1983

A Cognitive Structural Approach To Uncertainty Orientation In Terms Of Individual Differences In Construct Accessibility

Gillian Alison King

CANADIAN THESES ON MICROFICHE

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A COGNITIVE STRUCTURAL APPROACH TO UNCERTAINTY ORIENTATION IN TERMS OF INDIVIDUAL DIFFERENCES IN CONSTRUCT ACCESSIBILITY

by

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Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

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April, 1983

ABSTRACT

This dissertation examined the view that certainty- and uncertainty-oriented individuals are individuals for whom certainty and uncertainty, respectively, are cognitively relevant (Sorrentino, Short, & Raynor, in press). Study 1 examined whether certainty-related behavioral descriptions about another were better remembered by certainty-oriented subjects than uncertainty-oriented subjects, as a construct accessibility model of differences in the relative accessibility of certainty- and uncertainty-related constructs would predict (e.g., Higgins & King, 1981). Distortions of evaluatively ambiguous and evaluatively unambiguous descriptions were also examined. The data supported a cognitive structural view of individual differences in uncertainty orientation in terms of knowledge structures based on past experience (or schemata) which contain both certainty- and uncertainty-related information that is both differentially accessible and differentially evaluated by certainty- and uncertainty-oriented individuals. For example, uncertainty-oriented subjects are seen as having knowledge structures composed of a large amount of positively-tagged, uncertainty-related information and a smaller amount of certainty-related information that is negatively-tagged or viewed in a negative manner. A bipolar model of schemata in the uncertainty-certainty domain therefore was proposed to account for the results of Study 1.

A second study examined the relative utility of two cognitive structural views of differences in uncertainty orientation: one in terms of differences in integrative complexity (Schroder, Driver, &

Streufert, 1967) and the other in terms of differences in self-schemata (Markus,1977). Compared to low "need" for uncertainty individuals, high scorers in "need" for uncertainty-tended to have more highly differentiated cognitive structures and to display better overall memory for information about another. Uncertainty-oriented individuals had better relative memory than certainty-oriented individuals for accessible versus inaccessible behavioral descriptions about another over time, but the reverse was found on an immediate recall measure. A general processing model incorporating both the integrative complexity and self-schemata approaches was proposed to account for the observed relations between uncertainty orientation, "need" for uncertainty, degree of cognitive structure in the interpersonal domain, and the processing of interpersonal information. In summary, both studies supported a cognitive structural view of differences in uncertainty orientation and revealed that this variable has important effects on the processing and remembrance of information about others.

ACKNOWLEDGEMENTS

My gratitude and appreciation are extended to the following individuals for their guidance and support during the preparation of this thesis: my advisor, Dr. Richard M. Sorrentino, for his attention to detail and his unflagging interest and guidance in both this research project and others conducted over the years; Dr. E. Tory Higgins, who initially was a member of my advisory committee, for his theoretical contributions to the conceptualization of this thesis; and Mitch Rothstein, for his continual advice, support, and encouragement. I also thank my advisory committee members, Dr. Nick Kuiper and Dr. James M. Olson, for their contributions and advice.

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CHAPTER ONE

A COGNITIVE APPROACH TO UNCERTAINTY ORIENTATION IN TERMS OF BOTH CONTENT AND STRUCTURE

(1) Introduction

An important way in which individuals differ from one another is in their degree of uncertainty orientation. Uncertainty-oriented individuals supposedly focus on the novel and unfamiliar; uncertainty and uncertain situations are thought to be cognitively relevant to them (Sorrentino, Short, & Raynor, in press). In contrast, certainty-oriented individuals find familiarity and certainty to be cognitively relevant (Sorrentino et al., in press). Since many situations in our daily lives involve some degree of certainty or uncertainty as to the outcome (e.g., meeting someone for the first time, going to a job interview, making a decision) and since many of the trait-labels we use reflect certainty- or uncertainty-related behaviors (e.g., careful, adventurous, indecisive, tolerant), individual differences in uncertainty orientation can be seen as potentially having important effects on both our perception and selection of situations and on the way we perceive others. Research by Sorrentino et al. (in press) has, in fact, shown that differences in uncertainty orientation have strong effects on performance in achievement-related situations (which, by definition, involve some degree of uncertainty as to the outcome). However, there has been no research on whether and how individual differences in uncertainty orientation affect our perceptions of others and, most importantly, there has been little research examining Sorrentino et al.'s (in press) view

that uncertainty orientation is a cognitive variable rather than a motivational one. This, then, was the focus of the present research: to see whether uncertainty orientation can be viewed as a cognitive variable that affects the processing of interpersonal information. More specifically, this dissertation had two main aims. These were (a) to examine whether individual differences in uncertainty orientation could be viewed in terms of differences in chronically accessible constructs, and (b) to examine the utility of a cognitive structural approach to uncertainty orientation. In terms of the second aim, this research examined the relations between uncertainty orientation and the two cognitive structural variables of integrative complexity (Schroder, 1971; Schroder, Driver, & Streufert, 1967) and self-schemata (Markus, 1977), and attempted to determine which of these two cognitive structural variables, if any, provided a better basis for a more detailed cognitive conceptualization of uncertainty orientation than has currently been proposed. These two variables were chosen because they have received a fair degree of attention in the literature, and because they appear to be highly related, in theoretical terms, to the variable of uncertainty orientation.

According to Atkinson and Shiffrin (1968), the memory system can be seen as involving (a) control processes that are under voluntary control and which may differ considerably from one situation or task to another (e.g., rehearsal operations and research strategies), and (b) permanent structural features that include both the physical system and the built-in processes that are fixed and unvarying across situations (e.g., the short-term memory store). In terms of Atkinson.

and Shiffrin's (1968) classification, the present research exemplified a cognitive structural approach. However, processing was also a concern here since both proposed structural conceptions of uncertainty orientation hold that structure affects information processing in certain ways (as will be discussed in this chapter).

The first study in this dissertation examined whether individual differences in uncertainty orientation could be viewed in terms of differences in chronically accessible constructs (e.g., Higgins & King, 1981). It therefore examined the processing consequences of a cognitive approach to uncertainty orientation. The nature of information recalled about another (or the contents of memory) was the variable of interest here. More specifically, this study examined whether certainty- and uncertainty-oriented subjects differ in both their memory for and distortion of certainty- and uncertainty-related behavioral descriptions of another. For example, according to construct accessibility theory (e.g., Higgins & King, 1981), certainty-oriented subjects should remember more certainty-related than uncertainty-related descriptions about another because certainty-related constructs are more accessible (i.e., come more easily to mind) than uncertainty-related ones. Similarly, uncertainty-oriented individuals should recall more uncertainty-related descriptions than certainty-related descriptions because uncertainty-related constructs are more accessible. Support for this prediction, and others, would suggest that construct accessibility mediates individual differences in uncertainty orientation and would have important implications for a cognitive model of uncertainty orientation.

The second study in this dissertation addressed the major issue

of the relations between the three personality variables of interest (uncertainty orientation, integrative complexity, and self-schemata in the certainty-uncertainty domain) and also examined whether integrative complexity or self-schemata in the certainty-uncertainty domain provided a better match to uncertainty orientation in terms of similar processing of accessible vs. inaccessible trait information. In a study by Higgins, King, and Mavin (1982) individuals low in level of cognitive structure in the interpersonal domain (as measured by Zajonc's (1960) variable of differentiation) displayed significantly weaker relative memory for accessible versus inaccessible interpersonal information than did individuals who were high in level of cognitive structure. Consequently, in the present study, low levels of cognitive structure were expected to be related to weaker accessibility effects than were high levels of cognitive structure. Since the self-schemata and integrative complexity approaches to uncertainty orientation lead one to expect relatively weak accessibility effects for different groups of subjects in uncertainty orientation (the moderates in uncertainty orientation and certainty-oriented subjects, respectively), this study was thought to provide a clear-cut test of the self-schemata and integrative complexity structural approaches. Thus, the importance of this second study was that it attempted to provide evidence in support of either a self-schemata or an integrative complexity conceptualization of uncertainty orientation, both of which have important implications for a cognitive model of differences in uncertainty orientation. Since there has been little research on individual differences in construct accessibility and on the nature and consequences of individual differences in

uncertainty orientation, the present research was thought to be an important and meaningful contribution because it attempted to integrate these two diverse areas.

The format of this dissertation is as follows: in the present chapter, the variables of uncertainty orientation, integrative complexity, and self-schemata are introduced and discussed one at a time, and then the theoretical and empirical relations between the three are considered. In the second chapter, the hypotheses, method, and results of Study 1 are presented and the findings are discussed. The next chapter contains the predictions, method, results, and discussion for Study 2. The last chapter--Chapter Four--integrates the results of the two investigations, presents general conclusions, and suggests several directions for future research.

(2) The Major Variables of Interest

(i) Uncertainty Orientation

As initially conceptualized, uncertainty orientation was concerned with one's desire to either approach and master or to avoid situations where the outcome of one's actions is uncertain (Sorrentino, Short, & Raynor, Note 1). Uncertainty orientation was viewed as a primary or general motive aroused in all situations (because all situations involve some degree of certainty or uncertainty as to outcome) that interacted with secondary motives such as achievement, affiliation, and power (that are aroused by particular situations). However, this motivational conception has been modified in recent years. In their most recent paper on uncertainty orientation, Sorrentino, Short, and Raynor (in

press) state that a cognitive conceptualization of this variable seems to fit the data best. At present, however, there is little direct evidence regarding the utility of a cognitive approach. (A study by Sorrentino and Hewitt (Note 2) has provided some evidence that uncertainty-oriented subjects are more cognitively attuned to situations involving new information than are certainty-oriented subjects.) We turn now to a discussion of Sorrentino et al.'s (in press) performance data, which involve the variables of uncertainty orientation (also called resultant uncertainty orientation because it is composed of two separate measures) and achievement motivation.

Sorrentino et al. (in press) conducted three studies testing the proposition that individual differences in uncertainty orientation will differentially affect performance in achievement situations. More specifically, they hypothesized that the often-found pattern of interaction between task difficulty and achievement-related motives only holds for uncertainty-oriented persons. This pattern of interaction between task difficulty and achievement-related motives is as follows: Characteristic differences in performance due to achievement-related motives (higher performance for success-oriented than failure-threatened persons) are found to be greater at tasks of intermediate difficulty than at very easy or very difficult tasks (e.g., Karabenick & Yousseff, 1968).

