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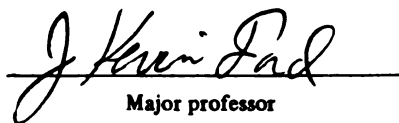
Stereotypes in Decision Making:
The Influences of Category Labelling, Information
Consistency, and Need for Cognition
on Information Acquisition

presented by

Keith Evan Hattrup

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**STEREOTYPES IN DECISION MAKING:
THE INFLUENCES OF CATEGORY LABELLING, INFORMATION
CONSISTENCY, AND NEED FOR COGNITION
ON INFORMATION ACQUISITION**

By

Keith Evan Hatstrup

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ABSTRACT

STEREOTYPES IN DECISION MAKING: THE INFLUENCES OF CATEGORY LABELLING, INFORMATION CONSISTENCY, AND NEED FOR COGNITION ON INFORMATION ACQUISITION

By

Keith Evan Hatstrup

Research in the area of decision making in organizations has not adequately addressed the role of schematic information processes during the acquisition of decision-relevant information. The present study represents an attempt to apply recent theoretical and empirical work in social cognition to a complex decision task. Subjects were given an opportunity to gather information about potential co-workers, either labelled with stereotypic occupation labels or unlabelled with respect to occupation membership, before rating their preference to work on a joint task with each of the co-workers. Information about the co-workers was consistent or inconsistent with occupation stereotypes. The results demonstrated significantly less search for information describing labelled co-workers. Indirect support was found for the ability of inconsistent information to undercut category-based processing in the presence of stereotypic labels. Need for cognition was found to relate to search depth but not search latency or search strategies.

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INTRODUCTION

The study of judgment and decision making has been a central focus of much research in industrial/organizational psychology. Recently, interest in the cognitive mechanisms involved in decision making has grown, largely out of the apparent failure of more prescriptive models to account for unstable and seemingly irrational behavior during judgments and decisions (Pitz & Sachs, 1984). Decision makers take shortcuts; they satisfice; and they often do not fully comprehend or consider the implications of relevant information when making their decisions (Abelson & Levi, 1985). Although decision makers are thought to be generally active processors of information, they are nonetheless limited in their cognitive capacities. Consequently, much emphasis has recently been placed upon understanding the processes by which decision makers select and employ simplifying "rules of thumb", or heuristics, during the cognitive processing of information for decisions.

Much cognitively oriented research in decision making has sought to ascertain the influences of various environmental, task, and/or person factors on the cognitive processing of decision-relevant information (Abelson & Levi, 1985; Beach & Mitchell, 1978; Ford, Schmitt, Schechtman, Hults, & Doherty, 1988). Within this context, decision making behavior is seen as highly contingent on the contextual factors present at the time information is being cognitively processed in service of the decision maker's ultimate judgment activity (e.g.

Beach & Mitchell, 1978; Einhorn & Hogarth, 1981; Payne, 1982). In research, important insights regarding cognitive functioning have increasingly been provided through analysis of information gathering behavior during decision making tasks. Thus, unsystematic and cursory information gathering prior to a decision indicates relatively mindless or heuristic processing, whereas an exhaustive search for information indicates more painstaking and deliberate cognitive activity (Einhorn & Hogarth, 1981).

Although task characteristics and, to a lesser extent, environmental factors have been well researched in the area of decision making, relatively little attention has been paid to the role of person factors in the processing of information during decision making. Several researchers have related individual differences in prior knowledge or experience with processing of decision-relevant information (e.g. Bettman & Park, 1980; Ford & Kozlowski, 1988; Kozlowski & Ford, 1988; Hoyer & Jacoby, 1982; Jacoby, Chestnut, & Fischer, 1978; Schechtman & Ford, 1987) whereas a smaller number has examined individual differences in cognitive ability and skill (Capon & Davis, 1984; Jacoby, Mazursky, Troutman, & Kuss, 1984; Klayman, 1985), socioeconomic status (Capon & Burke, 1980), and perceived risk associated with decisions (Capon & Burke, 1980; Jacoby, et al, 1978). Largely ignored in the published literature on decision making is the possibility that individuals bring unique expectations or stereotypes to a decision which subsequently influence their consideration of decision-relevant information.

Social psychologists studying the processes of person perception, cognition, and persuasion, have long since established that pre-existing

knowledge structures, such as schemata and attitudes strongly influence the cognitive processing of information in the social environment (e.g. Fiske & Taylor, 1984; Judd & Kulik; 1980; Lingle & Ostrom; 1981; Marcus & Zajonc, 1985). This research has demonstrated that cognitive structures often serve as organizing heuristics for the interpretation and storage of social information. By so doing, stereotypes and attitudes may remain remarkably persistent even in the light of seemingly disconfirming information (e.g. Darley & Gross, 1983; Lord, Ross, & Lepper, 1979). In addition, recent empirical work has demonstrated that schemata and other cognitive structures may trigger immediate evaluative responding whereby a systematic or thoughtful consideration of judgment-relevant information is made unnecessary (Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986). Although much of this research attempts to provide inferences regarding cognitive activity based on sophisticated measures including argument recall (e.g. Srull, Lichtenstein, & Rothbart, 1985), response latency (e.g. Fazio, Chen, McDonel, & Sherman, 1982), gaze duration (e.g. Neuberg & Fiske, 1987), and valence of post-communication judgments (e.g. Fiske, Neuberg, Beattie, & Milberg, 1987), researchers in this area have seldom addressed overt information acquisition as a possible manifestation of the cognitive processing of social information.

The purposes of the proposed research are twofold. First, the influences of cognitive structures on the processing of information during decision making will be examined. Pre-existing attitudes or expectations may represent an important person factor that can account, in part, for the seemingly irrational nature of human decision behavior in organizations. Second, it is hoped that by focusing on information

acquisition, this study can make a contribution to more basic social psychological research on schemata and attitudes. Information acquisition, a measure of cognitive activity developed in research on decision making behavior, may provide additional insight into the influences of cognitive structures on the processing of social information.

The next section of this paper provides a brief overview of decision making research with particular emphasis on the methods typically used in efforts to examine information acquisition. This is followed by a review of the relevant social psychological research on schematic information processing. Included in this discussion is a description of an important individual difference factor, the need for cognition, which has been shown to influence cognitive behavior under situations involving persuasion and attitude change. Finally, research on social cognition, decision making, and the need for cognition is integrated in an experimental design which combines these areas of research in hopes of increasing our knowledge of information acquisition processes.

Decision Making

Research in decision making has recently sought to examine the underlying cognitive processes involved in complex problem solving and decision making (see Abelson & Levi, 1985 for a review). Two distinct methods have typically been employed in research to uncover cognitive processes during decision making. The first of these, often called structural or statistical modeling, examines the relation between information input and subsequent decision responses (Abelson & Levi, 1985). Structural models focus on the integration, weighting,

balancing, and combining of information to describe mathematically how people make decisions (Slovic & Lichtenstein, 1971). As an example, policy capturing involves the use of multiple regression to uncover a judge's implicit weighting of decision-relevant information in arriving at a final judgment (Abelson & Levi, 1985).

While structural models are generally concerned with the outcomes of decision processes, a second method has evolved to examine more directly the processes leading up to a decision. Process models focus on predecisional behavior, including the acquisition of information and the strategies and heuristics people use in solving decision problems (Abelson & Levi, 1985; Ford, et al, 1988; Payne, 1982). As such, process models are useful in providing information about the attentional processes involved during decision tasks, such as, which of the available information cues are attended to and the sequence with which cues are considered. Given that the present study is focused on acquisition processes, process tracing techniques are described below.

Process Tracing Techniques

Eye Movements. Process techniques of tracing the decision maker's use of information prior to rendering a judgment have typically included (1) recording eye movements, (2) verbal protocols, and (3) information boards (Abelson & Levi, 1985; Ford et al, 1988). Eye movements can be measured for factors such as fixation and duration, which provide insight into the subject's acquisition and processing of decision relevant information. This method has proven to be useful in studying simple decision behavior in addition to behavior on other cognitive tasks (see Abelson & Levi, 1985). However, the technical problems associated with this technique, such as the necessity of limiting the

number of information items and of spacing them relatively far apart to permit precise measurement, has prevented the recording of eye movements from becoming a well practiced technique.

Verbal Protocols. Verbal protocol or thought listing analysis has been used extensively in research in both decision making (see Abelson & Levi, 1985 for a review) as well as attitudes and attitude change (e.g. Fiske, et al 1987; Erber & Fiske, 1984). In decision making research, verbal protocols are generated when subjects are instructed to think aloud while working on a decision task. The decision maker is asked to report all of his or her passing thoughts while acquiring and evaluating information relevant to a decision or judgment. The subject's statements are then broken down into core components which are analyzed to yield quantifiable information regarding decision behavior.

Information Boards. The information board, by far the most widely used process tracing technique, allows the researcher to examine decision makers' explicit search for information. Using this technique, information regarding a set of alternatives is presented in matrix format, where common attributes or dimensions of information are available for each of the decision alternatives. The decision maker's task usually involves uncovering cards which contain information about the value of a particular attribute for a given alternative. While the subject uncovers cards in succession, the experimenter records the sequence of search and the amount of time spent looking at each item of information. Recently, computer-controlled information boards have been developed for use in process tracing research.

Three assumptions underlie the use of information boards in process tracing research (Abelson & Levi, 1985). First, it is assumed

that when an individual looks at an item of information, he or she is attending to the data and is actively encoding and processing the information. Second, an individual's attention to an item of information is assumed to be the result of a deliberate and purposeful search that is based on a particular strategy for gathering information. Finally, it is assumed that the amount of time spent looking at decision-relevant information is positively related to the complexity of the decision maker's cognitive processing of that item of information.

Research employing the information board technique typically focuses on three key dependent variables in examining underlying cognitive processes: the latency, depth, and sequence of information search. Latency of search refers to the amount of time spent examining particular pieces of information, or alternative/attribute pairs. In some cases, researchers also assess the total amount of time required to make a final decision. To illustrate, decision tasks involving relatively severe time constraints have been associated with shorter processing latencies per item of information acquired than tasks that allow the decision maker more time to form his or her judgment (Payne, Bettman, & Johnson, 1986). Similarly, Onken, Hastie, and Revelle (1985) found shorter overall decision latencies among subjects given difficult decision tasks compared to subjects given easier tasks. Presumably, shorter periods of attention to decision relevant information and/or faster decisions indicate relatively simple, or thoughtless, processing of information. Thus, Onken et al. (1985) argued that individuals, perceiving greater cognitive strain on difficult tasks, seek to reduce the tasks, and therefore their strain, through the use of simplifying heuristics or shortcuts.

Search depth refers simply to the absolute amount of information examined by the decision maker; that is, the number of alternative/attribute pairs acquired by the subject. Many researchers have examined search depth (e.g. Biggs, Bedard, Gaber, & Linsmeier, 1985; Capon & Burke, 1980; Capon & Davis, 1984) and have suggested that less exhaustive overall search is generally associated with attempts to simplify the decision task. As an example, Klayman (1985) discovered a tendency among high cognitive ability children to acquire more information than lower ability children, presumably because lower ability children are more likely to simplify cognitively demanding tasks. Klayman's (1985) findings did not hold when the children were given easier decision tasks, suggesting that simplifying strategies will be utilized only when decisions call for relatively painstaking information acquisition and consideration.

Finally, search sequence refers to the pattern(s) of information acquisition and is often categorized according to whether search depth was constant or variable across alternatives, and whether the search was primarily intra- or inter-attribute. Sequence is assessed by examining the n th and $n + 1$ pieces of information acquired by the subject. Thus, an inter-dimensional pattern is indicated when the $n + 1$ piece of information corresponds to the n th piece in alternative but not in attribute. Alternatively, when the n th and $n + 1$ pieces share the same dimension but involve different alternatives, an intra-dimensional pattern is indicated. A mixed pattern would involve a lack of correspondence in both alternative and attribute between the n th and $n + 1$ pieces of information. Sequence and depth of search are frequently

examined concurrently to determine the search strategies employed by decision makers (Payne, 1976).

Information Search Strategies

Two general categories of search and processing strategies have been described in the decision making literature. The first of these includes strategies which involve a relatively deliberate comparison and "trading off" of attribute values. With these strategies, a high value on one attribute of a choice alternative compensates for a low value on another attribute of the same alternative (Payne, 1976). Such compensatory models represent cognitively sophisticated attempts to determine rationally the preferred alternative. By definition, compensatory models imply an active and exhaustive search for information.

The second category of decision strategies includes models which do not allow for the trading-off of attribute values. Such non-compensatory strategies are thought to involve the use of simplifying rules or heuristics in managing the decision task (Olshavsky, 1979). Researchers often examine the extent to which search was inter or intra-dimensional and whether search was compensatory or non-compensatory concurrently to further classify the subjects' search strategies according to rules described by Payne (1976). However, much of this analysis depends on verbal protocols to differentiate strategies that would otherwise appear identical on the basis of a simple analysis of the patterns of explicit information search.

Factors Affecting Information Acquisition:

Prior Knowledge/Experience

Much research in the area of decision making has examined the influences of various environmental, task, and/or person factors on the use of compensatory or non-compensatory strategies in decision making (see Abelson & Levi, 1985; Ford et al, 1988 for reviews).

Fundamentally, these studies demonstrate that the extent to which decision makers exploit simplifying decision strategies depends in part on the contextual factors present at the time decision-relevant information is being gathered and considered. Thus for example, cognitively demanding tasks, such as those requiring consideration of a large amount of data, are associated with simplifying non-compensatory strategies, presumably because decision makers are highly motivated to reduce the cognitive strain associated with complex tasks (so long as the costs associated with making incorrect decisions do not become too great; Beach & Mitchell, 1978; Onken, et al, 1985). Similarly, choice decisions among highly dissimilar alternatives have been associated with heuristic processing while choices among similar alternatives, which inherently require more careful scrutiny, have been associated with relatively systematic compensatory search strategies (Biggs, et al, 1985).

Recently, researchers have examined the role of prior knowledge or experience in the acquisition of information during decision making. Within this context, prior knowledge is thought to play a part in the formation of cognitive structures, such as schemata or attitudes, which in turn influence the processing of information in the environment. Using a simulated purchase decision task, Jacoby, et al (1978) found

that past experience with breakfast cereals, operationalized as self reported purchasing and consumption frequency and number of brands free recalled, was positively related to the amount of product information examined prior to the decision. The researchers explained that past experience may engender an ability to consider and make use of more information in greater detail. In a similar study, Hoyer and Jacoby (1982) were unable to demonstrate any systematic relationship between self-reported previous experience with contraceptives and sex and search for information regarding different contraceptive techniques during the decision task. The researchers suggested that a contraceptive decision may be of sufficiently great importance to override the effects of any prior knowledge or attitudes on the search for more information. Research in the area of attitudes and persuasion provides an analogous explanation. Petty and Cacioppo (1979) demonstrated that issues of high personal relevance resulted in careful argument scrutiny whereas issues that were less personally relevant were associated with relatively heuristic processing of information.

A study conducted by Bettman and Park (1980) found that processing of decision-related information was curvilinearly related to prior experience. Subjects in this study were classified into high, medium, and low prior experience groups based on their responses to a series of questions regarding the extent to which they had ever searched for information on, used, or owned microwave ovens. Analyses of verbal protocol data revealed that subjects in the medium experience group tended to rely on the available information to a greater extent when making a simulated purchase decision than did subjects in either the low or high experience groups. Statements made by subjects in the high

experience group indicated that they were more likely to rely on prior decision-relevant knowledge or attitudes whereas subjects classified as belonging in the low experience group relied more on prior attitudes or evaluations rather than objective prior knowledge or the available task information.

The researchers explained that subjects in the low knowledge group were more likely to simplify the decision task by relying on their available attitudes primarily because they lacked the available knowledge structures to adequately make sense of the presented information. In contrast, subjects who were highly experienced with microwave ovens apparently had the ability to process the task information but were unlikely to be motivated to do so since they could rely solely on information available in memory. Subjects in the medium experience group, however, had sufficient prior knowledge to make sense of the task information, but not so much that they did not need to process the available information prior to rendering their judgments.

Recent studies in the area of performance appraisal (Ford & Kozlowski, 1988; Kozlowski & Ford, 1988; Schechtman & Ford, 1987) have demonstrated that familiarity with ratees tends to influence rating behavior in the direction of reducing subjects' search for additional information. To manipulate ratee familiarity, Schechtman and Ford (1987) provided performance related information for six of nine police officers prior to a performance appraisal task which required subjects to choose officers for job training or promotion. The absolute amount of information made available about the six officers was held constant; however, half of these officers were characterized as being consistently

poor performers whereas the other half were described as consistently good performers.

Drawing from cognitive theories of performance appraisal (e.g. DeNisi, Cafferty, & Meglino, 1984; Ilgen & Feldman, 1983) which suggest that people initially attempt to categorize others and later use that category membership to judge individuals, the researchers predicted that ratees would not utilize additional diagnostic information about individuals with whom the subjects had some familiarity. Instead, familiarity should lead to the formation of a schema or attitude that could be used in place of specific behavioral information. Consistent with their predictions, subjects in their study sought out more information about the three officers for whom no prior information had been made available compared to officers for whom performance information had been presented prior to the appraisal task.

In a follow up study, Ford and Kozlowski (1988) manipulated the degree of familiarity with police officer ratees by varying the amount of information made available to subjects prior to a job performance rating task. Specifically, ratees were described with either 0, 2, 4, 6, 12, or 18 pieces of performance-related information prior to the actual performance rating task. Prior information was designed to be consistently favorable, consistently unfavorable, or non-existent for each of the police officer ratees. As expected, subjects sought out more information for police officer ratees as their exposure to prior performance-related information about those ratees decreased. Kozlowski and Ford (1988) later included a delay manipulation to examine the influences of memory decay on the use of prior performance-relevant information. Subjects in this study were first exposed to varying

amounts of information about police officer rates and then returned after a delay of 2, 4, or 7 days to acquire additional performance-related information and provide performance ratings for the officers. Subjects in a control condition sought out additional performance information and made their ratings immediately after being exposed to the varying amounts of prior information. As predicted, subsequent information search was greatest among control subjects encountering few pieces of prior performance related information. As the amount of prior information increased, information search among control subjects decreased to levels of delay subjects. According to the researchers, over time, delay subjects came to rely on their overall impressions of the target rates and as a result, subsequent information search was uninfluenced by the amount of prior information presented to subjects.

Limitations of Research on the Influences of Prior Knowledge/Experience in Decision Making

Studies designed to ascertain the influences of prior knowledge on the use of information in decision making have come from two distinct traditions of research, consumer decision making and performance appraisal, each with its own theoretical underpinnings. When taken together, these studies provide compelling evidence that prior knowledge is an important factor in decision making. Knowledge of the decision topic or familiarity with the decision alternatives appears to reduce one's likelihood of evaluating the available stimulus information in some cases. In others, especially when knowledge is only at a moderate level, one may become more motivated to consider the available information (Bettman & Park, 1980).

There are at least four limitations to the available research on the role of prior knowledge in decision making. First, each of the studies reviewed above manipulated prior knowledge or familiarity in a manner that permits numerous interpretations of the obtained results. Bettman and Park (1980) asked their subjects to report their own experience with microwave ovens prior to a simulated purchase decision task which required them to search for information about specific brands of ovens. Hoyer and Jacoby (1982) and Jacoby, et al (1978) studied consumer decisions using a similar methodology. Since subjects did not indicate their knowledge of the specific product brands used in each of these studies, the results attributable to what is in essence, knowledge of the decision topic, may be confounded with knowledge of the decision alternatives, or brands. That is, it is unclear whether highly knowledgeable subjects seek out less information about decision alternatives (Bettman & Park, 1980) because they need only to consider a few highly diagnostic attributes when making their decisions (knowledge of the decision topic) or because they have some prior knowledge of the alternatives themselves. This is an important distinction. In the former case, subjects rely on their knowledge of which features of a microwave oven are most important and how those features interrelate. When relying on knowledge of the alternatives themselves, on the other hand, subjects may access specific product information in memory or may use an overall impression or attitude about the brands. Evidence for this difference was provided in a study by Kozlowski, Kirsch, and Chao (1986) which found that knowledge of a job performance domain and knowledge of individual ratees operated uniquely to determine job performance ratings.

Studies by Schechtman and Ford (1987) and Ford and Kozlowski (1988; Kozlowski & Ford, 1988) attempted to manipulate prior familiarity with the decision alternatives while holding knowledge of the decision topic constant. In these studies, undergraduate subjects were presented with varying amounts of performance related information about police officers prior to a performance based decision or rating. Initial information about the ratees was thought to lead to the formation of overall impressions or attitudes which were later used to simplify the performance appraisal tasks. It is quite possible however, that subjects did not form impressions of the ratees during presentation of the initial information and instead, relied on memory for specific pieces of the prior information when making their decisions. Specific information from memory was combined with specific data available in the information board until a minimum threshold of ratee knowledge was reached in order to render a judgment. With no prior information available in memory, this threshold necessarily took longer to reach.

This interpretation is consistent with impression formation research which demonstrates that subjects are unlikely to spontaneously form impressions based on specific trait or behavioral information unless they have the explicit goal of doing so (Hastie & Park, 1986; Lichtenstein & Srull, 1988). When asked at a later time to give their impression of a target individual, subjects with simple comprehension or memory goals must "compute" an impression based on whatever original information can be recalled from memory. Since subjects in the studies reviewed above were simply told that they would need the initial information to later judge the overall performance of the officers (an arguably weak impression goal) or were told to try to remember the

initial information (a memory goal), it is possible that subjects did not form early overall impressions of the officers. As a result, information processing may not have been "top-down" or "theory-driven" as suggested by the researchers, but instead may have resembled more "data-driven" or "bottom-up" processing of information. As is discussed in more detail below, these differing modes of information processing have important implications for the use of information during judgments and decision making.

