountability manipulations. (See Appendix G.) In addition, a brief demographic questionnaire was administered at that time. (See Appendix H.)

When subjects completed the manipulation check they were thoroughly debriefed. Subjects were asked if they had any questions concerning the experiment and whether they wished to receive a summary of the study upon its completion. (See Appendix I for a copy of the debriefing letter.) Any further questions were answered at that time and a list of the subjects wishing to receive a summary of the study results was generated. If the subjects had no further questions, they were thanked for their participation and dismissed. This procedure was modified slightly for subjects in the high externally-imposed accountability conditions.

In the high externally-imposed accountability conditions, neither subject was permitted to leave the experiment until both subjects had completed the decision task. Subjects were asked to complete the dimension importance,

manipulation check, and demographic questionnaires, indicate when they had completed the forms, and then wait for the other subject to complete the task and questionnaires. Due to the lack of soundproofing in the experimental laboratories, subjects were able to hear the conversations and noise of activity in the adjoining debriefing room. Allowing one subject to leave the experiment while the other subject was still performing the decision task would have allowed one subject's descriptions of his/her decision processes to contaminate the decisions of the other subject. (Appendix J contains the complete transcript of the experimenter instructions.)

Independent Variables and Manipulations

The independent variables manipulated in this study have been fully described in the literature review and only a brief description will be included here. A summary of the task and experimental manipulations follows these descriptions.

Response Mode

Subjects performed one of two types of decision tasks. The tasks differed according to the response mode required, i.e., whether the task required the selection of one alternative from a group of alternatives, or whether the decision maker had to determine a rating for each alternative presented. The response mode manipulation was presented as part of the externally-imposed accountability manipulation. The process tracing program presented one of the two response modes. During the tutorial, subjects received basic instructions on how to operate the computer program itself in regard to the type of response mode required.

Internally-Imposed Accountability

Internally-imposed accountability stems from an individual's personal dispositions toward the issues surrounding a decision or with the consequences of the decision itself. It should be restated that this personal involvement does not stem from the imposition of others' expectations on the decision maker, the decision making process, or the decision itself. Internally- imposed accountability can also be induced by creating a condition of indebtedness on the part of the decision maker. The manipulation of internally-imposed accountability was based on the recent review of social influence techniques by Cialdini (1988).

Of the techniques described, the norm of reciprocity (Gouldner, 1960) appeared most suitable for use in our investigation. The norm of reciprocity states that individuals will feel compelled to restore equity in a situation where they receive unexpected overcompensation. The individual will attempt to restore equity in a manner that is situation specific (Cialdini, 1988). From studies and anecdotal accounts, Cialdini (1988) reports that the norm of reciprocity is central to societal advances and can be found to operate in situations ranging from donation solicitation to the purchasing of unwanted items and the sparing of lives in wartime. While our manipulation does depend on invocation of the reciprocity norm, we will be satisfied if individuals devote greater effort to the decision task as opposed to donating money or sparing lives.

We based the manipulation of internally-imposed accountability on the premise that if individuals receive an unexpected 'gift' (early dismissal from the experimental session with full credit), they would attempt to repay the gift in a way that was equitable and to the advantage of the experimenter (increased effort on the decision task). Alternately stated, when individuals perceived their receipt

of rewards was not in accordance with the prescribed amount of inputs necessary to generate those outputs, they would attempt to restore the input/output ratio in whatever fashion was reasonable to the situation (Adams, 1965). When individuals were not aware that they were receiving this gift, or the gift was expected, feelings of inequity would not arise. Due to the nature of the task and the limited opportunities in which to restore equity, increasing task effort appeared to be the only viable means to reciprocate.

Two levels of this variable were examined: no internally-imposed accountability and high internally-imposed accountability. The level of internally-imposed accountability was manipulated by creating a situation in which either the subject experienced a feeling of positive inequity (due to experimenter emphasis on the subject's overcompensation for prior task performance), or the subject did not have a feeling of inequity (the inequity in compensation was not made salient).

To create a situation where unexpected overcompensation could occur, all subjects performed a task prior to the process tracing task. The task selected for the purpose of decision maker overcompensation was the Job Security Threat (JST) task. The JST task was included here simply as a way to create a situation where internally-imposed accountability could be manipulated. The task required respondents to describe their perceptions and intended responses to a threat to their continued employment. Individuals were to imagine that they worked at a part-time job that was essential to their financial support while in school. The threat to respondents' employment status varied according to severity, certainty, immediacy, and duration, all of which were based on the declining financial status of their employer. After presentation of the threat message, subjects were asked

to recall background aspects of the message, as well as the four manipulated variables. Subjects were assessed on their inclination to begin a job search and the requirements that they would expect a new, more "certain " job to fulfill before they would consider leaving the threatened job. The four conditions of the JST task were counterbalanced across the experimental conditions of the main study. (See Appendix K for a complete summary of the JST task and its accompanying stimulus materials.)

Following the completion of the JST task, individuals received the internally-imposed accountability manipulation. In conditions of high internally-imposed accountability, individuals were informed that the data they provided on the Job Security Threat task was sufficient to warrant their early dismissal with full credit. Thus, these individuals were getting several extra credit points that should have obligated their complete participation in a rather lengthy experiment. Individuals in the low internally-imposed accountability conditions were not made aware of their receipt of unearned extra credit points, although the tasks performed in these conditions and the level of extra credit points awarded did not differ from those in the high internally-imposed accountability conditions.

Externally-Imposed Accountability

Externally-imposed accountability arises not from the dispositions of the decision makers, but from the impositions of others' expectations. When accountability is an external imposition, individuals are directly responsible to others for the quality of the decision made. Performance will be directly attributed to the individuals and consequences of the decision (both good and bad) will in some way be reflected back on the individuals. Simply stated, a fundamental precondition for externally-imposed accountability condition in any

task is the identifiability of individuals' performance. In some tasks, not only does externally-imposed accountability mean that individuals' performance will be observed, but that people directly impacted by the decision will have the opportunity to confront, or possibly retaliate against the decision maker. For these reasons, people are motivated to appear competent and the integrity of the task performed becomes salient.

Two levels of externally-imposed accountability were examined: no externally-imposed accountability and high externally-imposed accountability. Because externally-imposed accountability arises when others are in a position to evaluate the decision and have the ability to respond positively or negatively toward the decision maker, one way in which to impose this type of accountability was to require that decision makers justify their final decisions and decision processes to an authority figure or audience. The sense of high externally-imposed accountability was implemented by informing subjects in these conditions that they would be videotaped as they explained to the experimenter, their final decision and the decision processes they used to arrive at that decision. Video recording equipment was set-up and visible in the lab area to enhance the manipulation. In conditions of no externally- imposed accountability, subjects were not told of a videotaping session, nor did they see any video recording equipment in the lab area. They were informed that their decisions would remain strictly confidential.

Task Perception Scales

The experimental manipulations were hypothesized to differentially affect individuals' perceptions of the decision task. Subjects were asked to respond to a series of semantic differential items which were then grouped into scales based on

their item content. These scales assessed individuals' perceptions of task importance, decision maker performance, task equity, task familiarity, task affect, decision maker accountability, and decision maker effort. In the cases of task importance, task equity, and decision maker accountability, the task perception scales were to serve as manipulation checks. The viability of these task perception scales as manipulation checks has been questioned. It has been expressed that a manipulation check should be a direct question of how the conditions surrounding the experiment were perceived, not how the task was perceived after the experimental conditions were effected. In other words, these scales may not be sufficiently proximal to the event which we wished to assess. These reservations are addressed below. In addition, each perception scale and the hypotheses concerning the relationships of the manipulations to these scales are discussed below.

Task Importance

The task importance scale measured individuals' beliefs in the decision task's usefulness, worth, and consequentiality. The task importance scale was originally employed by Billings and Scherer (1988) as a manipulation check for their decision importance manipulation. The scale was composed of five items, including the four original items used by Billings and Scherer (1988), and an additional item we added to the scale. This scale was used to assess the similarity or difference in subjects' task perceptions across the present study and the study conducted by Billings and Scherer (1988). We were not satisfied with their manipulation of task importance since it relied on elements of accountability, yet we wanted to see if refinements in the manipulation of accountability would

ultimately be perceived in terms of accountability or still as differences in task importance.

Based on the work done by Billings and Scherer (1988), we had anticipated no differences in task importance between response mode conditions. However, differences were anticipated between levels of accountability for both internally-, and externally-imposed accountability such that individuals in the high accountability conditions would perceive the task to be more important than would the individuals in the low accountability conditions. The difference between the internally-imposed accountability conditions was expected due to high accountability subjects being more aware of the need to restore equity in the experimental session than their low accountability counterparts. People who are personally involved in their decisions view those decisions as important (Billings & Scherer, 1988). Conditions of high external accountability arouse and focus the attention of decision makers such that they perceive the task to be more important than people in low accountability conditions (e.g., Adelberg & Batson, 1978; McAllister et al., 1979).

Decision Maker Performance

The performance scale assessed subjects' perceptions of decision task competency and quality. The scale was composed of eight items. It was hypothesized that perceptions of task performance would differ according to response mode, internal accountability, and external accountability conditions. The cognitively demanding rating response mode would lead subjects to believe that their decisions were less effective than the decisions rendered by the subjects making a selection. Raters made a series of decisions, each of which was (supposedly) metrically comparable to the others, while people making a choice

needed only make broad categorical decisions. Individuals performing an easy task should be more confident in their performance than individuals performing a difficult task. When individuals make a concerted effort to 'do well', it is expected that they will perceive their performance to be enhanced accordingly. For this reason, it was anticipated that individuals in the condition of high internal accountability would believe their decision performance was superior when compared to the perceptions of performance given by the low internal accountability individuals. Lastly, due to preemptive criticism experienced by individuals in high external accountability conditions, it was expected that their perceptions of performance would be more conservative than the perceptions of performance submitted by subjects in the low external accountability condition.

Task Equity

The task equity scale was composed of four items which assessed the level of fairness of the decision task as perceived by the decision makers. The scale was to serve as the manipulation check for equity such that in conditions of high internal accountability, subjects would perceive the task to be more equitable than would subjects in the low internal accountability condition. Again, it is duly noted that this scale may not be proximal enough to the construct in which we were interested. However, in light of the manner in which Billings and Scherer (1988) assessed the efficacy of their manipulations, we believed that the scale could be used as a check on the internal accountability manipulation. No differences in the perceptions of task equity were anticipated between the response mode conditions or between the conditions of low and high external accountability.

Task Familiarity

The task familiarity scale was composed of seven items which were designed to assess individuals' perceptions concerning the novelty and realism of the decision task. We had made a concerted effort to isolate a decision task that would be realistic and familiar to the individuals who would serve as our subjects. In that way, our participants would be subject matter experts and the external validity of the study would be enhanced. Because we selected only those individuals who claimed to have current and/or past work experience at a fast food restaurant, we believed that there would be no differences in task familiarity across conditions. By measuring perceptions of familiarity, we could validate our assumptions of homogeneity in the sample.

Task Affect

The task affect scale was composed of six items which were designed to assess subjects' feelings toward the decision task; did people find the task pleasant or aversive, interesting or uninteresting, etc. This scale was included as a purely exploratory measure - no hypotheses were put forth concerning this group of perceptions.

Decision Maker Accountability

The decision maker accountability scale was composed of three items which attempted to assess how accountable or responsible subjects felt concerning their participation in the task. This scale was the manipulation check for our internal and external accountability manipulations. Issues concerning the appropriateness of task perceptions as indicators of efficacious experimental manipulations have been discussed. Subjects in the high internal and external accountability conditions were expected to feel more accountable for their decision

making behavior than individuals in the low internal and external accountability conditions. In the high internal accountability condition, subjects would feel a personal involvement with the task due to their attempts to restore equity to the situation. High external accountability individuals would feel accountable due to the requirement that they submit their decision(s) and decision making rationale while being videotaped.