In the first study, where the number of complex arithmetic problems correctly solved was the performance measure, Sorrentino et al. (in press) predicted and found that achievement motivation and uncertainty orientation interacted in the following way: Success-oriented persons performed better than failure-threatened persons at tasks perceived as intermediate in difficulty ($p = .5$) when they were also uncertainty-

oriented, whereas the biggest differences between success-oriented and failure-threatened persons occurred at very high (p = .2) and very low (p = .8) difficulty levels when they were also certainty-oriented. This pattern of results can be seen in Figure 1. Thus, differences due to achievement-related motives were greatest in situations relevant to the person's orientation towards uncertainty or certainty (Sorrentino et al., in press). For the uncertainty-oriented group, the difference in performance between subjects who were failure-threatened and those who were success-oriented was greatest at p = .5 (the greatest level of uncertainty), whereas for the certainty-oriented group, the greatest difference in performance occurred at p = .2 and p = .8 (the levels of least uncertainty or most certainty).

The second and third studies conducted by Sorrentino et al. (in press) tested predictions from Raynor's (1969; 1974) elaborated theory of achievement motivation which takes into account the relevance of future goals to present performance on a task. According to Raynor's elaborated theory, the characteristic differences due to achievement-related motives are enhanced when subjects perceive that the opportunity to engage in a future task depends upon success at the immediate task (contingent path). Therefore, it was predicted that success-oriented persons should have higher performance and failure-threatened persons lower performance in a contingent than in a noncontingent path, because success implies still further achievement-oriented activity and this is positively motivating to success-oriented persons but negatively motivating to failure-threatened persons. Once again, since achievement situations, by definition, involve some uncertainty as to the outcome (McClelland, 1961), individual differences in uncertainty orientation

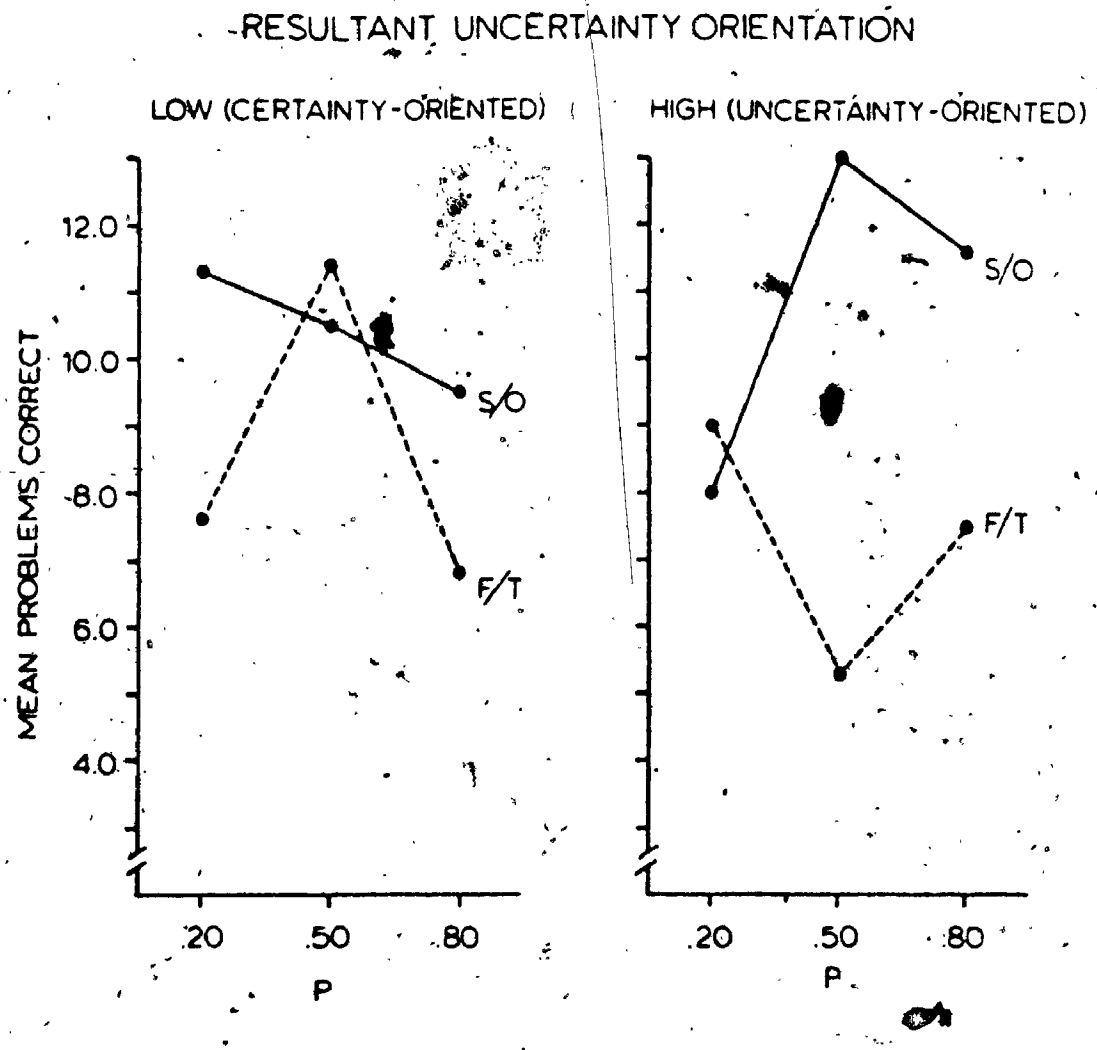


Figure 1. Mean number of problems correct for success-oriented (S/O) versus failure-threatened (F/T) persons as a function of resultant uncertainty orientation X probability of success levels (P) in Study 1 by Sorrentino, Short, and Raynor (in press)

should affect performance. Since the contingent path condition implies facing future situations with an uncertain outcome, it should be of greater relevance to uncertainty-oriented than certainty-oriented persons. Conversely, certainty-oriented persons should find greater relevance when there is no future situation (noncontingent condition). Sorrentino et al. therefore expected a three factor interaction on performance (# of complex arithmetic problems correctly solved) as a function of achievement-related motives X resultant uncertainty orientation X conditions, since a conceptually similar interaction was predicted and found in Study 1. The results of this study clearly supported the hypothesis. In the uncertainty-oriented group, success-oriented subjects performed better than failure-threatened subjects, and this difference was greater in the contingent than noncontingent path. For the certainty-oriented group, however, the reverse pattern occurred, with the success-oriented subjects performing better than the failure-threatened subjects in the noncontingent condition, and this difference being greater than in the contingent condition.

The third study by Sorrentino et al. was a field study aimed at replicating the results of the previous study (and also a study by Raynor, 1970), and thus providing some external validity to their theoretical notions. Subjects were classified as either high or low in perceived instrumentality of their introductory psychology course. Perceived instrumentality was determined by asking subjects how important or relevant the course was to their future career plans. Mid-term and final exam grades, and final course grades, served as measures of performance. On all three measures, a three-way interaction was found in the predicted direction. That is, uncertainty-oriented subjects who were also success-

oriented had higher grades than those who were also failure-threatened, and the difference was greater when the course was perceived as instrumental than when it was not. Once again the reverse pattern was found for the certainty-oriented group. The three studies that have been discussed therefore provide strong support for the proposition that individual differences in resultant uncertainty orientation interact with achievement-related motives and experimental conditions to affect performance.

According to Sorrentino et al. (in press), various aspects of their data suggest that a cognitive or cognitive-affective conceptualization of uncertainty orientation may make more sense than a motivational one. For example, one major inconsistency concerns the finding that failure-threatened subjects who are also certainty-oriented perform better at tasks with an intermediate probability of success ($p = .5$) than at very easy ($p = .8$) or very difficult ($p = .2$) tasks (as seen in Figure 1). From a motivational viewpoint, one would expect these subjects to avoid uncertainty and therefore to perform worst at a task involving a high amount of uncertainty as to the outcome, whereas in fact they perform best at such a task. Thus, if avoidance was really involved (as a motivational view holds) one would expect the worst performance from certainty-oriented, failure-threatened subjects at tasks having a high amount of uncertainty as to the outcome. In addition, the pattern of achievement X uncertainty X condition interaction found in the three studies by Sorrentino et al. (in press) can be interpreted in cognitive terms. For certainty-oriented persons, the biggest differences between those who are success-oriented and those who are failure-threatened occur at $p = .2$ and $p = .8$, which are essentially certain situations. At

p = .2, one is almost certain to fail at the task, whereas at p = .8, one is virtually guaranteed to succeed. Conversely, for uncertainty-oriented subjects, the biggest difference between those who are success-oriented and those who are failure-threatened occurs at p = .5, where the outcome is most uncertain. Thus, the biggest difference between subjects who are extreme on the secondary motive occurs in the type of situation that is considered to be the domain of focus for those individuals according to a cognitive viewpoint (i.e., uncertain situations for uncertainty-oriented subjects and certain situations for certainty-oriented subjects). The second study in this dissertation examined the utility of two different cognitive structural conceptualizations of uncertainty orientation--the first in terms of integrative complexity and the second in terms of self-schemata in the certainty-uncertainty domain.

(ii) Integrative Complexity

The cognitive structural variable of integrative complexity has figured prominently in the research by Schroder and his colleagues (e.g., Schroder, 1971; Schroder et al., 1967). Level of integrative complexity or level of conceptual structure refers to the way an individual receives, stores, processes, and transmits information. In other words, integrative complexity refers to individual differences in information processing. According to Schroder et al. (1967), integratively simple individuals look externally for rules to avoid uncertainty and alternatives; are characterized by rigid, concrete thought structures and black-white thinking; are unable to take more than one perspective; have overgeneralized perceptions of

others; and are intolerant of ambiguity. Integratively complex individuals, on the other hand, exhibit exploratory and creative behavior; look for diversity; have a flexible, adaptive orientation to stress; can combine and integrate schemata so that new relationships are generated and uncertainty increases in the sense that more alternatives become available; and have a higher capacity to take the perspectives of others than do individuals low in integrative complexity.

Schroder et al. (1967) point out a number of important differences between their conception of integrative complexity and past conceptions of flexibility-rigidity. First of all, integrative complexity is viewed as a structural, information processing variable rather than as a content variable. Second, it is not viewed as a general trait or cognitive style variable that affects functioning in all content areas. According to Schroder et al. (1967), integrative complexity is specific to a particular content domain, and therefore a person can be integratively simple in some areas and complex in others. Third, level of information processing in a given area is not necessarily static over time. Situational variables are assumed to affect the level of processing that a person displays.