Although the results obtained by Kozlowski and Ford (1988) suggest that subjects in delay conditions may have relied on an overall impression when judging ratees (even though no explicit impression formation goal was provided), interpretation of the results of this study is made difficult by the finding that subjects in the delay conditions differed dramatically from zero delay subjects in the amount of additional information gathered about targets for whom no prior information had been available. One possibility is that delay subjects were unable to remember which items of information available in memory applied to which specific target. Recalling that most of the targets had been presented with some prior information, these subjects could simply have chosen to search a relatively constant, but minimal amount of information across all of the ratees. Zero delay subjects therefore appeared more sensitive to the varying amounts of prior information.

A second major limitation to the available research on prior knowledge in decision making pertains to the use of consistent and inconsistent data in the information board matrix. Those studies that have manipulated knowledge of the decision alternatives apart from topic knowledge (Ford & Kozlowski, 1988; Kozlowski & Ford, 1988; Schechtman &

Ford, 1987) have utilized wholly consistent information across both the initially presented information and the information available subsequently. An issue that has not yet been addressed is whether people will search for information differently depending on the congruency of the available data with their prior knowledge or expectations. As is discussed in the next section of this paper, research in social psychology demonstrates that people may either attempt to integrate the inconsistencies with their prior expectations or may instead, attempt to discount the information or may simply ignore it.

The relative lack of well articulated theoretical descriptions of the underlying cognitive processes involved with prior knowledge and its influence on decision making represents the third major limitation to the available research on this person factor (see Kozlowski & Ford, 1988 for an exception). Most existing research has merely described the influences of prior knowledge in terms of simple cause-effect relationships without developing a rationale for how prior knowledge operates to influence intervening cognitive processes and the resultant decision process. As Ilgen and Klein (1988) have recently pointed out, research in organizational behavior would benefit from attempts to describe the contributions of cognitive processes in organizational phenomena. Adapting theoretical frameworks established in research on social cognition, for example, may provide sophisticated explanations of apparent social processes in organizational behavior and ideally would contribute to the more basic psychological research (Ilgen & Klein, 1988).

Finally, experiments that have attempted to systematically ascertain whether prior knowledge or familiarity influences information processing during decision making are few in number. The studies that could be found were limited to the six reviewed above. More research is needed to examine the role of prior knowledge structures in the use of information during decision making. Research in social cognition can be used to provide a theoretical framework which addresses many of the limitations described above.

Schematic Processes in Social Cognition

Historically, much social psychological research has been offered in support of one or the other of two opposing models of social information processing: the elemental or attribute-oriented approach, and the configural or schema-based approach (Asch, 1946; Fiske, et al, 1987; Fiske & Pavelchak, 1987; Ostrom, 1977). According to the attribute-oriented view, people are thought to consider each available item of information independently of other information when forming evaluative impressions of people. The evaluative implications of each piece of information are assumed to be combined algebraically (by summing or averaging them) in order to yield an overall evaluation of the target person (Anderson, 1981). Affective reactions to others are based solely on the information given, hence they are "data-driven" or "bottom-up" in nature.

The schema-based approach, in contrast, holds that cognitive processing of social information is holistic in nature. That is, people are thought to utilize central or primary information in organizing their impressions of others. This approach can be traced back to early Gestalt psychology and to the seminal work of Asch (1946) in which the

evaluative implications of traits, such as "intelligent" and "calm", were found to vary depending on the contexts within which the traits were presented. More recently, the configural model has embraced the likelihood that prior knowledge structures, such as schemata, attitudes, and stereotypes, are similarly used to interpret information in the environment. From this perspective, the social environment is thought to be evaluated in a "top-down" or "theory-driven" fashion. This schematic processing of information simplifies an otherwise potentially chaotic and ambiguous overabundance of stimuli by providing frames of reference for the interpretation of reality (Cantor & Mischel, 1979; Taylor & Crocker, 1981).

Given research demonstrating the viability of both of these competing approaches (see Ostrom, 1977), recent efforts have been undertaken to describe the conditions under which attribute-based or schema-driven processing is most likely to occur (e.g. Lichtenstein & Srull, 1986; Wyer & Srull, 1986). An integrative model of social information processing has recently been proposed by Fiske and Neuberg (1990; see also Fiske & Pavelchak, 1986) in which category-based and attribute-based processing are described as lying on opposite ends of a continuum. According to this view, people initially attempt to categorize others using explicitly provided labels, such as ethnic identity, age, or gender, or on the basis of easily categorizable attributes, such as "wears glasses and a white coat, and carries a stethoscope". If categorization is successful, the target person can be evaluated in a top-down or theory-driven mode. Specifically, at the category-based end of the continuum, the affective "tag" linked with category membership is used to evaluate the target irrespective of any

potentially individuating information that may be available about the target. At intermediate stages along the continuum, individuating information about the target is considered but may be processed heuristically or may be accommodated with the initial category assignment. Toward the piecemeal or attribute-oriented end of the continuum, information about the target person is evaluated piece-by-piece and then combined to form an overall evaluation.

The continuum model of impression formation proposed by Fiske and Neuberg (1990) derives from a large body of research on the use of information in social perception. By so doing, it provides an excellent framework for developing hypotheses that are consistent with past research in distinct areas of social psychology, such as attitudes and persuasion, stereotyping, and impression formation. In fact, Fiske and Linville (1980) pointed out that the schema concept itself emphasizes principles of cognition which generalize to more specific instances, such as stereotypes, attitudes, and attributions. In the remainder of this section the continuum model and supporting research will be described in more detail. This review provides a contingency-based view of the social perceiver as one who, under certain specifiable circumstances, utilizes piecemeal processing of information about others, whereas at other times relies on schema-based processing.

Category-Based Information Processing

Schematic processes in social perception form the foundation of much recent theorizing in stereotyping, attitude change, and impression formation (e.g. Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986; Lingle & Ostrom, 1981; Wyer & Carlston, 1979; Wyer & Srull, 1986). Essentially, a schema refers to a cognitive structure that represents organized

knowledge about a given concept or stimulus domain (Taylor & Crocker, 1981; Fiske & Linville, 1980). It contains general knowledge about the attributes of the stimulus domain in addition to assumed relationships among attributes (Fiske & Taylor, 1984; Taylor & Crocker, 1981).

Schematic information is stored in an abstract form or as a general case rather than as a collection of specific instances or examples of the general case (Fiske & Taylor, 1984). Thus, by having a chair schema, for example, you are able to interpret a novel combination of wood pieces as comprising a chair rather than as some more complex arrangement of parts. Although affect may not be linked with every schema, many schemata are evaluative in nature. For example, stereotypes are often regarded as a special class of affect laden schemata which serve to organize one's knowledge of members of particular socially defined groups (Fiske, et al, 1987; Fiske & Taylor, 1984).

Researchers recognize that schemata and other cognitive structures, such as stereotypes and attitudes, may be functional for people by simplifying and organizing information in the environment (Fiske & Taylor, 1984; Katz, 1960; Smith, Bruner, and White, 1956). People draw on their prior knowledge and experience to interpret and understand new information. Further, by relying on one's generalized knowledge or expectations one can simplify the social environment by reducing the number of stimuli that must receive attention (Cantor & Mischell, 1977). This latter perspective follows from the assumption that although people actively process information and construct reality, they are nonetheless limited in their cognitive capacities (Fiske & Taylor, 1984). Thus, instead of processing all of the available

information in the environment at face value, people often utilize simplifying heuristics, or rules of thumb, for selectively attending to and interpreting a subset of the available information (Fiske & Taylor, 1984). This view, often called the "cognitive miser" or "lazy organism" model, emphasizes the seemingly irrational nature of human information processing and problem solving.

According to the continuum model of impression formation (Fiske and Neuberg, 1990), people initially attempt to categorize others to simplify the processing of social information. The process of successfully categorizing another person is thought to invoke an hierarchical schema stored in memory, which consists of a category label at the top level and a set of expected attributes at a subordinate level. Initial categorization occurs when an individual encounters an existing category label among the information available about another person. Category labels may include racial identity (Secord, Bevan, & Katz, 1956), gender (Taylor, Fiske, Etcoff, & Ruderman, 1978), mental illness (Neuberg & Fiske, 1987), occupation (Cohen, 1981; Fiske, et al, 1987), and personality traits (Cantor & Mischell, 1979). Categorization may also occur upon encountering a set of specific trait or behavioral attributes which easily prime a category stored in memory. For example, subjects were able to judge that a person described as gregarious and literary was more likely to be a journalism major than an engineering major (Slovic, Fischhoff, & Lichtenstein, 1976).

Upon categorizing another person, the social perceiver is thought to invoke automatically the affective tag linked with category membership and may use this affect as a basis for drawing inferences and making judgments about the other person (Fiske & Neuberg, 1990; Fiske &

Pavelchak, 1986). At the extreme category-based end of the continuum, this may reduce the likelihood that the perceiver will carefully consider individuating information about the target person. For example, Neuberg (1989) found that subjects given a negative expectation regarding another person spent less time listening to the other during a simulated job interview than did subjects given no such expectation regarding the applicant. However, subjects did not differ as a function of their expectations either in the number of verbal encouragements given to applicants or in the number of opportunities given to applicants to provide additional information during the interview. Moreover, these results held only when subjects were given no explicit impression formation goals prior to the task. When subjects were instructed to form accurate impressions of the applicants, they actually spent more time listening to the negative-expectancy applicants compared to no-expectancy applicants, and gave the negative-expectancy applicants more opportunities to provide additional information during the interview. (The influences of motivation on the use of information during impression formation will be discussed in more detail below).

In a more direct test of the continuum model, Fiske, et al (1987, Experiment 2) collected verbal protocols as subjects responded to individuals described with occupation labels and individuating attributes. Subjects in this experiment were assigned to one of four information conditions, two designed to elicit category-based processing and two designed to elicit piecemeal processing of available information. Specifically, category-based processing was hypothesized to occur (a) when a target person was described with a category label and a set of attributes that were rated previously as being consistent

with category membership ("consistent" condition), and (b) when subjects received a category label along with a set of attributes that were themselves uninformative regarding the target's category membership ("label-focus" condition). In order to elicit piecemeal processing, a target was described (c) with attributes that were inconsistent with the available category label ("inconsistent" condition), or (d) with an uninformative label, such as "person", along with a set of attributes which, by themselves would not easily cue any particular category ("attribute-focus" condition). According to the researchers, when presented with category labels and additional individuating information, subjects initially attempt to judge the fit between the label and the target's specific attributes. Category-based affect may then be used to judge the target person. To the extent that the attributes are inconsistent with the category, the individuating information should invalidate category membership and therefore, elicit more piecemeal processing. When confronted with an uninformative category label, such as "person", along with a set of attributes that by themselves did not suggest any particular category, subjects would of necessity rely on the available individuating attributes when judging the target person.

As predicted, subjects mentioned the individuating attributes more frequently when encountering individuating information in the absence of any meaningful category label and when the information was clearly inconsistent with the given label (i.e. the attribute-focus and inconsistent conditions) than in either the consistent or label-focus conditions. In contrast, category membership was mentioned less frequently in the attribute-focus condition than in the other three conditions, which did not differ significantly among each other. Thus,

attention to category membership did not differ across the conditions in which initial category assignment could be made (i.e. consistent, label-focus, inconsistent conditions), whereas attention to the targets' attributes varied between the conditions designed to elicit category-based processing and those designed to elicit piecemeal consideration of the information. The researchers concluded that the extent to which subjects' impressions were influenced by individuating information was mediated by an increased use of attribute information, rather than a decreased use of category membership. As predicted by the model, category-based processes appeared to have priority over more piecemeal processes.

As an additional test of the continuum model, response time has been measured under conditions thought to elicit category-based versus piecemeal processing of information (Fiske, Beattie, & Milberg, 1983, reported in Fiske & Pavelchak, 1986). Presumably, category-based responding facilitates heuristic processing of information and should therefore be associated with shorter response latencies than piecemeal processing which implies a more deliberate consideration of information. Consistent with these predictions, subjects responded faster when they were given a category label and consistent or uninformative attributes compared to when they were given no label or a label and inconsistent attributes. These studies and others (e.g. Bodenhausen & Lichtenstein, 1987; Bodenhausen & Wyer, 1985; Lingle & Ostrom, 1979) provide compelling evidence that social perceivers often do not carefully consider individuating information when category membership can be used as a basis for responding to another individual.

Midway Along the Impression Formation Continuum:

Confirmatory Information Processing

According to the continuum model, attention to an individual's unique characteristics mediates the use of that information when forming an impression of the other person. To the extent that the social perceiver has available processing resources or is otherwise motivated to attend to the other person, individuating information about the other may influence the perceiver's impressions. However, the model and much past research indicate that perceivers often attempt to confirm their initial expectations regarding other people (e.g. Darley & Fazio, 1980; Snyder, 1981). This may occur through efforts to reinterpret ambiguous, or even inconsistent information, to be congruent with one's pre-existing schema or stereotype (e.g. Sagar & Schofield, 1980). Moreover, people may employ situational attributions to explain inconsistent behavior (Crocker, Hannah, & Weber, 1983; Fiske & Taylor, 1984; Kulik, 1983) or may simply discount inconsistencies (see Lord, et al, 1979) when attempting to retain their initial category assignment of another person.

These processes underscore the possibility that attitudes, schemata, and stereotypes may remain remarkably persistent even in the light of seemingly diagnostic and potentially disconfirming evidence. As an example, Lord, et al (1979) found that subjects remained largely uninfluenced in their attitudes towards capital punishment when presented with evidence supporting an opposing point of view. In this study, subjects encountered research evidence ostensibly supporting or refuting the deterring effects of capital punishment on violent criminal behavior. When later asked to judge the convincingness and empirical

quality of the evidence, opponents of capital punishment judged the research in support of their own views more positively than the research favoring the opposing side of the controversy. Similarly, when encountering the same information, proponents of capital punishment judged the evidence indicating capital punishment had a strong deterrent effect as more probative than the opposing data. Moreover, subjects reported that their attitudes had in fact, become more polarized upon presentation of the conflicting evidence regarding capital punishment. Similar results were reported by Darley and Gross (1983). In their study, judgments of a child's ability tended to be more in line with initial expectations after presentation of information that both supported and contradicted early impressions of the child.

Toward More Piecemeal Integration of Available Information

Attempts to respond to others on the basis of category membership alone sometimes fail, often because there is no basis for categorization or because strongly inconsistent information invalidates initial category assignment. Perceivers are often confronted with information about others that neither contains an implicit category label nor easily primes an available category in memory. Moreover, the attributes possessed by another person may be undeniably incongruent with those implied by the other's category membership. Under these circumstances the social perceiver must evaluate information piece-by-piece when forming an impression and responding to the other person. At the most extreme piecemeal-based end of the continuum, information for an impression may be combined by averaging the evaluative implications of each individual piece of information (see Anderson, 1981) or through some more iterative combinatorial process, such as anchoring-and-

adjustment (Lopes, 1982). With this latter process, the evaluative implications of each piece of information are combined with a running average impression of the target. The impression is then adjusted to reflect consideration of each new item of information. At less extreme levels of piecemeal processing, perceivers may attempt to recategorize others on the basis of their initial category assignment along with a piece-by-piece consideration of information that is interpreted as inconsistent with that initial category membership, for example recategorizing someone as an "artsy construction worker".

As reviewed above, studies have demonstrated that when confronted with uncategorizable attributes or attributes that are clearly inconsistent with an available category, social perceivers are likely to attend more to the individuating attributes (Fiske, et al, 1987) and to process information about the targets more slowly (Fiske, Beattie, & Milberg, 1983 cited in Fiske & Pavelchak, 1986) when forming impressions. In an additional test of the model, Fiske, et al (1987, Experiment 1) correlated judgments of a target's likability with subjects' earlier judgments of the likability of particular category labels and individuating attributes. As in the studies reviewed above, information about stimulus persons was presented in four conditions, two designed to elicit category-based responding and two designed to elicit piecemeal processing.

Correlations between likability judgments of the target and judgments of the assigned category label were highest when targets were described with either uninformative or consistent attributes, reflecting a greater reliance on category membership during impression formation. In contrast, when attributes were clearly inconsistent with the assigned

category or when no category label had been assigned, judgments of the target were more highly correlated with judgments of the individuating attributes, reflecting increased reliance on individuating information in the two conditions designed to elicit piecemeal processing. Similar findings reported by others (e.g. Heilman, 1984; Locksley, Borgida, Brekke, & Hepburn, 1980; Locksley, Hepburn, & Ortiz, 1982) have also indicated that dramatically inconsistent information often undercuts the effects of prior stereotypic expectations on the processing of information about others.

According to the continuum model, attention to individuating information depends not only on informational circumstances, such as those just discussed, but also on the perceiver's motivation to carefully consider available information about another person. Thus, the perceiver might rely primarily on an attribute-by-attribute evaluation of another when a potentially well established category-based response might otherwise dominate. To illustrate, Neuberg and Fiske (1987, Experiment 1) demonstrated that outcome dependency, that is, the extent to which valued outcomes depend on another person, influenced subjects' apparent motivations to consider individuating information about a stimulus person who was described with a category label and individuating attributes. Subjects in this study were asked to consider information about a former schizophrenic patient with whom they would later work on a joint task. In one condition the target person was described with a category label ("schizophrenic") and a set of attributes that were previously judged inconsistent with membership in the category. To elicit more category-based processes, subjects in another condition were presented the same category label along with a

set of neutral attributes. Outcome dependency was manipulated through instructions given to subjects regarding the way in which task performance would be evaluated. Specifically, subjects were told that they might receive a monetary reward, based either on their joint task performance (i.e. outcome dependent condition) or on their individual contribution to the task (i.e. not outcome dependent condition).

As predicted, subjects' judgments of the likability of the target were more negative, and therefore in line with the schizophrenic label, when the subjects encountered information that was neutral with respect to the target's true category membership compared to when they received the same label and inconsistent information. Importantly, this difference was eliminated when subjects were dependent on the target for valued outcomes. Outcome dependent subjects, presumably more motivated to understand and predict the target's behavior, relied to a greater extent on the evaluative implications of the available individuating information, rather than the otherwise dominant category-based response, when judging the likability of the target person.

Studies have also demonstrated that when explicitly given the goal of forming accurate impressions, subjects may similarly become motivated to process information in a more individuating manner (e.g. Neuberg, 1989; Neuberg & Fiske, 1987, Experiment 3). Taken together, these studies provide strong evidence that various motivational circumstances increase the likelihood that the social perceiver will carefully consider individuating information when forming impressions of others. Alternatively, perceivers might become motivated to respond solely on the basis of category membership even when strongly inconsistent information would dictate otherwise, as when one attempts to gain the

approval of others who subscribe to particular category-based opinions or expectations (e.g. Smith, et al, 1956). As an additional possibility, Fiske and Neuberg (1990) argue that one's own internalized values may motivate one to rely to a greater or lesser extent on available individuating information when judging others. For example, members of the Klu Klux Klan may hold steadfastly to their prejudices even when faced with an overwhelming amount of contradictory information, whereas individuals who consider themselves fair and accurate judges of others would be much less likely to rely solely on stereotypic expectations when forming impressions (Fiske & Neuberg, 1990).

Individual Differences in Attribute-Based
Information Processing: The Need for Cognition

The research cited above indicates that various informational demands--such as the perceived incongruence between initial category assignment and available information--and motivational circumstances--such as the perceived interdependence structure--determine the extent to which individuating information will be incorporated into the perceiver's impression of another person (Fiske & Neuberg, 1990). Although not directly addressed by the continuum model (Fiske & Neuberg, 1990), research in the area of attitudes and persuasion has demonstrated that variability in information processing may also be the result of chronic differences among people in their desire to carefully consider information in the environment (e.g. Cacioppo & Petty, 1982; Cacioppo, Petty, & Morris, 1983; Cohen, Stotland, & Wolfe, 1955). Termed "need for cognition", this individual difference factor has been formulated to account for variability among people in their dispositions to engage in

and enjoy effortful thinking. Thus, Cacioppo and Petty (1982) found that subjects who scored high on a scale designed to measure need for cognition were more likely to enjoy working on a complex task than a simple one, whereas subjects who were low in need for cognition enjoyed working on a simple task more. Importantly, these differences occurred in the absence of any explicit feedback regarding task performance (Cacioppo, et al, 1983). In addition, responses to the need for cognition scale were unrelated to social desirability and were negatively correlated with responses on a scale developed in previous research (Troidahl & Powell, 1965) to measure dogmatism, or the extent to which individuals are concerned more with recognition and with being obedient than with being more broad-minded. Thus, the need for cognition is a unique construct that may account, in part, for variability in effortful processing of available information.

In a study designed to examine the influences of need for cognition on judgment-relevant thinking, Cacioppo, et al (1983) presented undergraduate subjects with messages containing either strong or weak arguments justifying a proposed increase in the student tuition. As hypothesized, subjects high in need for cognition were more polarized in their evaluations of strong and weak arguments and were more likely to agree with strong arguments and disagree with weak ones than were subjects lower in need for cognition. Additionally, evidence was provided that high need for cognition subjects viewed their own cognitive behavior as more effortful than did subjects with lower need for cognition.