Decision Maker Effort

The decision maker effort scale was composed of three items which attempted to assess the amount of effort individuals devoted to the decision task. We had anticipated differences from each of the manipulations. It was expected that due to the inherently more demanding task, individuals required to make a set of ratings would perceive the task to be more effortful than individuals required to make a selection. For conditions of internal accountability, we anticipated high accountability subjects to try harder to make a good decision than individuals not internally accountable. Thus, the high internal accountability subjects would perceive their level of effort to be greater than the level of effort reported by the low internal accountability individuals. In conditions of high external accountability, individuals process information more effortfully than individuals in low external accountability conditions. Thus, high external accountability individuals are likely to report perceptions of greater task effort than the low accountability subjects.

Dependent Variables

The response mode and accountability manipulations were hypothesized to differentially affect decision makers' information acquisition strategies. Indicators of acquisition strategy that were of interest in this study included the following

measures - depth of search, latency of search, search variability, dimensionality of search, search pattern, and linearity of search.

Depth of Search

The amount of information accessed by individuals during their search was recorded automatically by the computer. This raw score indicates the number of matrix cells accessed and thus, the depth of search.

Latency of Search

Latency of search is the amount of time individuals spent acquiring information. This variable was analyzed at the cell and matrix levels, i.e., the time spent examining each cell and the total search time, respectively. The process tracing program automatically recorded the time spent viewing a particular piece of information and from these individual times, the total search time and search time per cell was calculated.

Search Variability

The search variability measure is an index of the amount of information searched within an alternative across all alternatives. Variability of search is the standard deviation of the number of information cells accessed for each alternative. This measure was treated both as a continuous score, ranging from a constant search (standard deviation of zero) to a variable score search (standard deviation of greater than zero), and as a dichotomous score (constant search versus variable search).

Dimensionality of Search

Dimensionality of search (e.g., Billings and Marcus, 1983; Billings and Scherer, 1988; Payne, 1976; Schechtman and Ford, 1987) is an indication of the manner in which individuals "move" through the information board during

information acquisition. Thus, dimensionality of search is a temporal index of individuals' search sequences. This index is based upon the relationship between the alternatives and dimensions associated with the nth and nth + 1 pieces of information (Payne, 1976). A move from the nth to the nth + 1 piece of information can be intradimensional, interdimensional, or a shift. A move is classified as intradimensional if the nth piece and nth + 1 piece of information are in the same dimension, but involve different alternatives. Conversely, a move to a new piece of information is classified as interdimensional if both the nth and the nth + 1 pieces of information involve the same alternative, but are across dimensions. A move which is both across alternatives and across dimensions is classified as a shift. The Payne Index (e.g., Billings and Marcus, 1983; Schechtman and Ford, 1987) is computed by subtracting the sum of all intradimensional moves from the sum of all interdimensional moves, then dividing the difference by the sum of all inter- and intradimensional moves. (The number of shifts is not of interest in this study and is not used in the calculating the Payne Index (Payne, 1976)). An entirely interdimensional search strategy will have an index of +1.00, while an entirely intradimensional search strategy will have an index of -1.00 (Payne, 1976). In practice, however, these values will range somewhere between the two extremes, with interdimensional search indices approaching +1.00 and intradimensional search indices approaching -1.00. A mixed strategy, combining more equal amounts of intra- and interdimensional moves, will have an index value approaching zero.

Pattern of Search

The pattern of search displayed by individuals is considered indicative of their underlying decision processes. Pattern of search was determined by

combining individuals' measures of variability of search (constant versus variable) and dimensionality of search (intradimensional versus interdimensional; Billings and Scherer, 1988). As previously mentioned, each of these four patterns implies the use of a different type of decision model (Einhorn and Hogarth, 1981; Payne, 1976; Tversky, 1972; Svenson, 1979). These patterns represent decision strategy types ranging from compensatory models to noncompensatory models in the following manner: linear model (interdimensional/constant search), additive difference or disjunctive models (intradimensional/constant search), conjunctive model (interdimensional/variable search), and, lastly, the elimination by aspects model and lexicographic (intradimensional/variable search) (Billings and Scherer, 1988).

Linearity of Search

Gilliland (1989) proposed the use of a continuous nonlinearity index to judge the degree to which decision makers' information search follows a linear versus nonlinear strategy. The index is based upon Payne's (1976) assertion that a linear search is implied by the acquisition of a constant amount of information across alternatives, while a nonlinear strategy is characterized by a search for variable amounts of information across alternatives. The index of nonlinearity is unique - researchers have yet to adopt a standard methodology for determining nonlinearity of information use - and has received limited attention in decision making research (Doherty, 1987). The methodology for determining this index is given below and is based on the work of Gilliland (1989).

The information accessed by each subject was recorded by the computer as part of the process tracing output. This information was then transcribed onto a grid representing the N cells of the information (A alternatives X B dimensions)

available for search. The alternative with the highest number of dimensions accessed was identified and this accessed dimension became the standard to which other alternatives were compared. (By definition, an alternative was accessed when at least one dimension within the alternative was examined.) Compared with the dimensions accessed in the standard, across accessed alternatives, each time a dimension was not examined, a score of 1 was assigned to that cell of the decision matrix. This scoring procedure was repeated for all accessed alternatives.

To calculate the index of nonlinearity, several intermediate values must be determined. First, the number of assigned scores was summed. This value, NA, represents the number of times a dimension was accessed in the standard, but not in the remaining alternatives under consideration. NA was determined by counting the assigned values of 1. Second, the dimensions accessed in the standard, DS, were counted. Lastly, the total number of alternatives used in the comparison were counted. This value, AU, includes the standard. Using these three values, the Gilliland (1989) index of nonlinearity was calculated by dividing NA by the difference of the product of DS and AU, minus the sum of DS and AU less one. In algebraic terms, this equation appears: NA / ((DS X AU) - (DS + AU - 1)). Scores can range from 0.00 to +1.00 - a low score in this range indicating the use of a linear strategy, a high score indicating the use of a nonlinear strategy (Gilliland, 1989). It should be stated that while this index provides information on the use of linear versus nonlinear strategies, it is not strategy specific in the sense of distinguishing between, for example, additive difference and conjunctive strategies. This index is reviewed in Appendix A.

IX. Results

This study was conducted to address several hypotheses concerning the effects of selected task and environmental decision characteristics on decision making behavior. Before the results are discussed in relation to the proposed hypotheses, the task perception scales ("manipulation checks") and their relationships with each other are presented. Next the results of analyses addressing the relationships between the experimental manipulations and the task perception scales are provided. Measures of the dependent variables calculated ("search variables") in this study are then discussed and the relationships between these variables and the task perception scales are examined. Lastly, each hypothesis and the analyses performed to address it are given. For the sake of clarity and simplicity, this portion of the discussion will follow the order of the hypotheses as originally presented.

Task Perception Scale Properties

Upon completion of the computerized decision task, subjects were asked to fill out a set of questionnaires concerning, among other things, their impressions of the task. Scales comprised of these items were formed on the basis of item content and the score of each scale represents the mean item response. The reliabilities and intercorrelations of these scales are presented in Table 1. Scale reliabilities were calculated using Cronbach's (1951) coefficient of internal consistency and ranged from Accountability (alpha=.49) to Performance (alpha=.83).

TABLE 1.

Descriptive Statistics and Intercorrelations for Task Perception Scales.[a]

	Scale	Mean	S.D.	Range	1	2	3	4	5	6	7	
1	Importance	1.25	.82	-.60	- 3.00	.80[b]						
2.	Performance	2.13	.87	-.25	- 3.00	.44	.83					
3.	Equity	1.85	.78	-.75	- 3.00	.37	.36	.76				
4.	Familiarity	1.36	.81	-.86	- 3.00	.55	.48	.54	.73			
5.	Feelings	1.25	.78	-.80	- 3.00	.46	.38	-.03	.40	.76		
6.	Accountability	1.91	.93	-2.00	- 3.00	.29	.53	.24	.29	.29	.49	
7.	Effort	.27	1.18	-2.67	- 3.00	.16	.01	.00	.01	-.03	.20	.60

[a] N=143
[b] Internal consistency reliabilities (coefficient alphas) are presented in the diagonal.
r=.16, p <.05
r=.20, p <.01
r=.24, p <.001

As can be seen in Table 1, the seven perception scales are moderately correlated with one another. This suggests the possibility of an underlying general factor. However, they will be treated separately because the scales are internally consistent and the disattenuated correlations are significantly less than 1.0. Thus, the scales appear to be tapping distinct aspects of individuals' perceptions of the decision task.

Effects of Experimental Manipulations on Task Perceptions

A 2 X 2 X 2 multivariate analysis of variance (MANOVA) was performed to examine the effects of the manipulated variables on individuals' perceptions of task importance, decision maker performance, task equity, task familiarity, task affect, decision maker accountability, and decision maker effort. If the multivariate effects attained statistical significance, they were tested using analysis of variance (ANOVA). We had anticipated several strong relationships between experimental conditions and the corresponding task perceptions. The results of these analyses are discussed below and presented in Table 2.

Specifically, we had expected to find a difference in perceptions of task importance between the low and high accountability conditions for both internal and external accountability. However, the results of an ANOVA indicated that the only significant effect on perceptions of task importance was due to the Response Mode X External Accountability interaction, $F(1,139)=6.10$, $p<.05$. In the choice response condition, individuals perceived the task to be more important when in the low external accountability condition than in the high external accountability condition (mean= 1.48 and 1.04, respectively). A simple one-way ANOVA showed this to be significant ($F(1,72)=6.56$, $p<.01$). When individuals were required to give ratings, those in the low accountability condition thought the task

TABLE 2.
MANOVA Results for the Effects of Experimental Manipulations on Task Perceptions.[a]

Source[b]	Importance F	Performance F	Equity F	Familiarity F	Feelings F	Accountability F	Effort F
Main Effects							
RM	.043	15.222***	5.045*	1.000	.381	3.336	2.424
INT	.015	.051	1.243	.117	.257	.842	1.584
EXT	.608	1.816	6.657**	9.123**	.614	.121	.637
2-Way Interactions							
RM X INT	.362	1.895	.001	.171	.168	.178	.034
RM X EXT	6.210**	.000	.166	.116	.063	.254	2.029
INT X EXT	2.200	1.578	.016	2.210	1.376	1.614	.232
3-Way Interaction							
RM X INT X EXT	.149	.141	.361	.574	.261	.092	.520
	(.655)[c]	(.550)	(.718)	(.628)	(.605)	(.736)	(1.371)

[a] The degrees of freedom for all tests are (1,135).

[b] Where source is abbreviated as follows: RM - Response Mode, INT - Internal Accountability, EXT - External Accountability.

[c] Numbers in parentheses are the mean square errors associated with the F tests directly above them in the table.

* p<.05

** p<.01

*** p<.001

was less important than did the subjects in the high accountability condition (means=1.12 and 1.34, respectively). This effect was not significant ($F(1,67)=1.15$, ns).

In addition, it was expected that there would be an effect of response mode on perceptions of task performance. Specifically, individuals making multiple and cognitively complex decisions would be less sure of their task performance than individuals making a simple choice decision. This expectation was confirmed by the results of the ANOVA; perceptions of task performance were strongly affected by response mode, $F(1,141)=15.50$, $p<.001$. The mean scores for perceptions of task performance were 2.09 and 1.60 for the choice and rating response modes, respectively.

We had anticipated perceptions of task performance to be lower in conditions of high external accountability than in conditions of low external accountability. While not significant, the trend displayed by the data is supportive of this relationship.

We hypothesized were formulated regarding the relationships between the experimental manipulations and individuals' feelings of task equity. However, ANOVA analyses revealed two main effects on perceived equity, one by response mode, ($F(1,141)=3.45$, $p<.05$), and one by external accountability, ($F(1,141)=4.56$, $p<.05$). Individuals performing a choice task perceived the task to be more equitable (mean=2.28) than individuals who performed a rating task (mean=1.97). Likewise, individuals in the condition of low external accountability felt the task was more equitable (mean=2.31) than the individuals in the high external accountability condition (mean=1.95).