As mentioned above, integrative complexity is viewed as specific to a particular content domain. The most widely used measure is the Paragraph Completion Test (Phares & Schroder, 1969) which measures structure in the area of social interaction. This content area is relevant to the present investigations since they are concerned with the constructs one employs in categorizing the behavior of others, memory for social information, and social judgments. The Paragraph

Completion Test contains the following five sentence stems: "When someone disagrees with me ...", "When I am in doubt ...", "When others criticize me it usually means ...", "Rules ...", and "Confusion ...". Subjects are asked to write two or three sentences in response to each stem and are given two minutes to do so. Their responses to each stem are scored on a seven-point scale from low (1) to high (7) levels of integrative complexity. The criteria employed in scoring subjects' protocols in terms of structural complexity are outlined in a scoring manual by Phares and Schroder (1969). In general, the rater scores responses using rules such as the following: Can it be inferred that the response was generated by a conceptual structure which failed to produce alternate interpretations of the event?; If a number of alternative perceptions occurred, were they simultaneously held in focus and compared?; Was conflict, uncertainty, or ambiguity viewed as unpleasant? Two averages are generally obtained for each subject: the mean scale score over the five sentences and the mean of the top two scores. However, both measures are highly correlated and both are satisfactory for experimental purposes (Schroder et al., 1967).

Schroder et al. (1967) report that the Paragraph Completion Test has been found to correlate significantly with scores on Adorno, Frenkel-Brunswik, Levinson, and Sanford's (1950) measure of authoritarianism. The correlation with authoritarianism has ranged from about -.25 to -.55 over various samples (Schroder et al., 1967). Thus, individuals who are high in integrative complexity tend to be low authoritarians, and those low in integrative complexity tend to be high authoritarians. Integrative complexity also correlates

negatively (with borderline significance) with Rokeach's (1960) Dogmatism scale (Schroder et al., 1967). Schroder et al. (1967) also report that although integrative complexity has been found to be significantly positively related to intelligence (correlations range from .15 to .45 over a number of samples), it is not related to either social desirability (Edwards, 1957) or verbal fluency (the length of sentence completions).

With regard to construct validity, integratively complex persons (in terms of interpersonal stimuli) have been found to score higher on role-taking performance than integratively simple persons (Wolfe, 1963). They therefore appear to have a greater ability to empathize with others, which is in line with the theoretical conceptualization. The effects of individual differences in conceptual structure on information processing and performance have also been examined. Schroder et al. (1967) found, for example, that the integrative characteristics of information processing in task performance increased as the integrative complexity of personality (in the domain of uncertainty and interpersonal conflict) increased. Thus, integratively complex subjects tended to interrelate the task information in different ways in order to generate new perspectives towards the task whereas integratively simple subjects tended to view the task in a static and unidimensional manner. In addition, Tuckman (1966) found that integratively complex individuals were the most creative on a series of tasks measuring creative performance whereas integratively simple individuals were the least creative. These findings are also in line with Schroder et al.'s (1967) conception.

(iii) Self-Schemata

According to Markus, self-schemata are cognitive structures or "cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information" (Markus, 1977, p. 64). Thus, self-schemata represent the differentiation and articulation of the self in memory and are the result of a person's attempts to organize, summarize, and explain his/her behavior in a particular domain (Markus, 1977). From the above definition, it is apparent that self-schemata are cognitive structures that are activated by the presence of information relevant to the self in a particular content area (such as dependence-independence). This view of self-schemas as cognitive structures follows from the conceptualization of schemas as systematic frameworks used during the processing of information (Neisser, 1976; Palmer, 1977).

According to Markus, individuals only have schemas for behavioral dimensions that are important or distinctive to them in some way (Markus, 1977; Markus & Smith, 1981). Individuals for whom a particular behavioral dimension is of little or no importance are termed Aschematics since they have not developed a schema or knowledge structure in order to explain or understand behavior in that area. Schematics have been shown to differ from Aschematics in their performance on a number of cognitive tasks in the following ways: (1) Schematics in a particular domain have shorter response latencies in judging adjectives relevant to that domain as self-descriptive than do Aschematics; (2) Schematics are better able to retrieve behavioral examples for a particular domain than are Aschematics;

(3) Schematics can confidently predict future behavior on schema-related dimensions; and (4) Schematics are more resistant to information that is counter to the prevailing schema than are Aschematics (Markus, 1977). In sum, self-schemata or cognitive structures about the self have been shown to affect the processing of information about the self (judgments and decisions about the self) in a number of ways.

(3) Theoretical and Empirical Relations Between Uncertainty Orientation, Integrative Complexity in the Domain of Social Interaction, and Self-Schemata in the Certainty-Uncertainty Domain

(i) Uncertainty Orientation and Integrative Complexity

We now turn to a discussion of the theoretical and empirical relations between the three personality variables that have been introduced. First of all, the theoretical relationship between uncertainty orientation and integrative complexity in the domain of social interaction should be obvious. Uncertainty-oriented individuals are thought to be individuals for whom uncertainty-related information and uncertain situations are highly relevant and Schroder et al. (1967) describe integratively complex individuals as being attracted to new and uncertain situations. Certainty is thought to be highly relevant for certainty-oriented individuals and, similarly, integratively simple individuals attempt to avoid uncertainty and are intolerant of ambiguity. Since the currently-used measure of resultant uncertainty orientation is a motivational one that combines "need" for uncertainty (scored using the TAT) and "fear" of uncertainty (measured by the Byrne and Lamberth (1971) authoritarianism

scale), the significant negative correlations between integrative complexity and Adorno et al.'s (1950) measure of authoritarianism (reported by Schroder et al., 1967) can be viewed as support for the notion that integrative complexity and uncertainty orientation are theoretically related.

Pilot data also provide support for the proposed theoretical relation between uncertainty orientation and integrative complexity in the domain of social interaction. In a pilot study involving 131 subjects, a significant (although small) correlation was found between resultant uncertainty scores and integrative complexity scores ($\underline{r}(130) = .26$, $\underline{p} < .001$ one-tailed, for the mean overall measure of complexity). Thus, these data indicate that uncertainty orientation and integrative complexity in the domain of social interaction are significantly related in an empirical sense, and supports the theoretical relation between the two variables that was outlined earlier.

(ii) Uncertainty Orientation and Self-Schemata in the Certainty-Uncertainty Domain

We now turn to a discussion of uncertainty orientation in terms of self-schemata in the certainty-uncertainty domain. As pointed out previously, there are some problems with a motivational conception of uncertainty that indicate that it may be better to view uncertainty in cognitive terms. A cognitive structural conceptualization in terms of Markus' (1977) notion of self-schemata would view

uncertainty-oriented individuals as uncertainty Schematics who have well-articulated schemas for self-relevant behavior in the domain of uncertainty. Certainty-oriented individuals would be certainty Schematics, individuals for whom certainty is important and who have developed well-organized self-schemas in this behavioral domain. Individuals for whom neither certainty or uncertainty is important would be termed certainty-uncertainty Aschematics. Unlike the Schematics, the Aschematics would have no facilitation for processing information in the certainty-uncertainty domain because they lack a well-organized and integrated self-schemata. The present research will examine the validity of a conceptualization of uncertainty orientation in terms of uncertainty and certainty schemata.

An interesting question arises regarding the Aschematics: Are these individuals the same as those who have moderate scores in various behavioral domains? Sorrentino and Short (1977) have presented strong evidence of a pervasive inconsistency in the behavior of individuals who obtain moderate scores on various motive measures. That is, although one would expect the moderates on some motive to fall in between the highs and lows with respect to the behavior being assessed (the nomothetic trait view), they often exhibit the highest or lowest amount of the behavior. A study by Sorrentino and King (Note 3) attempted to assess whether the "moderates phenomenon" could be explained by hypothesizing that moderates are more cross-situationally variable in their

behavior than highs or lows due to the importance of situational variables in determining their behavior. Also, on the basis of some data she collected, Markus (1977) has suggested that Schematics on a particular behavioral dimension may be more likely than Aschematics to display a correspondence between the way they describe themselves and their behavior, and therefore may be more likely to exhibit cross-situational consistency on that dimension. It follows, then, that the Aschematics, who are more likely to exhibit variable behavior across situations, may be the individuals who score moderately on a personality variable. This also makes sense from a conception of personality or trait scores as measures of the probability of behavior (e.g., Reed & Jackson, 1975). According to this probabilistic view, a high score on a trait or motive scale indicates a high probability of a non-test behavior belonging to the same dimension as that sampled by the scale, a low score indicates a high probability of behavior <u>not</u> belonging to the dimension, and a moderate score indicates an almost equal probability of behavior reflecting the trait or motive and behavior not reflecting the trait or motive. Thus, a moderate score essentially indicates the absence of a well-articulated schema on a behavioral dimension--the individual is neither "aggressive" (a high score) nor "nonaggressive/passive" (a low score), but somewhere between these two extremes, indicating that the dimension is not a relevant one for him/her (i.e.,

one on which he/she is Aschematic). In sum, there are a number of reasons for proposing that moderates in uncertainty are Aschematic in the certainty-uncertainty domain.

A final and most important (i.e., most convincing) reason for expecting a relation between moderates and Aschematics has to do with the way in which Markus has classified subjects as Schematic or Aschematic. Markus (1977) asked subjects to rate themselves on the Gough-Heilbrun Adjective Check List (Gough & Heilbrun, 1965) and on several semantic differential scales describing a number of behavioral domains, including the one of interest. Subjects also were asked to rate the semantic differential scales in terms of their importance to their self-description. Individuals who rated themselves in the middle range (points 5-7 on an 11-point scale) on the semantic differential scales relating to the behavioral domain of interest, and who fell in the lower portion of scores on the importance scale, and who did not check the relevant adjectives on the adjective check list as self-descriptive were classified as Aschematic. Thus, there were two criteria for judging a person as Aschematic: an extremity criterion and an importance criterion. According to Markus (1977), these two criteria make it possible to separate Aschematics from individuals who display behavior characteristic of one type of Schematic (e.g., independent behavior) in certain kinds of situations and behavior characteristic of the opposite type of Schematic (e.g., dependent behavior) in other classes of situations, and do so consistently. Thus, the major difference between the method of determining moderates on a dimension and Markus' (1977) method of determining Aschematics is her use of an importance criterion in addition to an extremity criterion. It appears, then, that a large

number of moderates would also be Aschematics since only a few would be excluded from the Aschematic classification by virtue of the importance criterion. There are a number of important implications of a relation between moderates and Aschematics in the certainty-uncertainty domain. Not only would it support a cognitive structural reinterpretation of uncertainty orientation, but it also may lead to an explanation of the moderates phenomenon. In other words, conceptualizing moderates as individuals without schemas may provide important insights into the variability in the moderates' behavior that is often observed.