A similar study by Srull, et al (1985) examined the influences of need for cognition on subjects' memory for information presented about

another person. Subjects were presented with an initial trait description of a target person along with additional descriptive information containing behaviors that were consistent, inconsistent, or irrelevant with respect to the initial expectancy. According to the researchers, information that is inconsistent with an initial expectation or impression requires more careful consideration in order to accommodate the information with existing knowledge. As a result, inconsistencies stay in working memory longer and build up more associative linkages in memory than does information that easily fits one's expectations. When asked at a later time to recall information presented about another person, subjects should therefore retrieve a larger proportion of inconsistent data than information that is either consistent or irrelevant with respect to the initial impression. Because high need for cognition subjects are more likely to process the information carefully, whereas low need for cognition subjects are likely to utilize more heuristic processing, memory for inconsistent information should be greatest among subjects diagnosed as high in need for cognition. Replicating earlier research (Cacioppo, et al, 1983), the researchers found that high need for cognition subjects recalled more information overall than did subjects low in need for cognition. More importantly, recall for inconsistent information was greater among subjects high in need for cognition than among low need for cognition subjects. Thus, the research cited in this section strongly suggests that the probability of attribute-based versus more piecemeal processing being dominant during impression formation may depend in part on the perceiver's inherent need to understand and carefully consider information in the social environment.

Contributions and Limitations of Research
in Social Cognition

Research has indicated that social information processing can be characterized as lying on a continuum from pure category-based responding to pure piece-by-piece integration of the available information (Fiske & Neuberg, 1990). At the extreme category-based end of the impression formation continuum, social perceivers ignore relevant diagnostic information and respond to others solely on the basis of the others' membership in particular categories. At intermediate stages along the continuum perceivers attend to available information but are often uninfluenced by information that does not confirm their initial expectations or attitudes. This likely occurs through interpretive, attributional, and/or discounting mechanisms that serve to perpetuate the perceiver's pre-existing stereotypes or attitudes.

When faced with information that does not cue any particular category in memory, or when information undeniably disconfirms an initial category assignment of another person, perceivers rely primarily on the available diagnostic information when forming an impression of the target person. The perceiver recategorizes the other on the basis of the available information or, at the extreme attribute-based end of the continuum, combines the information algebraically (by summing, averaging, or by anchoring-and-adjustment) to yield an overall impression of the target. Like informational demands, such as the presence of schema-inconsistent information, motivational circumstances determine the extent to which perceivers process social information in a relatively category-based or attribute-based mode. Outcome dependency, processing objectives, self presentation concerns, and personal values

may importantly influence the processing of social information. In addition, although not directly incorporated into the model, information processing may also be a function of differences among people in their dispositions to engage in and enjoy effortful thinking, or their need for cognition.

In the research reviewed above, support for the continuum model of impression formation (Fiske & Neuberg, 1990) has come from a variety of sources, many with unique methodologies for examining underlying cognitive processes. For example, outcome measures, such as reported attitudes (e.g. Cacioppo, et al, 1983) or likability judgments of stimulus persons (e.g. Fiske, et al, 1987, Experiment 1), have provided evidence that informational demands, motivational circumstances, and individual differences often determine the extent of attribute-based processing. Process measures, such as listening time (Neuberg, 1989) and response time (Fiske, Beattie, & Milberg, 1983, reported in Fiske & Pavelchak, 1986), have indicated that category-based processes generally have priority during impression formation. Finally, verbal protocol analysis (e.g. Fiske, et al, 1987, Experiment 2) has similarly provided support for hypotheses derived from the continuum model.

Converging findings from studies employing different methodologies provide compelling evidence that the continuum model has predictive value. However, several limitations to past methodological applications are noteworthy. First, outcome measures are just that. They provide a snapshot of the result, and not the process, of cognitive activity. Consequently, the likelihood that judgments will be consistent with category labels even after exposure to disconfirming information does not necessarily indicate that information was ignored or discounted;

instead, it might have been reinterpreted or forgotten. When paired with other measures, such as information recall or judgments of the information itself, or when examining the integration or weighting of information, outcome measures often provide useful insights.

Second, process measures of response time are poor indicators of that process. Although researchers often explain that shorter response latencies indicate less attention to the available details, another explanation might account for the assumed heuristic bias indicated by rapid responding. Specifically, schemata and other cognitive structures may facilitate efficiency in information processing. Schemata may allow the social perceiver to process more information in greater detail than would occur in the absence of such organizing frameworks. Thus, information may be reckoned with quickly by the perceiver possessing relevant schemata while the perceiver without the necessary knowledge structures necessarily takes more time to evaluate the stimulus environment. Finally, verbal protocols have been criticized in the literature as being potentially susceptible to self presentation biases (Erber & Fiske, 1984) and for being poor measures of unconscious cognitive activity (Nisbett & Wilson, 1977). Analysis of overt information gathering behavior, albeit a somewhat limited method itself, may help advance our knowledge of the cognitive mechanisms involved in person perception and decision making.

Applying Principles From Social Cognition Research to Research in Decision Making

Implicit in the foregoing discussions of literature in decision making and social cognition are several inherent parallels between the two domains of research. First, many of the assumptions underlying

research in the two areas are similar. Specifically, researchers in both domains assume that although individuals are active processors of the stimulus environment, they are necessarily limited in their capacities to cognitively process all of the available information (Abelson & Levi, 1985; Fiske & Taylor, 1984). As a result, people rely on simplifying rules of thumb, or heuristics, to reduce the demands placed on their cognitive systems (Pitz & Sachs, 1984; Fiske & Taylor, 1984). One possible mechanism for simplifying the environment might be to reduce one's attention to information pertaining to an issue or person for which one possesses prior attitudes or stereotypes (Fiske & Neuberg, 1990).

Methodological assumptions involved in research in decision making and in social cognition also generalize across both domains. Researchers in both areas assume that attention to information indicates active processing of that information, and that final judgments are a true reflection of preferences (Abelson & Levi, 1985; Fiske & Taylor, 1984). Additionally, response time is assumed to indicate the extent to which perceivers carefully process stimulus information (Onken, et al, 1985; Fiske & Pavelchak, 1986).

A second parallel between research in decision making and research in social cognition pertains to the methodologies often chosen to examine underlying cognitive processes. For example, both areas have employed verbal protocol analysis to ascertain the extent to which subjects carefully consider judgment-relevant information (e.g. Bettman & Park, 1980; Fiske, et al, 1987). Similarly, response time has been examined in both decision making research and research in social

cognition (e.g. Onken, et al, 1985; Fiske, et al, 1983, reported in Fiske & Pavelchak, 1986).

Finally, an inherent similarity exists in the types of tasks involved in decision making and in social perception and impression formation. Specifically, tasks in social cognition research and in decision making often involve judgments of particular issues, objects, or persons. In research in both areas, detailed information regarding particular choice alternatives or target persons is presented to subjects who are then instructed to judge each alternative or to choose from among the alternatives. In recent decision making research, specific information regarding the alternatives is hidden from the view of the subject. The depth, latencies, and patterns with which the subject searches for the hidden diagnostic information provide researchers in this area with insights regarding cognitive activity during the decision tasks (Ford, et al, 1988).

Research in social cognition and in particular, research designed to test particular aspects of the continuum model, employs a slightly different methodology. In these studies, all of the available information regarding a target person is presented at once and the subject is requested to render his or her judgment after examining the available data. The valence of subjects' judgments or the speed with which the judgments are rendered are presumed to indicate the extent to which subjects integrate individuating information into their overall impressions of the targets (Fiske, et al, 1987). Thus, an important difference between information gathering behavior and measures of cognitive processing employed in social cognition research is the degree of volitional control inherent in the acquisition of information. That

is, information gathering involves a determination regarding whether additional data is needed prior to the final decision. An important question for research then is: given a choice, will perceivers seek out additional information when a category-based process might otherwise provide the perceiver with a ready response?

The purpose of this research is to examine the role of schematic processes in decision making. Prior knowledge structures, such as schemata and stereotypes, may have a dramatic influence on subjects' search for information during decision making. This research examines whether category labels, such as membership in particular occupations, influence the acquisition of information during decision making. Informational circumstances, such as the presence of inconsistent or disconfirming evidence, and individual differences in need for cognition are also examined to assess the influence of these factors on the use of individuating information during decision making. Search depth, latency, and sequence provide separate measures of information acquisition behavior. This research seeks to increase our knowledge of how organizing cognitive structures influence the decision making process. In addition, by examining information acquisition behavior, this study also seeks to advance our knowledge in the area of social cognition.

Operationalizations and Hypotheses

Category Labelling. Previous research has demonstrated strong labelling effects for occupation categories (e.g. Cohen, 1981; Fiske, et al, 1987). These studies have established that stereotypes regarding members of particular occupations operate to influence information processing in ways that are consistent with the predictions offered by the continuum model of impression formation (e.g. Fiske, et al, 1987). Specifically, occupation labelling has been associated with heuristic processing of individuating information during impression formation and judgment tasks relative to unlabelled conditions (e.g. Fiske, et al, 1987). Thus, based on previous research and the forgoing discussions, several hypotheses are suggested regarding the effects of occupation labelling on information acquisition variables:

Hypothesis 1: Depth of search will be greater when individuating information is presented without a label describing the target person's occupation compared to when a label is present.

Hypothesis 2: Latency of search will be shorter when individuating information is presented in the presence of occupation labels than when labels are not present.

Hypothesis 3: Search strategies will be relatively non-compensatory when individuating information is presented with occupation labels. Strategies will be compensatory when information is presented in the absence of occupation labels.

Information consistency. According to the continuum model, strongly inconsistent information invalidates category membership and results in relatively individuating impression formation when category-based processing would otherwise dominate. This phenomenon has been demonstrated with categories regarding membership in particular occupations (e.g. Fiske, et al, 1987). Thus, it is expected that

information consistency moderates the effects of occupation labelling on information acquisition variables. Specifically, because subjects need to resolve inconsistencies when presented with an occupation label and attributes that are inconsistent with that label, depth of search should be greatest when occupation labels are presented with inconsistent information. Alternatively, because subjects initially attempt to simply confirm category membership and then judge targets on the basis of category-level affect, information search should be least exhaustive when occupation labels are presented along with consistent information. When occupation labels are not available during the decision task, search depth should be similar to that in the labelled-inconsistent condition and should be unaffected by information consistency. Latency of search and search strategies should follow similar patterns. Although information consistency has no meaning for unlabelled alternatives, a comparison of search behavior given unlabelled alternatives and consistent versus inconsistent information provides a test of the assumption that information acquisition is influenced only by the extent of consistency of the available information with a given category label and not by any extraneous characteristics of the information unrelated to its consistency with the available category label. Figure 1 provides an overview of the hypothesized relationships between category labelling, information consistency, need for cognition (see below), and information acquisition variables.

Hypothesis 4: Depth of search will be greatest when occupation labels are presented along with inconsistent information and when occupation labels are not available. Search depth will be least exhaustive when occupation labels are presented with consistent information.

Hypothesis 5: Latency of search will be longest when occupation labels are presented along with inconsistent information and when occupation labels are not available. Search latency will be shortest when occupation labels are presented with consistent information.

Hypothesis 6: Search strategies will be relatively more compensatory when occupation labels are presented along with inconsistent information and when occupation labels are not available. Search strategies will be least compensatory when occupation labels are presented with consistent information.

Need for Cognition. Research has demonstrated that people differ in their dispositions to engage in and enjoy effortful thinking (Petty & Cacioppo, 1982). People high in need for cognition are more likely to carefully scrutinize an attitudinally relevant message (Cacioppo, et al, 1983) and may attend more to inconsistent information (Srull, et al, 1985) than subjects low in need for cognition. Although need for cognition has not previously been tested within the framework of the continuum model, it seems likely that differences among individuals in their dispositions to engage in effortful thinking influence the use of individuating information during decision making. Several exploratory hypotheses are suggested regarding the influences of need for cognition on information acquisition variables. First, persons high in need for cognition should search more information across all identical information conditions than subjects lower in need for cognition. This relationship is represented by the dashed line denoted "a" in Figure 1. Search latency and search strategies should be similarly influenced by need for cognition.

As an alternative to this simple main effect model, need for cognition may also interact with category labelling and category consistency in influencing information acquisition. This relationship

is depicted by the dashed line labelled "b" in Figure 1. Although the model represented by this alternative relationship is purely speculative, possible patterns among the data are presented in Figure 2. In the figure, when confronted with occupation labels and consistent information, subjects low in need for cognition might search for very little information compared to high need for cognition subjects and subjects in unlabelled conditions. This is because subjects low in need for cognition would be highly motivated to simplify the decision task and consistent category membership would provide a readily available means for doing so. Subject high in need for cognition are unlikely to place as much emphasis upon simplifying the task, therefore depth of search should be relatively uninfluenced by labelling when individuating information is consistent with category membership. When confronted with unlabelled alternatives and additional information, high need for cognition subjects should search more information than low need for cognition subjects.

When occupation labels are presented with inconsistent information high need for cognition subjects should search a great deal of the available information in an effort to understand the target persons, compared to low need for cognition subjects and subjects in unlabelled conditions. Subjects low in need for cognition should search slightly more of the available information when the information is inconsistent with an available occupation label compared to unlabelled conditions. However, search for additional inconsistent information should nonetheless be less exhaustive than high need for cognition subjects who encounter unlabelled alternatives. Low need for cognition subjects likely attempt to rely on category membership even in the face of

disconfirming evidence; thus, search among subjects low in need for cognition should be greater for unlabelled alternatives than labelled alternatives presented with inconsistent information. Latency of search and search strategies should follow similar patterns. Thus, in summary, the following exploratory hypotheses are suggested by the above reasoning:

Hypothesis 7a: Subjects high in need for cognition will search for more information than low need for cognition subjects across all identical information conditions.

Hypothesis 7b: Need for cognition may interact with both category labelling and information consistency to influence search depth.

Hypothesis 8a: Subjects high in need for cognition will search longer for information than low need for cognition subjects across all identical information conditions.

Hypothesis 8b: Need for cognition may interact with both category labelling and information consistency to influence search latency.

Hypothesis 9a: Subjects high in need for cognition will utilize strategies that are more compensatory than will low need for cognition subjects across all identical information conditions.

Hypothesis 9b: Need for cognition may interact with both category labelling and information consistency to influence the use of compensatory or non-compensatory search strategies.

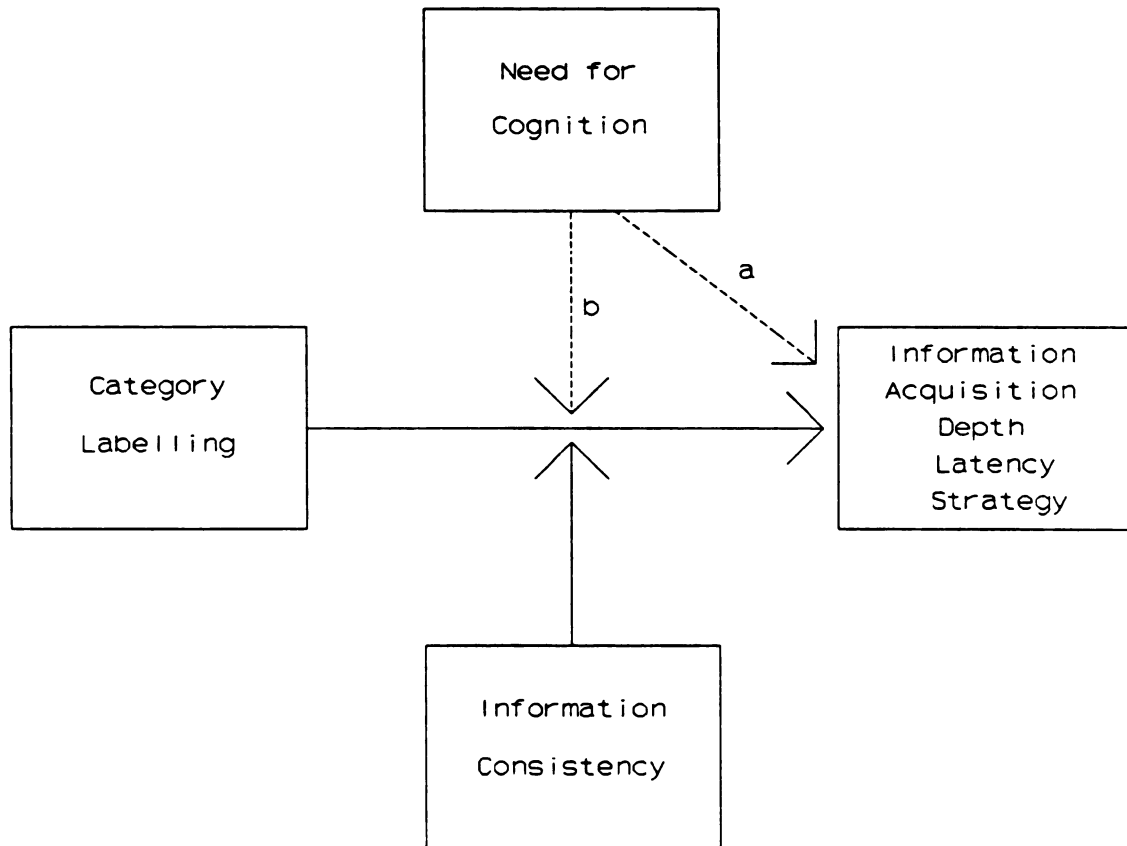


Figure 1. A Model of Information Acquisition Processes

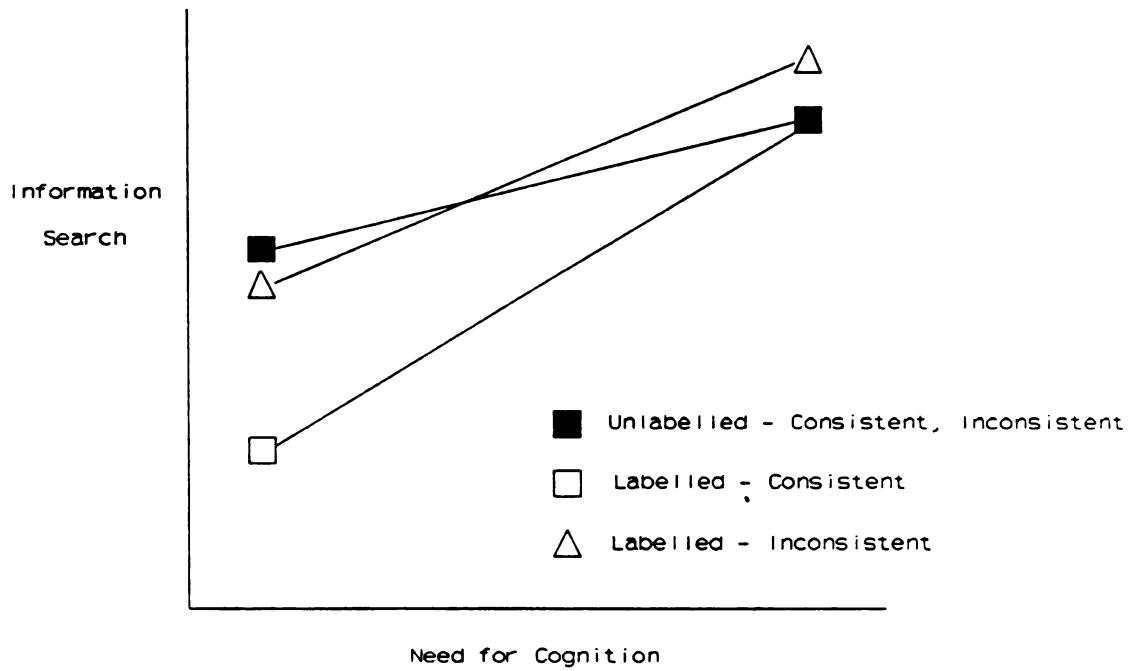


Figure 2. Predicted Information Search as a Function of Labelling, Information Consistency, and Need for Cognition.

METHOD

Overview

Subjects in this study searched a computer-controlled information board for information describing target persons with whom the subjects expected to later work on a joint task. The subjects' decision task involved rating the extent to which the subjects would prefer to work with each of the described target individuals. One half of the subjects examined information about targets labelled with membership in particular occupations, whereas the remainder of the subjects examined information about unlabelled target persons. Consistency of the available information with the given occupation label constituted a second manipulation which was crossed with the labelling manipulation. Two pilot experiments, similar to those conducted by Cohen (1981) in her study of occupation categories, were conducted to establish a set of occupation labels and consistent and inconsistent attributes to be used in the decision making study. In the first experiment, subjects provided open-ended descriptions of several target persons who were described with occupation labels. Subjects in a second experiment rated the typicality of each of several descriptive characteristics, obtained from the first experiment, for members of particular occupations. This provided a final list of occupation labels and attributes that were judged consistent or inconsistent with a given label, had some decision relevance, and were among or (in the case of

inconsistent attributes) were clearly inconsistent with features obtained from the open-ended descriptions given by subjects in Experiment 1.

Experiment 1

Method

Subjects. Subjects included 13 male and 47 female undergraduate psychology students who received nominal course credit for participation in the experiment. Subjects were run in groups of approximately 10 and were randomly assigned to describe one half of the total set of occupation members.

Materials. Sixteen occupations were selected for use in the first phase of this research. Two similar questionnaires, each containing separate blank pages for eight of the occupation members, were prepared for this experiment. Each blank page included an occupation label and an instruction not to turn the page until instructed to do so by the experimenter. This allowed consistent timing of the open-ended responses given by the subjects. Instructions on the front page of this questionnaire indicated that when describing occupation members, subjects should try to imagine vividly what the target person would be like. Descriptions could range from complete sentences to single words. An example of one of these questionnaires is provided in Appendix B. The complete list of occupations used in this experiment is provided in Appendix A.

A "co-worker preference questionnaire" was constructed to gather judgments of the extent to which subjects would prefer to work on a joint task with individuals who were described only by an occupation label. Subjects rated all 16 occupation members using a 7-point scale

anchored "would very much prefer not to work with this person" to "would very much prefer to work with this person". Instructions indicated that subjects should imagine a joint task in which they would work with one other person with whom they would have to interact frequently and with whom they would need to cooperate. In addition, subjects were instructed to imagine that their performance on the joint task would be judged not on the basis of the joint outcome, but on the subjects' individual contribution to the task. See Appendix C for a copy of this questionnaire.