We had expected no differences by experimental manipulations on perceptions of task familiarity. However, the ANOVA results indicate a highly significant effect of external accountability on perceptions of familiarity, $F(1,141)=9.33$, $p<.01$. Individuals in the high external accountability condition felt the task was less familiar than did subjects in the low external accountability condition (means=1.16 and 1.56, respectively). That the difference was found in the external accountability condition is, in retrospect, not too surprising. Subjects in the videotaping condition (high external accountability) had not yet been interviewed, but they did know that after completing the questionnaire they would be asked about the experiment. While the questionnaire asked about their familiarity with the decision task per se, the subjects may have equated the "decision task" with "the experiment" (as these are defined from the perspective of the experimenter). Thus, it is easy to see why these individuals felt the task was less familiar than did those individuals who were not videotaped.

ANOVA results indicate that the experimental manipulations produced no significant effects on individuals' feelings about the decision task. The trends in the data indicate that subjects making a choice felt more positive affect toward the task than subjects performing a rating task. Similarly, subjects in the condition of low external accountability expressed more positive affect toward the task than did the subjects who were videotaped.

Search Variable Properties

Several dependent measures were collected from individuals' information search. These measures include the depth and latency of search, the number of inter- and intradimensional moves, and the amount of information accessed within each alternative. From these measures, the Payne index, Nonlinearity index, and

search mode were calculated. The means, standard deviations, and intercorrelations of the continuous search variables are presented in Table 3. It should be noted that individuals were allowed to examine as much information as they wanted and to reaccess information if they felt it would assist them in making their decision. No time (Bettman, Payne, and Johnson, 1989) or cost (Connolly and Wholey, 1988) constraints were placed upon the task. Thus, the number of information cells accessed (mean=43.65, SD=17.64), exceeded the actual number of unique information cells (36 - 6 alternatives X 6 dimensions). The mean Payne index was .53 (SD=.63) indicating a compensatory pattern of search. The average search was also fairly linear with a mean Nonlinear index of .13 (SD=.21). Table 4 presents the simple counts of the four search modes. The two predominant modes of search were interdimensional/constant, and interdimensional/variable, suggesting linear, and conjunctive or disjunctive decision strategies, respectively (Billings and Scherer, 1988).

Intercorrelations of Task Perception Scales and Search Measures

Correlations were computed between the task perception scales and all continuous search measures and indices. As can be seen in Table 5, the zero- order correlations are moderate at best, and in many cases, the variables are virtually uncorrelated. Despite the low correlations, some of the relationships are statistically significant. These are described below.

Perceptions of task importance were found to be positively correlated with task latency (r=.15); as the perceptions of task importance increased, so too did the time spent performing the decision task.

Perceptions of task performance were correlated with several dependent measures, (a) depth of search (r=-.23), (b) number of interdimensional moves (r=

TABLE 3.
Descriptive Statistics and Intercorrelations for Search Measures.[a]

Measure	Mean	S.D.	1	2	3	4	5	6	7	8
1. Depth	43.65	17.64								
2. Task Latency (sec.)	195.67	90.67	.62**							
3. Item Latency (sec.)	4.63	1.85	-.20*	.61**						
4. Interdimensional Moves	26.08	14.50	.74**	.43**	-.18*					
5. Intradimensional Moves	7.43	10.17	.31**	.25**	.01	-.39**				
6. Payne Index	.53	.93	.11	.05	-.04	.71**	-.86**			
7. Nonlinearity Index	.13	.21	-.51**	-.43**	-.03	-.52**	.03	-.37**		
8. Variability	.54	.70	-.38**	-.31**	-.01	-.33**	-.06	-.11	.72**	

[a]N=143
* p <.05
** p <.01

TABLE 4.

Frequency of Search Modes.

	dimensionality[a]	variability[b]	N
1.	interdimensional	constant	57
2.	intradimensional	constant	13
3.	interdimensional	variable	54
4	intradimensional	variable	18

[a] This categorization is based on the Payne Index where a value greater than 0.0 indicates a search pattern that is more interdimensional than intradimensional, while a value of less than 0.0 is indicative of a more intradimensional than interdimensional search.

[b] This categorization is based on the dichotomization of the variability of amount of information searched within accessed alternatives. If the standard deviation of amount of information accessed equals zero, variability is constant. If the standard deviation is greater than zero, the search is considered variable.

TABLE 5.

Intercorrelations of Search Measures and Task Perceptions.[a]

Measure	Importance	Performance	Equity	Familiarity	Feelings	Accountability	Effort
1. Depth	.04	-.23**	.09	.04	-.08	.06	.27**
2. Task Latency (sec.)	.15*	-.06	.11	.11	-.03	.07	.22**
3. Item Latency (sec.)	.12	.11	.07	.13	.05	.00	-.02
4. Interdimensional Moves	.11	-.18*	.08	.06	-.05	.10	.15*
5. Intradimensional Moves	-.05	-.03	.04	-.04	.01	-.05	.15*
6. Payne Index	.09	-.05	.02	.09	-.02	.03	-.08
7. Nonlinearity Index	.06	.28**	.10	.06	.16*	.17*	-.05
8. Variability	.08	.26**	.08	.04	.13	.16*	.00

[a] N=143

* p <.05

** p <.01

.19), (c) nonlinearity of search (r=.28, The Nonlinearity index increases as information search becomes less linear.), and (d) variability of search (r=.26). The perception of task performance increased when less information was searched and the search itself was less compensatory and linear.

Feelings toward the task were positively correlated with the Nonlinearity index (r=.16), such that linearity of information search decreased as positive affect for the task increased.

All other correlations between task perception scales and the search measures were statistically nonsignificant.

Test Of Hypotheses

A 2 X 2 X 2 MANOVA was used to examine the manipulation effects on depth of search, task latency, inter- and intradimensional moves, the Payne index, the Nonlinearity index, and search variability. If the multivariate effects attained statistical significance, they were tested using analysis of variance (ANOVA). In this manner, the influence of response mode, internally-imposed accountability, and externally-imposed accountability on each of the search variables was examined. The results of these analyses are presented in Table 6.

Two other types of analyses were performed to test the hypotheses concerning item latency and search mode. To test the effects of the manipulations on item latency, analyses of covariance (ANCOVAs) were performed. We analyzed task latency using depth of search as the covariate. In this way, we were able to partial out the variance in task latency accounted for by depth of search. Using average item latency in ANOVAs (task latency divided by depth) assumes that task latency regresses exactly onto depth, while using ANCOVAs does not restrict the regression weight of item latency. The ANCOVAs are presented in

TABLE 6.

MANOVA Results for the Effects of Experimental Manipulations on Search Measures.[a]

Depth Source[b]	Task F	Latency F	Interdim F	Intradim F	Payne Index F	Nonlinearity F	Variability F
Main Effects							
RM	.752	.233	2.425	2.229	4.221* fts	2.748*	9.664**
INT	2.858*	2.222	1.227	.358	.008	.040	.070
EXT	.706	.862	.083	.694	1.528	1.347	1.479
2-Way Interactions							
RM X INT	.561	4.996**	.884	.000	.176	.000	.150
RM X EXT	.095	.656	.084	.080	.257	3.934**	4.048**
INT X EXT	.557	.368	.005	.453	.063	.001	1.171
3-Way Interaction							
RM X INT X EXT	.310	1.625	.061	.015	.268	2.373	.950
	(309.596)[c]	(8017.581)	(210.163)	(106.180)	(.392)	(.042)	(.451)

[a] The degrees of freedom for all tests are (1,135).

[b] Where source is abbreviated as follows: RM - Response Mode, INT - Internal Accountability, EXT - External Accountability.

[c] Numbers in parentheses are the mean square errors associated with the F tests directly above them in the table.

* $p<.10$

** $p<.05$

Table 7. Finally, the hypotheses considered only one search mode, the intradimensional/variable mode of search. To test the effects of the experimental conditions on the intradimensional/variable search mode, simple chi-squared tests were performed between experimental groups. These analyses are presented in Table 8.

Hypothesis One

Hypothesis 1 states that the greater cognitive demands inherent in a rating task will promote the use of strategies that are more compensatory and linear than strategies necessitated by a choice task. Behaviors indicative of compensatory and linear strategies are an increased depth of search, longer search latency (at both the task and item levels), decreased variability of search, a lower Nonlinearity Index, and a less variable/intradimensional mode of search when compared to behaviors displayed during the use of noncompensatory and nonlinear strategies. The statistical analyses of the effects of response mode on the search measures are discussed below and presented in Tables 6, 7, and 8.

Results of the ANOVAs indicate response mode had a significant effect on the Payne index, indicating a difference in the dimensionality of search behavior elicited by the rating and choice tasks ($F(1,140)=4.43$, $p<.05$). As hypothesized, subjects performing a rating task displayed more compensatory search behavior (mean Payne index=.64) than did subjects in the choice task (mean Payne index=.42).

Response mode also had a highly significant effect on the variability of search, $F(1,141)=9.00$, $p<.01$. Individuals in the rating condition were less variable in the amount of information searched per employee alternative (S.D.=.37) than were individuals in the choice response condition (S.D.=.71).

TABLE 7.

ANCOVA Results for the Effects of Experimental Manipulations on Item Latency.[a]

Source[b]	F
Covariate	
DEPTH	92.902*** (451420.799)[c]
Main Effects	
RM	.002 (7.591)
INT	.241 (1170.155)
EXT	.339 (1645.629)
2-Way Interactions	
RM X INT	4.921* (23911.826)
RM X EXT	1.674 (8132.839)
INT X EXT	1.801 (8751.406)
3-Way Interaction	
RM X INT X EXT	4.186* (20341.317)

[a] The degrees of freedom for this test are (1,134).
[b] Where source is abbreviated as follows: RM - Response Mode, INT - Internal Accountability, EXT - External accountability.
[c] Numbers in parentheses are the mean square errors associated with the *F* tests directly above them in the table.

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

TABLE 8.

Chi-Square Results for the Effects of Experimental Manipulations on Search Mode.[a]

Condition[b]	Cochran Q	df	Sig.
Hypothesis 1			
RM	2.000	1	.157
Hypothesis 2			
INT	.222	1	.637
Hypothesis 3			
EXT	.889	1	.346
Hypothesis 4[c]			
RM X INT	2.444	3	.485
Hypothesis 5[c]			
RM X EXT	3.778	3	.287

[a] Where search mode represents an intradimensional/variable search strategy.

[b] Where experimental condition is abbreviated as follows: RM - Response Mode, INT - Internal Accountability, EXT - External accountability.

[c] The assumption of independent samples was violated. Had the effects approached statistical significance, a log-linear analysis would have been performed.

There were also two marginally significant effects of response mode, one on the linearity of individuals' search, ($F(1,140)=2.68$, $p=.10$), and one on the number of interdimensional moves within the search, ($F(1,141)=3.09$, $p<.10$). As hypothesized, individuals in the rating condition scored lower on the Nonlinearity index (mean=.10) than did subjects in the choice condition (mean=.16). Individuals in the rating condition also made a greater number of interdimensional moves (mean=28.28) than did subjects in the choice condition (mean=24.04).

No other effects reached statistical significance.

Hypothesis Two

Hypothesis 2 states that internal accountability will affect search behaviors such that in the condition of high internal accountability, individuals are more likely to use compensatory and linear strategies than individuals in the condition of low internal accountability.

This hypothesis was unsupported by the data. (See Tables 6, 7, and 8 for the results of analyses performed to address Hypothesis 2.)

Hypothesis Three

Hypothesis 3 states that when individuals are made accountable to others for their decision making behavior, they will exhibit search strategies that are more compensatory and linear than search strategies displayed by individuals who are in a low externally-imposed accountability condition.

This hypothesis was unsupported by the data. (See Tables 6, 7, and 8 for the results of analyses performed to address Hypothesis 3.)