(iii) Self-Schemata and Integrative Complexity

The relation between self-schemata and integrative complexity, both of which are cognitive structural variables that affect information processing, remains to be considered. So far we have proposed a reconceptualization of uncertainty orientation in terms of both self-schemata and integrative complexity. Is it possible for both of these reconceptualizations to be valid? In other words, need the acceptance of one reconceptualization result in the rejection of the other?

According to Markus (1977), Schematics (i.e., both uncertainty Schematics and certainty Schematics) have equally well-organized and well-articulated cognitive structures for processing information about the self, whereas Aschematics lack these well-organized cognitive structures. Since integrative complexity refers to the degree of structure in a certain behavioral domain (Schroder et al., 1967), one would expect the Schematics at both extremes of a behavioral domain to be high in integrative complexity and the Aschematics to be low in integrative complexity. In fact, Schroder states that "increasing levels

of information processing involve the emergence of more complex and interrelated schemata" (Schroder et al., 1967, p. 20). Although integrative complexity explicitly refers to the set of rules a person uses to combine information in various ways (i.e., "how" a person thinks), with integratively simple individuals characterized by simple, static rule structures with fixed rules and integratively complex individuals characterized by emergent rule structures enabling integratively complex thought, it is assumed that there is a gradual increase in the number of dimensional attributes perceived with higher structural levels (i.e., "what" a person thinks).

An additional reason for expecting a relationship between self-schemata and integrative complexity is that individuals high in integrative complexity or level of information processing are assumed to process information faster (and are able to process a larger amount of information in a given period of time) than individuals low in level of information processing (Schroder et al., 1967). Similarly, Markus (1977) has found that self-schemata facilitate the processing of information about the self. Therefore, there is strong reason to expect Schematics to be integratively complex and Aschematics to be integratively simple. In fact, Markus (1977) herself suggests a cognitive style reinterpretation of self-schemata, with Schematics being differentiated and Aschematics being undifferentiated, but then rules out this reinterpretation of her data on the grounds that self-schemata refer to a particular behavioral domain whereas cognitive style is a general personality variable. It is important to note that integrative complexity, as conceived by Schroder et al. (1967), is not a general cognitive style but is specific to a particular content area.

If Schematics are in fact integratively complex and Aschematics are integratively simple; it would seem to be impossible for both reconceptualization's of uncertainty orientation to be valid. The reasoning is as follows: whereas uncertainty-oriented individuals may be both integratively complex and uncertainty Schematics, certainty-oriented individuals may not be both integratively simple and certainty Schematics, since to be a Schematic implies a well-organized and well-articulated cognitive structure whereas to be integratively simple implies the opposite. (The pilot data presented previously support the view that only uncertainty-oriented individuals are integratively complex and seem to rule out the conceptualization in terms of self-schemata but a replication of this finding was obviously necessary and no data had--at this point--been gathered with regard to the self-schema conceptualization.)

To summarize this section on the relations between the three major personality variables of interest in the present research, uncertainty orientation has been theoretically and empirically linked to two different cognitive structural variables that hopefully will provide a better understanding of uncertainty orientation and its effect on performance. One important point to note is that whereas self-schemata pertain to specific behaviors, integrative complexity is determined with respect to a specific domain, and uncertainty orientation is viewed as a general variable that affects performance in all situations, since all situations involve some degree of uncertainty or certainty with regard to outcome (Sorrentino et al., in press). Therefore, in the present investigations a more narrow view was taken of uncertainty orientation since the focus was

on certainty and uncertainty in the realm of social behavior. Similarly, a more general class of self-schemata was involved in this dissertation than is generally examined because of the more global nature of certainty-oriented and uncertainty-oriented behavior, as compared to independent and dependent behavior, for example. Thus, the three variables of interest were examined with regard to a middle level of specificity--with respect to a specific domain.

In conclusion, the first study in this dissertation examined the utility of a cognitive view of uncertainty orientation in terms of construct accessibility. The rationale underlying this study was that if construct accessibility mediates the performance of uncertainty-oriented and certainty-oriented subjects, then differences should be found both in the way they encode and label ambiguous material and in their recall of unambiguous, certainty-related and uncertainty-related material. The second study examined the empirical relations among the variables of interest, and provided an experimental test of the two proposed reconceptualizations of uncertainty orientation in terms of relative memory for accessible versus inaccessible trait information.

CHAPTER TWO

AN INFORMATION PROCESSING APPROACH TO UNCERTAINTY ORIENTATION IN TERMS OF CONTENT: INDIVIDUAL DIFFERENCES IN CHRONICALLY ACCESSIBLE CONSTRUCTS AND EVALUATIVE BIASES IN THE PROCESSING OF AMBIGUOUS AND UNAMBIGUOUS SOCIAL INFORMATION

(1) Introduction

The purpose of Study 1 was to examine the utility of viewing differences in uncertainty orientation in terms of differences in chronically accessible constructs. In this study, then, a cognitive approach was taken toward a variable traditionally thought to be motivational in nature. Such an approach exemplifies much of the current research in social cognition, which attempts to provide a better understanding of social phenomena such as impression formation, memory for social information, and person perception by employing cognitive or information processing techniques and variables (e.g., Ebbesen & Allen, 1979; Hamilton, Katz, & Leirer, 1980; Hastie, 1980b). However, in contrast to most of the research in this area, the present study represented an attempt to view a personality variable, as opposed to a social phenomenon, in information processing terms.

The specific aim of the study was to relate differences in uncertainty orientation to differences in the labelling and recall of person information, as mediated by the processing variable of construct accessibility. Uncertainty-oriented and certainty-oriented individuals are thought to be concerned with uncertainty and certainty, respectively (Sorrentino et al., in press). In other

words, these two domains are thought to be differentially relevant for these two types of individuals. Differences in construct accessibility therefore may have developed for these two groups as a result of their focus on certainty or uncertainty in the outcomes of situations as well as on the certainty- or uncertainty-related behaviors of others. Thus, different accessible constructs may have developed through cognitive differences in the judged relevance of certainty or uncertainty. Alternatively, differences in construct accessibility may have developed through past selective exposure to uncertain and certain situations. This would be a motivational view of the development of accessible constructs. From either developmental viewpoint, one could argue that uncertainty-oriented individuals have developed evaluatively positive accessible constructs for uncertainty-related behaviors (e.g., "adventurous", "daring", "open to change"), whereas certainty-oriented individuals have developed evaluatively positive accessible constructs for certainty-related behaviors (e.g., "cautious", "not reckless", "careful"). In addition, one might expect that uncertainty-oriented individuals have evaluatively negative accessible constructs for certainty-related behaviors (e.g., "timid", "boring", "stubborn"), whereas certainty-oriented individuals have evaluatively negative accessible constructs for uncertainty-related behaviors (e.g., "reckless", "nosey", "indecisive").

The point made above is that present differences in the relevance of certainty or uncertainty are thought to be mediated by individual differences in construct accessibility that originated in the past (i.e., historically). Therefore, the predictions for this first

study follow from historically-determined differences in construct accessibility. This brings up an important distinction regarding the causes of behavior: Behavior can be seen as having both historical (i.e., past) and dynamic (i.e., present) determinants, and these determinants can be either cognitive or affective in nature. Thus, it is important to consider both the historical and the dynamic causes of behavior, since an historical cognitive determinant (e.g., construct accessibility) can be overridden by a dynamic, affective determinant (e.g., active set), as discussed by Higgins and King (1981). Since both historical and dynamic determinants can be either cognitive or affective in nature, four possible combinations of past and present causes of behavior can occur: (1) historically cognitive and dynamically cognitive, (2) historically cognitive and dynamically affective, (3) historically affective and dynamically affective, and (4) historically affective and dynamically cognitive. In Study 1, the first combination (i.e., historically cognitive and dynamically cognitive) is seen as underlying the predicted effects. In other words, the predicted effects are assumed to be due to present differences in construct accessibility that have an historical basis (i.e., chronic individual differences in construct accessibility). (As an aside, it should be noted that although historically-determined differences in construct accessibility are seen as underlying present differences, the historical differences in construct accessibility could themselves be due to affective reasons, e.g., needs, goals, motivation (Higgins & King, 1981)--it depends how far back one wants to go.) Since subjects in this study were given an essay to read about another person and were asked only to reproduce this essay, no current

influences due to motivation were expected. However, if subjects had been asked to form an impression of the target person, then dynamic, affective, or motivational influences on behavior would have been expected. This is due to the fact that the goal of forming an impression can give rise to an active set to view the target person in a particular manner (Higgins & King, 1981). In sum, the historical-dynamic distinction is an important one to keep in mind with regard to the predictions made in this dissertation.

We turn now to a discussion of the three major sets of predictions for Study 1. These predictions involved analyses of subjects' reproductions of an essay containing 12 behavioral descriptions of a target person, and analyses of the labels subjects used when asked to overtly characterize the ambiguous descriptions using a single word. The essay that subjects were given to read contained four ambiguous descriptions that could be seen in either a positive or a negative light (two certainty-related and two uncertainty-related) and eight unambiguous descriptions (four evaluatively positive and four evaluatively negative, with equal numbers of both nested within the certainty-related vs. uncertainty-related classification). Reproductions of the 12 behavioral descriptions contained in the stimulus essay were scored in terms of the four coding categories employed by Higgins and Rholes(1978)--deletion, reproduction without distortion, positive distortion, and negative distortion. In addition to completing reproduction, overt characterization, and attitude measures in an initial session, subjects completed the reproduction and attitude measures once again in a second session held one week after the first. The detailed method of Study 1 will

follow the presentation of the predictions.

(i) Predictions Involving Distortions of Ambiguous and Unambiguous Descriptions

Since it was thought that positive constructs come to mind for uncertainty-oriented subjects in uncertain situations and when faced with uncertainty-related behaviors (since uncertainty is highly relevant to them), whereas positive constructs come to mind for certainty-oriented subjects in certain situations (since certainty is highly relevant to them), it was predicted that uncertainty-oriented individuals would make more positive distortions of uncertainty-related behavioral descriptions than of certainty-related descriptions whereas the reverse would be true for certainty-oriented individuals. This prediction was examined using a relative measure of positive distortions: number of positive distortions of certainty-related descriptions minus number of positive distortions of uncertainty-related descriptions. Certainty-oriented subjects were expected to have significantly higher scores on this measure than uncertainty-oriented subjects.