Subjects in this experiment also completed the Need for Cognition scale developed by Cacioppo and Petty (1982). In constructing this scale, Cacioppo and Petty (1982) retained 34 of 45 original items on the basis of an item's ability to discriminate between university faculty and assembly line workers. Factor analysis of these remaining items revealed one general factor; split-half reliability was .87 (Cacioppo & Petty, 1982). Subsequent investigations indicated a tendency for subjects classified as high in need for cognition to prefer a complex task over a simple one, whereas low need for cognition subjects preferred the simple task (Cacioppo & Petty, 1982, Experiment 4). Subjects in the present study responded to items on this questionnaire using a 9-point scale anchored "very strongly agree" to "very strongly disagree". A copy of the Need for Cognition scale is provided in Appendix D.

Part One of the Group Embedded Figures Test (Witkin, 1950-1951) was used as a filler task in this experiment. Subjects' responses on this test were not analyzed as part of this experiment.

Procedure. Upon arrival to the experiment, subjects were asked to read and sign a consent form. A copy of the consent form used in this study is presented as Appendix E. When all subjects had arrived and completed the consent form, the experimenter explained that the subjects would be participating in three separate pilot experiments, each designed to examine a different aspect of human behavior. Subjects were then given a folder containing the measures to be used in this experiment.

The first item in the folder was one of the two open-ended description questionnaires. Subjects were randomly assigned to describe either the first or second set of eight occupation members. Subjects were given three minutes to write down as much as they could for an occupation member before turning to the next occupation. After completion of this task, subjects then responded to the co-worker preference questionnaire, Part One of the Group Embedded Figures Test, and finally, the Need for Cognition scale. Subjects were fully debriefed and thanked for their participation at the conclusion of the experiment.

Results and discussion. In choosing a smaller set of occupation labels to be used in the second pilot experiment, several criteria were considered. First, an attempt was made to select occupations that had mean co-worker preference ratings that were different from the middle, or "no preference", rating on the scale. If subjects could not make a strong determination of their preferences regarding occupation members when given just the occupation label, it was thought that this might indicate that subjects did not have a clear stereotype regarding members of that occupation. As a consequence, subjects would rely to a large

extent on available individuating information when deciding whether they would like to work with that occupation member. On the other hand, it must be pointed out that subjects may have had strong stereotypes about all of the occupations used in this experiment, but that the subjects may have nonetheless had no preference regarding whether they would like to work with some of the occupation members. In this case, subjects would still rely primarily on the occupation label when deciding that they really did not care whether they were paired with a member of that particular occupation. In fact, examination of the amount of information provided by subjects in the open-ended descriptions reveals that this latter hypothesis is the more tenable. Subjects were quite able to provide descriptions when given only a label indicating the target's membership in a particular occupation (see Appendix A).

Second, open-ended descriptions of some of the targets differed dramatically across subjects. For example, several subjects described the Politician as greedy, selfish, and untrustworthy, whereas many others described the same target as warm, honest, and friendly. Thus, an attempt was made to select occupations for which there was general agreement in the open-ended descriptions.

Third, occupations were selected to be distinct from other occupations on the basis of the open-ended descriptions. For example, descriptions of the Army Drill Sergeant were quite similar to descriptions of the Interstate Truck Driver and descriptions of the Research Chemist resembled those of the Neurosurgeon. Consequently, the second occupation in each of the above two pairs was retained and the first in each pair was eliminated. Finally, occupations were retained if the descriptions were extensive and rich enough to result in the

extraction of several unique descriptive characteristics. Ten occupations were selected for use in Experiment 2 (see Appendix A).

A count of the total number of words written by a subject and the number of unique meaningful descriptors given in the open-ended descriptions was performed in order to ascertain whether need for cognition (Ncog) might relate to the amount of information provided by subjects. Results of this analysis are presented in Appendix A. Contrary to expectations, slightly less information was provided as need for cognition increased (average $\bar{x} = -.17$). This difference approached significance in 7 of the 32 correlations ($-.31 < \bar{x} < -.36, p < .10$). Although these analyses are purely exploratory and do not bear directly on the experimental hypotheses, one possible explanation of these results is that high need for cognition subjects were able to describe target persons in terms of a few highly descriptive traits or adjectives which served to organize many less global and somewhat redundant features. Alternatively, high need for cognition subjects may have seen greater differentiation among members of a given occupation category and therefore had difficulty describing targets with adjectives or traits that would be true across all sub-categories of the given occupation category.

Subjects were asked to indicate the extent to which they would prefer to work on a joint task with members of particular occupations. Means and standard deviations of these ratings along with the correlations of these ratings with subjects responses to the Need for Cognition scale are presented in Appendix A.

Experiment 2

Method

Subjects. Subjects included 97 male and 212 female undergraduate psychology students who received nominal course credit for participation in the experiment. Subjects were run in groups of approximately 30 and were assigned randomly to experimental conditions.

Materials. Several short, one to four-word, descriptive characteristics, including traits, roles, interests, and attitudes, were extracted from subjects open-ended descriptions in Experiment 1 for each of the ten remaining occupation labels. Descriptors were selected on the basis of the absolute frequency with which they were mentioned and their consistency with the overall tone of subjects' descriptions of a given occupation member. An attempt was made to extract features that were distinctive for a given occupation member; that is, unique to members of that occupation. In addition, one to three adjectives, judged by the researcher to be consistent with subjects' overall descriptions of a given occupation member and distinctive for the occupation, were selected for each of the ten occupation labels from Anderson's (1968) list of 555 personality trait adjectives.

Inconsistent characteristics were extracted in a similar manner. For each occupation several descriptors, judged by the researcher to be directly opposite to or clearly inconsistent with the extracted consistent features and overall tone of the open-ended descriptions, were generated by the researcher or were selected from Anderson's (1968) list of adjectives. The resultant consistent and inconsistent features were combined to form a master list of 252 descriptive characteristics that could be applied for all ten occupation labels.

To reduce the potential effects of fatigue on ratings, the master list was split in half to form two separate lists of 126 features. The order of descriptors on the two lists was then reversed to create two additional lists. A single occupation label appeared at the top of each list, therefore resulting in a total of 40 lists of 126 descriptors, with lists differing in occupation, order of descriptors, and list of features. Subjects judged the typicality of each descriptor for members of a given occupation using a 9-point scale anchored "extremely atypical or unlike members of the occupation" to "extremely typical or like members of the occupation". Instructions at the top of each questionnaire indicated that when judging the typicality of the descriptors for members of a given occupation, subjects should try to imagine vividly what the target person would be like. Examples of two of the four questionnaires used for the Neurosurgeon occupation are presented as Appendix F. In order to assess the valence of descriptive characteristics used in this experiment, a separate group of 38 subjects was asked to judge the extent to which they would prefer to work with persons described with each of the independent descriptors. A copy of this questionnaire is available as Appendix G.

Procedure. Upon arrival to the experiment, subjects were asked to read and sign a consent form. A copy of the consent form used in this experiment is presented as Appendix E. When all subjects had arrived and completed the consent form, the experimenter welcomed the subjects and handed out the first questionnaire to be completed by the subjects, containing either the first or second half of the full set of descriptive features. Subjects were asked to indicate the extent to which each feature was typical or atypical of members of the occupation

given on the front page of the questionnaire. When all subjects had completed the first questionnaire, a second questionnaire, containing the remaining 126 descriptors, was handed out. Subjects judged the typicality of attributes for a different occupation member during the second half of the experiment in order to reduce any potential effects of fatigue or boredom. Order of adjectives, order of lists (1st or 2nd half of the master list), and order of occupations were completely counterbalanced across subjects. A similar procedure was used to collect preference ratings of the independent descriptors. When all subjects had completed the second questionnaire, the subjects were fully debriefed as a group and thanked for their participation.

Results and Discussion. Several criteria were established to aid in the selection of consistent and inconsistent attributes to be used in Experiment 3. First, descriptors were retained for an occupation if their mean typicality/atypicality rating was significantly different from the scale midpoint. This resulted in an initial list of 429 consistent and 447 inconsistent attributes across all ten occupations ($2.860 < \bar{x} < 67.749$, $p < .01$) Second, among the consistent attributes, features that had been mentioned by subjects in Experiment 1 were identified for possible use in Experiment 3. Among the inconsistent attributes, features that were clearly opposite or directly contrary to features mentioned by subjects in Experiment 1 were retained for Experiment 3. Finally, the lists of consistent and inconsistent attributes were further narrowed by requiring that attributes have some decision relevance. This criteria resulted in the elimination of items such as "drives an economy car" (Elementary School Teacher) and "middle-

class" (Secretary). Two occupations were eliminated for lack of attributes meeting the above criteria.

The final lists of consistent and inconsistent attributes for the eight remaining occupations are presented in Tables 1 through 8. The resultant attributes differ significantly from the scale midpoint ($3.155 < \bar{x} < 67.749$, $p < .01$), are among those features mentioned in or contrary to descriptions given by subjects in Experiment 1, and have some decision relevance.

Experiment 3

Method

Subjects. Subjects included 52 male and 132 female undergraduate psychology students who received nominal course credit for participation in the experiment. Subjects were randomly assigned to experimental conditions. Data from five subjects was removed from analysis due to the subjects' apparent difficulty understanding some english words or their failure to access sufficient information to make informed judgments about each potential co-worker (i.e. at least one attribute of information for each potential co-worker).

Materials. Subjects completed Cacioppo & Petty's (1982) Need for Cognition scale as described under Experiment 1. A copy of this scale is available as Appendix D. A demographics questionnaire was used to provide information regarding subjects' age, gender, major, parents' occupations, and suspicions regarding the experiment. A copy of the demographics questionnaire is presented as Appendix H.

Table 1

Consistent and Inconsistent Attributes. Means.
and Standard Deviations of Typicality Ratings
for the Neurosurgeon Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
188.	"well-educated"	8.90	(0.31)	29	184.	"unintellectual"	1.28	(0.53)	29
226.	"intelligent"	8.79	(0.41)	29	2.	"unskilled"	1.55	(1.52)	33
171.	"respected"	8.35	(0.67)	29	240.	"reckless"	1.59	(0.83)	29
206.	"self-confident"	8.28	(0.84)	29	199.	"negligent"	2.00	(1.41)	29
95.	"precise"	8.27	(1.04)	33	76.	"clumsy"	2.06	(1.52)	33
247.	"ambitious"	7.93	(1.13)	29	98.	"unambitious"	2.12	(1.60)	33
31.	"achievement-oriented"	7.88	(1.22)	33	179.	"unrefined"	2.17	(1.34)	29
224.	"admirable"	7.83	(0.81)	29	207.	"unbalanced"	2.45	(1.30)	29
212.	"serious"	7.79	(1.18)	29	161.	"heartless"	2.48	(1.38)	29
110.	"steady"	7.67	(1.53)	33	225.	"unenterprising"	3.10	(1.70)	29

Table 2

Consistent and Inconsistent Attributes, Means,
and Standard Deviations of Typicality Ratings
for the Elementary School Teacher Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
42.	"friendly"	7.91	(0.86)	32	219.	"uneducated"	1.76	(1.62)	29
188.	"well-educated"	7.90	(1.11)	29	117.	"sleazy"	1.78	(0.98)	32
26.	"caring"	7.75	(1.19)	32	79.	"ill-mannered"	2.25	(1.11)	32
217.	"helpful"	7.72	(1.44)	29	25.	"careless"	2.41	(0.95)	32
189.	"patient"	7.62	(1.68)	29	161.	"heartless"	2.52	(1.43)	29
228.	"pleasant"	7.31	(1.20)	29	80.	"unsympathetic"	2.53	(1.69)	32
191.	"kind-hearted"	7.14	(1.25)	29	193.	"unimaginative"	2.59	(1.35)	29
92.	"sympathetic"	7.09	(1.49)	32	139.	"unpunctual"	3.07	(1.44)	29
153.	"female"	6.83	(1.28)	29	211.	"withdrawn"	3.14	(1.55)	29
56.	"fun"	6.78	(1.45)	32	207.	"unbalanced"	3.21	(1.50)	29

Table 3
Consistent and Inconsistent Attributes, Means, and
Standard Deviations of Typicality Ratings for
the TV Evangelist Occupation

Consistent					Inconsistent				
Item					Item				
No.	Descriptor	M	S.D.	N	No.	Descriptor	M	S.D.	N
166.	"opinionated"	7.90	(0.96)	30	204.	"bashful"	2.20	(1.47)	30
192.	"talkative"	7.87	(1.04)	30	113.	"unmotivated"	2.29	(1.27)	31
93.	"persistent"	7.87	(1.23)	31	153.	"female"	2.57	(1.50)	30
162.	"persuasive"	7.80	(1.03)	30	172.	"soft-spoken"	2.60	(1.57)	30
127.	"annoying"	7.53	(1.46)	30	98.	"unambitious"	2.61	(1.67)	31
124.	"theatrical"	7.39	(1.89)	31	211.	"withdrawn"	2.77	(1.81)	30
181.	"well-spoken"	7.26	(1.46)	31	37.	"laid-back"	3.03	(1.60)	31
233.	"boisterous"	7.17	(1.42)	29	225.	"unenterprising"	3.03	(1.61)	30
103.	"greedy"	7.07	(1.73)	31	76.	"clumsy"	3.42	(1.57)	31
215.	"materialistic"	7.03	(1.67)	30	156.	"reserved"	3.30	(1.82)	30

Table 4

Consistent and Inconsistent Attributes, Means, andStandard Deviations of Typicality Ratings forthe Poet Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
137.	"expressive"	8.66	(0.72)	29	193.	"unimaginative"	1.59	(1.24)	29
195.	"creative"	8.59	(0.68)	29	28.	"uninspiring"	2.20	(1.64)	31
63.	"clever"	7.52	(1.09)	31	17.	"uncultured"	2.23	(1.65)	31
74.	"sensitive"	7.48	(1.36)	31	184.	"unintellectual"	2.31	(1.34)	29
116.	"observant"	7.39	(1.38)	31	238.	"rough and tough"	2.38	(1.35)	29
147.	"independent"	7.35	(1.05)	29	219.	"uneducated"	2.41	(1.32)	29
151.	"idealistic"	7.28	(1.39)	29	112.	"shallow"	2.77	(1.84)	31
129.	"complex"	7.17	(1.26)	29	2.	"unskilled"	2.81	(1.60)	31
197.	"introspective"	6.52	(1.48)	29	103.	"greedy"	3.16	(1.19)	31
106.	"nonconforming"	6.65	(1.84)	31	145.	"unquestioning"	3.38	(1.64)	29

Table 5

Consistent and Inconsistent Attributes, Means, andStandard Deviations of Typicality Ratings forthe Secretary for a Middle Level Manager Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
153.	"female"	8.00	(1.05)	32	235.	"vulgar"	2.47	(1.72)	32
251.	"organized"	7.59	(1.24)	32	64.	"disrespectful"	2.76	(1.53)	29
187.	"efficient"	7.56	(1.16)	32	79.	"ill-mannered"	2.82	(1.64)	29
213.	"dependable"	7.25	(1.30)	32	240.	"reckless"	3.00	(1.69)	32
155.	"punctual"	7.25	(1.59)	32	237.	"incompetent"	3.00	(1.70)	32
42.	"friendly"	7.03	(1.38)	29	216.	"dishonest"	3.06	(1.27)	32
138.	"obedient"	6.84	(1.14)	32	102.	"obnoxious"	3.14	(1.51)	29
23.	"well-mannered"	6.83	(1.17)	29	25.	"careless"	3.14	(1.83)	29
228.	"pleasant"	6.50	(1.24)	32	199.	"negligent"	3.22	(1.52)	32
101.	"skilled"	6.48	(1.66)	29	133.	"unobliging"	3.41	(1.66)	32

Table 6

Consistent and Inconsistent Attributes, Means, andStandard Deviations of Typicality Ratings forThe Loan Shark Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
128.	"male"	8.23	(1.12)	31	74.	"sensitive"	2.00	(1.04)	31
118.	"street-smart"	8.21	(1.35)	29	70.	"innocent"	2.03	(1.35)	29
103.	"greedy"	8.14	(0.88)	29	54.	"forgiving"	2.39	(1.55)	28
93.	"persistent"	8.10	(0.72)	29	65.	"understanding"	2.41	(1.48)	29
159.	"scheming"	7.94	(1.26)	31	191.	"kind-hearted"	2.45	(1.65)	31
215.	"materialistic"	7.65	(1.54)	31	224.	"admirable"	2.61	(1.78)	31
16.	"shady"	7.52	(1.43)	29	92.	"sympathetic"	2.69	(1.73)	29
4.	"ruthless"	7.38	(1.24)	29	50.	"gracious"	2.82	(1.39)	28
196.	"un-compromising"	7.23	(1.82)	31	26.	"caring"	2.82	(1.74)	28
161.	"heartless"	7.19	(1.42)	31	228.	"pleasant"	3.00	(1.37)	31

Table 7

Consistent and Inconsistent Attributes, Means, and
Standard Deviations of Typicality Ratings for
the Librarian at a Public Library Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
59.	"conservative"	8.00	(1.11)	30	238.	"rough and tough"	1.72	(1.02)	32
120.	"prim & proper"	7.80	(1.50)	30	117.	"sleazy"	1.77	(1.66)	30
135.	"knowledgeable"	7.78	(0.94)	32	105.	"clownish"	2.20	(1.45)	30
227.	"orderly"	7.75	(0.98)	32	219.	"uneducated"	2.31	(1.45)	32
136.	"quiet"	7.56	(1.37)	32	102.	"obnoxious"	2.33	(1.67)	30
217.	"helpful"	7.56	(1.54)	32	237.	"Incompetent"	2.53	(1.65)	32
214.	"well-read"	7.53	(1.44)	32	233.	"boisterous"	2.94	(1.61)	32
153.	"female"	7.31	(1.58)	32	249.	"flirtatious"	3.03	(1.77)	32
156.	"reserved"	7.22	(1.16)	32	46.	"forgetful"	3.23	(1.50)	30
172.	"soft spoken"	6.69	(1.62)	32	118.	"street-smart"	3.03	(2.04)	30

Table 8

Consistent and Inconsistent Attributes. Means, and
Standard Deviations of Typicality Ratings for
the Truck Stop Waitress Occupation

Consistent					Inconsistent				
Item No.	Descriptor	M	S.D.	N	Item No.	Descriptor	M	S.D.	N
94.	"chews gum"	7.93	(1.23)	30	78.	"sophisticated"	2.50	(1.36)	30
249.	"flirtatious"	7.61	(1.05)	31	205.	"well-bred"	2.52	(1.36)	31
15.	"smokes cigarettes"	7.23	(1.43)	29	70.	"innocent"	2.80	(1.45)	30
178.	"gossipy"	7.19	(1.66)	31	188.	"well-educated"	2.81	(1.58)	31
192.	"talkative"	7.10	(1.47)	31	10.	"timid"	3.07	(1.60)	30
125.	"un-sophis- ticated"	7.03	(1.40)	30	230.	"intellectual"	3.10	(1.40)	31
118.	"street-smart"	6.83	(1.56)	30	52.	"refined"	3.23	(1.70)	30
72.	"nosey"	6.53	(1.50)	30	172.	"soft spoken"	3.39	(1.48)	31
45.	"good- humored"	6.27	(1.68)	30	129.	"complex"	3.45	(1.73)	31
22.	"meddlesome"	6.03	(1.38)	29	156.	"reserved"	3.55	(1.67)	31

Design. The design of this experiment was a 2 (label-no label) x 2 (consistent-inconsistent) between-subjects factorial design. One half of the subjects acquired information and rated alternative co-workers labelled with membership in a particular occupation, whereas all remaining subjects encountered unlabelled alternatives. Consistency of the available attribute information with the occupation label was crossed with the labelling manipulation. Although consistency of the available attribute information has no meaning for unlabelled alternatives, a comparison between unlabelled-consistent and unlabelled-inconsistent conditions provided a test of the possibility that characteristics of the available information, apart from the consistency of the information with a category label, influenced information gathering during decision making.

Procedure. Experiment 3 was administered individually. Upon arrival to the experiment, subjects were greeted and asked to read and sign a consent form. A copy of the consent form used in this experiment is presented as Appendix I. The experimenter then explained that the purpose of the experiment was to identify individuals for a study of joint task performance to be conducted at some later date. Subjects were told that they would be given an opportunity to gather information about several people from the community with whom they may later be asked to work on a joint task. After gathering as much or as little information as the subject desired, the subject would then rate the extent to which they preferred to work with each available target. Subjects were led to believe that they might later be called for a subsequent study in which they would work with their most preferred co-worker. At that time, the subjects could choose to participate or not;

compensation for participation in this later study would ostensibly be \$10. Subjects were told that the joint task would involve close interaction with one other person and would require that the subject and co-worker cooperate during task performance. Additionally, subjects were instructed that if they chose to participate in the joint task, evaluation of their performance on that task would be based not on the joint outcome but on their individual contribution to the task irrespective of what the co-worker contributed.

Prior to beginning the computer search task, subjects were exposed to a 10 minute computer controlled instructional period in which they acquired familiarity with the search process and rating procedure. The computer training included a practice decision problem (rating the extent to which the subject would prefer to work with each of three targets: an inner city high school drop-out, a college engineering major, and a college business major). Subjects then searched an information board containing 8 alternative co-workers and 10 attributes of information available for each alternative. Each cell in the information board matrix contained a complete sentence containing one of the attributes presented in Tables 1 through 8. The set of attribute sentences for any given alternative was constructed to be equal in length to the sets of sentences used for each of the other alternative co-workers. The information board matrices used in this experiment and an example of information available in one of the cells are presented as Appendix J. When subjects had determined that they had acquired sufficient information, they then rated the extent to which they preferred to work with each available alternative co-worker using a 7-point scale anchored "would very much prefer not to work with this

person" to "would very much prefer to work with this person". The rating scales used in this experiment are presented in Appendix J.