Hypothesis Four

Hypothesis 4 states that response mode will interact with internal accountability such that individuals in the choice-high accountability condition

will use more compensatory and linear strategies than individuals in the choice-low accountability condition. No significant differences are anticipated between individuals in the low and high accountability rating conditions. The statistical analyses performed to test the Response Mode X Internal Accountability interaction effects on the search measures are discussed below and presented in Tables 6, 7, and 8.

Results of ANOVA indicated a significant Response Mode X Internal Accountability interaction effect for task latency, $F(1,139)=5.31$, $p<.05$. However, the simple main effects analyses used to examine this interaction showed that this effect was not as anticipated. Contrary to the hypothesis, there was no statistically significant effect on task latency for internal accountability under the choice condition (197.52 seconds vs. 184.70 seconds, in the low and high accountability conditions, respectively), $F(1,72)=.59$, ns. Rather, it was the effect of internal accountability under the rating condition that was significant, $F(1,67)=4.30$, $p<.05$, (171.34 seconds vs. 227.36 seconds), with high accountability eliciting greater search latency than low accountability. The grand mean for task latency was 195.67 seconds and it is interesting to note that task latency was somewhat decreased in the choice-high accountability condition. In the rating condition, low internal accountability decreased task latency, while high accountability encouraged individuals to spend more time on the task.

The Response Mode X Internal Accountability interaction also had a significant effect on item latency ($F(1,138)=4.87$, $p<.05$). As with task latency, the greatest difference in item latency was in the rating condition, ($F(1,66)=2.89$, $p<.10$), with mean item latencies of 4.19 seconds and 4.97 seconds in the low and high accountability conditions, respectively. The mean item latencies in the choice

condition for low and high accountability were 4.94 and 4.42 seconds, respectively ($F(1,71)=1.85$, ns). The interaction effects on task and item latency are illustrated in Figure 1.

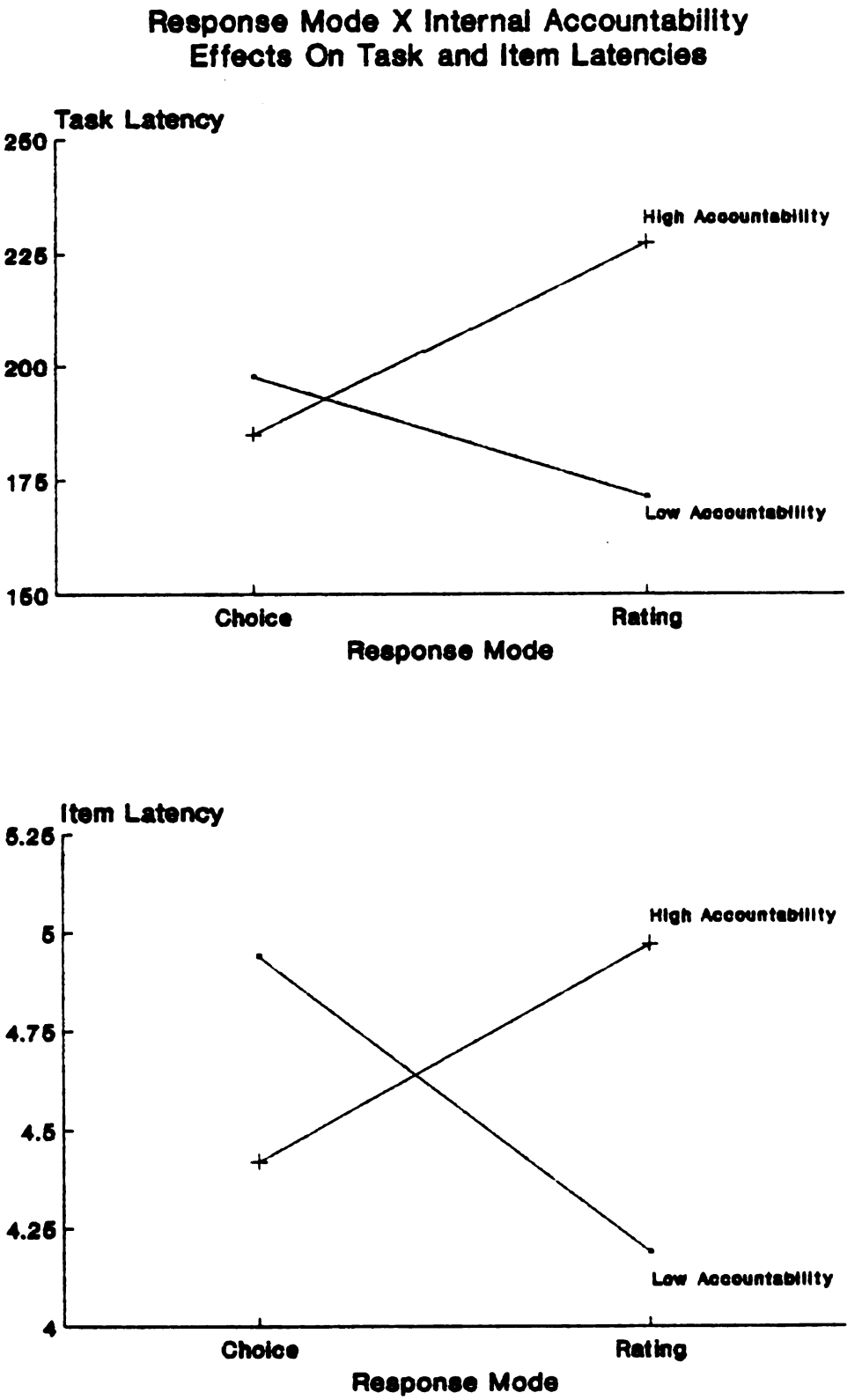
Hypothesis Five

Hypothesis 5 states that response mode will interact with externally-imposed accountability such that individuals in the choice-high accountability condition will use more compensatory and linear strategies than individuals in the choice-low accountability condition. No significant differences were anticipated between individuals in the low and high accountability rating conditions. The statistical analyses performed to test the Response Mode X Internal Accountability interaction effects on the search measures are discussed below and presented in Tables 6, 7, and 8.

The Response Mode X External Accountability interaction had a significant effect on individuals' linearity of search, $F(1,138)=4.08$, $p<.05$. Under the choice condition, individuals in the low and high accountability conditions scored .11 and .21 on the Nonlinearity index, respectively, indicating a more nonlinear search for the high accountability individuals. This difference was significant, $F(1,71)=4.57$, $p<.05$. The scores on the Nonlinearity index for the low and high accountability individuals in the rating condition were .12 and .09, respectively. This difference in linearity of search between the accountability conditions was not significant ($F(1,67)=.44$, ns). In summary, while a significant difference in the linearity of search was found, the greater nonlinearity of the choice - high accountability condition was in the exact opposite direction of the prediction.

The two-way interaction of response mode and external accountability also had a marginally significant effect on the variability of search, $F(1,139)=3.60$,

Figure 1.

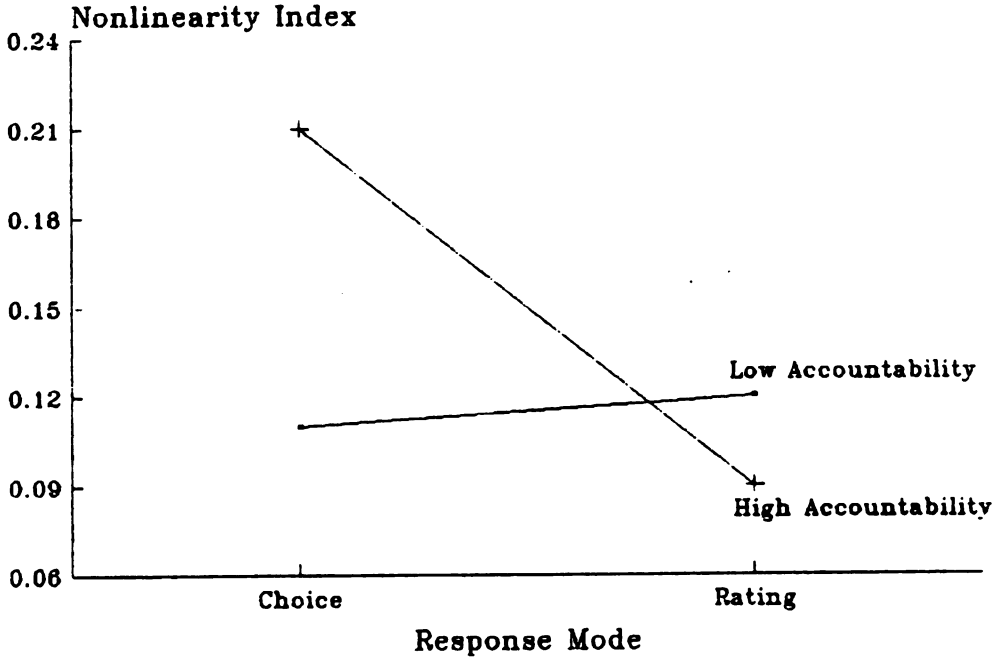


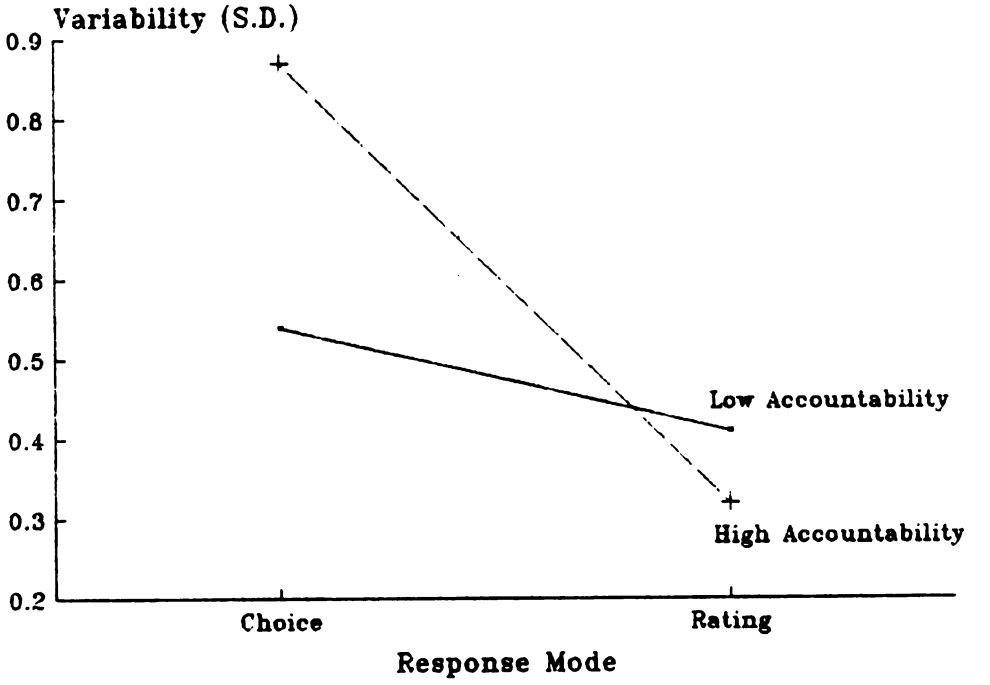
Note. Latencies are in seconds.

$p<.10$. The difference in variability of search between individuals in the low and high accountability conditions in the choice task (SD=.54 and SD=.87, respectively), was marginally significant, $F(1,72)=3.41$, $p<.10$. The variability of search in the rating condition was SD=.41 and SD=.32, for low and high accountability, respectively. This difference was not significant, $F(1,67)=.50$, ns. As with linearity, the obtained effect was exactly opposite the prediction; we had anticipated greater variability of search in the choice-low accountability condition, rather than in the condition of choice-high accountability. The interaction effects on search linearity and variability are illustrated in Figure 2.

Figure 2.