Negative distortions were also of interest. It was thought that uncertainty-oriented individuals would be more likely to distort certainty-related descriptions in a negative manner than in a positive manner since they may have developed evaluatively negative labels for certainty-related behaviors (e.g., "overcautious","timid") as a consequence of viewing uncertainty-related behaviors in a positive light (cf. Kelly's (1955) notion of bipolar constructs). In contrast, certainty-oriented individuals were expected to make more negative

distortions of uncertainty- than certainty-related descriptions. Consequently, uncertainty-oriented subjects were expected to have significantly higher scores than certainty-oriented subjects on a relative measure of negative distortions (# of negative distortions of certainty-related descriptions minus # of negative distortions of uncertainty-related descriptions).

Positive and negative distortions also were examined in a single index. Since it was thought that uncertainty-oriented individuals have evaluatively positive accessible constructs for uncertainty-related behaviors and evaluatively negative accessible constructs for certainty-related behaviors whereas certainty-oriented individuals have evaluatively positive accessible constructs for certainty-related behaviors and evaluatively negative accessible constructs for uncertainty-related behaviors, positive distortions were expected when there was a match between a subject's orientation and the content domain of the behavioral descriptions and negative distortions were expected when there was a mismatch. This overall prediction was tested using a relative distortion measure that reflected amount of positive distortion in the certainty-related direction plus amount of negative distortion in the uncertainty-related direction compared to amount of positive distortion in the uncertainty-related direction plus amount of negative distortion in the certainty-related direction. Certainty-oriented subjects were expected to have high scores on this measure whereas uncertainty-oriented subjects were expected to have low scores.

(ii) Predictions Involving Deletion of Unambiguous Descriptions

Relative memory for certainty- and uncertainty-related descriptions was examined using unambiguous descriptions only since Higgins and Rholes (1978) state that unambiguous behavioral descriptions (as opposed to ambiguous ones) best reveal the effect of construct accessibility on recall of information. Also, when ambiguous descriptions are deleted, one doesn't know whether this is because of their content (certainty-related or uncertainty-related) or because they were viewed in a positive or negative manner. If differences in resultant uncertainty orientation are mediated by differences in construct accessibility, then the certainty-related unambiguous descriptions should be more accessible for the certainty-oriented subjects whereas the uncertainty-related unambiguous descriptions should be more accessible for the uncertainty-oriented subjects. Consequently, it was predicted that certainty-oriented subjects would delete more uncertainty-related than certainty-related descriptions in their reproductions (since the latter are more accessible to them than the former), whereas the reverse would be true for uncertainty-oriented subjects. This prediction was examined using a relative deletion measure that reflected number of deletions of certainty-related unambiguous descriptions compared to number of deletions of uncertainty-related unambiguous descriptions. Uncertainty-oriented subjects were expected to have high scores on this measure (indicating more deletion of certainty-related descriptions) whereas certainty-oriented subjects were expected to have low scores.

Relative deletion of positive unambiguous and negative unambiguous

descriptions also were examined separately. It was expected that certainty-oriented individuals would delete more positive uncertainty-related descriptions than positive certainty-related descriptions, whereas the reverse would be true for uncertainty-oriented individuals. The prediction for the deletion of the unambiguously negative descriptions was not as clear-cut. One might argue that all uncertainty-related constructs--both positive and negative--are more accessible than certainty-related constructs for the uncertainty-oriented individual. However, one could also argue that negative certainty-related constructs (e.g. "timid") are relatively more accessible to this type of individual than are negative uncertainty-related constructs (e.g. "indecisive"). Tentatively, however, it was predicted that certainty-oriented individuals would delete more negative uncertainty-related descriptions than negative certainty-related descriptions, whereas the reverse would be true for uncertainty-oriented individuals.

In terms of memory effects over time, both the predicted deletion and distortion effects were expected to become stronger over time, as had been found by Higgins and Rholes (1978). If the predicted deletion and distortion effects did in fact become stronger over time, this would provide additional support for the view that construct accessibility mediates the predicted differences in recall for certainty- and uncertainty-oriented subjects. According to construct accessibility theory (e.g., Higgins & King, 1981), the effects of construct accessibility on memory should increase over time because the individual forgets the details of the stimulus information and, consequently, his/her accessible constructs should

have a greater impact on memory. If stronger deletion and distortion effects were found on a delayed reproduction measure, then one important implication of viewing uncertainty orientation in terms of construct accessibility would be that uncertainty- and certainty-oriented individuals have greater long-term than short-term biases to view the uncertainty- and certainty-related behavior of others in manners consistent with their own orientations.

(iii) Predictions Involving Overt Characterizations and Evaluations of the Target Person

So far, we have discussed the effects of differences in construct accessibility for uncertainty- and certainty-oriented subjects in terms of distortions and deletions on a reproduction measure. Higgins et al. (1977) found that momentary differences in construct accessibility (i.e., "primed" differences) had a strong effect on subjects' characterizations and evaluations of a stimulus person. Three-quarters of their subjects were asked to overtly characterize each of the descriptions in the stimulus essay with a single word. In addition, subjects were asked to take all of the information in the essay into account and then to rate the target person, Donald, on a 10-point scale ranging from extremely undesirable to extremely desirable.

Subjects' characterizations and evaluations of the stimulus person were also obtained in the present study. With regard to overt characterizations, uncertainty-oriented subjects were expected to apply positive labels (e.g., "adventurous") to the ambiguous, uncertainty-related descriptions (because positive, uncertainty-

related constructs were thought to be accessible for these subjects), and negative labels (e.g., "timid") to the ambiguous, certainty-related descriptions (because negative, certainty-related constructs were thought to be relatively more accessible than positive, certainty-related constructs for these subjects), whereas certainty-oriented subjects were expected to apply positive labels (e.g., "careful") to the ambiguous, certainty-related descriptions and negative labels (e.g., "reckless") to the ambiguous, uncertainty-related descriptions. These predictions were examined using the following three measures: a relative measure of positive characterizations (# positive labels used to characterize the certainty-related, ambiguous descriptions minus # positive labels used to characterize the uncertainty-related, ambiguous descriptions), a relative measure of negative characterizations, and an overall relative characterization measure that took both positive and negative labels into account.

Since subjects were expected to apply positive labels to the ambiguous descriptions that matched their orientation and negative labels to those that didn't, and since there were equal numbers of positive and negative unambiguous descriptions, subjects were expected to view the stimulus person in a neutral manner when asked to rate their attitude towards Donald (i.e., approximately 0 on an 11-point scale, where +5 reflects an extremely positive attitude). Since Higgins, King, and Mavin (1982) found subjects' expressed liking of a target person to be highly related to the overall judged desirability of their written impression, we wondered whether attitudes would be related to distortions of behavioral descriptions in the present study. Higher scores on a measure of relative

distortions (# of positive distortions minus # of negative distortions) were expected to be related to more positive attitudes towards Donald. In other words, the overall nature of a subject's distortion of the behavioral descriptions was expected to be related to the overall evaluative impression that he/she formed of Donald.

In summary, Study 1 took a cognitive approach toward uncertainty orientation and attempted to demonstrate that differences in construct accessibility for certainty- and uncertainty-oriented subjects resulted in different encoding and recall biases for material in the certainty-uncertainty domain. Research by Markus (e.g., Markus & Smith, 1981) and Kuiper (Kuiper & Rogers, 1979; Kuiper & Derry, 1981) has demonstrated that the way we view ourselves and our own behavior has implications for the way in which we view others. Similarly, Study 1 hopefully will demonstrate that uncertainty- and certainty-oriented subjects differ in the recall and distortion of uncertainty- and certainty-related information about others (due to the assumed mediation of differences in construct accessibility).

(iv) List of Hypotheses

(a) distortions

(1) Uncertainty-oriented subjects will make more positive distortions of uncertainty-related descriptions than of certainty-related descriptions in their reproductions of the stimulus essay whereas the reverse will be true for certainty-oriented subjects.

(2) Uncertainty-oriented subjects will make more negative distortions of certainty-related descriptions than of uncertainty-related descriptions in their reproductions of the stimulus essay

whereas the reverse will be true for certainty-oriented subjects.

(3) Uncertainty-oriented subjects will have significantly lower scores than certainty-oriented subjects on an overall measure of relative distortions in the certainty-related direction (# positive distortions of certainty-related descriptions plus # negative distortions of uncertainty-related descriptions minus # positive distortions of uncertainty-related descriptions plus # negative distortions of certainty-related descriptions).

(b) deletions

(1) Uncertainty-oriented subjects will delete more certainty-related than uncertainty-related descriptions in their reproductions of the stimulus essay whereas the reverse will be true for certainty-oriented subjects.

(2) Uncertainty-oriented subjects will delete more positive certainty-related than positive uncertainty-related descriptions in their reproductions of the stimulus essay whereas the reverse will be true for certainty-oriented subjects.

(3) Uncertainty-oriented subjects will delete more negative certainty-related than negative uncertainty-related descriptions in their reproductions of the stimulus essay whereas the reverse will be true for certainty-oriented subjects.

(c) effects over time

(1) The predicted distortion and deletion effects will be stronger on reproductions made 1 week after reading the essay than on reproductions made after a 15-minute filler task.

(d) overt characterizations

(1) In terms of overt characterizations, uncertainty-oriented

subjects will apply more positive labels to the ambiguous, uncertainty-related descriptions than to the ambiguous, certainty-related descriptions whereas the reverse will be true for certainty-oriented subjects.

(2) Uncertainty-oriented subjects will apply more negative labels to the ambiguous, certainty-related descriptions than to the ambiguous, uncertainty-related descriptions whereas the reverse will be true for certainty-oriented subjects.

(3) Uncertainty-oriented subjects will have significantly lower scores than certainty-oriented subjects on an overall measure of relative characterizations in the certainty-related direction (# positive labels applied to certainty-related, ambiguous descriptions plus # negative labels applied to uncertainty-related, ambiguous descriptions minus # positive labels applied to uncertainty-related, ambiguous descriptions plus # negative labels applied to certainty-related, ambiguous descriptions).

(e) attitudes

(1) On average, the target person will be viewed as neutral in likeableness.

(2) Subjects who make more positive than negative distortions of the behavioral descriptions will have positive attitudes towards Donald whereas subjects who make more negative distortions than positive will have negative attitudes towards Donald.

(2) Method

Ninety-two University of Western Ontario undergraduates participated as subjects in this study. The study involved two sessions held

one week apart. The first session lasted one and a half hours, and the second lasted one half hour. Subjects were run in five groups of approximatley 20 subjects each. One subject was omitted from the analyses for failing to return for the second session. Complete data therefore were obtained for 91 subjects (although some subjects failed to complete certain measures). Appendix I contains questionnaires without copyrights that were used in this study.