After completing the search task subjects responded to the Need for Cognition scale and the demographics questionnaire. These questionnaires were ostensibly used to determine good matches between subjects and co-workers. At the conclusion of the experiment, subjects were questioned for suspicions and fully debriefed regarding the nature of the experiment and the bogus second study.

Analysis

Information Acquisition Variables. During the subject's search task, the computer automatically recorded the order with which the attribute information was accessed, the exact pieces of information acquired, and the amount of time each piece of information appeared on the screen before the subject went on to the next item of information or ended the search task. Search depth was operationalized as the total amount of attribute information acquired by the subject. Search latency was assessed by examining the average amount of time spent examining items of information in the matrix. Finally, the extent to which the subject examined a constant or variable amount of information per alternative provided an index of the use of compensatory versus non-compensatory search strategies (Payne, 1976). This was accomplished by computing the variance in search across alternatives for each subject. However, in order to eliminate confounding with search depth inherent in a simple variance computation, the square of the total amount of information searched was substituted for N in the denominator of a conventional variance equation relating the sum of squared deviations in search across alternatives to the total number of observations (or in

this case, alternatives). The resulting quantity was then multiplied by 8 to yield a strategy index ranging from 0 to 7.

Testing the Experimental Hypotheses. Multiple regression analyses were conducted to examine the influences of labelling, information consistency, and need for cognition on the dependent variables. The first equation tested the first hypothesized model wherein need for cognition influenced search directly, without interacting with labelling and consistency. This equation entered need for cognition last, after controlling for the influences of labelling, consistency, and the interaction between labelling and consistency.

Equation 1: Search = Labelling (L) (step 1)

+ Consistency (C) (step 2)

+ Interaction L x C (step 3)

+ Need for Cognition (N) (step 4)

According to Cohen and Cohen (1983), tests of exploratory variables are best performed by entering the exploratory variables last in regression analyses testing the impact of variables of primary interest. This provides increased power in detecting relationships between dependent variables and independent variables of primary interest. Moreover, this procedure provides a more appropriate test of hypotheses when controlling for exploratory variables might result in the removal of variance that would otherwise be included in the analysis of variables of primary interest.

A second regression equation tested the alternative hypothesis that need for cognition interacts with labelling and consistency to influence search. This equation entered the triple interaction term

last, after controlling for all possible main effects and two-way interactions.

Equation 2: Search = Labelling (L) (step 1)

+ Consistency (C) (step 2)

+ Need for Cognition (N) (step 3)

+ Interaction L x C (step 4)

+ Interaction L x N (step 5)

+ Interaction C x N (step 6)

+ Interaction L x C x N (step 7)

RESULTS

The results are presented in the order of the experimental hypotheses. First, descriptive and demographic statistics are presented. This is followed by a description of potential control variables and their effects on search depth, latency, and strategy. The influences of labelling, information consistency, need for cognition, and interactions are then each addressed in turn according to their hypothesized relationships with each of the dependent variables.

Descriptive Statistics

Table 9 presents the means and standard deviations of the major variables in this study. Intercorrelations among independent, dependent, and control variables are presented in Table 10. As can be seen in Table 10, the three dependent variables were all significantly intercorrelated. Increased search depth was associated with shorter average search latency ($r = -.43, p < .001$) and less variability in search across alternatives ($r = -.26, p < .001$). Longer average latencies were associated with significantly more variability in search ($r = .17, p < .05$).

Correlations among independent variables should all approach zero with random assignment of subjects. The results in Table 10 largely confirm this. However, subjects in the inconsistent information conditions tended to be slightly higher in need for cognition than subjects in consistent conditions ($r = -.14, p < .10$), possibly as a

Table 9

Means and Standard Deviations of
Variables in the Study

	<u>Mean</u>	<u>S.D.</u>
<u>Demographics</u>		
Age	20.15	2.41
Gender ¹	.72	.45
G.P.A. ²	2.88	.41
<u>Control Variables</u>		
Mean Attribute Preference ³	3.92	.80
Mean Alternative Rating ⁴	3.64	.74
<u>Independent Variables</u>		
Labelling ⁵	.51	.50
Information Consistency ⁶	.49	.50
Need for Cognition ⁷	174.58	19.72
<u>Dependent Variables</u>		
Search Depth ⁸	62.41	30.09
Search Latency ⁹	4.01	1.22
Search Strategy ¹⁰	.13	.13

N = 179

¹Coded 0=Male, 1=Female.

²Grade Point Average (0.00 - 4.00).

³Average preference rating of attributes examined: 1=Would Very Much Prefer Not to Work With This Person, 7=Would Very Much Prefer to Work With This Person.

⁴Average final preference rating of alternatives in the matrix: 1=Would Very Much Prefer Not to Work With This Person, 7=Would Very Much Prefer to Work With This Person.

⁵Coded 0=No label condition, 1=Label condition.

⁶Coded 0=Inconsistent condition, 1=Consistent condition.

⁷Sum of 34 items anchored 1=Very Strongly Disagree, 9=Very Strongly Agree.

⁸Total number of attributes examined.

⁹Average time spent examining attribute items, in seconds.

¹⁰Variance in search across alternatives:

$$(\sum (\text{Search}_{alt,i} - (\text{Depth}/8))^2 / \text{Depth}^2) \times 8$$

Table 10

Intercorrelations Among Control, Independent, and Dependent Variables

	1	2	3	4	5	6	7
<u>Control Variables</u>							
1. Mean Attribute Preference							
2. Mean Alternative Rating	.57***						
<u>Independent Variables</u>							
3. Labelling	-.01	-.11					
4. Information Consistency	.97***	.63***	-.03				
5. Need for Cognition	-.11	-.11	.02	-.14*			
<u>Dependent Variables</u>							
6. Search Depth	.11	.08	-.23***	.14*	.11		
7. Search Latency	-.15**	-.06	-.09	.12	-.02	-.43***	
8. Search Strategy	-.00	-.08	.06	-.13*	-.03	-.26***	.17

*** p < .01 (N = 179)

** p < .05

* p < .10

result of sampling error.

The two control variables, the mean preference rating of attributes examined and the mean rating of the eight alternative co-workers, and their relationships with other variables are addressed in more detail below. Internal consistency (Coefficient Alpha) of the Need for Cognition scale was .85.

Control Variables

As described in the previous section, examination of information search across unlabelled-consistent and unlabelled-inconsistent conditions provided a test of the possibility that factors other than information consistency operated to influence subjects' decision making behavior. To the extent that search differed across these two conditions, controlling for factors inherent in the stimulus information, other than information consistency, became the first step in testing the experimental hypotheses. Table 11 presents cell means for search depth, latency, and strategy. As can be seen in the table, search depth and search latency both differed across unlabelled-consistent and unlabelled-inconsistent conditions whereas search strategy did not differ across these conditions. Importantly, these differences were larger than those across labelled conditions.

One possible explanation of these results was that differences in the valence of the available information attributes existed across consistent and inconsistent conditions and operated to influence subjects' attention to attribute information. In fact, data collected during Experiment 2 indicated that, in general, the average of subjects' independent ratings of their preference to work with individuals described with a particular attribute were lower for the attributes

Table 11

Uncorrected Cell Means and Standard Deviations for SearchDepth, Search Latency, and Search Strategyby Labelling and Consistency

Search Depth		
	Consistent	Inconsistent
Labelled	57.23 (24.91) ¹ (n = 43)	54.33 (24.01) (n = 48)
Unlabelled	75.95 (33.12) (n = 44)	62.73 (33.55) (n = 44)
Search Latency		
	Consistent	Inconsistent
Labelled	3.80 (0.84) (n = 43)	4.01 (1.50) (n = 48)
Unlabelled	3.92 (1.18) (n = 44)	4.32 (1.19) (n = 44)
Search Strategy		
	Consistent	Inconsistent
Labelled	0.10 (0.08) (n = 43)	0.17 (0.19) (n = 48)
Unlabelled	0.12 (0.10) (n = 44)	0.12 (0.12) (n = 44)

¹Standard deviations appear in parentheses directly below cell means.

selected for use in inconsistent conditions than for those used in consistent conditions. This was unavoidable given the necessity to select information attributes that met the three criteria outlined above for inclusion in Experiment 3.

To assess the impact of attribute valence, or preference, on information search, a variable was created for each subject reflecting the average of mean attribute preference ratings, obtained during Experiment 2, of the actual information attributes examined by the subject. Not surprisingly, this variable was highly correlated with the information consistency manipulation ($r = .97, p < .001$). Moreover, attribute preference was significantly correlated with search latency ($r = -.15, p < .05$) whereas the correlation between attribute preference and search depth approached significance ($r = .11, p < .13$). Attribute preference was uncorrelated with search strategy ($r = -.00, p > .10$).

Given that average attribute preference differed greatly between consistent and inconsistent conditions, it seemed reasonable to expect that the average of final ratings of alternative co-workers would also differ across these conditions. A large correlation between mean alternative rating and information consistency (see Table 10) confirmed this ($r = .63, p < .001$). However, the large correlation between mean alternative rating and mean attribute rating ($r = .57, p < .001$) along with relatively low correlations between average alternative rating and the dependent variables ($-.08 \leq r \leq .08, p > .10$) suggested that mean ratings of decision alternatives explained little additional variance in search beyond that explained by attribute preference. Multiple regression analyses indicated that mean alternative rating resulted in non-significant changes in the incremental R^2 after first controlling

for mean attribute rating for each of the dependent variables (search depth: $F(2,176) = 0.22, p > .10$; latency: $F(2,176) = 0.16, p > .10$; strategy: $F(2,176) = 0.21, p > .10$). Hence, average final ratings of decision alternatives were ignored from further tests of the experimental hypotheses.

Controlling for mean preference ratings of the attributes examined by subjects was accomplished by entering this variable first in regression analyses testing the experimental hypotheses. Cell means corrected for differences in average attribute preference ratings are presented in Table 12. As can be seen in the table, equating subjects on the control variable resulted in smaller differences between unlabelled-consistent and unlabelled-inconsistent cells for both search depth and latency. Equating subjects on the control variable had no effect on means for search strategy because the two variables were uncorrelated.

Category Labelling

Tables 13, 14, and 15 present results from the first set of regression analyses testing the experimental hypotheses for each of the dependent variables. The first hypothesis of this study posited that category labelling would be associated with less overall search for labelled than for unlabelled alternatives. As can be seen in Table 13, this hypothesis was supported ($F(2,176) = 9.60, p < .01$). Mean search depth, after correcting for the control variable, was 55.64 for labelled alternatives and 69.30 for unlabelled alternatives. Subjects accessed more information when alternatives were presented without occupation labels than when potential co-workers were labelled with membership in a particular occupation.

Table 12

Corrected Cell Means for Search
Depth, Search Latency, and Search Strategy
by Labelling and Consistency

Search Depth		
	Consistent	Inconsistent
Labelled	53.67 (n = 43)	57.60 (n = 48)
Unlabelled	72.64 (n = 44)	65.96 (n = 44)
Search Latency		
	Consistent	Inconsistent
Labelled	3.98 (n = 43)	3.84 (n = 48)
Unlabelled	4.09 (n = 44)	4.15 (n = 44)
Search Strategy		
	Consistent	Inconsistent
Labelled	0.10 (n = 43)	0.17 (n = 48)
Unlabelled	0.12 (n = 44)	0.12 (n = 44)

The second hypothesis posited that search latency would be longer for unlabelled than for labelled alternatives. As can be seen in Table 14, this hypothesis was not supported ($F(2,176) = 1.41, p > .10$). Mean corrected latency was 3.91 seconds per attribute for labelled alternatives and 4.12 seconds for unlabelled alternatives. Although these means were in the expected direction, their difference was not statistically significant.

The third hypothesis relating to category labelling posited that search strategies would be more compensatory when alternatives were presented without category labels compared to when labels were present. As can be seen in Table 15, this hypothesis did not receive support ($F(2,176) = 0.67, p > .10$). The mean strategy index for labelled alternatives was .14 versus .12 for unlabelled co-workers. Variability in search across alternatives did not differ between labelled and unlabelled conditions.

Information Consistency

The fourth hypothesis of this study posited that labelling and information consistency would interact to influence search depth. Specifically, search depth was hypothesized to be least exhaustive when subjects were exposed to labelled alternatives with consistent information relative to labelled-inconsistent, unlabelled-consistent, and unlabelled-inconsistent conditions, which should not differ significantly. As can be seen in Table 13, this interaction was not supported ($F(4,174) = 1.23, p > .10$). Examination of the corrected cell means in Table 12 reveals that search was most exhaustive in the unlabelled-consistent condition ($M = 72.64$) followed by the

Table 13

Regression Analysis with Search Depth
as the Dependent Variable and Need for
Cognition Entering as a Main Effect Only

Variables entered in regression equation	Multiple R	Beta ¹	R ² Change	F of Change
Step 1. <u>Mean Attribute</u> <u>Preference</u>	.115	-.313	.013	2.37
Step 2. <u>Labelling</u>	.253***	-.151	.051	9.60***
Step 3. <u>Consistency</u>	.272***	.529*	.010	1.86
Step 4. <u>Interaction Term</u> <u>L X C</u>	.284***	-.124	.006	1.23
Step 5. <u>Need for Cognition</u>	.316***	.142*	.019	3.73*

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

*** p < .01

** p < .05

* p < .10

Table 14

Regression Analysis with Search Latency
as the Dependent Variable and Need for
Cognition Entering as a Main Effect Only

<u>Variables entered</u> <u>in regression</u> <u>equation</u>	<u>Multiple</u> <u>R</u>	<u>Beta</u> ¹	<u>R</u> ² <u>Change</u>	<u>F of</u> <u>Change</u>
Step 1. <u>Mean Attribute</u> <u>Preference</u>	.147*	-.436	.022	3.89*
Step 2. <u>Labelling</u>	.171*	-.126	.008	1.41
Step 3. <u>Consistency</u>	.187	.266	.006	1.03
Step 4. <u>Interaction Term</u> <u>L X C</u>	.193	.077	.002	0.39
Step 5. <u>Need for Cognition</u>	.195	-.028	.001	0.13

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

*** p < .01

** p < .05

* p < .10

Table 15

Regression Analysis with Search Strategy
as the Dependent Variable and Need for
Cognition Entering as a Main Effect Only

Variables entered in regression equation	Multiple R	Beta ¹	R ² Change	F of Change
Step 1. <u>Mean Attribute</u> <u>Preference</u>	.002	2.161***	.000	0.00
Step 2. <u>Labelling</u>	.062	.187**	.004	0.67
Step 3. <u>Consistency</u>	.522***	-2.072***	.268	64.49***
Step 4. <u>Interaction Term</u> <u>L X C</u>	.545***	-.280**	.025	6.11**
Step 5. <u>Need for Cognition</u>	.554***	-.102	.010	2.53

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

*** p < .001

** p < .05

* p < .10

unlabelled-inconsistent ($\bar{M} = 65.96$), labelled-inconsistent ($\bar{M} = 57.60$), and labelled-consistent conditions ($\bar{M} = 53.67$).

It should be noted that (after correcting for attribute preference) information search was lowest in the condition hypothesized to elicit category-based processes (i.e. the labelled-consistent condition), however the remaining three means were not as predicted. Specifically, means in the inconsistent conditions were lower than expected (after correction) and as a result, attenuated the hypothesized label X consistency interaction. Correcting the cell means for the control variable served to reduce some of the discrepancy between consistent and inconsistent conditions and resulted in a pattern of means more congruent with the experimental hypotheses; however, this correction was small given the relatively minor correlation between the control and dependent variables.

Hypothesis five posited an interaction between labelling and consistency in influencing mean latency of search. Latency was predicted to be shortest in the labelled-consistent condition relative to the remaining three conditions. As can be seen in Table 14, this hypothesis did not receive support ($F(4,174) = 0.39, p > .10$). Mean latency, corrected for the control variable, was shortest in the labelled-inconsistent condition ($\bar{M} = 3.84$), followed by the labelled-consistent ($\bar{M} = 3.98$), unlabelled-consistent ($\bar{M} = 4.09$), and unlabelled-inconsistent ($\bar{M} = 4.15$) conditions (see Table 12). These means did not evidence the pattern of means predicted by the experimental hypothesis.

The sixth hypothesis stated that search strategies would be least compensatory in the labelled-consistent condition than in the remaining three conditions. The test for this hypothesis was significant

($F(4,174) = 6.11, p < .05$), however the means were not in the expected direction. As can be seen in Table 12, information search was most compensatory (i.e. least variable) in the labelled-consistent condition ($M = 0.10$) and was least compensatory in the labelled-inconsistent condition ($M = 0.17$). Strategies did not differ across the unlabelled-consistent and unlabelled-inconsistent conditions ($M = 0.12$) as was predicted by the experimental hypotheses; however, the overall pattern of means did not resemble the predicted pattern of means (see Table 12).

Need for Cognition

The seventh hypothesis of this study posited that search depth would be greater for subjects higher in need for cognition than for subjects lower in need for cognition. As can be seen in Table 13, the test for this hypothesis approached significance ($F(5,173) = 3.73, p < .06$). Information search was slightly higher as subjects' need for cognition became greater.

Hypothesis 8a stated that longer search latency would be associated with higher need for cognition. This hypothesis was not supported ($F(5,173) = 0.13, p > .10$). Need for cognition was unrelated to search latency after controlling for the effects of labelling, information consistency, and the interaction between labelling and consistency.

Hypothesis 9a posited that search strategies would be more compensatory with increasing need for cognition. As can be seen in Table 15, this hypothesis did not receive support ($F(5,173) = 2.53, p > .10$). Search strategies did not differ as a function of need for cognition after first controlling for variance in strategies due to

labelling, information consistency, and the labelling X consistency interaction.

The Interaction Between Labelling, Information
Consistency, and the Need for Cognition

Several exploratory hypotheses were suggested relating need for cognition with category labelling and information consistency in influencing information search depth, latency, and strategy. The results from analyses testing these hypotheses are presented in Tables 16, 17, and 18. The first of these exploratory hypotheses posited that need for cognition would interact with both category labelling and information consistency to influence search depth. As can be seen in Table 16, this hypothesized 3-way interaction was non-significant ($F(8,170) = 0.02, p > .10$). A significant main effect for labelling was obtained in this analysis ($F(2,176) = 9.60, p < .01$) indicating greater search for unlabelled than for labelled alternatives. In addition, when tested before controlling for variance in search due to the interaction between labelling and consistency, need for cognition accounted for a significant proportion of the variance in search depth ($F(4,174) = 3.98, p < .05$). Increased depth of search was associated with higher levels of need for cognition. This analysis differed from the analysis reported earlier in the order with which variables were entered in the regression equation (see above). Results also indicated that need for cognition and information consistency interacted in influencing search depth ($F(7,171) = 4.53, p < .05$). Subjects acquired increasingly more information in the consistent conditions, relative to the inconsistent conditions, as need for cognition increased.

Hypothesis 8b posited that need for cognition would interact with category labelling and information consistency to influence search latency. As can be seen in Table 17, the hypothesized 3-way interaction was not supported ($F(8,170) = 0.00, p > .10$). A main effect for average attribute preference approached significance ($F(1,177) = 3.89, p < .06$), indicating slightly shorter latency of search with attributes rated higher in preference. No other main effects or interactions were statistically significant in this analysis.

Table 18 presents results bearing on hypothesis 9b which posited a triple interaction between need for cognition, labelling, and consistency in influencing search strategies. This hypothesis was not supported ($F(8,170) = 0.00, p > .10$). A significant main effect for information consistency was obtained in this analysis ($F(3,175) = 64.49, p < .001$) indicating greater variability in search in inconsistent conditions compared to consistent conditions (see Table 12). In addition, a significant labelling X consistency interaction ($F(5,173) = 6.63, p < .05$) revealed more variability in search in the labelled-inconsistent condition than in the other conditions which did not differ markedly from one another (see Table 12). As with the previous set of analyses, the hypothesized labelling X consistency interaction was obtained, however the means were not as predicted. Search was least compensatory in the condition (i.e. labelled-inconsistent) designed to elicit relatively painstaking compensatory search strategies. No other main effects or interactions were significant in this analysis.