Response Mode X External Accountability
Effects on Linearity and Variability





X. Discussion

Summary and Further Interpretation of Results

This study was conducted to address several hypotheses concerning the relationships between task and environmental characteristics of a decision, and the processes used to acquire information relevant to making that decision. Based on the cost/benefit contingency model of decision making articulated by Beach and Mitchell (1978), it was anticipated that task response mode, and both internally- and externally-imposed accountability would influence individuals' information search strategies. The results of this experiment do verify the relation between characteristics of the task and decision making behavior. However, the relationships are not as parsimonious as originally hypothesized, especially those involving interactions.

As hypothesized, decision response mode had a strong effect on the way individuals acquired decision relevant information. When the task dictated that individuals make a series of ratings, these individuals demonstrated a tendency to use decision strategies that were more compensatory and less variable than those exhibited by individuals making a choice decision. While only marginally significant, raters also used strategies that were more linear and interdimensional than the strategies used by subjects making a choice.

The effect of response mode on the search variables was consistent with the results found by Billings and Scherer (1988). When a decision task requires an explicit judgment of each alternative, individuals will search for information in a

fashion that could be described as more systematic than the behavior of individuals making a choice. However, "systematic" is something of a misnomer. Rating search behavior is predominantly compensatory with some noncompensatory search taking place perhaps, as individuals try to identify the alternatives that will anchor the dimension on which the alternatives are being evaluated. While we do not commonly think of a nonlinear and noncompensatory search as being "systematic", it is far from being random. Lexicographic and EBA strategies, while noncompensatory, can be executed in a very systematic way. Individuals making a choice may discover a piece of information that is so overwhelming that the alternative is no longer viable and further search within that alternative is unnecessary. The search may appear haphazard, yet the decision not to continue the search on that alternative has been reasoned and executed systematically. The process tracing methodology employed in this study does not allow us to uniquely identify a specific strategy, even if only one has been used. We can only describe strategy in terms of broad indicators such as compensatory versus noncompensatory, linear versus nonlinear, and variable versus constant.

It was surprising not to find significant differences in the search measures between the high and low accountability conditions. Neither the internal accountability manipulation, nor the external accountability manipulation had the effects anticipated by our hypotheses. Trends in the data indicate that individuals in the high internal accountability condition searched longer and for more information than subjects in the low internal accountability condition, and that their search was also more compensatory and interdimensional. Trends in the data indicate that individuals in the high external accountability condition spent more time and searched for more information than did the low external accountability

subjects. However, the high external accountability subjects exhibited less compensatory and linear search behavior. Contrary to hypothesis, they had a lower Payne index, a higher Nonlinearity index, and exhibited greater variability of search than the low external accountability subjects.

The interaction effects of response mode with internal and external accountability yielded results that were not only unexpected, but challenging to interpret. In both interactions, it was expected that the choice - low accountability condition would promote search behavior that was much less linear and compensatory than that displayed in the other three cells (choice - high accountability, rating - low accountability, and rating - high accountability). We anticipated that the remaining cells would not differ significantly from one another on the search measures. Instead, we found the following significant results. The Response Mode X Internal Accountability interaction had a significant effect on task and item latencies such that the latencies in the rating - high internal accountability condition were elevated when compared to the other cells. The Response Mode X External Accountability interaction had a significant effect on search linearity and a marginally significant effect on search variability. The choice - high external accountability condition differed from the others and was the cell which displayed behavior that was actually less linear and more variable than the search strategies displayed in the other response mode - external accountability conditions.

In trying to explain the Response Mode X Internal Accountability interaction effects on task and item latencies, it appears necessary to reconsider how the type of decision (assessment for promotion, dismissal, training, etc.) can influence the way in which the task is approached. The one conclusion we are

willing to draw from Williams, et al. (1985) is that the context and characteristics of the task influence how decision makers acquire information. We had been conceptualizing response mode not as a motivator of behavior, but as a type of limiter or constraint which taxed decision makers' abilities. While the latter may be a realistic view of the influence of response mode when the decision involves, say, determining which breakfast cereal is most desirable, when considering decisions involving people, it is also necessary to consider the absolute significance of the decision.

Response mode may have implications for decision makers not only in the way they make a decision, but also in the impact the decision will have once it is made. In the case of choice response mode, decision makers may experience a more direct connection between their responses and actual consequences experienced by themselves or others. Thus, while we did not expect the choice response mode to produce an effect of internally-imposed accountability, it is possible that subjects may have perceived themselves to be accountable in that way.

The data suggest for the choice task that the limits to the influence of the internal accountability manipulation had been reached. Thus, the two choice - internal accountability (e.g., both the high and low) conditions produced comparable latencies for both task and item.

When compared to the choice conditions, the task and item latencies in the rating - high internal accountability condition were markedly elevated, while the latencies in the rating - low internal accountability were slightly depressed. In keeping with the explanation advanced above, the rating task would not imbue decision makers with a sense of self-imposed accountability or a sense of absolute

task significance. Thus, when the environment promoted a need to establish equity, individuals responded by investing more time in the task; they were not already engaged in trying to respond to other accountability demands.

The idea that response mode might induce self-imposed accountability would also help to explain the unexpected effects of the Response Mode X External Accountability interaction on the linearity and variability of search. Recall that the choice - high external accountability condition produced the most nonlinear and variable search pattern of the four interaction conditions and that the three remaining conditions did not have statistically significant differences from one another. It appears that individuals in the choice - high external accountability condition were actually under two types of accountability, self-imposed accountability due to the response mode, and externally-imposed accountability due to the manipulation. These individuals would be expected to be highly motivated to search the information matrix in a very systematic (albeit the least compensatory) and easily defensible manner. (Remember that while not compensatory, EBA and lexicographic search strategies are not random, and in fact are very systematic.) If so, these highly motivated individuals would have been on task immediately. However, we were unable to test this previous statement directly for two reasons. As previously mentioned, we have no way to delineate specific search strategies, although the access of variable amounts of information between alternatives is taken as indicative of nonlinear and noncompensatory search strategies. Also, the process tracing program was set up to calculate the dependent measures of variability and nonlinearity for a search of the first 36 pieces of information. To detect changes in these measures over the remaining course of the information search would require rewriting the process tracing

program. For the choice - low external accountability condition, being internally accountable due to the choice response mode would have motivated these individuals to be thorough and constant in their information search. The same thoroughness and constancy of search would have been expected from the individuals in the rating conditions - for the low accountability subjects due to the demands of the task, for the high accountability subjects due to both the task demands and the ease with which a linear search could be defended.

In addition to the finding that response mode seems to have the capacity to engender a sense of internal accountability, the Response Mode X Accountability interaction effects also presented information for which the literature had not prepared us. The literature concerning accountability led us to expect that internal and external accountability would have similar effects on predecisional search behavior, i.e., high accountability of either variety would encourage individuals to rely on compensatory strategies for information acquisition. This appears not to have been the case. Recall that the significant two-way interaction effects for the two types of accountability did not show the same pattern of differences among the Response Mode X Accountability Level conditions. Moreover, interactions involving the two types of accountability affected different search variables. For the response mode - internal accountability interaction, task and item latencies were augmented in the rating - high internal accountability condition. For the response mode - external accountability interaction, search nonlinearity and variability were elevated in the choice - high accountability condition. The emergent picture of accountability effects appears to be that while decision makers are affected by internal accountability manipulations, their actual search behavior does not seem to vary from other conditions. Higher levels of internal

involvement leads individuals to spend more time examining the information matrix, rather than changing their pattern of searching that matrix. This is in agreement with other industrial/organizational psychology research that has looked at the relationship between inputs and outputs in an equity framework. When people are in a situation where they are being overcompensated for their inputs, they initially respond by increasing those inputs in order to restore equity. We had anticipated that individuals would generally try harder to make a good decision if they perceived that they were being overcompensated. Instead, it appears that these individuals simply try longer. On the other hand, individuals who must be accountable to others for their behavior, do appear to approach the task in a very direct and defensible manner. These individuals appear to have a set strategy to their search (given the limitations we have mentioned concerning our ability to note changes in search over time). Thus, internal accountability promotes increased effort (as measured by latency), while external accountability appears to promote change in the search strategy.

Implications of the Present Study

The major implication of this study is that, in agreement with Beach and Mitchell (1978), individuals are affected by task and environmental characteristics of the decision context and will adapt their decision strategies to fit the requirements of that context. While the relationships between the search measures and the characteristics of internal and external accountability are somewhat ambiguous, the relationship between task response mode and the search measures is fairly clear.

A decision task should be structured as a rating if it is important that the majority, if not all, of the available decision relevant information is examined, and

that the examination of this information is what is commonly thought of as methodical. By requiring a set of ratings, the task demands may help to reduce or alleviate decisions based on partial and/or incorrect information. This can be especially important when the influence of preconceived notions concerning the fitness of alternatives might serve to limit the amount or type of information individuals are willing to examine. Rating tasks may serve to counteract the influence of biases and stereotypes held by decision makers by exposing them to disconfirming information. As suggested by Billings and Scherer (1988), when a thorough and methodical examination of information is desirable, explicit global judgments should be made an integral part of the selection process.

Another implication of this study is that response mode itself may have the capacity to induce a condition of internal accountability. When the outcome of a selection impacts the object of the decision in a direct and significant way, decision makers appear willing to commit more resources than the task characteristic of choice itself demands. We would expect, for example, that when selecting the poorest performing employee for dismissal, individuals would spend more time looking at a given amount of information than if the decision involved selecting the worst cheese dip. When considering ways to promote a sense of internal accountability, we should consider the possibility that response mode might also serve that purpose. Also, if it is known that individuals will be making a selection decision that will significantly impact the object of that decision, they may need to be alotted extra time for the task.

Lastly, the results of this study suggest that internal and external accountability influence decision making behavior in different ways. If it is important to increase the level of effort which is dedicated to the decision making

process, then inducing internal accountability in a rating task may have the desired effect. If it is important that a defensible and succinct strategy is used when decisions are being made, then decision makers should be held accountable to others for their behavior when making a choice.

Limitations of the Study

This study had several limitations, some of which were foreseen, most of which were not. The issues of internal and external validity of an experiment are ever present, and the appropriateness of the decision task might also be questioned. The possible limitations of the experiment due to the decision task will be addressed first.

The basic task required individuals to access as much information as necessary from a 6 X 6 matrix before submitting their ratings or choice. As mentioned earlier, individuals oversampled the 36 unique pieces of information by an average of almost 30%. While there were several significant differences in search measures between groups according to response condition, two task factors may have contributed to the reduced between-group variability which we had anticipated in the accountability conditions. First, by not imposing costs or setting limits on the time or the number of pieces of information subjects could (re)access, we reduced the cognitive expenditures necessary to perform the decision task. Individuals were not very selective in their search behavior, regardless of the accountability conditions. The typical strategy appears to have been to look at the majority of the information in a fairly compensatory (mean Payne index=.53) and linear (mean Nonlinearity index=.13) fashion before going back to review previously accessed items.

Although confounded by the lack of information constraints, the low complexity of the task may be a second factor contributing to reduced between-accountability group variability. We know that as cognitive load increases, people will switch from compensatory to noncompensatory strategies when possible. Perhaps thirty-six pieces of information do not create a cognitive load of sufficient significance to warrant the use of simplifying strategies. We do not have a reliable measure of task effort, so it is not certain how subjects perceived that dimension of the task. Since subjects knew they could reexamine information, the question of cognitive load level is interesting, but unanswerable.

Turning now to the issue of internal validity, the biggest challenge to this study concerns the accountability manipulations and why they did not have the intended effects on the search measures and the task perception scales. There are two possible explanations for this. First, it may be that the manipulations were not perceived by the subjects at all. If this were the case, we would see no difference in individuals' search behaviors between accountability conditions. While there were no significant main effects for internal and external accountability, the data show that the accountability manipulations produced interaction effects. It does appear that subjects were influenced to some degree by the two accountability manipulations.

The alternative explanation for the failure to support the hypothesized accountability effects is that the manipulations were perceived, but not in the way that we had anticipated. This would explain how the manipulations could have some effect on the search measures and relatively limited effect on the measures of task perception.