In the first session, subjects were told that they were participating in a study concerned with personality and psycholinguistics. More specifically, they were told that the experimenter was interested in the relationship between a number of personality and cognitive style variables and the interpretation of language. Consequently, they were going to fill out a number of personality and cognitive style questionnaires, and also were going to be given some material to read for psycholinguistic purposes in both the present session and the half hour session in the following week. Subjects then were given a projective measure of "need" for uncertainty that was administered following standard procedures (Atkinson's, 1958, Appendix III). (The traditionally-used, "motivational" measure of uncertainty orientation was used in this thesis. The more appropriate cognitive measure has yet to be developed; in fact, this was one aim of the present research--to see whether cognitive structural measures can adequately tap the notion of uncertainty orientation.)

The TAT measure contained a number of different sentence leads, one of which was the following: "A person is sitting, wondering about what may happen ...". This sentence lead has been used in

previous research and has been found to have predictive validity in terms of performance differences for high and low scorers in "need" for uncertainty (e.g., Sorrentino et al., in press). Subjects completed the next measure at their own speed. This was the Byrne and Lamberth (1971) acquiescence-free measure of authoritarianism (used to determine the second component of uncertainty orientation).

Next, subjects were given a one-page essay to read describing a person named Donald. Four different random orders of the descriptions in this essay were used and one of these essay forms is presented in Table 1. The essay contained 12 behavioral descriptions: four ambiguous (two certainty-related and two uncertainty-related), four certainty-related, unambiguous descriptions (two positive and two negative), and four uncertainty-related, unambiguous descriptions (two positive and two negative). Therefore, it contained equal amounts of positive and negative, uncertainty-related information and positive and negative, certainty-related information so that overall valence and content were controlled for. The ambiguous descriptions were ones that could be viewed in either a positive or negative light (e.g., the sample of behavior could be considered "adventurous" or "reckless", "cautious" or "fearful") whereas the unambiguous descriptions were clearly positive or negative in nature. Extensive piloting was required to choose the actual descriptions used in the essay. Those that were selected met the criteria described by Higgins and Rholes (1978). For example, the ambiguous descriptions were moderately likeable rather than neutral, and the positive and

Table 1

One Form of the Uncertainty-Certainty Essay Used in Study 1

Donald's interests and ideas have not changed much during his years in university. His interests are still confined to a small set of activities and it is difficult to get him interested in anything new (narrowminded, C-R -ve*). Donald is not the type of person who forces his ideas and views on others. He feels that there is no one correct way of doing things or no one correct point of view, and so he accepts and respects other people's beliefs and practices (tolerant, U-R +ve). Donald realizes that there is usually more than one way of looking at any problem and so he isn't upset when he runs across material with more than one possible interpretation. Donald feels it isn't necessary, and may even be harmful, to take a clear-cut, definite position when researching a problem (intellectually openminded, U-R +ve). Donald spends a great amount of his time in search of what he likes to call excitement. He has already climbed Mt. McKinley, shot the Colorado rapids in a kyack, driven in a demolition derby, and piloted a jet-powered boat - without knowing very much about boats. He has risked injury, and even death, a number of times. Now he is in search of new excitement. He is thinking, perhaps, he will do some skydiving or maybe cross the Atlantic in a sailboat (adventurous vs. reckless, ambiguous U-R). While some people pay little attention to money matters, Donald manages his money wisely and with sound judgment. When he was left some money by his grandfather, Donald only decided where to invest it after a good deal of thought and a thorough consideration of the various options (cautious/careful, C-R +ve). Donald is overly interested in the affairs of others. Although he doesn't know the people in his dorm too well, he tries to find out about their activities and relationships by asking many unwelcome questions and he sometimes listens in on conversations that aren't really any of his concern (nosey, U-R -ve). Donald often has trouble making up his mind about what activities to do because he doesn't have very strong opinions about things. After a good deal of thought, he will finally make up his mind, but then change it almost immediately, much to the annoyance of others (indecisive, U-R -ve). Donald often wearies others by talking on and on about the same old things and by repeating things he has previously said (boring, C-R -ve). Donald is able to change his character and way of acting to suit different situations and circumstances. He therefore adjusts easily to changes in the environment, with the result that he can appear one way one moment and the opposite way the next (adaptable vs. inconsistent/ flighty, ambiguous U-R). Donald prefers to stop and think before he acts, even on trifling matters, because he is concerned about the possible negative consequences of his actions (cautious vs. timid/ fearful, ambiguous C-R). Once Donald makes up his mind CONT.

Table 1 (Cont.)

to do something it is as good as done, no matter how long it might take or how difficult the going might be. Only rarely does he change his mind, even when it would have been better if he had (persistent vs. stubborn/obstinate, ambiguous C-R). Donald is the type of person who follows the old saying; "a place for everything and everything in its place". He can find almost anything at a moment's notice (orderly, C-R +ve).

* these labels were not included in the actual stimulus essays

C-R= certainty-related

U-R= uncertainty-related

negative poles of these descriptions were elicited from pilot subjects with approximately equal frequency in an overt characterization task. The unambiguous descriptions were clearly positive or negative in nature.

The overt characterization vs. no overt characterization manipulation occurred after subjects had read the essay. Subjects in three of the five groups (N=52) were randomly selected to receive the overt characterization task. In this task, the 52 subjects were asked to characterize each of the four ambiguous descriptions of Donald using a single word (e.g., "Considering only Donald's attitude towards mountain-climbing and sky-diving, how might one characterize, with a single word, this aspect of his personality?" and "Considering only Donald's behavior after he makes up his mind to do something, how might one characterize, with a single word, this aspect of his personality?"). They then were given a 15-minute, nonverbal, interference task (Raven's Advanced Progressive Matrices) in order to rule out the effects of short-term memory. The Raven's was administered using standard procedures and instructions (Raven, Court, & Raven, 1977) in order to provide a reliable and valid measure of intelligence, as well as being used as a filler task. The 39 subjects not given the overt characterization measure were given the Raven's immediately after reading the Donald essay. After completing the Raven's, all subjects were given a reproduction measure in which they were asked to rewrite exactly, word for word, the paragraph about Donald. Finally, they were asked to rate how likeable they considered Donald to be on an 11-point scale ranging

from -5 (extremely unlikeable) to +5 (extremely likeable). In the second session held one week later, subjects once again completed the reproduction and attitude measures, in that order. Subjects were thanked for their participation and debriefed.

(i) The Measure of Uncertainty Orientation

Uncertainty orientation is a composite variable based on the authoritarianism and "need" for uncertainty measures. Scores on both measures are individually transformed into z-scores and then a subject's authoritarianism z-score is subtracted from his/her "need" for uncertainty z-score to obtain his/her score in uncertainty orientation (Sorrentino et al., in press). The "need" for uncertainty measure used in this study was based on the following TAT sentence lead: "A person is sitting, wondering about what may happen ...". One rater scored each subject's story written in response to this sentence lead for the presence of uncertainty imagery. This was done using a scoring system developed by Fredrick and Sorrentino (Note 4) to assess the amount of uncertainty imagery in stories written in response to sentence leads. In previous scoring sessions, this rater had had rank-difference correlations of above .90 with the rankings made by an expert scorer. (These rankings reflected the amount of uncertainty imagery contained in the stories.) A second rater scored 20 randomly-selected protocols and ranked them according to amount of imagery. The rank-difference correlation (or rho) between the ranks of the two raters for this set of stories was .87. After determining "need" for uncertainty scores, the transformation procedure described above was followed to get subjects'

scores in uncertainty orientation. A tertile split was then performed on these uncertainty orientation scores to yield the uncertainty-oriented, moderate, and certainty-oriented subgroups.

(ii) Computation and Description of the Dependent Variables

Each subject's immediate and delayed reproduction of the stimulus essay was scored in terms of the following four coding categories--deletion, reproduction without distortion, positive distortion, and negative distortion. A second rater scored 20 randomly-selected protocols from each of the immediate and delayed reproductions. The Pearson Product-Moment correlations between the scores of these two raters were .93 for the deletion category, and .80 for the other three coding categories combined.

On the basis of the four coding categories, the following measures were calculated for each subject for both his/her immediate and delayed reproductions: three relative characterization measures (positive, negative, and overall), three relative distortion measures (positive, negative, and overall), and three relative deletion measures (positive, negative, and overall). High scores on the relative characterization and relative distortion measures reflected more distortion in the certainty-oriented direction compared to distortion in the uncertainty-oriented direction, whereas high scores on the relative deletion measures reflected better memory in the uncertainty-oriented direction than in the certainty-oriented direction. The nature of these measures, their method of computation, and their meaning are presented in detail in Table 2.

The three relative characterization measures were computed for

Table 2

Study 1: Description, Method of Computation, and Meaning of the Relative Characterization Measures, the Relative Distortion Measures, and the Relative Deletion Measures

DESCRIPTION OF MEASURE	METHOD OF COMPUTATION	MEANING OF HIGH SCORE
(A) RELATIVE CHARACTERIZATION MEASURES:		
(i) Positive Characterization Measure (relative positivity of certainty-related vs. uncertainty-related characterizations)	# +ve C-R* characterizations minus # +ve U-R characterizations	high= more +ve characterizations of certainty-related ambiguous descriptions
(ii) Negative Characterization Measure (relative negativity of certainty-related vs. uncertainty-related characterizations)	# -ve C-R characterizations minus # -ve U-R characterizations	high= more -ve characterizations of certainty-related ambiguous descriptions
(iii) Overall Characterization Measure (overall characterizations in the certainty-oriented vs. uncertainty-oriented direction)	# +ve C-R plus # -ve U-R minus # -ve C-R plus # +ve U-R	high= more characterizations in the certainty-oriented direction
(B) RELATIVE DISTORTION MEASURES:		
(i) Positive Distortion Measure (relative positivity of certainty-related vs. uncertainty-related distortions)	# +ve C-R distortions minus # +ve U-R distortions	high= more +ve distortions of certainty-related descriptions (ambiguous and unambiguous)

CONT.

Table 2 (Cont.)