Table 16

Regression Analysis with Search Depth
as the Dependent Variable and Need for
Cognition Entering in a Triple Interaction

Variables entered in regression equation	Multiple R	Beta ¹	R ² Change	F of Change
Step 1. <u>Mean Attribute</u> <u>Preference</u>	.115	-.321	.013	2.37
Step 2. <u>Labelling</u>	.253***	.190	.051	9.60***
Step 3. <u>Consistency</u>	.272***	-.699	.010	1.86
Step 4. <u>Need for Cognition</u>	.308***	.055	.021	3.98**
Step 5. <u>Interaction Term</u> <u>L X C</u>	.316***	-.020	.005	1.00
Step 6. <u>Interaction Term</u> <u>L X N</u>	.318***	-.337	.001	0.23
Step 7. <u>Interaction Term</u> <u>C X N</u>	.353***	1.235	.023	4.53**
Step 8. <u>Interaction Term</u> <u>L X C X N</u>	.353***	-.100	.000	0.02

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

*** p < .01

** p < .05

* p < .10

Table 17

Regression Analysis with Search Latency
as the Dependent Variable and Need for
Cognition Entering in a Triple Interaction

Variables entered in regression equation	Multiple R	Beta¹	R² Change	F of Change
Step 1. <u>Mean Attribute Preference</u>	.147*	-.454	.022	3.89*
Step 2. <u>Labelling</u>	.171*	-.333	.008	1.41
Step 3. <u>Consistency</u>	.187	1.142	.006	1.03
Step 4. <u>Need for Cognition</u>	.189	.044	.001	0.16
Step 5. <u>Interaction Term L X C</u>	.195	.106	.002	0.36
Step 6. <u>Interaction Term L X N</u>	.195	.204	.000	0.02
Step 7. <u>Interaction Term C X N</u>	.228	-.874	.014	2.57
Step 8. <u>Interaction Term L X C X N</u>	.228	-.034	.000	0.00

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

*** p < .01

** p < .05

* p < .10

Table 18

Regression Analysis with Search Strategy
as the Dependent Variable and Need for
Cognition Entering in a Triple Interaction

Variables entered in regression equation	Multiple R	Beta ¹	R ² Change	F of Change
Step 1. <u>Mean Attribute</u> <u>Preference</u>	.002	2.162***	.000	0.00
Step 2. <u>Labelling</u>	.062	.165	.004	0.67
Step 3. <u>Consistency</u>	.522***	-1.997**	.268	64.49***
Step 4. <u>Need for Cognition</u>	.530***	-.099	.008	2.00
Step 5. <u>Interaction Term</u> <u>L X C</u>	.554***	-.318	.027	6.63**
Step 6. <u>Interaction Term</u> <u>L X N</u>	.554***	.022	.000	0.01
Step 7. <u>Interaction Term</u> <u>C X N</u>	.554***	-.076	.000	0.01
Step 8. <u>Interaction Term</u> <u>L X C X N</u>	.554***	.038	.000	0.00

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

*** p < .01

** p < .05

* p < .10

Summary of Results

As predicted, category labelling had a significant impact on the amount of information gathered by subjects during decision making (see Table 13). Subjects sought out less of the available individuating information when targets were labelled with membership in a particular occupation compared to when subjects encountered unlabelled targets. Labelling did not result in shorter search latencies compared to unlabelled conditions however (see Table 14). Moreover, labelling did not result in the use of relatively non-compensatory decision strategies compared to unlabelled conditions (see table 15).

Contrary to expectations, information consistency did not interact with category labelling in influencing search depth (see Table 13). After correcting for the control variable, cell means for search depth evidenced a pattern quite congruent with the experimental hypotheses; however lower means in the two inconsistent conditions reduced the likelihood of obtaining the expected interaction (see Table 12). Labelling and information consistency did not interact to influence search latency (see Table 14). Although the expected label X consistency interaction was obtained for search strategies (see Table 15), the cell means did not resemble the pattern of means predicted by the experimental hypotheses.

Need for cognition accounted for a marginally significant portion of the variance in search depth in the first set of analyses (see Table 13) but had no relation to either search latency (see Table 14) or search strategies (see Table 15). When need for cognition was entered before the labelling X consistency interaction term in the second set of analyses it accounted for a significant portion of the variance in

search depth. Search depth increased as subjects' need for cognition became greater. Moreover, need for cognition interacted with information consistency in influencing search depth. Need for cognition remained unrelated to search latency and strategy in the second set of analyses and did not interact with labelling and consistency in influencing any of the dependent variables.

DISCUSSION

This study examined the effects of category labelling, information consistency, and need for cognition on the acquisition of information during decision making. Although a number of the experimental hypotheses were not supported, the results of this study provide some insight into the influences of stereotypes on decision making behavior. In this section, the results of labelling, consistency, and need for cognition on information search are discussed in detail. This is followed by a discussion of the implications of the results for research and theory in stereotyping and decision making. Finally, potential limitations of the study are described and future research directions are outlined.

The Results

Category Labelling

The results demonstrated that in the presence of a label describing a target's membership in a particular occupation, information search was reduced relative to unlabelled situations. This finding supports past research and theory suggesting that diagnostic labels activate stereotypic categories in memory which allow the perceiver to reduce the number of stimuli receiving attention. Search latency, although somewhat faster in labelled than unlabelled conditions, was essentially uninfluenced by category labelling. This is surprising given past research (e.g. Fiske, et al, 1983, reported in Fiske &

Pavelchak, 1986) demonstrating faster judgment latencies in conditions eliciting categorization.

It should be pointed out however, that judgment latency as measured in past research may be more analogous to overall decision latency in the present context. Because overall decision latency in the present study is simply a combination of search depth and average latency per attribute, results for depth and latency when taken together provide relatively unambiguous support for the hypotheses predicting heuristic processing in labelled conditions. On the other hand, processing of information attributes should have nevertheless been significantly faster when subjects encountered a consistent fit between individuating information and category labels compared to when attributes had to be understood and organized without the benefit of categorization or when the attributes invalidated category membership.

Results did not support the hypothesized relationship between labelling and the use of non-compensatory strategies. Search strategies did not differ overall between labelled and unlabelled conditions. This may indicate that search strategies do not differ as a function of individuating versus category-based processing. Although the continuum model predicts variability in attention to attribute information under various informational and motivational conditions, it does not explicitly posit that increased attention to attribute information will occur in a systematic (or compensatory) or more random (or non-compensatory) fashion. On the other hand, as is discussed in more detail below, variability in search across alternatives may have in fact been a poor measure of the use of heuristic versus deliberate search processes.

The Interaction Between Category Labelling
and Information Consistency

Contrary to the experimental hypotheses, labelling did not interact with consistency in influencing search depth and latency. However, after correcting cell means for the average preference of the attributes examined, search depth in the four experimental conditions was remarkably similar to the pattern of means predicted by the hypotheses. That is, search was least exhaustive when subjects encountered labelled targets and consistent information (the one condition designed to elicit category-based processing) than when subjects encountered either labelled targets with inconsistent information or unlabelled targets.

One explanation for the non-significant interaction for depth of search may lie in differences that remained between the available consistent and inconsistent information after correction for the average preference value of the attributes examined by the subjects. Indeed, search differed between the two unlabelled groups after correction for the control variable, suggesting some unmeasured variable may have depressed search in both of the inconsistent conditions relative to the consistent conditions. If that is true, lower means (and uncontrolled variance) may have reduced the likelihood of obtaining a significant interaction in this analysis.

It should be noted that controlling for the covariate in this study involved simply assigning the mean of preference ratings of each of the independent attributes, obtained in Experiment 2, to each of the attributes examined by the subjects in Experiment 3. The attribute values (or mean ratings) were then averaged across the attributes

examined by subjects and then controlled as a first step in the regression analyses. Ideally, attribute preference ratings would have been provided by the actual subjects participating in Experiment 3 and then the average of these idiosyncratic ratings could have been covaried as a first step in the analyses. This would have likely resulted in a larger correlation between individual search and perceived attribute preference and, given the direction of the correction in cell means provided by the covariate analysis in this study, a consequent correction in cell means closer to the pattern predicted by the experimental hypotheses. Hence, a depression of search in the two unlabelled conditions might be attributed to uncontrolled variance in the perceived valence of attributes examined in the different conditions of this study. This would be consistent with previous research demonstrating greater weight given to negative versus positive information in influencing attitudes and impressions (e.g. Fiske, 1980; see also Fiske & Taylor, 1984).

Alternatively, differences between search depth in the unlabelled conditions may have simply been the result of chance and not some stable but unmeasured variable. The large standard deviations in search depth (see Table 11) along with the lack of any interpretable pattern of means for search latency support this alternative explanation.

Although the predicted labelling X consistency interaction was supported when search strategy was the dependent variable, the obtained pattern of means for this variable were not as predicted. Specifically, search was least variable (i.e. most compensatory) when targets were presented with labels and consistent information, the condition hypothesized to elicit heuristic non-compensatory search. Moreover,

search was most variable (i.e. most non-compensatory) in the labelled-inconsistent condition relative to the remaining conditions, which did not differ markedly from each other.

One possible explanation for the greater variability in search across alternatives in the labelled-inconsistent condition may relate to differences among alternatives in the extent to which the available attribute information disconfirmed category membership. That is, it may have taken more inconsistent information to invalidate category membership for some of the alternatives in the labelled-inconsistent matrix than for other alternatives in this condition. This problem relates to possible differences among the occupation labels used in this study in the robustness of stereotypic expectations associated with those occupations; in other words, some occupation stereotypes may have been more well formed among subjects in this study and were therefore more resistant to disconfirming evidence.

Contrary to what might be expected given the above reasoning, search strategies in the labelled-consistent condition did not evidence greater variability in search across alternatives relative to unlabelled conditions. However, confirmatory information processing, like that hypothesized to occur in the labelled-consistent condition, is thought to represent a relatively simple heuristic process. That is, because successful category-based information processing involves simply confirming the congruence between a category and available consistent or neutral individuating information (Fiske & Neuberg, 1990), gathering a relatively minimal and constant amount of information across each alternative should suffice.

The Need for Cognition

In the first set of analyses, variance in search due to need for cognition was tested after first controlling for the effects of labelling, consistency, and the interaction between labelling and consistency. When assessed in this manner, the relationship between need for cognition and search depth approached significance. Search depth was slightly greater as need for cognition increased. This finding is consistent with past research (e.g. Cacioppo & Petty, 1982; Cacioppo, et al, 1983; Srull, et al, 1985) demonstrating that persons high in need for cognition are more likely than persons lower in need for cognition to engage in effortful thinking.

Need for cognition was unrelated to search latency and strategies in the first set of analyses. These results strongly suggest that the manner in which information was gathered (apart from the absolute amount of information gathered) did not differ among higher and lower need for cognition subjects. However, it is also possible that real differences existed in search processes that were not reflected in the latency and strategy measures used in this study. That is, differing mechanisms may have operated to influence search latency and strategy in the same direction for subjects with differing levels of need for cognition.

For example, shorter average search latencies among high need for cognition subjects may have been the result of relatively fast and efficient processing of the available information, whereas for subjects lower in need for cognition, shorter latencies would have been the result of less effortful attention to the attribute information. Similarly, more variable search among subjects high in need for cognition may have been caused by increased sensitivity to differences

among alternatives in the extent to which the attribute information disconfirmed category membership. At the same time, greater variability in search among subjects lower in need for cognition might have resulted from mindless or heuristic processing of the available information.

Alternatively, the lack of a significant relationship between need for cognition and search latency and strategy may suggest that need for cognition influences only those behaviors that are under direct volitional control. Need for cognition (at least as measured by the scale used in this study) may relate only to explicit choices regarding the extent to which effortful thinking should be undertaken. Search depth for example, involved an explicit choice to continue or to end the search process. On the other hand, subjects in this study were unlikely to have attended closely to the amount of time during which attribute information appeared on the computer screen and may not have made conscious choices based on the amount of variability in their search across alternatives. Differences among people in the need for cognition may not influence more subtle forms of effortful thinking which are less the result of explicit choices, such as search latency and strategy as measured in this study. The distinctions between conscious decisions to engage in effortful thinking and semi or non-conscious behavior have not been addressed in previous research examining the effects of need for cognition. Indeed, the processes by which need for cognition might have differing relationships with these two modes of processing are not clear at this time.

In the second set of analyses, the three-way interactions among need for cognition, labelling, and information consistency were tested after first controlling for all possible main effects and two-way

interactions. Although none of the hypothesized triple interactions were significant, several of the results of these analyses are noteworthy. Specifically, need for cognition accounted for a significant portion of the variance in search depth when need for cognition was tested before controlling for the interaction between labelling and consistency. This analysis differed from the first in the order with which variables were entered in the regression equation (see above). As in the first analysis, search depth increased with increasing need for cognition.

A second noteworthy result of this set of analyses was a significant interaction between need for cognition and information consistency in influencing search depth. Although search was uninfluenced by need for cognition in the two inconsistent conditions, subjects sought out increasingly more of the available information in the consistent conditions, relative to inconsistent conditions, as the need for cognition became greater. This finding contradicts past research (e.g. Srull, et al, 1985) demonstrating greater attention to inconsistent information among subjects high in need for cognition.

The present results may suggest that differences existed between high and low need for cognition subjects in their sensitivity to the valence of the available information attributes. Given that subjects undoubtedly differed in their perceptions of the preference of each of the available attributes, and that much of this variance in perceptions went uncorrected (see above), increasing search for the consistent attributes, relative to the inconsistent attributes, with increasing need for cognition may reflect a greater bias on the part of high need for cognition subjects in interpretations of the preference of

information attributes. That is, subjects higher in need for cognition may have been more extreme in their perceptions of the valence of available information attributes. This greater sensitivity to attribute valence would have resulted in greater depression of search for information in the inconsistent conditions relative to subjects lower in need for cognition, and increased search for information in the consistent conditions.

It is not clear however why subjects higher in need for cognition would be more sensitive to the valence of the available individuating information. One possibility is that subjects higher in need for cognition were more able to recognize the importance of positive or negative information in the context of the co-worker selection decision. Alternatively, high need for cognition subjects might have been more able to keep previously examined information in mind or were more likely to try to form an impression on-line based on the information acquired. Given repeated exposure to negative information, subjects higher in need for cognition may have felt little need to acquire additional confirmatory (in the sense of confirming previous negative information) negative information.

Implications of The Study

The results of this study suggest several implications for our understanding of the role of stereotypes in decision making behavior. Namely, results demonstrated that stereotypes influence the amount of information acquired in making decisions, a volitional response to contingencies in the stimulus environment. The results also supported previous theory and research on the need for cognition and, in so doing, provided additional clarity to the influences of motivation on the use

of individuating information during impression formation. Finally, information search was primarily individuating in this study, suggesting information acquisition may not approach fully category-based processing under conditions in which information is easily accessible and costs associated with gathering information are low. These issues will each be addressed in more detail below.

The Influences of Stereotypes on Decision Behavior

The results of this study demonstrated that in the presence of labels indicating membership in particular stereotypic groups, information gathering during impression formation is reduced relative to when stereotypic labels are not available. This finding is consistent with much past research demonstrating less attention to individuating information about targets who can be categorized as belonging to certain socially defined groups (e.g. Bodenhausen & Lichtenstein, 1987; Bodenhausen & Wyer, 1985; Fiske, et al, 1987). However, the present study expands our knowledge of the influences of stereotypes on information processing by elucidating the relationships of stereotyping to information gathering behavior.

Past research in impression formation and stereotyping has demonstrated the impact of categorization on various aspects of information processing, including process measures of attention, such as listening time (Neuberg, 1989) and response time (Fiske, et al, 1983, reported in Fiske & Pavelchak, 1986), and outcome measures of attitude or judgment, such as likability ratings (e.g. Fiske, et al, 1987, Experiment 1). Although many of the specific methodologies utilized in past research examining information processing can be criticized for various reasons (see above), converging findings across a large body of

research in the areas of stereotyping, attitudes, and impression formation strongly suggest that categorization facilitates heuristic processing of individuating information.

The present study takes a further step in demonstrating the biasing influences of stereotypes on information gathering behavior. Information acquisition, as measured in this study, necessarily involves a determination regarding whether additional data is needed in order to render a judgment of another person. Hence, the present results demonstrate that stereotypic expectations bias even those behaviors that are under the direct control of volition. That is, subjects encountering labelled targets chose to gather less of the available diagnostic information than did subjects encountering unlabelled target persons. Moreover, the results demonstrate that decisions commonly made in organizations, such as co-worker or personnel selection decisions, may be susceptible to stereotypic biases in the acquisition of important diagnostic information.

The Need for Cognition

The results of this study demonstrated increased search for individuating information as subjects' need for cognition became greater. This finding is important in demonstrating the role of individual differences in the use of attribute information. Like outcome dependency, need for cognition may represent an important motivational factor that can account for variability in movement along the continuum of impression formation (Fiske & Neuberg, 1990) from pure category-based responding to more individuating processing of available diagnostic information. In other words, like subjects motivated to understand others on whom important outcomes depend, persons higher in

need for cognition likely experience greater motivation to gather information about others prior to rendering a judgment. Thus, the results of this study provide evidence of the heuristic value of the continuum model (Fiske & Neuberg, 1990) for developing hypotheses consistent with the vast body of research in attitude change, person perception, and impression formation.

In addition, the results provide further insight into the role of person factors in decision making. Although a small number of studies has examined the influences of cognitive ability and skill (Capon & Davis, 1984; Jacoby, et al, 1984; Klayman, 1985) or socioeconomic status (Capon & Burke, 1980) on the acquisition of information during decision making, relatively little attention has been paid to the impact of individual differences in decision making. The present study represents the first attempt to relate need for cognition to information gathering behavior during decision making. Thus, the results demonstrate that differences among people in the need for cognition may have an important impact on decision making in organizations.

Finally, the results provide evidence of the construct validity of the Need for Cognition scale developed by Cacioppo and Petty (1982). Previous research has demonstrated that subjects high in need for cognition are more likely than persons lower in need for cognition to enjoy complex tasks over simple tasks (Cacioppo & Petty, 1982) and to view their own cognitive behavior as more effortful than do subjects with lower need for cognition (Cacioppo, et al, 1983). Additionally, evidence has been presented that subjects high in need for cognition are more apt to notice differences among strong and weak messages (Cacioppo, et al, 1983) and to process inconsistent information more deeply than do

subjects lower in need for cognition (Srull, et al, 1985). The present results indicate, moreover, that need for cognition has a significant relationship with the amount of information acquired during a complex decision task.

Information Acquisition Was Primarily Individuating

Subjects in this study sought out a large proportion of the available attribute information across all of the information conditions. Indeed, 51 subjects (29% overall; including 9, or 21% of subjects in the labelled-consistent condition) examined all of the available attribute information, and in many cases re-examined much of the information before making final ratings. Although, as is discussed in more detail below, this may represent an artifact due to the methodology employed in this study, it is clear that pure category-based processing seldom occurred in this study. This was surprising in light of research and theory suggesting that search for individuating information would be abandoned in favor of more category-based processing whenever possible, and given the large amount of information available for examination in the alternative X attribute matrices.

The results may indicate therefore, that stereotypes have less an effect on moving overt information acquisition toward pure category-based processing than on moving overall judgments or judgment latencies toward that end of the impression formation continuum. That is, although search was reduced when labels were provided, it may be unlikely that information gathering would ever depart from primarily individuating processing given easily accessible information and little cost associated with gathering the information. The psychological impact associated with knowledge that one has refused to gather

important diagnostic information prior to judging another person may be greater than that associated with a less evident interpretational bias or a bias in processing time, both of which are unlikely to be recognized by the perceiver. Hence, reasonably minded perceivers may feel less inclined to ignore individuating information when it can be easily acquired.

On the other hand, the decision tracing methodology employed in this study may have encouraged individuating processing that would not otherwise have occurred given some other method of assessing information acquisition. For example, a decision task involving a search through a variety of different sources with differing presentation formats, such as newspapers, technical journals, employment records, or word-of-mouth, might have produced results more closely resembling pure category-based processes. In order to reduce the easy availability of information and raise the perceived costs associated with gathering information in a process tracing task, future research employing the present methodology might attempt to impose artificial constraints on search for the available attribute information. These issues are discussed in more detail below.

Limitations of the Study

Several limitations of the present study are worth noting. First, as is discussed above, information available in the inconsistent conditions was more negative than attribute information in the two consistent conditions. Although some of the variance in search due to attribute valence was controlled statistically, uncontrolled variance undoubtedly remained and may have depressed search in the two inconsistent conditions. Second, search was primarily individuating

across all of the information conditions. This necessarily qualifies any firm conclusions that stereotypes result in category-based processes during information acquisition. Third, the occupation labelling manipulation may have been confounded with the believability of the cover story presented to subjects at the outset of the experiment. Finally, results of the study underscore several difficulties in the measurement of search strategies in decision making.

Attribute Preference

In order to aid in the selection of information attributes to be used in Experiment 3, several criteria were established. First, information attributes were selected if they were among, or were clearly consistent with (clearly inconsistent attributes were selected for the two inconsistent conditions), the open-ended descriptions provided by subjects in Experiment 1. Additionally, attributes were selected if the mean typicality ratings provided in Experiment 2 were significantly above the rating scale midpoint, and if the attribute had some minimal decision relevance. This procedure necessarily resulted in two sets of information attributes, one to be used in the two inconsistent conditions (labelled and unlabelled), and a second set to be used in the consistent conditions.

Results from Experiment 3 indicated that search for the available information differed overall between the consistent and inconsistent conditions. Hence, the information consistency manipulation was confounded with inherent differences in the information used in the different conditions. Although some of the variance in search due to this apparent confound was eliminated statistically, differences in search between the two consistent conditions and the two inconsistent

conditions likely remained. As is discussed above, because the covariate was simply an average attribute value obtained from subjects in Experiment 2, differences in search across the two information types may have been the result of uncontrolled variability in perceptions of the valence of the available information attributes.

If this apparent confound hadn't existed or could have been eliminated entirely through statistical correction, the hypothesized interaction between labelling and consistency might have reached significance. Future research is being designed to eliminate this obvious limitation. One method of doing so might involve simply applying the consistent attributes for a given occupation to another occupation for which the attributes would be inconsistent. This would require either relaxing the criteria for selection of consistent and inconsistent attributes or empirically testing information attributes in order to obtain the desired matrices. Alternatively, additional research might be conducted wherein subjects would be asked to provide both consistent and inconsistent open-ended descriptions of target persons. These descriptions could then provide the basis for development of the desired information board matrices.