We had specific notions of how individuals would perceive the manipulations and asked subjects to describe their perceptions using our descriptors, not their own. It may be that subjects would have chosen words different from our own to describe how they felt about the experiment. We had assummed a general stability in the way that individuals would perceive the task. However, two of the scales which were internally consistent during pilot testing were unreliable in the main experiment. Variable and inconsistent perceptions of the task may be the reason why reliable and significant differences between accountability conditions were not found for the search measures, and most notably, the manipulation check scale of Accountability.

Internal validity limits not only the specific conclusions we can draw from the experimental sample, but the generalizations we can make to a given population. In spite of our reservations with the accountability manipulations, it is reasonable to expect that our findings can be generalized to samples of decision makers other than college undergraduates. While the appropriateness of studying a complex cognitive task such as decision making using a sample of college undergraduates is justifiably suspect, we did take steps to ensure some level of generalizability. First of all, we used realistic performance information. The performance stimuli were based on actual job descriptions and performance ratings materials used by two major fast food restaurants, as well as interviews and on-site observations (McKellin, 1989). Secondly, we selected only those individuals who had past and/or current work experience at a fast food restaurant. In this way, experiment participants would be familiar with the job behaviors that are indicative of good, moderate, and poor performance. Lastly, while giving subjects unlimited search resources may have hampered our ability to detect

accountability effects, it is probable that people making personnel decisions of the type addressed in this study will also have large amounts of resources to devote to their decisions. While decision time and effort are not unlimited resources, decision makers do have the option of looking at the data more than once. The present study shows that even when individuals are familiar with the type of personnel data with which they are presented and can examine that data at will, one should still expect differences in search measures due to response mode.

It is reasonable to question the mode of information presentation used in this experiment and how that can limit the the study's external validity. Alternatives to the computerized information board have been discussed. Current limitations in our ability to unobtrusively trace the search process leave us no other viable solution to study the information gathering phase of decision making behavior. Traditionally, performance data has been recorded and utilized in hard copy form, that is, on paper. However, in larger organizations, it is likely that much of the new data (and perhaps the old) will be placed into magnetic format where it can be conveniently stored and retrieved. When performance data is stored electronically, we can expect that evaluations of personnel data will be made while individuals interface with a video display terminal in much the same way as subjects did in this experiment. In this sense too, the results of this study are generalizable to other dismissal decisions involving a computerized search for performance data.

Implications for Further Research

This study has offered as many questions to be answered, as answered the questions asked. We did confirm the hypothesis regarding the effects of response mode task demands on search strategies. Certainly, more research on the task

demand aspect of response mode is necessary as the number of studies investigating the effects of this characteristic is limited. An unexpected finding was the possibility that response mode can engender a sense of internal accountability in the decision maker not attributable to the task demand of choice itself. A question that had originally sparked an interest in decision making behavior, and one which we had wanted to address, was how selection out of the workforce differs from the traditional selection into the workforce. We were unable to answer that question directly due to constraints in the experimental design, but we did incorporate the lay-off scenario as part of the experimental task. And perhaps we do have a partial answer to our question. From this finding, we are obligated to ask when do decision makers take a personal interest in the decision being made?

The lack of main effects for both of the accountability manipulations is puzzling. To avoid what may have been a three-way interaction between internal accountability due to a significant choice task, internal accountability due to the manipulation, and external accountability, it is necessary to isolate the internal and external accountability manipulations in any subsequent study. That is, study one or the other, but not both, or study both, but only with a task that is of low importance. Because the internal accountability we attempted to create relied on a social manipulation, any study involving the effect should be simple to start with. Perhaps the implication is that the practicality of trying to generate internal accountability through social manipulation is somewhat limited. Of more potential value is the effect of external accountability and it is here that our attention should be focused.

It is a popular belief that to improve the quality of decisions, we need only make decison makers accountable to others for their decisions. While we did not find main effects for external accountability on the search measures, it is possible that the manipulation improved the quality of the decisions rendered. This appears to be a necessary avenue to explore given the desire for prescriptive decision heuristics. As such, other attempts should be made to manipulate external accountability and assess its effects on the search process. Collected along with the search measures should be an objective measure of a 'good' or correct decision. By placing resource constraints on the task, we may find significant effects on the search and outcome measures for the manipulation.

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APPENDICES

APPENDIX A

Appendix A

Index of Nonlinearity Clarification

The Gilliland Index of Nonlinearity (1989) addresses a problem that has been apparent in other indices of linearity. Prior indices have not been comparable across matrices of different size (e.g. Doherty, 1987). Indices calculated with the Gilliland (1989) index are comparable across tasks; the index is not specific to a particular decision matrix. That is, an index of nonlinearity computed for a matrix of A_1 alternatives X B_1 dimensions is comparable to the same index calculated for a matrix of A_2 alternatives X B_2 dimensions regardless of whether $A_1 = A_2$, or $B_1 = B_2$. The Gilliland (1989) index is based only on the dimensions of the matrix which are examined by the individual. The remainder of this discussion is from Gilliland (1989).

The following formula will be used to calculate an index of nonlinearity of search:

$$\text{Nonlinearity Index} = \frac{NA}{((DS \times AU) - (DS + AU - 1))}$$

Where:

NA = Number of times a standard dimensions not accessed along those alternatives that were accessed on at least one standard dimension

DS = Number of dimensions accessed in the standard

AU = Number of alternatives used in the comparison, including the standard

The rationale for the components of this equation is as follows:

1. The numerator gives an indication of the degree of dissimilarity between the standard and those alternatives accessed on at least one dimension of the standard. Alternatives are limited to those accessed on at least one dimension of the standard because perfect linearity can exist even when all alternatives are not accessed.

2. The multiplicative component of the denominator gives the size of the matrix examined for linearity.

3. The additive component of the denominator adjusts the denominator for those elements that do not add into the numerator. Specifically, the number of dimensions in the standard are excluded because they never add into the numerator. Additionally, one dimension of each alternative will never add into the numerator because each alternative must be accessed on at least one dimension to be included.

The following are examples of how the index works (note that x indicates an accessed dimension):

1.

		Dimensions				
		1	2	3	4	5
	1	x	x	x	x	x
Alts	2	x	x	x	x	x
	3	x	x	x	x	x
	4	x	x	x	x	x

NA = 0, DS = 5, AU = 4, Linearity index = 0.00

2.

		Dimensions				
		1	2	3	4	5
	1	x	x	x	x	x
Alts	2	x				
	3	x				
	4	x				

NA = 12, DS = 5, AU = 4, Linearity index = 1.00

		Dimensions				
3.		1	2	3	4	5
	1	x				
Alts	2		x			
	3			x		
	4				x	

NA = 0, DS = 1, AU = 1, Linearity index = undefined (denominator is zero)

		Dimensions				
4.		1	2	3	4	5
	1	x	x	x	x	x
Alts	2	x	x			
	3	x	x			
	4	x	x			

NA = 9, DS = 5, AU = 4, Linearity index = .75

		Dimensions				
5.		1	2	3	4	5
	1	x	x	x	x	x
Alts	2	x		x		
	3		x			x
	4	x			x	

NA = 9, DS = 5, AU = 4, Linearity index = .75

APPENDIX B

Appendix B

Power Analysis

The following power analysis is for a 2 x 2 x 2 experimental design. A medium effect size is anticipated, f = .25, and a power of .80 is desired. The value of u, (u = k-1), for this design is 1 (u = k-1 = 2-1 =1). The formula for sample size as given in Cohen (1977) is:

$$n_c = \frac{(n' - 1)(u + 1)}{\text{\# of cells}} + 1$$

$$N_s = n_c \times \text{\# of cells}$$

From the tables provided by Cohen (1977):

n'	effect size	N_s	
1571	.05	3152	
393	.10	792	(sample size to detect small effect)
175	.15	360	
99	.20	208	
64	.25	136	(sample size to detect medium effect)
45	.30	96	
33	.35	72	
26	.40	64	(sample size to detect large effect)

Therefore, the correct sample size for this design is 136 subjects (17 subjects/cell X 8 cells).

APPENDIX C

Appendix C

Computer Task Behavioral Descriptions

Job Dimension 1 - French Fry Production

1. Employee discards cooked fries held in bagging station longer than 7 minutes and rotates fries first in - first out in bagging station.
2. Employee discards cooked fries held in bagging station longer than 7 minutes, but does not rotate fries first in - first out in bagging station.
3. Employee does not discard cooked fries held in bagging station longer than 7 minutes, and does not rotate fries first in - first out in bagging station.

Job Dimension 2 - Restroom Maintenance

1. Employee remembers to check toilets to see if they are clean and checks washroom regularly.
2. Employee remembers to check toilets to see if they are clean, but checks the washroom only when there is nothing else to do.
3. Employee forgets to check toilets to see if they are clean, and checks the washroom only when there is nothing else to do.

Job Dimension 3 - Dining Room Maintenance

1. Employee mops up a small spill instead of leaving it for later; also cleans table tops and sides, high chairs, and door handles using cloth and sanitizer solution.

2. Employee mops up a small spill instead of leaving it for later; but does not clean table tops and sides, high chairs, and door handles using cloth and sanitizer solution.
3. Employee leaves a small spill alone, intending to mop it up later; also does not clean table tops and sides, high chairs, and door handles using cloth and sanitizer solution.

Job Dimension 4 - Counter Service

1. Employee gives customer correct change and delivers the correct products to the customer.
2. Employee gives customer correct change, but delivers the wrong products to the customer.
3. Employee gives customer incorrect change and delivers the incorrect products to the customer.

Job Dimension 5 - Sandwich Preparation

1. Employee cleans hands before taking over preparation and cooks meat correctly.
2. Employee cleans hands before taking over preparation, but cooks meat incorrectly.
3. Employee forgets to clean hands before taking over preparation and cooks meat incorrectly.

Job Dimension 6 - Outside Maintenance

1. Employee cleans drive-thru and equipment and checks to see that it is functioning properly; also picks up all trash on the sidewalks, grass, and street gutters.
2. Employee cleans drive-thru and equipment, checking to see that it is functioning properly, although does not pick up all trash on the sidewalks, grass, and street gutters.
3. Employee does not clean drive-thru and equipment, nor check to see that it is functioning properly; also does not pick up all trash on the sidewalks, grass, and street gutters.

APPENDIX D

APPENDIX D

Consent Form For Low Accountability Conditions.

This experimental session is scheduled to last approximately 1 and 1/2 hours. Your participation in this experiment is voluntary and you may choose not to participate, or to stop participating at any time during the session. If you choose not to participate, you may do so without penalty.

During this experiment you will be asked to complete several job-related decision tasks and questionnaires. For example, you may be asked to role play a situation where there is a possible threat to your employment security. Another example may include a computerized employment decision task. You will be asked about your work experience and your impressions of the decision tasks. However, your responses will be treated confidentially.

If you choose to participate, the purpose of this study will be explained to you at the conclusion of the session and any questions you have regarding the research will be answered at that time.

I have read and understand the above statement. The tasks involved have been explained to me. I volunteer to participate in this research, but understand that I may discontinue my participation at any time without adverse consequences to me. I understand that my responses will be confidential.

Signature_____ Date _____

Printed name_____

Experimenter: Larry Marcy
18 Baker Hall
353-9166

APPENDIX D (cont'd.).

Consent Form For High Accountability Conditions.

This experimental session is scheduled to last approximately 1 and 1/2 hours. Your participation in this experiment is voluntary and you may choose not to participate, or to stop participating at any time during the session. If you choose not to participate, you may do so without penalty.

During this experiment you will be asked to complete several job-related decision tasks and questionnaires. For example, you may be asked to role play a situation where there is a possible threat to your employment security. Another example may include a computerized employment decision task. At the end of the experiment you will be asked to describe how you made your decisions. Although this portion will be videotaped for later evaluation by experts in this area, your responses will be treated confidentially.

If you choose to participate, the purpose of this study will be explained to you at the conclusion of the session and any questions you have regarding the research will be answered at that time.