DESCRIPTION OF MEASURE	METHOD OF COMPUTATION	MEANING OF HIGH SCORE
(ii) Negative Distortion Measure (relative negativity of certainty-related vs. uncertainty-related distortions)	# -ve C-R distortions minus # -ve U-R distortions	high= more -ve distortions of certainty-related descriptions (ambiguous and unambiguous).
(iii) Overall Distortion Measure (overall distortions in the certainty-oriented vs. uncertainty-oriented direction)	# +ve C-R plus #-ve U-R minus # -ve C-R plus # +ve U-R distortions	high= more distortions in the certainty-oriented direction
(C) RELATIVE DELETION MEASURES:		
(i) Positive Deletion Measure (relative memory for +ve uncertainty-related vs. +ve certainty-related, unambiguous descriptions)	# deletions of +ve C-R unambiguous descriptions minus # deletions of +ve U-R unambiguous descriptions	high= better memory for positive, uncertainty-related, unambiguous descriptions
(ii) Negative Deletion Measure (relative memory for -ve uncertainty-related vs. -ve certainty-related, unambiguous descriptions)	# deletions of -ve C-R unambiguous descriptions minus # deletions of -ve U-R unambiguous descriptions	high= better memory for negative, uncertainty-related, unambiguous descriptions
(iii) Unambiguous Deletion Measure (relative memory for uncertainty-related vs, certainty-related unambiguous descriptions)	# deletions of C-R unambiguous descriptions minus # deletions of U-R unambiguous descriptions	high= better memory for uncertainty-related, unambiguous descriptions

* C-R= certainty-related
U-R= uncertainty-related

those subjects who received the overt characterization manipulation (i.e., those subjects who were asked to characterize each of the ambiguous descriptions with a single word). For example, these subjects were asked the following: "Considering only Donald's attitude towards mountain-climbing and sky-diving, how might one characterize, with a single word, this aspect of his personality?" The three characterization measures all reflected the number of overt characterizations of certainty-related vs. uncertainty-related, ambiguous descriptions. One measure tapped the number of positive, certainty-related characterizations compared to the number of positive, uncertainty-related characterizations or labels (the positive characterization measure), another tapped the relative number of negative characterizations of certainty-related and uncertainty-related, ambiguous descriptions (the negative characterization measure), and the third was an overall characterization measure which took both positive and negative characterizations into account.

A word needs to be said about the method used to decide whether or not a given overt characterization was positive or negative in nature. This was a two-stage process. First, a decision was made as to the applicability of the word used by the subject to characterize a given certainty-related or uncertainty-related, ambiguous description. This decision was made primarily on the basis of words used by subjects in piloting sessions, who were asked to characterize ambiguous descriptions one at a time (rather than after reading a 12-description essay, as in the present study). A thesaurus also was used to generate applicable labels. Second, the positivity vs. negativity of the applicable labels was decided using both Anderson's

(1968) likeableness ratings and mean positivity ratings made by pilot subjects who used a particular label.

The relative distortion measures were similar in nature to the relative characterization measures except that they dealt with the evaluative distortion of the behavioral descriptions (both ambiguous and unambiguous) rather than the evaluative nature of trait labels applied to the ambiguous descriptions. The positive distortion measure tapped the number of positive, certainty-related distortions compared to positive, uncertainty-related distortions. The negative distortion measure tapped the relative number of negative distortions of certainty-related descriptions compared to the number of negative distortions of uncertainty-related descriptions. The last measure, the overall distortion measure, took both positive and negative distortions into account in order to test the overall prediction that subjects would positively distort descriptions matching their orientation and negatively distort descriptions that did not match. This measure was composed of number of positive distortions of certainty-related descriptions plus number of negative distortions of uncertainty-related descriptions minus the opposite (i.e., positive, uncertainty-related distortions plus negative, certainty-related distortions).

The three deletion measures were concerned with recall of unambiguous descriptions only (i.e., descriptions that are clearly positive or negative in nature). They therefore focused on a subset of the information tapped by the distortion measures since the latter involved distortions of ambiguous descriptions as well as distortions of unambiguous descriptions. One of the deletion

measures looked at relative recall for the positive, unambiguous descriptions, another looked at relative recall for the negative, unambiguous descriptions, and the third looked at recall of all unambiguous descriptions (both positive and negative).

(3) Results

The characterization, distortion, and deletion results for uncertainty orientation will be presented in separate sections. The characterization measures were analyzed using one-way analyses of variance with extreme groups in uncertainty orientation as the between-subjects factor. Time was not a factor in these analyses since overt characterizations were only obtained in the first session. The distortion and deletion measures were analyzed using repeated measure analyses of variance, with characterization (overt characterization vs. no overt characterization) as a between-subjects factor, extreme groups in uncertainty orientation as a between-subjects factor, and time (immediate vs. delayed) as the repeated measure factor. Multivariate analyses of variance (MANOVAs) were performed for each type of dependent variable in order to control for the effect of multiple measures on Type 1 error rate. It should be noted that all these analyses involved extreme groups in uncertainty orientation since the focus of this study was on how uncertainty-oriented and certainty-oriented subjects differ in information processing. Moderate scorers were deleted so that direct comparisons between extreme group subjects in characterizations, distortions, and recall could be made without being concerned that significant effects were obscured by the variable behavior of the moderates (Sorrentino & Short, 1977).

(i) Characterization Measure Results

A multivariate analysis of variance (MANOVA) could only be performed appropriately on the positive characterization measure together with the negative characterization measure since including the overall characterization measure resulted in linear dependence among the dependent variables. (This overall measure was, in fact, a composite of the other two measures.) The MANOVA on the positive characterization and negative characterization measures employed extreme groups in uncertainty orientation as a between-subjects factor and only showed a trend towards significance (Hotelling's T^2= 4.50, $F(2,31)$= 2.18, $p<.13$). Thus, effects for uncertainty orientation on positive and negative characterizations perhaps should be viewed as capitalizing on chance in the following univariate ANOVAs. However, one could argue that concern with Type 1 error rate is not an issue here since it was predicted a priori that uncertainty- and certainty-oriented subjects would differ in both their positive and negative characterizations. For a priori planned comparisons between two groups that are relevant to a single hypothesis, the hypothesis is traditionally viewed as the conceptual unit for error rate (Kirk, 1968, p. 85).

The one-way ANOVA on positive characterizations with extreme groups in uncertainty orientation as the between-subjects factor was marginally significant, $F(1,32)$= 2.89, $p<.10$. Contrary to expectation, uncertainty-oriented subjects tended to make more positive characterizations in the certainty-oriented direction on this relative measure (M= .06) than did certainty-oriented subjects (M= -.50). Higher scores on this measure reflect more positive characterizations

of certainty-related than uncertainty-related descriptions and lower scores reflect the reverse.

The one-way ANOVA on negative characterizations with extreme groups in uncertainty orientation as the between-subjects factor also was marginally significant, $F(1,32) = 3.62$, $p < .07$. It was predicted that uncertainty-oriented subjects would make more negative characterizations of the certainty-related, ambiguous descriptions than of the uncertainty-related, ambiguous descriptions whereas the reverse would be true for certainty-oriented subjects. Exactly the opposite was found, as had been the case for positive characterizations. Uncertainty-oriented subjects tended to make more negative characterizations in the uncertainty-oriented direction than in the certainty-oriented direction ($M = -.33$) whereas certainty-oriented subjects tended to make more negative characterizations in the certainty-oriented rather than uncertainty-oriented direction ($M = .13$).

A one-way ANOVA involving extreme groups in uncertainty orientation was also performed on an overall characterization measure in order to test the overall prediction that subjects would positively distort descriptions matching their orientation and negatively distort those that didn't. This ANOVA was significant ($F(1,32) = 4.35$, $p < .05$) and once again revealed the opposite pattern to expectation. Uncertainty-oriented subjects had higher scores on this measure ($M = .39$) than did certainty-oriented subjects ($M = -.63$). Since higher scores reflect more positive characterizations of certainty-related descriptions and more negative characterizations of uncertainty-related descriptions whereas negative scores reflect the

opposite, uncertainty-oriented subjects actually made overall characterizations in the direction expected for certainty-oriented subjects and certainty-oriented subjects made overall characterizations in the direction expected for uncertainty-oriented subjects.

(ii) Distortion Measure Results

A multivariate repeated measure analysis of variance (MANOVA) involving characterization (overt characterization vs. no overt characterization) as a between-subjects factor, extreme groups in uncertainty orientation as a between-subjects factor, and time (immediate vs. delayed) as the repeated measure factor was performed on the positive distortion measure and the negative distortion measure. (The overall distortion measure was excluded from this MANOVA since it was a linear composite of the other two measures.) The MANOVA revealed only a marginally significant interaction between uncertainty orientation and time (Hotelling's $T^2 = 5.88$, $F(2,54) = 2.89$, $p < .06$). This marginally significant multivariate F indicates that we can be reasonably confident that employing a number of distortion measures doesn't lead to significant univariate Fs due to an increase in Type 1 error rate. In other words, we can be reasonably confident that any interactions found between uncertainty orientation and time on the distortion measures are not spuriously significant due to capitalization on chance.

The repeated measure ANOVA on positive distortions--involving characterization vs. no overt characterization, high vs. low groups in uncertainty orientation, and time (immediate vs. delayed) as factors--revealed a significant uncertainty orientation by time

interaction, $F(1,55)= 3.87$, $p< .05$. On the immediate positive distortion measure, uncertainty-oriented subjects made more relative distortions in the certainty-oriented direction ($M= -.10$) than did certainty-oriented subjects ($M= -.30$). On the delayed measure, however, this pattern reversed and the uncertainty-oriented subjects made fewer relative distortions in the certainty-oriented direction ($M= -.62$)--or more relative distortions in the uncertainty-oriented direction--than did the certainty-oriented subjects ($M= -.03$). Since it was predicted that differences between uncertainty- and certainty-oriented subjects would be stronger on delayed positive distortions, T_1 and T_2 differences between subject groups were examined using Dunn's multiple comparison procedure for planned comparisons (Kirk, 1968, p. 79). Dunn's procedure controls for Type 1 error rate by splitting up α among a set of planned comparisons. Using this procedure, uncertainty- and certainty-oriented subjects were found to be significantly different from one another only in delayed positive distortions ($D= .59$, $p< .05$). Thus, as predicted, uncertainty-oriented subjects made more positive distortions in the uncertainty-oriented direction than in the certainty-oriented direction on delayed reproductions whereas the reverse was true for certainty-oriented subjects.

A repeated measure ANOVA was also performed on negative distortion scores. This ANOVA revealed a marginally significant uncertainty orientation by time interaction, $F(1,55)= 2.91$, $p< .09$. On the immediate negative distortion measure, uncertainty-oriented subjects tended to make more negative distortions in the uncertainty-oriented direction ($M= -.48$) than did certainty-oriented subjects

(M= -.17). Once again, however, this pattern reversed on the delayed negative distortion measure and the uncertainty-oriented subjects tended to make fewer relative distortions in the uncertainty-oriented direction (M= -.07)--or more negative distortions in the certainty-oriented direction--than did the certainty-oriented subjects (M= -.23).