Individuating Versus Category-Based Processing

As is discussed above, search for the available attribute information was primarily individuating across all of the information conditions in this study. Contrary to expectations, the availability of stereotypic labels did not result in purely category-based processing of the diagnostic attribute information. Instead, a sizable proportion of the study sample sought out a majority, if not all, of the available attribute information. Though it is possible that these results

indicate differences between the biasing effects of stereotypes on information acquisition versus potential biases in the interpretation of diagnostic information (e.g. Lord, et al, 1979), or apparent attention to information (e.g. Fiske, et al, 1987), the present results may as likely be the result of the particular method employed in this study to examine information acquisition. That is, characteristics of the decision task may have elicited individuating processing when category-based processes might otherwise dominate in reality.

For example, searching the computer for available information was a relatively simple operation which allowed for a thorough search of the entire alternative-attribute matrix within the time allocated for the experimental session. As a result, subjects may have felt compelled to search a moderate to large amount of the information because that could easily be done within the time scheduled for the experiment. Hence, demand characteristics associated with the decision task may have inflated search depth above what might otherwise have occurred given a different decision context. In addition, the computer task itself was likely a novel experience for many of the subjects thus inflating search due to the inherently interesting nature of the experiment. Subjects may have spent nearly as much time searching the computer in order to understand the task itself as they did in order to understand the target rates.

It should also be pointed out that the cover story and instructions given to subjects may have motivated the subjects to form accurate impressions of the potential co-workers. Subjects anticipating a joint task in which they would interact with a member of the community may have been highly motivated select the most favorable candidate based

on the information given. That is, the unspecified nature of the joint task along with the uncertainty associated with task oriented interaction with a stranger may have elicited impression accuracy goals among subjects, whereby subjects attempted to optimize the decision outcome. Thus, even though an attempt was made to reduce subjects' perceived outcome dependency, participants may have nonetheless been motivated to reduce the uncertainties associated with the joint task by accurately understanding the potential co-workers.

As is pointed out above, future research might attempt to impose artificial constraints on subjects' search for information. For example, subjects may, in future research efforts, be required to complete their decision within a specified amount of time. In fact, Fiske and Pavelchak (1986) have suggested that time constraints should elicit increased reliance on category-based judgments of target others. Conversely, increasing the available time should discourage purely category-based processing of social information (Fiske & Pavelchak, 1988). Given the lack of any empirical work on the effects of time constraints and movement along the continuum of impression formation however, the present research attempted to increase the cognitive demands of the task through providing a wealth of attribute information rather than artificially impose time constraints. It seems clear from the results that some constraints on search are necessary.

Acceptance of the Cover Story

It must be pointed out that subjects in the two labelled conditions encountered potential co-workers that were identified as belonging to certain salient occupations, for example a loan shark and television evangelist. This was unavoidable given the necessity to

select occupations for which people have stereotypic expectations regarding members of the occupation. Hence, search in the two labelled conditions may have been reduced as a result of the perceived speciousness of the experiment's cover story and the ostensible "second study". Subjects rejecting the possibility of a joint task would therefore be less motivated to form accurate impressions than would subjects in the two unlabelled conditions.

In order to assess the possibility of a bias in search due to the credence given to the cover story, responses to the post experiment questionnaire were coded according to whether the subjects reported having suspicions regarding the experimental deceptions. Although the correlation between reported suspicions and the labelling manipulation approached significance ($r = .14$, $p < .08$), search depth did not differ as a function of awareness of the experimental deceptions ($r = -.02$, $p > .10$). Moreover, among subjects in the two labelled conditions, average search depth per alternative remained constant across alternatives ($F(7,1424) = 1.57$, $p > .10$), suggesting that search was not influenced by differences in the salience of occupation categories. In other words, contrary to what might be expected given the above reasoning, search for information describing the elementary school teacher, the librarian, and the secretary, three relatively common occupations, was not more thorough than search for the more salient occupations, such as loan shark or television evangelist. It must be pointed out however, that variability in search across alternatives in the two labelled conditions may have been the result of at least three independent factors, including (1) the ease of category confirmation or disconfirmation, (2) differences in the perceived preference of working

with each of the alternative co-workers, and (3) the perceived likelihood of a second study involving each of the alternative co-workers.

Search Strategies

Difficulties exist in the measurement of information processing strategies during decision making. Previous research has attempted to classify strategies according to variability in search across decision alternatives. Constant search across alternatives is thought to indicate careful attention to the attribute information, whereby attribute values compensate for one another in the evaluation of decision alternatives (i.e. compensatory processing strategies). Variable search is presumed to indicate non-compensatory search in which the task is simplified through a variety of heuristic decision rules.

However, non-compensatory search may indicate more complex processing of available information than has previously been thought. For example, an elimination-by-aspects strategy, in which alternatives are eliminated on the basis of failing to satisfy certain minimal attribute requirements, may in fact represent a complex weighting of various important outcomes, including perceived attribute importance, direct alternative comparisons, and an analysis of the potential costs and benefits of making a correct decision. With this type of strategy, minimal attribute criteria might be established interactively or from prior knowledge or experience (Hults, 1988). Constant, or seemingly compensatory search, on the other hand, may represent nothing more than an automatic processing of information wherein attributes are examined by rote and then combined heuristically to form an overall impression (see Hults, 1988).

Clearly, none of the measures of information acquisition used in this study, indeed few of the measures used in previous research in the areas of impression formation and person perception (see Fiske, et al, 1987, Experiment 2 for an exception), provide reliable insights into the content of subjects' thought processes during decision tasks. Future research might attempt to include verbal protocol analysis as an additional measure of information processing during decision making. This would add further clarity to our understanding of the various strategies used in decision making as well as the processes of attention, interpretation, and evaluation during decision making involving stereotypic others.

Recommendations for Future Research

In addition to the many research directions outlined throughout the previous sections, several further recommendations might be made for future research into the influences of stereotypes on decision making behavior. First, research needs to be focused on understanding the influences of motivation on information processing during decision making. The present results indicated that subjects higher in need for cognition were more motivated to carefully process available attribute information than were subjects with lower need for cognition. Future research might attempt to manipulate outcome dependency, accountability, or decision importance in an effort to understand how individuals come to be motivated to carefully process decision relevant information and how that motivation influences selective attention, interpretation, and encoding during information acquisition. Although motivation is presumed to be an integral aspect of movement along the continuum of impression formation (Fiske & Neuberg, 1990), little empirical work has

been done to establish the linkages between motivating contextual factors and use of individuating information during impression formation and judgment (see Erber & Fiske, 1984; Neuberg & Fiske, 1987, for exceptions).

Future research might also benefit from attempts to describe the influences of stereotyping in decision making in terms of an overall cost-benefit model of decision behavior (e.g. Beach & Mitchell, 1978). Beach and Mitchell (1978) suggest that during decision making, individuals attempt to minimize costs, such as time and effort, while at the same time maximizing benefit through producing an optimal outcome from the decision problem. Research on cognitive dissonance (e.g. Festinger, 1957) and selective exposure to confirmatory information (e.g. Frey, 1981; Schwartz, Frey, & Kumpf, 1980; see also Snyder, 1981) suggests that the maintenance of one's stereotypic expectations of others may represent a desired outcome of any decision problem. Research might also attempt to examine the balancing of competing outcomes, such as the maintenance of one's beliefs versus fairness in decisions, through manipulations of the costs and benefits of such outcomes. Further, motivation likely plays an important role in any cost-benefit judgment and therefore might be incorporated in research investigating the influences of stereotyping on decision making utilizing a cost-benefit framework.

Another direction for future research might involve the application of policy capturing (see Abelson & Levi, 1985) to examine strategies in information acquisition. The present study did not provide evidence of the interpretational biases that are thought to occur during the processing of information about members of stereotypic

categories. Examination of the weighting of information attributes during decision making would give insight into the use of category-based expectations and individuating data during decision making and the strategies involved in arriving at a final judgment. Thus, a seemingly compensatory strategy in which attributes receive little weight in a decision, may indicate heuristic and automatic, rather than deliberate and painstaking, processing of diagnostic information. This would have important implications for our current understanding of decision strategies.

Finally, research on the influences of stereotypes on information acquisition might benefit from attempts to apply the same theoretical propositions in a different decision context and information acquisition task. As is pointed out above, information search was primarily individuating in this study. This may have been the result of method bias or demand characteristics associated with the computer task used in this study. That is, the computer decision task may have been a novel or overly simple procedure for many of the subjects. Indeed, because a large majority of the experimental participants were college freshmen or sophomores, it is possible that many of them had little familiarity with the computer as used in this study. Low familiarity and the inherently engaging nature of the task may have resulted in findings that have little resemblance to what might occur in reality. Hence, future research might utilize an in-basket approach whereby subjects gather information presented in a variety of formats. This might eliminate whatever method bias may occur as a result of searching through a computer for information, and would likely provide greater generalizability of the study results.

Final Comments

The results of this study provided limited support for hypotheses relating stereotype-based categorization with information acquisition during decision making. Subjects in this study acquired less information during decision making when a stereotypic label was available indicating a target's membership in an occupation category. Information inconsistency did not undercut the use of category-based processes, however, and results for search latency and strategies were not as predicted. The results suggest several implications for our understanding of decision making and stereotyping in organizations. Moreover, the results underscore several limitations in current decision making research and suggest several avenues for future research. Our current understanding of organizational decision making behavior would benefit from further exploration of the influences of stereotyping.

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APPENDIX A

**Means and Standard Deviations of Total Number of Words
and Number of Meaningful Descriptors, and Correlations with
Need for Cognition for Occupation Labels**

**Means and Standard Deviations for Preference Ratings,
and Correlations with Need for Cognition
for Occupation Labels**

APPENDIX A

Table A-1

Means and Standard Deviations of Total Number of Words
and Number of Meaningful Descriptors, and Correlations
with Need for Cognition for Occupation Labels

<u>Occupation</u>	<u>M</u>	<u>S.D.</u>	<u>Correlation with Ncog</u>
* <u>Neurosurgeon</u> (n = 30)			
Total Words	32.60	11.97	.04
Descriptors	10.47	3.97	-.19
* <u>Elementary School</u>			
<u>Teacher</u> (n = 30)			
Total Words	31.67	13.32	-.14
Descriptors	10.43	3.01	-.31**
* <u>TV Evangelist</u> (n = 30)			
Total Words	35.40	13.24	.01
Descriptors	10.13	3.63	-.12
<u>Hotel Maid at a</u>			
<u>Fancy Hotel</u> (n = 30)			
Total Words	33.60	15.20	-.22
Descriptors	8.97	2.87	-.02
* <u>Interstate Truck</u>			
<u>Driver</u> (n = 30)			
Total Words	38.33	13.91	-.34**
Descriptors	10.60	3.11	-.34**
<u>Politician</u> (n = 30)			
Total Words	38.37	10.42	-.19
Descriptors	11.03	2.75	-.03
* <u>Poet</u> (n = 30)			
Total Words	34.13	14.89	-.07
Descriptors	10.30	3.42	-.09
* <u>Secretary for a Middle</u>			
<u>Level Manager</u> (n = 30)			
Total Words	30.97	12.31	-.16
Descriptors	9.83	3.01	-.13
<u>Investment</u>			
<u>Broker</u> (n = 30)			
Total Words	36.83	18.43	-.36**
Descriptors	8.60	2.90	-.20

Table A-1 (cont'd.)

<u>Occupation</u>		<u>M</u>	<u>S.D.</u>	<u>Correlation with Ncog</u>
<u>*Dishwasher</u>	(n = 30)			
	Total Words	35.60	18.72	-.29
	Descriptors	6.70	2.59	.19
<u>*Loan Shark</u>	(n = 30)			
	Total Words	35.57	20.14	-.31**
	Descriptors	9.37	2.89	-.09
<u>Priest</u>	(n = 30)			
	Total Words	36.67	16.79	-.02
	Descriptors	11.33	3.21	-.09
<u>Research</u>				
<u>Chemist</u>	(n = 30)			
	Total Words	34.67	17.73	-.29
	Descriptors	9.07	2.18	-.34**
<u>*Librarian at a Public</u>				
<u>Library</u>	(n = 30)			
	Total Words	32.83	17.13	-.33**
	Descriptors	11.03	2.75	-.03
<u>*Truck Stop</u>				
<u>Waitress</u>	(n = 30)			
	Total Words	34.13	14.89	-.07
	Descriptors	10.30	3.42	-.09
<u>Army Drill</u>				
<u>Sergeant</u>	(n = 30)			
	Total Words	30.97	12.31	-.16
	Descriptors	9.83	3.01	-.13

* Occupations selected for use in Study 2.

** p < .10

Table A-2

Means and Standard Deviations for Preference Ratings.
and Correlations with Need for Cognition
for Occupation Labels

Occupation		M	S.D.	Correlation with Ncog
*Neurosurgeon	(n = 60)	5.37	1.37	.24**
*Elementary School Teacher	(n = 60)	5.35	1.26	.09
*TV Evangelist	(n = 60)	1.80	1.34	.17
Hotel Maid at a Fancy Hotel	(n = 60)	3.17	1.52	.06
*Interstate Truck Driver	(n = 60)	3.03	1.78	-.01
Politician	(n = 60)	3.83	1.77	.08
*Poet	(n = 60)	4.25	1.61	.11
*Secretary	(n = 60)	4.07	1.68	-.20
Investment Broker	(n = 60)	4.58	1.54	-.12
*Dishwasher	(n = 60)	2.58	1.46	.11
*Loan Shark	(n = 60)	2.02	1.50	.01
Priest	(n = 60)	3.93	1.92	-.00
Research Chemist	(n = 60)	4.45	1.67	.21
*Librarian at a Public Library	(n = 60)	3.72	1.72	.02
*Truck Stop Waitress	(n = 60)	2.73	1.70	.02
Army Drill Sergeant	(n = 60)	3.28	1.83	.08

* Occupations selected for use in Study 2.

** p < .10

APPENDIX B

Open-Ended Description Questionnaire

APPENDIX B

Open-ended Description Questionnaire

Instructions: On the next several pages you will be asked to write down as many distinguishing characteristics of members of different occupations as you can. These characteristics can be single words, such as "trustworthy", or complete sentences, such as "Members of this occupation are always well educated."

When describing members of a given occupation, try to imagine vividly what the typical member of that occupation would be like: What sets them apart from members of other occupations and makes them unique? What would you expect about the person if all you knew was what occupation they happened to be in? What is their personality like? Be as descriptive as you can!! You can describe their likely appearance, attitudes, personality traits, home environment, life-style, beliefs, interests, or whatever comes to mind.

For example, let's say you are asked to describe a reporter. You may well describe the typical reporter as "curious, energetic, perceptive, aggressive, and liberal". You might also say that reporters usually have a good knowledge of current events, often seem pushy, don't seem to care much about other peoples' privacy, and so on.

You will have three minutes to write down as much as you can for each occupation listed in the pages that follow.

DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO BY THE EXPERIMENTER

You have 3 minutes to describe all that you can about a NEUROSURGEON.

[illegible]

DO NOT TURN THIS PAGE UNTIL INSTRUCTED TO DO SO BY THE EXPERIMENTER

APPENDIX C

Co-Worker Preference Questionnaire

APPENDIX C

Co-worker Preference Questionnaire

Instructions In the next set of questions you will be asked to indicate the extent to which you would like to work on a joint task with members of different occupations. For this exercise, imagine a task in which you would have to interact frequently with another person and might need to cooperate with him or her while working on the task. Also imagine that your ultimate performance on the task would be evaluated not on the joint outcome, but on your individual contribution to the task irrespective of what the other person may have contributed.

Use the following scale to indicate the extent to which you would prefer to work with each of the persons listed below:

1	2	3	4	5	6	7
Would Very			Would Not			Would Very
Much Prefer			Care			Much
NOT to			Either Way			Prefer to
Work With						Work With
This Person						This Person

To what extent would you prefer to work this person on a joint task:

Investment Banker?	_____	Truck Driver?	_____
Politician?	_____	Secretary?	_____
Artist?	_____	Dishwasher?	_____
University Professor?	_____	Priest?	_____
Chemist?	_____	Librarian?	_____
Waitress?	_____	Loan Shark?	_____
Doctor?	_____	TV Evangelist?	_____
Hotel Maid?	_____		

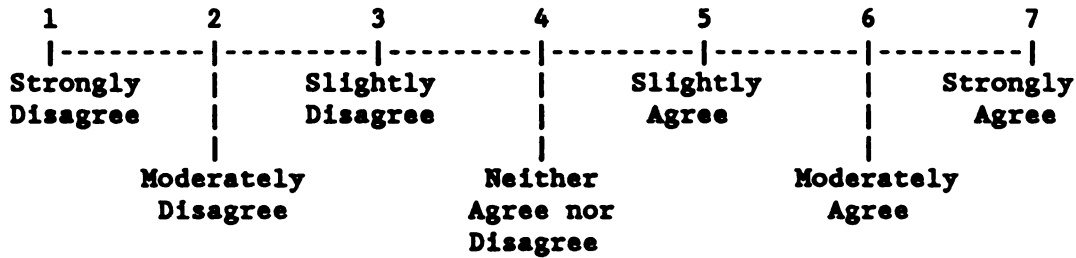
APPENDIX D

Need for Cognition Scale

APPENDIX D

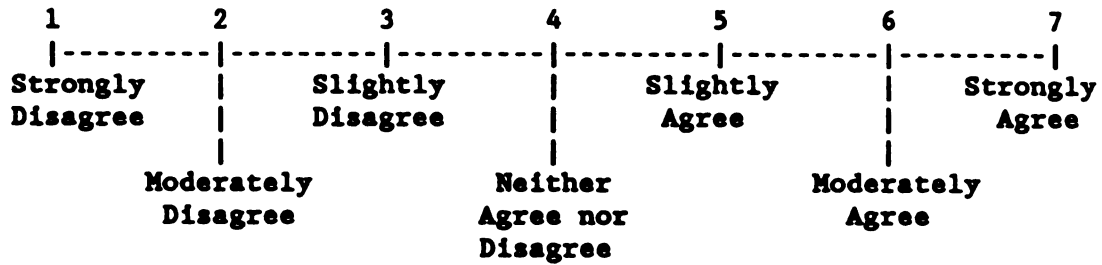
Need for Cognition Scale

For each of the following questions indicate the degree to which you agree with these statements, using the following scale:

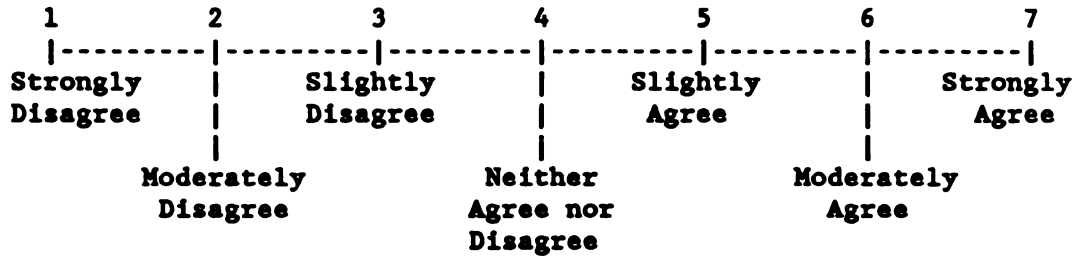


Please indicate as accurately as you can the extent to which you agree with each of the statements. There are no "correct" or "incorrect" answers to these questions.

- ___ 1. I really enjoy a task that involves coming up with new solutions to problems.
- ___ 2. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
- ___ 3. I tend to set goals that can be accomplished only by expending considerable mental effort.
- ___ 4. I am usually tempted to put more thought into a task than the job minimally requires.
- ___ 5. Learning new ways to think doesn't excite me very much.
- ___ 6. I am hesitant about making important decisions after thinking about them.
- ___ 7. I usually end up deliberating about issues even when they do not affect me personally.
- ___ 8. I prefer just to let things happen rather than try to understand why they turned out that way.
- ___ 9. I have difficulty thinking in new and unfamiliar situations.



- ___ 10. The idea of relying on thought to make my way to the top does not appeal to me.
- ___ 11. The notion of thinking abstractly is not appealing to me.
- ___ 12. I am an intellectual.
- ___ 13. I only think as hard as I have to.
- ___ 14. I don't reason well under pressure.
- ___ 15. I like tasks that require little thought once I've learned them.
- ___ 16. I prefer to think about small, daily projects to long-term ones.
- ___ 17. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
- ___ 18. I find little satisfaction in deliberating hard and for long hours.
- ___ 19. I more often talk with other people about the reasons for and possible solutions to international problems than about gossip or tidbits of what famous people are doing.
- ___ 20. These days, I see little chance for performing well, even in "intellectual" jobs, unless one knows the right people.
- ___ 21. More often than not, more thinking leads to more errors.
- ___ 22. I don't like to have the responsibility of handling a situation that requires a lot of thinking.
- ___ 23. I appreciate opportunities to discover the strengths and weaknesses of my own reasoning.
- ___ 24. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.
- ___ 25. Thinking is not my idea of fun.
- ___ 26. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.



- ___ 27. I prefer watching educational to entertainment programs.
- ___ 28. I think best when those around me are very intelligent.
- ___ 29. I prefer my life to be filled with puzzles that I must solve.
- ___ 30. I would prefer complex to simple problems.
- ___ 31. Simply knowing the answer rather than understanding the reasons for the answer to a problem is fine with me.
- ___ 32. It's enough for me that something gets the job done, I don't care how or why it works.
- ___ 33. Ignorance is bliss.
- ___ 34. I enjoy thinking about an issue even when the results of my thought will have no effect on the outcome of the issue.

APPENDIX E

**Consent Form: Experiment 1 and
Experiment 2**

APPENDIX E

Consent Form: Experiment 1 and Experiment 2

For this research project you will be asked to work on a simple embedded-figures test and to respond to a number of questions on several different questionnaires. You will be given further instructions on how to complete each of these tasks when the experiment begins.