I have read and understand the above statement. The tasks involved have been explained to me. I volunteer to participate in this research, but understand that I may discontinue my participation at any time without adverse consequences to me. I understand that my responses will be confidential.

Signature_____ Date _____

Printed name_____

Experimenter: Larry Marcy
18 Baker Hall
353-9166

APPENDIX E

Appendix E

Computer Task Tutorial

WELCOME

This exercise is a simulation of a particular type of decision faced by supervisory personnel in most organizations. Today, you will be taking the role of a manager in a fast food restaurant and will be required to make a choice (or, in the alternate response mode, a rating) decision regarding the evaluation of your subordinate hourly employees.

Organizations utilize performance evaluation information for a variety of different purposes. One use of performance information is to make decisions regarding dismissals when business conditions force the reduction of the current workforce. Today, you will be required to evaluate the performance of a portion of your current part-time hourly employees. When you have reviewed their performance, you will be asked to select an employee for dismissal (or, rate each employee on his/her deservedness for dismissal.)

PLEASE PRESS THE RETURN KEY FOR FURTHER EXPLANATION

When a supervisor must make a dismissal selection, (or, ratings about deservedness for dismissal), the decision should be based on worker performance. As you are aware, work in a fast food restaurant requires several different skills and abilities. Your task is to determine which employee should be let go based on his/her work performance (or, how suitable each employee is for dismissal.)

If you have any questions, please ask the experimenter for assistance. If you do not have any questions, press the RETURN key and you will receive more specific instructions concerning your task.

To aid you in searching for information about your employees' performance, you will be presented with two lists. The first list, labelled ALTERNATIVES, contains six employees on which you will make your selection decision, (or, your ratings.) The second list, which contains descriptions of your employees' job behaviors at various work stations, is labelled DIMENSIONS. For example, if you were making your decision about the performance of secretaries, you might see a screen such as:

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

As you can see, each alternative and each dimension is identified by a number. To begin searching for information, you will be asked two questions: (1) the alternative number about whom 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 to the dimension you would like.

PRESS THE RETURN KEY TO CONTINUE

CONFUSED? Let's go through the evaluation process in detail.

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

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 render a decision. At that time, you will select an employee for dismissal, (or, rate each employee on his/her deservedness for dismissal.) You will be provided with a form on which to indicate your choice, (or, ratings.)

PRESS THE RETURN KEY TO CONTINUE

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

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

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 you are interested in the TYPING SKILLS of EMPLOYEE C. You would press -3- for EMPLOYEE C, the RETURN key, and then -1- for the TYPING dimension and the RETURN key. The present screen will disappear and be replaced by a screen displaying the requested information as follows:

PRESS THE RETURN KEY TO CONTINUE

EMPLOYEE C misspells every fourth word in a report which goes to the company president.

PRESS THE RETURN KEY TO CONTINUE

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

ENTER 1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE YOUR FINAL DECISION

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

PRESS THE RETURN KEY TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

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 about the PHONE MANNERS used by EMPLOYEE D. You would type in a -4- for EMPLOYEE D, hit the RETURN key, type a -2- for PHONE MANNERS, and hit the RETURN key.

PRESS THE RETURN KEY TO CONTINUE

Now the computer displays the following message:

EMPLOYEE D answered the phone with the department's name and gave his name.

PRESS THE RETURN KEY TO CONTINUE

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

ENTER 1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE THE FINAL DECISION

Again, let's assume that you are not ready to make the final selection, (or, ratings.) Again, after pressing -1- for more information, the computer will return to the screen with the original lists of ALTERNATIVES and DIMENSIONS.

PRESS THE RETURN KEY TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

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 see EMPLOYEE A's performance on SCHEDULING. You would type a -1- for EMPLOYEE A, hit the RETURN key, type a -4- for SCHEDULING, and hit the RETURN key.

PRESS THE RETURN KEY TO CONTINUE

EMPLOYEE A schedules two meetings in the same conference room at the same time.

PRESS THE RETURN KEY TO CONTINUE

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

ENTER 1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE THE FINAL DECISION

Again, let's assume that you are not ready to make the final selection, (or, the final ratings.) Again, after pressing -1- for more information, the computer will return to the screen with the original lists of ALTERNATIVES and DIMENSIONS.

PRESS THE RETURN KEY TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=EMPLOYEE A	1=TYPING SKILLS
2=EMPLOYEE B	2=PHONE MANNERS
3=EMPLOYEE C	3=FILING
4=EMPLOYEE D	4=SCHEDULING

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 see EMPLOYEE B's performance on FILING. You would type a -2- for EMPLOYEE B, hit the RETURN key, type a -3- for FILING, and hit the RETURN key.

PRESS THE RETURN KEY TO CONTINUE

EMPLOYEE B is often unable to locate documents that he has filed.

PRESS THE RETURN KEY TO CONTINUE

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

ENTER 1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE THE FINAL DECISION

At this point in our example, let's assume that you have searched a sufficient amount of your employees' performance information to allow you to make your decision. You would type a -2- and hit the RETURN key.

PRESS THE RETURN KEY TO CONTINUE

The computer will now display the following message:

ENTER <N> IF YOU ARE NOT READY TO COMPLETE THE SELECTION
(or, RATINGS.)

ENTER <Y> IF YOU ARE READY TO COMPLETE THE SELECTION
(or, RATINGS.)

Since you are ready to complete the task, you would press the -Y-key and then the RETURN key. The present screen will disappear and a form will appear on the next screen.

PRESS THE RETURN KEY TO CONTINUE

The computer will now display the following message:

On the following space, (or, Using the following 9-point scale), please indicate which employee is the one who should be dismissed from his/her current job (or, how deserving each employee is of being dismissed from his/her current job.) NOTE: Once a choice (or, the ratings) decision has (or, have) been made, you will not be allowed to change it (or, them.)

The employee who should be dismissed is EMPLOYEE (blank).

(Or, in the rating response mode,)

I------I------I------I------I------I------I------I------I

1 2 3 4 5 6 7 8 9

very undeserving to be -> dismissed

neither <- deserving nor undeserving to be dismissed

highly deserving to be dismissed

EMPLOYEE A DESERVES A RATING OF (blank).

EMPLOYEE B DESERVES A RATING OF (blank).

EMPLOYEE C DESERVES A RATING OF (blank).

EMPLOYEE D DESERVES A RATING OF (blank).

Following the cursor's prompt (e.g., the flashing colon), you would submit your choice (or, ratings) by entering the appropriate letter (or, numbers) in the space(s) provided after the colon.

PRESS THE RETURN KEY TO CONTINUE

At this point, the computer will summarize the results of your selection (or, ratings) as follows:

EMPLOYEE C has been selected to be dismissed.

(Or, in the rating response mode,)

EMPLOYEE A has been assigned a rating of 8 on deservedness for dismissal.

EMPLOYEE B has been assigned a rating of 6 on deservedness for dismissal.

EMPLOYEE C has been assigned a rating of 9 on deservedness for dismissal.

EMPLOYEE D has been assigned a rating of 2 on deservedness for dismissal.

PRESS THE RETURN KEY TO CONTINUE

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

PRESS THE RETURN KEY 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 decision task. For this practice task, you will be evaluating the performance of university professors as a basis for their tenure. These professors' performance will be described along 4 performance dimensions. As in the example, you will be selecting (or, rating) which alternative should not be kept (or, how deserving each professor is of being let go.) You can search for as little or as much information as you feel is necessary in making your choice (or, ratings.) The alternatives and dimensions are as follows:

ALTERNATIVES	DIMENSIONS
1=PROFESSOR A	1=LECTURING
2=PROFESSOR B	2=ANSWERING QUESTION
3=PROFESSOR C	3=ADVISING
4=PROFESSOR D	4=EXAM WRITING

Remember to choose one alternative and one dimension at a time. Type in the number corresponding to 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 your selection (or, ratings) for the professors' performance.

PRESS THE RETURN KEY TO CONTINUE

ALTERNATIVES	DIMENSIONS
1=PROFESSOR A	1=LECTURING
2=PROFESSOR B	2=ANSWERING QUESTION
3=PROFESSOR C	3=ADVISING
4=PROFESSOR D	4=EXAM WRITING

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

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

PROFESSOR A explains a complex concept so that class understands it.

ENTER 1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE THE FINAL DECISION

ENTER <N> IF YOU ARE NOT READY TO COMPLETE THE SELECTION
(or, RATINGS.)

ENTER <Y> IF YOU ARE READY TO COMPLETE THE SELECTION
(or, RATINGS.)

On the following space, (or, Using the following 9-point scale), please indicate which professor is the one who should be dismissed from his/her current job (or, how deserving each professor is of being dismissed from his/her current job.) NOTE: Once a choice (or, the ratings) has (or, have) been made, you will not be allowed to change it (or, them.)

The professor who should be dismissed is PROFESSOR (blank).

(Or, in the rating response mode,)

I------I------I------I------I------I------I------I------I

1 2 3 4 5 6 7 8 9

very	neither	highly
undeserving	<- deserving	deserving
to be ->	nor	to be
dismissed	undeserving	dismissed
	to be	
	dismissed	

PROFESSOR A DESERVES A RATING OF (blank).

PROFESSOR B DESERVES A RATING OF (blank).

PROFESSOR C DESERVES A RATING OF (blank).

PROFESSOR D DESERVES A RATING OF (blank).

APPENDIX F

Appendix F

Computer Task Introduction Screen

Now that you have done an example, you should be ready to begin the actual task. You will be presented with a list of six, currently employed, part-time hourly employees (ALTERNATIVES). You will also be presented with a list of six job dimensions (DIMENSIONS) related to the work of hourly employees and along which you are to evaluate your workers. Your task is to evaluate as little or as much information as necessary for you to make your decision. The dimensions along which you will be evaluating your employees are:

1. French Fry Production
2. Restroom Maintenance
3. Dining Room Maintenance
4. Counter Service
5. Sandwich Preparation
6. Outside maintenance

If you have any questions, please ask the experimenter at this time. Otherwise, press the RETURN key to begin the task.

APPENDIX G

Appendix G

Manipulation Checks

Below you will find a number of dimensions that may be used to describe your attitudes about this experiment. For each of these dimensions, please circle the number corresponding to the way you feel about the experiment and your performance.

Importance manipulation check (Billings & Scherer, 1988)-

The task was...

worthless	-3	-2	-1	0	+1	+2	+3	valuable
inconsequential	-3	-2	-1	0	+1	+2	+3	consequential
useless	-3	-2	-1	0	+1	+2	+3	useful
important	-3	-2	-1	0	+1	+2	+3	unimportant (R)
irrelevant	-3	-2	-1	0	+1	+2	+3	relevant (additional item)

Accountability manipulation check-

I felt...

responsible	-3	-2	-1	0	+1	+2	+3	unattributable (R)
uninvolved	-3	-2	-1	0	+1	+2	+3	involved
accountable	-3	-2	-1	0	+1	+2	+3	unaccountable (R)

Equity manipulation check-

The experimental conditions were...

fair	-3	-2	-1	0	+1	+2	+3	unfair (R)
unjust	-3	-2	-1	0	+1	+2	+3	just
unnecessary	-3	-2	-1	0	+1	+2	+3	necessary
unreasonable	-3	-2	-1	0	+1	+2	+3	reasonable

Effort perceptions-

The task was...

easy	-3	-2	-1	0	+1	+2	+3	difficult
effortful	-3	-2	-1	0	+1	+2	+3	effortless (R)
challenging	-3	-2	-1	0	+1	+2	+3	unchallenging (R)

Performance perceptions-

My decisions were...

ineffective	-3	-2	-1	0	+1	+2	+3	effective
successful	-3	-2	-1	0	+1	+2	+3	unsuccessful (R)
unacceptable	-3	-2	-1	0	+1	+2	+3	acceptable
inferior	-3	-2	-1	0	+1	+2	+3	superior

I felt...

confident	-3	-2	-1	0	+1	+2	+3	unconfident (R)
certain	-3	-2	-1	0	+1	+2	+3	uncertain (R)
willing	-3	-2	-1	0	+1	+2	+3	unwilling (R)
competent	-3	-2	-1	0	+1	+2	+3	unprepared (R)

Familiarity of task-

The task was...

novel	-3	-2	-1	0	+1	+2	+3	familiar
acceptable	-3	-2	-1	0	+1	+2	+3	unacceptable (R)
unrealistic	-3	-2	-1	0	+1	+2	+3	realistic

The task was...

inexperience	-3	-2	-1	0	+1	+2	+3	experience
appropriate	-3	-2	-1	0	+1	+2	+3	inappropriate (R)
uncommon	-3	-2	-1	0	+1	+2	+3	common
justifiable	-3	-2	-1	0	+1	+2	+3	unjustifiable (R)

Feelings about task-

The task was...

boring	-3	-2	-1	0	+1	+2	+3	fun
uninteresting	-3	-2	-1	0	+1	+2	+3	interesting
aversive	-3	-2	-1	0	+1	+2	+3	pleasant
stressful	-3	-2	-1	0	+1	+2	+3	relaxing
agreeable	-3	-2	-1	0	+1	+2	+3	offensive (R)
unfulfilling	-3	-2	-1	0	+1	+2	+3	satisfying

APPENDIX H

Appendix H

Demographic Questionnaire

We are interested in a few variables that will help us when we analyze the information you have given us. We emphasize that this information will not be used to single you out. It merely helps us to answer some of the research questions that are of interest to us.

1. What are the last four digits of your student number? _____

2. Gender: female __ male ____

3. Class standing: Freshman __ Sophomore __ Junior ____ Senior ____

4. Currently or past employed at: McDonald's ____

   Wendy's ____

   Burger King ____

5. Length of employment in months: _____

6. Average hours worked per week: _____

7. Job title: _____

8.a. Past participation in an experiment: yes __ no ____

(If yes, then please answer 8.b.)

b. How many <u>minutes</u> participation for one extra credit point?

<u>for you</u>:

15 >_ 15_ 30_ 45_ 60_ 75_ 90_ 105___

<u>for others</u>:

15 >_ 15_ 30_ 45_ 60_ 75_ 90_ 105___

APPENDIX I

APPENDIX I

Debriefing Form

This experiment is designed to answer several hypotheses concerning how individuals make decisions in contexts that vary in task and environmental characteristics. One environmental characteristic of interest to this study is decision maker accountability. Accountability can be internally- or externally-imposed. One method for generating internally-imposed accountability is to invoke what is referred to as the norm of reciprocity - basically, making someone feel obligated to return an unexpected favor. In some conditions of this experiment, subjects were led to believe that they were being overcompensated for their participation. Thus, these individuals may have felt obligated, or even genuinely wanted to "do a good job" on the decision task. In other conditions however, individuals received an equal amount of extra credit for approximately equivalent participation time.

Decision makers are often accountable to others for the quality and outcomes of their decisions. This is what I refer to as externally-imposed accountability. Externally-imposed accountability can be generated in several ways. The method I have chosen makes decision maker's strategies public knowledge - some individuals were videotaped while they discussed their decision strategy. This required individuals to be accountable to the experimenter for their decision making behavior. Again, externally-imposed accountability is expected to affect decision maker's search strategies.

This has been a very brief overview of the experimental manipulations. If you have any further questions about the study, please feel free to ask them now, or if you prefer, call me at the number below. If you wish to receive a final

summary of this study, I will put your name on a mailing list. Finally, I ask that you please keep the specific nature of this experiment confidential as it will continue through the remainder of Winter term. I can't overemphasize the need for confidentiality, but I can tell you that it will be greatly appreciated. Thank you again for your participation.

Larry Marcy
18 Baker Hall
353-9166

APPENDIX J

APPENDIX J

Experimenter Instructions

The first portion of instructions was common to all experimental conditions.

"Hello and welcome to the experiment on employee decisions in a fast food restaurant. My name is Larry and if you have questions at any time during this session, please feel free to ask them. As I indicated on the sign-up sheet, you should only be participating in this experiment if you have been or are currently employed in either Wendy's, McDonald's, or Burger King. If you do not meet this qualification, you will be unable to complete the experiment. Have you had work experience in any of these restaurants?" (pause)

"Okay then, before we can start, I need to get your consent to participate in this study. If you choose to participate, you will need to sign a form that indicates that choice. This is the consent form. Please read along as I read it to you. If you wish to continue after that point you will need to sign and date the form." [Experimenter reads the consent form.]

"Great! I appreciate your cooperation. Now I'd like you each to take a seat at one of the personal computers in the labs - one computer per person."

[Experimenter shows subjects where computers are located.]

[Experimenter gives the following instructions to each subject.]

"The first task I have for you is the Job Security Threat task. This is a role playing task and is fairly self explanatory. However, if you don't understand the instructions, please let me know and I will try to clarify them."

"Please let me know when you have completed the task."

[Subject completes task.]

Internally-Imposed Accountability

The general experimenter instructions for the two internally-imposed accountability conditions are presented below.

No internally-imposed accountability. "Thank you for completing the JST task. As you know, this experiment is scheduled for 1 and 1/2 hours that means you're supposed to be out of here by ____. However, having looked over your performance on the JST task, I don't think you need to do all of the other tasks. The one remaining task that I do need you to complete shouldn't take quite that much time to finish; so you may be done a little early."

"This task is related to decisions and how they are made. The time it takes to complete the task varies. But regardless of when you finish, I will let you go and you will receive all your extra credit points."

"Do you have any questions at this point?" (pause)

"Okay then, let me describe the decision making task to you and then you can get started." [The externally-imposed accountability manipulation will then be presented at this point in the experiment.]

<u>High internally-imposed accountability</u>. "Thank you for completing the JST task. As you know, the experiment is scheduled for 1 and 1/2 hours. That means you're supposed to be out of here by ____. However, given your performance on the JST task, I'm sure I can dismiss you much earlier than that. I have several other tasks that I usually ask people to perform, but I think the information you gave me is complete enough that I can give you a break. Even though the information is crucial to my master's thesis, I think I have the information I need without keeping you here too much longer. I just need you to complete one other task."

"This task is related to decisions and how they are made. After you complete that, I can let you go. As you know, you're supposed to get one extra credit point for every half hour of participation. Basically, I'm giving you three extra credit points for doing much less than an hour's work, plus I'm letting you leave early. You don't mind the unearned points do you?" (slight pause)

"Do you have any questions at this point?" (pause)

"Okay then, let me describe the other task to you and then you can get started." [Externally-imposed accountability manipulation will then be presented at this point in the experiment.]

Externally-Imposed Accountability

The general experimenter instructions for these two conditions are presented below. Underlined portions are specific to the two response mode conditions.

No externally-imposed accountability. "The task I want you to perform now is related to decisions and how they are made. Your task will involve using the computer to search for information that may help you to make a decision. The information is about current job holders working at a fast food restaurant and you should be familiar with the type of information presented."

"Specifically, you are being asked to make a choice concerning which job incumbent should be dismissed from his/her job," (or, in the alternate response mode condition,"rating of each job incumbent concerning his/her suitability for termination.") "That is, I am interested in who should be let go from their current job," (or,"your ratings of each person's deservedness to be let go- you can have ties in the ratings.") "The whole information search and decision process is computerized and you will have an opportunity to make a practice decision before you begin the actual task."

"Before you start the practice session, I want to emphasize that your responses will be strictly confidential. No one other than myself will see any of this information and the results of this study will not be traceable to any one person. Your anonymity will be completely guarded."

"Do you have any questions at this point?" (pause)

"Okay, I'd like you to start the practice session. Please read the instructions on the screen as I read them to you. [The instructions for the process tracing program will be read at this time.] When you have completed the practice session, please let me know."

"Do you have any questions at this point?" (pause)

[Subject completes practice session.]

"Did you understand how to operate the computer? Do you have any (more) questions about the task?" (pause) "Please tell me when you have finished. You may begin the final task."

[Subject completes computerized decision task.]

"I need you to fill out two questionnaires regarding your impressions of the task you just completed, then fill out a demographic questionnaire. The forms are self-explanatory, but again, feel free to ask for clarifications."

[Experimenter gives subject questionnaires.]

"At this point, you have completed this experimental session. Before I debrief you on the purpose and hypotheses of this study, I want to thank you for your participation."

[Experimenter reads the debriefing form, answers any questions, puts subject's name on mailing list to receive study results (if desired), and confirms subject's participation and extra credit.]

High externally-imposed accountability. "The task I want you to perform now is related to decisions and how they are made. Your task will involve using the computer to search for information that may help you to make a

decision. The information is about current job holders working at a fast food restaurant and you should be familiar with the type of information presented."

"Specifically, you are being asked to make a choice concerning which job incumbent should be dismissed from his/her job," (or, in the alternate response mode condition,"rating of each job incumbent concerning his/her suitability for termination.") "That is, I am interested in who should be let go from their current job," (or,"your ratings of each person's deservedness to be let go - you can have ties in the ratings.") "The whole information search and decision process is computerized and you will have an opportunity to make a practice decision before you begin theactual task."

"Before you start the practice session, I want to let you know that after you complete the actual decision task you will be asked to explain how you went about making your decision and what that actual decision was. I will be videotaping you as you do this so that the quality of your decision making process can be evaluated later by a panel of professors who are experts in this area. While we are not interested in identifying you by name, we will be using the last four digits of your student ID number to identify your discussion."

"Do you have any questions at this point?" (pause)

"Okay, I'd like you to start the practice session. Please read the instructions on the screen as I read them to you. [The instructions for the process tracing program will be read at this time.] When you have completed the practice session, please let me know."

"Do you have any questions at this point?" (pause)

[Subject completes practice session.]

"Did you understand how to operate the computer? Do you have any (more) questions about the task?" (pause) "Please tell me when you have finished. You may begin the task."

[Subject completes computerized decision task.]

"I need you to fill out two questionnaires regarding your impressions of the task you just completed, then fill out a demographic questionnaire. The forms are self-explanatory, but again, feel free to ask for clarifications."

[Experimenter gives subject questionnaires.]

"This last part of the experiment will only take a few minutes to complete. I know that this is difficult for some people, so I want to thank you for agreeing to do this. If you would just take a seat in front of the camera we can begin."

"I want you to describe how you went about making your decision as to which job incumbent should be dismissed from the job," (or, for the rating response mode, "the ratings you gave job incumbents on their deservedness to be dismissed.") "What were the dimensions of the job performance profiles that you thought were important and how did you try to use this information to reach your decision? If you had a strategy for deciding, that would be something that I would like you to mention, although if you didn't, that is okay too. You can begin now if you don't have any questions, but feel free to ask questions that you do have at any

time during this taping session and I'll do my best to answer them. Shall we begin?"

[Experimenter operates video camera and answers questions if necessary.]

"At this point, you have completed this experimental session. Before I debrief you on the purpose and hypotheses of this study, I want to thank you for your participation."

[Experimenter reads the debriefing form, answers any questions, puts subject's name on mailing list to receive study results (if desired), and confirms subject's participation and extra credit.]

APPENDIX K

APPENDIX K

Job Security Threat Task

This task requires respondents to describe their perceptions and intended responses to a threat to their continued employment. The first materials in this task ask the respondents to imagine themselves as having a part time job that is essential to their financial support while in school. The job has above-average levels of pay, interest, challenge, and supervisory and coworker support. In addition, the weekly number of hours fits in very well with the respondent's class schedule. Each respondent will receive one of four messages from the manager that describes a declining financial situation for the company and warns of the possibility of being laid off. The messages will vary the severity, immediacy, certainty, and duration of the threat. Dependent variables will include assessments of the respondent's memory for the background conditions, perceptions of the manipulated variables, and inclination to begin an immediate search for another job. There will also be an exercise that attempts to capture or identify a respondent's "certainty equivalent" job. The task will be used to determine what would be the minimum levels of pay rate, hours, interest, challenge, and supervisory and coworker support that would induce the respondent to quit the threatened ("uncertain") job and take the alternative ("certain") job.