The experiment requires one hour to complete and participation in the experiment is voluntary. While your participation will provide you with extra class credit in your psychology course, a decision not to participate will not affect your course grade. You also have the right to discontinue your participation in the experiment at any time for any reason.

All results from your participation will be treated with strict confidence and all of your performance records will remain anonymous. Within these restrictions, the final results of the experiment will be made available to you upon written request.

You will also be fully debriefed at the conclusion of the experiment. Any questions that you may have at any time in the experiment will be answered at that time.

I have read and understand the above statement. I will consent to participate in this experiment without waiving my right to discontinue my participation in the experiment at any time without recrimination.

Signature of Student

APPENDIX F

**Typicality Questionnaires:
Neurosurgeon Occupation**

APPENDIX F

Typicality Questionnaires: Neurosurgeon Occupation

Instructions. For this exercise you will be asked to rate how typical several descriptive characteristics, or adjectives, are for members of different occupations. These ratings will be made using a scale from 1 -- meaning the adjective is extremely atypical, or unlike, members of the occupation -- to 9 -- meaning the adjective is extremely typical of members of that occupation.

When making your ratings, try to imagine vividly what members of the given occupation would be like: What sets them apart from members of other occupations and makes them unique? What would you expect about the person if all you knew was what occupation they happened to be in? What is their personality like?

Before you begin making your ratings, it may help to form a picture in your mind of what that occupation member is like. Remember, there are no "right" or "wrong" answers; we are interested just in what you think about members of these occupations. Please DO NOT describe a single person you may have known; just indicate what members of that occupation are like in general.

Use the following scale to indicate how typical each of the adjectives are for members of the given occupation:

1	2	3	4	5	6	7	8	9
-----	-----	-----	-----	-----	-----	-----	-----	-----
Extremely				Neither				Extremely
Atypical				Typical Nor				Typical
or Highly		Moderately		Atypical		Moderately		or Highly
Unlikely		Atypical				Typical		Likely

To what extent are each of the following adjectives typical of a NEUROSURGEON:

___ annoying	___ expressive
___ male	___ obedient
___ complex	___ unpunctual
___ happy-go-lucky	___ prejudiced
___ subtle	___ drives an expensive car
___ tactful	___ literary
___ unobliging	___ untiring

1	2	3	4	5	6	7	8	9
-----		-----		-----		-----		
Extremely Atypical or Highly Unlikely		Moderately Atypical		Neither Typical Nor Atypical		Moderately Typical		Extremely Typical or Highly Likely

___ casual	___ moody
___ knowledgeable	___ unquestioning
___ quiet	___ responsible
___ independent	___ upright
___ polite	___ respected
___ superficial	___ soft spoken
___ complaining	___ courageous
___ idealistic	___ minority
___ weak	___ lives in a big city
___ female	___ southern
___ belligerent	___ proud
___ punctual	___ gossipy
___ reserved	___ unrefined
___ wears glasses	___ desperate
___ nurturing	___ well-dressed
___ scheming	___ well-paid
___ mature	___ rich
___ heartless	___ unintellectual
___ persuasive	___ drives an economy car
___ arrogant	___ cultured
___ lives in the countr y	___ efficient
___ inquisitive	___ well-educated

1	2	3	4	5	6	7	8	9
----- ----- ----- ----- ----- ----- ----- -----								
Extremely Atypical or Highly Unlikely		Moderately Atypical		Neither Typical Nor Atypical		Moderately Typical		Extremely Typical or Highly Likely

___ opinionated
 ___ grouchy
 ___ warm
 ___ restless
 ___ unimaginative
 ___ fast-talking
 ___ creative
 ___ uncompromising
 ___ introspective
 ___ gourmet
 ___ negligent
 ___ attentive
 ___ strong-minded
 ___ intolerant
 ___ eccentric
 ___ bashful
 ___ well-bred
 ___ self-confident
 ___ unbalanced
 ___ silent
 ___ tolerant
 ___ ordinary

___ patient
 ___ lower class
 ___ kind-hearted
 ___ talkative
 ___ dishonest
 ___ helpful
 ___ systematic
 ___ uneducated
 ___ irritable
 ___ helpless
 ___ scientific
 ___ feminine
 ___ admirable
 ___ unenterprising
 ___ intelligent
 ___ orderly
 ___ pleasant
 ___ submissive
 ___ intellectual
 ___ wise
 ___ not understanding
 ___ boisterous

1	2	3	4	5	6	7	8	9	
-----		-----		-----		-----		-----	
Extremely Atypical or Highly Unlikely		Moderately Atypical		Neither Typical Nor Atypical		Moderately Typical		Extremely Typical or Highly Likely	

___ withdrawn

___ serious

___ dependable

___ well-read

___ materialistic

___ alert

___ reckless

___ impolite

___ dishonorable

___ feared

___ enterprising

___ impatient

___ loves nature

___ vulgar

___ violent

___ incompetent

___ rough and tough

___ wholesome

___ ambitious

___ unkempt

___ flirtatious

___ devout

___ organized

___ daydreamer

Instructions. For this exercise you will be asked to rate how typical several descriptive characteristics, or adjectives, are for members of different occupations. These ratings will be made using a scale from 1 -- meaning the adjective is extremely atypical, or unlike, members of the occupation -- to 9 -- meaning the adjective is extremely typical of members of that occupation.

When making your ratings, try to imagine vividly what members of the given occupation would be like: What sets them apart from members of other occupations and makes them unique? What would you expect about the person if all you knew was what occupation they happened to be in? What is their personality like?

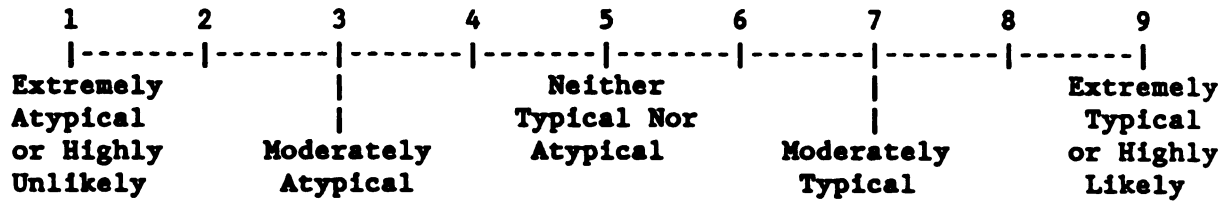
Before you begin making your ratings, it may help to form a picture in your mind of what that occupation member is like. Remember, there are no "right" or "wrong" answers; we are interested just in what you think about members of these occupations. Please DO NOT describe a single person you may have known; just indicate what members of that occupation are like in general.

Use the following scale to indicate how typical each of the adjectives are for members of the given occupation:

1	2	3	4	5	6	7	8	9
-----	-----	-----	-----	-----	-----	-----	-----	-----
Extremely				Neither				Extremely
Atypical				Typical Nor				Typical
or Highly		Moderately		Atypical		Moderately		or Highly
Unlikely		Atypical				Typical		Likely

To what extent are each of the following adjectives typical of a TRUCK STOP WAITRESS:

___ small	___ frank
___ unskilled	___ unconventional
___ ingenious	___ indifferent
___ ruthless	___ narrow-minded
___ unenthusiastic	___ smokes cigarettes
___ brilliant	___ shady
___ simple	___ uncultured
___ wasteful	___ meditative
___ rebellious	___ unhappy



_____ timid
 _____ immodest
 _____ meddlesome
 _____ well-mannered
 _____ disheveled/messy
 _____ careless
 _____ caring
 _____ deliberate
 _____ uninspiring
 _____ obliging
 _____ likes rock music
 _____ achievement-oriented
 _____ do-gooder
 _____ lazy
 _____ phony
 _____ tidy
 _____ likes classical music
 _____ laid-back
 _____ well-spoken
 _____ reflective
 _____ practical
 _____ poised

_____ likes country music
 _____ connoisseur
 _____ good-humored
 _____ forgetful
 _____ insulting
 _____ predictable
 _____ self-serving
 _____ gracious
 _____ masculine
 _____ refined
 _____ large
 _____ forgiving
 _____ methodical
 _____ fun
 _____ rational
 _____ gruff
 _____ conservative
 _____ gentle
 _____ discouraged
 _____ hasty
 _____ clever
 _____ disrespectful

1	2	3	4	5	6	7	8	9
----- -----		----- -----		----- -----		----- -----		
Extremely Atypical or Highly Unlikely		Moderately Atypical		Neither Typical Nor Atypical		Moderately Typical		Extremely Typical or Highly Likely

___ friendly	___ understanding
___ unfashionable	___ middle-class
___ nervous	___ overweight
___ wealthy	___ egotistical
___ stressed	___ sympathetic
___ innocent	___ persistent
___ sexist	___ chews gum
___ nosey	___ precise
___ gullible	___ romantic
___ sensitive	___ dedicated
___ well-adjusted	___ unambitious
___ clumsy	___ loyal
___ unwavering	___ tender
___ sophisticated	___ skilled
___ ill-mannered	___ obnoxious
___ unsympathetic	___ greedy
___ courteous	___ drives an old car
___ family-oriented	___ clownish
___ self-righteous	___ nonconforming
___ interested in the arts	___ sensible
___ self-reliant	___ sullen
___ doesn't smoke	___ hypocritical

1	2	3	4	5	6	7	8	9
-----	-----	-----	-----	-----	-----	-----	-----	
Extremely Atypical or Highly Unlikely		Moderately Atypical		Neither Typical Nor Atypical		Moderately Typical		Extremely Typical or Highly Likely

_____ undecided

_____ steady

_____ pompous

_____ opportunistic

_____ passive

_____ shallow

_____ unmotivated

_____ prim and proper

_____ cheerful

_____ generous

_____ loves children

_____ cordial

_____ observant

_____ hostile

_____ sleazy

_____ theatrical

_____ street-smart

_____ unsophisticated

_____ caucasian

_____ normal

APPENDIX G

Attribute Preference Questionnaires

APPENDIX G

Attribute Preference Questionnaire

Instructions In the next set of questions you will be asked to indicate the extent to which you would like to work on a joint task with persons who were described as having certain descriptive characteristics. For this exercise, imagine a joint task in which you would be working with one other person with whom you would have to interact frequently and with whom you might need to cooperate while working on the task. Also imagine that your ultimate performance on the task would be evaluated not on the joint outcome, but on your individual contribution to the task irrespective of what the other person may have contributed.

Please rate each adjective independently; the list of adjectives is not meant to describe a single individual.

Use the following scale to indicate the extent to which you would prefer to work with persons described by each of the adjectives listed below:

1	2	3	4	5	6	7
-----		-----		-----		-----
Would Very Much Prefer NOT to Work With This Person		Would Not Care Either Way		Would Very Much Prefer to Work With This Person		

To what extent would you prefer to work with a person who was:

___ annoying	___ expressive
___ male	___ obedient
___ complex	___ unpunctual
___ happy-go-lucky	___ prejudiced
___ subtle	___ drives an expensive car
___ tactful	___ literary
___ unobliging	___ untiring
___ casual	___ moody
___ knowledgeable	___ unquestioning

1	2	3	4	5	6	7
-----		-----		-----		
Would Very Much Prefer NOT to Work With This Person			Would Not Care Either Way		Would Very Much Prefer to Work With This Person	

☐ quiet	☐ responsible
☐ independent	☐ upright
☐ polite	☐ respected
☐ superficial	☐ soft spoken
☐ complaining	☐ courageous
☐ idealistic	☐ minority
☐ weak	☐ lives in a big city
☐ female	☐ southern
☐ belligerent	☐ proud
☐ punctual	☐ gossipy
☐ reserved	☐ unrefined
☐ wears glasses	☐ desperate
☐ nurturing	☐ well-dressed
☐ scheming	☐ well-paid
☐ mature	☐ rich
☐ heartless	☐ unintellectual
☐ persuasive	☐ drives an economy car
☐ arrogant	☐ cultured
☐ lives in the country	☐ efficient
☐ inquisitive	☐ well-educated
☐ opinionated	☐ patient
☐ grouchy	☐ lower class

1	2	3	4	5	6	7
----- ----- -----			----- -----		-----	
Would Very Much Prefer NOT to Work With This Person			Would Not Care Either Way		Would Very Much Prefer to Work With This Person	

___ warm	___ kind-hearted
___ restless	___ talkative
___ unimaginative	___ dishonest
___ fast-talking	___ helpful
___ creative	___ systematic
___ uncompromising	___ uneducated
___ introspective	___ irritable
___ gourmet	___ helpless
___ negligent	___ scientific
___ attentive	___ feminine
___ strong-minded	___ admirable
___ intolerant	___ unenterprising
___ eccentric	___ intelligent
___ bashful	___ orderly
___ well-bred	___ pleasant
___ self-confident	___ submissive
___ unbalanced	___ intellectual
___ silent	___ wise
___ tolerant	___ not understanding
___ ordinary	___ boisterous
___ withdrawn	___ loves nature
___ serious	___ vulgar

1	2	3	4	5	6	7
-----		-----		-----		
Would Very Much Prefer NOT to Work With This Person		Would Not Care Either Way		Would Very Much Prefer to Work With This Person		

___ dependable

___ well-read

___ materialistic

___ alert

___ reckless

___ impolite

___ dishonorable

___ feared

___ enterprising

___ impatient

___ violent

___ incompetent

___ rough and tough

___ wholesome

___ ambitious

___ unkempt

___ flirtatious

___ devout

___ organized

___ daydreamer

Instructions In the next set of questions you will be asked to indicate the extent to which you would like to work on a joint task with persons who were described as having certain descriptive characteristics. For this exercise, imagine a joint task in which you would be working with one other person with whom you would have to interact frequently and with whom you might need to cooperate while working on the task. Also imagine that your ultimate performance on the task would be evaluated not on the joint outcome, but on your individual contribution to the task irrespective of what the other person may have contributed.

Please rate each adjective independently; the list of adjectives is not meant to describe a single individual.

Use the following scale to indicate the extent to which you would prefer to work with persons described by each of the adjectives listed below:

1	2	3	4	5	6	7
-----		-----		-----		-----
Would Very Much Prefer NOT to Work With This Person		Would Not Care Either Way				Would Very Much Prefer to Work With This Person

To what extent would you prefer to work with a person who was:

___ small	___ frank
___ unskilled	___ unconventional
___ ingenious	___ indifferent
___ ruthless	___ narrow-minded
___ unenthusiastic	___ smokes cigarettes
___ brilliant	___ shady
___ simple	___ uncultured
___ wasteful	___ meditative
___ rebellious	___ unhappy
___ timid	___ likes country music
___ immodest	___ connoisseur
___ meddlesome	___ good-humored

1	2	3	4	5	6	7
----- ----- -----			----- -----		-----	
Would Very Much Prefer NOT to Work With This Person			Would Not Care Either Way		Would Very Much Prefer to Work With This Person	

_____ well-mannered
 _____ disheveled/messy
 _____ careless
 _____ caring
 _____ deliberate
 _____ uninspiring
 _____ obliging
 _____ likes rock music
 _____ achievement-oriented
 _____ do-gooder
 _____ lazy
 _____ phony
 _____ tidy
 _____ likes classical music
 _____ laid-back
 _____ well-spoken
 _____ reflective
 _____ practical
 _____ poised
 _____ friendly
 _____ unfashionable
 _____ nervous

_____ forgetful
 _____ insulting
 _____ predictable
 _____ self-serving
 _____ gracious
 _____ masculine
 _____ refined
 _____ large
 _____ forgiving
 _____ methodical
 _____ fun
 _____ rational
 _____ gruff
 _____ conservative
 _____ gentle
 _____ discouraged
 _____ hasty
 _____ clever
 _____ disrespectful
 _____ understanding
 _____ middle-class
 _____ overweight

1	2	3	4	5	6	7
-----		-----		-----		
Would Very Much Prefer NOT to Work With This Person			Would Not Care Either Way		Would Very Much Prefer to Work With This Person	

___ wealthy	___ egotistical
___ stressed	___ sympathetic
___ innocent	___ persistent
___ sexist	___ chews gum
___ nosey	___ precise
___ gullible	___ romantic
___ sensitive	___ dedicated
___ well-adjusted	___ unambitious
___ clumsy	___ loyal
___ unwavering	___ tender
___ sophisticated	___ skilled
___ ill-mannered	___ obnoxious
___ unsympathetic	___ greedy
___ courteous	___ drives an old car
___ family-oriented	___ clownish
___ self-righteous	___ nonconforming
___ interested in the arts	___ sensible
___ self-reliant	___ sullen
___ doesn't smoke	___ hypocritical
___ undecided	___ steady
___ pompous	___ opportunistic
___ passive	___ shallow

1	2	3	4	5	6	7
-----		-----		-----		
Would Very Much Prefer NOT to Work With This Person			Would Not Care Either Way		Would Very Much Prefer to Work With This Person	

_____ unmotivated

_____ cheerful

_____ loves children

_____ observant

_____ sleazy

_____ street-smart

_____ caucasian

_____ prim and proper

_____ generous

_____ cordial

_____ hostile

_____ theatrical

_____ unsophisticated

_____ normal

APPENDIX H

Demographics Questionnaire

Please answer the following questions as best you can. You may choose not to answer any of these questions if you so desire.

- Use the following scale to answer questions 7 through 10:**

Enter an number from the scale above in the blank line next to each question (for questions 7 through 10 only).

-
-
-

APPENDIX I

**Consent Form:
Experiment 3**

APPENDIX I

Consent Form: Experiment 3

For this research project you will be asked to examine information stored in the computer about several individuals with whom you may later be asked to work on a joint task. Detailed instructions regarding the experiment and how to use the computer to acquire information will be given prior to the start of the experiment. After accessing the information on the computer, you will be asked to provide an overall rating of the extent to which you would prefer to work with each person described by the information on the computer. You will also be asked to respond to two questionnaires when you have completed the computer task. Instruction on how to complete the questionnaires will be given when you have completed the computer task.

This experiment requires one hour to complete and participation in the experiment is voluntary. While your participation will provide you with extra class credit in your psychology course, a decision not to participate will not affect your course grade. You also have the right to discontinue your participation in the experiment at any time for any reason without penalty.

All results from your participation will be treated with strict confidence and all of your performance records will remain anonymous. Within these restrictions, the final results of the experiment will be made available to you upon written request.

You will be fully debriefed at the conclusion of the experiment. Any questions that you may have regarding the research will be answered at that time.

I have read and understood the above experiment. The tasks involved in this research have been explained to me. I will consent to participate in this experiment without waiving my right to discontinue my participation at any time without recrimination.

Signature of Student

Experimenter: Keith Hatstrup
2 Baker Hall
353-9166

APPENDIX J

Information Boards, Rating Scales, and an Example of Cell Information

APPENDIX J

Information Boards, Rating Scales, and an Example of Cell Information

Labelled Information Board

ALTERNATIVE	ATTRIBUTE
1: NEUROSURGEON	1: ATTRIBUTE 1
2: ELEMENTARY SCHOOL TEACHER	2: ATTRIBUTE 2
3: TV EVANGELIST	3: ATTRIBUTE 3
4: POET	4: ATTRIBUTE 4
5: SECRETARY FOR A MIDDLE LEVEL MANAGER	5: ATTRIBUTE 5
6: LOAN SHARK	6: ATTRIBUTE 6
7: LIBRARIAN AT A PUBLIC LIBRARY	7: ATTRIBUTE 7
8: TRUCK STOP WAITRESS	8: ATTRIBUTE 8
	9: ATTRIBUTE 9
	10: ATTRIBUTE 10

ENTER NO. OF ALTERNATIVE FROM 1 TO 8, THEN RETURN ?

ENTER NO. OF ATTRIBUTE FROM 1 TO 10, THEN RETURN

Unlabelled Information Board

ALTERNATIVE

1: PERSON 1
2: PERSON 2
3: PERSON 3
4: PERSON 4
5: PERSON 5
6: PERSON 6
7: PERSON 7
8: PERSON 8

ATTRIBUTE

1: ATTRIBUTE 1
2: ATTRIBUTE 2
3: ATTRIBUTE 3
4: ATTRIBUTE 4
5: ATTRIBUTE 5
6: ATTRIBUTE 6
7: ATTRIBUTE 7
8: ATTRIBUTE 8
9: ATTRIBUTE 9
10: ATTRIBUTE 10

ENTER NO. OF ALTERNATIVE FROM 1 TO 8, THEN RETURN ?

ENTER NO. OF ATTRIBUTE FROM 1 TO 10, THEN RETURN

An Example of Cell Information

THIS PERSON IS DESCRIBED AS WELL-EDUCATED

ENTER

1: IF YOU NEED MORE INFORMATION

2: IF YOU ARE READY TO MAKE YOUR FINAL RATINGS

?

Rating Scale: Labelled Co-workers

Use the following scale to rate the extent to which you would prefer to work on a joint task with each of the following persons:

1-----2-----3-----4-----5-----6-----7
 Would Very Much Prefer NOT to Work With This Person Would Not Care Either Way Would Very Much Prefer to Work With This Person

1. Neurosurgeon
2. Elementary School Teacher
3. TV Evangelist
4. Secretary for a Middle Level Manager
5. Poet
6. Loan Shark
7. Librarian at a Public Library
8. Truck Stop Waitress

Rating Scale: Unlabelled Co-workers

Use the following scale to rate the extent to which you would prefer to work on a joint task with each of the following persons:

1-----	2-----	3-----	4-----	5-----	6-----	7-----
Would Very			Would Not			Would Very
Much Prefer			Care Either			Much Prefer
NOT to Work			Way			to Work
With This						With This
Person						Person

1. Person 1
2. Person 2
3. Person 3
4. Person 4
5. Person 5
6. Person 6
7. Person 7
8. Person 8

MICHIGAN STATE UNIV. LIBRARIES



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