Finally, a repeated measure ANOVA was performed on overall distortions. This ANOVA revealed a significant uncertainty orientation by time interaction, $F(1,55) = 5.61$, $p < .02$--as had been found for positive distortions (significant) and negative distortions (marginally significant). On the immediate overall distortion measure, contrary to prediction, uncertainty-oriented subjects made more relative distortions in the certainty-oriented direction (M= .38) than did certainty-oriented subjects (M= -.10). On the delayed measure, however, the expected pattern of overall distortion emerged. Here uncertainty-oriented subjects made more relative distortions in the uncertainty-oriented direction (M= -.55) than did certainty-oriented subjects (M= .20). Using Dunn's multiple comparison procedure, the two groups of subjects were found to be significantly different only in delayed overall distortions (D= .75, $p < .05$). Thus, as predicted, on the delayed recall measure uncertainty-oriented individuals made more relative distortions in the uncertainty-oriented direction (more +ve distortions of uncertainty-related descriptions and more -ve distortions of certainty-related descriptions combined than of the reverse) whereas certainty-oriented subjects made more relative distortions in the certainty-oriented direction (more +ve distortions of certainty-related descriptions and more -ve

distortions of uncertainty-related descriptions combined than of the reverse).

(iii) Deletion Measure Results

A multivariate repeated measure analysis of variance (MANOVA) involving characterization vs. no overt characterization, extreme groups in uncertainty orientation, and time as factors was performed on the positive and negative deletion measures. (The overall deletion measure was excluded from this MANOVA since it was a linear composite of the other two measures.) This MANOVA revealed a significant main effect for time (Hotelling's T^2= 10.09, $F(2,54)$= 4.95, $p < .01$) and a marginally significant uncertainty orientation by characterization condition interaction (Hotelling's T^2= 5.67, $F(2,54)$= 2.78, $p < .07$). Once again, then, we can be reasonably confident that significant univariate effects paralleling the multivariate ones given above are not spuriously significant.

First, a repeated measure ANOVA was performed on subjects' positive deletion scores. This ANOVA revealed a significant main effect for time ($F(1,55)$= 9.97, $p < .003$) in which fewer deletions of positive certainty-related than positive uncertainty-related descriptions were found at T_2 (M= -.32) than at T_1 (M= -.02). Thus, subjects made approximately equal numbers of deletions of both types of positive descriptions at T_1 but had better memory for the positive, certainty-related descriptions than the positive, uncertainty-related descriptions when recalling the stimulus essay one week later. The ANOVA on positive deletions also revealed a significant uncertainty orientation by characterization condition

interaction, $F(1,55) = 5.04$, $p < .03$. In the characterization condition, the uncertainty-oriented subjects made more relative deletions of positive, uncertainty-related descriptions ($M = -.50$) than did the certainty-oriented subjects ($M = .00$). Thus, when asked to overtly characterize the ambiguous descriptions, uncertainty-oriented subjects had better relative memory for positive, unambiguous, certainty-related descriptions than did the low scorers in uncertainty orientation. However, when no overt characterization was involved, uncertainty-oriented subjects made fewer relative deletions of positive, uncertainty-related descriptions ($M = .20$) than their counterparts ($M = -.18$). Similarly, a significant interaction between level of uncertainty orientation and characterization on the overall deletion measure ($F(1,55) = 4.10$, $p < .05$) showed that uncertainty-oriented subjects had worse relative memory for uncertainty-related descriptions ($M = .71$) than certainty-oriented subjects ($M = 1.28$) under the characterization condition, but better relative memory for uncertainty-related descriptions ($M = 1.25$) than certainty-oriented subjects ($M = .64$) under the no characterization condition. No significant effects were found for the negative deletion measure. In summary, when no characterization task was given, uncertainty-oriented subjects had better relative memory for uncertainty-related descriptions (particularly positive ones) than did low scorers in uncertainty orientation (as expected), whereas the reverse occurred under the characterization manipulation.

(iv) Attitude Measure Results

(a) initial attitudes and attitude change

First, the reader should note that, as expected, subjects viewed the target person in a neutral manner on both their immediate and delayed evaluative judgments (M= -.59 for both immediate and delayed attitudes). Thus, the stimulus essay appeared to be neutral in overall evaluative content, as desired. In addition to the immediate and the delayed attitude measures, an attitude change score was calculated for each subject by subtracting his/her immediate attitude score from his/her delayed attitude score (after Higgins et al., 1977). Only 40 out of the 91 subjects in this study (or approximately 44%) changed their attitudes over time. Despite this general effect of constancy in impressions over time (M= -.59 for initial attitudes and M= -.59 for delayed attitudes), a significant negative correlation was found between initial attitude scores and the attitude change scores ($r(90) = -.56$, $p < .0001$ two-tailed). Since high scores on both measures reflect more positive attitudes, the negative correlation indicates that positive initial attitudes were associated with negative change over time and vice versa (i.e., negative initial attitudes were associated with positive change over time). Time therefore had a moderating influence on attitudes; both positive and negative attitudes became less extreme over time. It is quite possible, however, that this change over time was not true change but rather was due to regression effects (e.g., Payne & McMorris, 1967).

(b) attitudes and distortions

It was predicted that more positive attitudes towards Donald would be associated with more positive than negative distortions of

the descriptions of Donald. This prediction was examined using an evaluative distortion measure consisting of the number of positive distortions (both certainty- and uncertainty-related) minus the number of negative distortions (both certainty- and uncertainty-related). Thus, unlike the other relative distortion measures which were concerned with both the content (certainty- or uncertainty-related) and evaluative direction (positive or negative) of distortions, the evaluative distortion measure was concerned only with the latter. Pearson product-moment correlations were computed between immediate and delayed attitude scores and immediate and delayed evaluative distortion scores. Both immediate and delayed attitudes were found to be significantly correlated with delayed evaluative distortions only, although these correlations were small ($r(89) = .18$, $p < .05$ one-tailed, and $r(89) = .20$, $p < .03$ one-tailed, respectively). Thus, as predicted, more positive attitudes were related to more positive than negative distortions on the delayed reproduction measure and more negative attitudes were related to more negative than positive delayed distortions.

We also wondered whether subjects' attitudes would be related to the content as well as evaluative direction of their distortions. For example, would more positive attitudes be associated with more positive, uncertainty-related distortions than positive, certainty-related distortions or vice versa? Accordingly, Pearson product-moment correlations were computed between immediate and delayed attitude scores and immediate and delayed positive distortion scores as well as immediate and delayed overall distortion scores. Significant (although small) correlations were found between attitudes

and the delayed overall distortion measure ($r(90) = -.25$, $p < .02$ two-tailed and $r(89) = -.20$, $p < .05$ two-tailed for immediate and delayed attitudes, respectively). (These correlations are two-tailed because the directions of the relations were not predicted.) Since higher attitude scores reflect more positive attitudes, and since higher scores on the overall distortion measure reflect more relative distortions in the certainty-oriented direction, the negative correlations indicate that both positive initial attitudes and positive delayed attitudes were associated with relative distortions in the uncertainty-oriented direction (and vice versa). In sum, positive attitudes were related to uncertainty-oriented distortion and negative attitudes were related to certainty-oriented distortion.

(4) Discussion

(i) Overview of Discussion

In this section, the results pertaining to the specific predictions for uncertainty orientation will be discussed. The findings for attitudes will be discussed in the general discussion chapter--Chapter Four. The present discussion section will conclude with the presentation of a model for understanding and explaining the findings for uncertainty orientation. This model of bipolar certainty and uncertainty schemata is used to account for the distortion and deletion of congruent and incongruent information found in the present study. The reader should note that none of the results to be discussed here were mediated by intelligence since analyses of covariance controlling for the effect of intelligence (measured by Raven's Progressive Matrices) were not different from the analyses of variance.

(ii) Specific Predictions for Uncertainty- and Certainty-Oriented Individuals

In terms of overt characterizations, it was predicted that uncertainty-oriented subjects would apply more positive labels to uncertainty-related, ambiguous descriptions, whereas certainty-oriented subjects would apply more positive labels to the certainty-related, ambiguous descriptions. In addition, uncertainty-oriented subjects were expected to apply more negative labels to the certainty-related, ambiguous descriptions than to the uncertainty-related, ambiguous descriptions, whereas the reverse was expected for certainty-oriented subjects. Marginally significant results were found for both positive and negative characterizations ($p < .10$ and $p < .07$, respectively) that were completely opposite to expectation. Uncertainty-oriented subjects tended to make more positive characterizations in the certainty-oriented direction compared to the uncertainty-oriented direction and more negative characterizations in the uncertainty-oriented direction compared to the certainty-oriented direction than did certainty-oriented subjects. An overall characterization measure which took both positive and negative characterizations into account revealed the same pattern of findings in a significant analysis ($p < .05$). Thus, uncertainty-oriented subjects labelled the ambiguous behavioral descriptions in the manner expected for certainty-oriented subjects and certainty-oriented subjects displayed the evaluative biases in labelling expected for uncertainty-oriented subjects.

Similarly, opposite results to those expected were found on immediate distortions (but not on delayed distortions). It was predicted that uncertainty-oriented subjects would display a positive

bias in the distortion of uncertainty-related descriptions, whereas certainty-oriented subjects would show a similar bias in the distortion of certainty-related descriptions. Compared to certainty-oriented subjects, high scorers in uncertainty orientation made more positive distortions in the certainty-oriented direction at T_1 (opposite to expectation), but more positive distortions in the uncertainty-oriented direction at T_2, as predicted ($p < .01$). It was also predicted that uncertainty-oriented subjects would make more negative distortions of certainty-related descriptions than of uncertainty-related ones, whereas the reverse would be true for certainty-oriented subjects. A marginally significant interaction was found ($p < .09$) that paralleled the positive distortion finding. Thus, the opposite effect tended to be found at T_1 whereas the predicted direction of difference tended to be found at T_2. Finally, the same pattern was found on a measure combining positive and negative distortions ($p < .02$). Since it was predicted that the expected distortion effects would be stronger on subjects' delayed reproductions, Dunn's multiple comparison procedure was used to compare the positive and overall distortions of the two subject groups at T_1 and T_2. In both cases, only the delayed effects were significant ($p < .05$ for both distortion measures). Thus, the reversals at T_1 were not significant in themselves whereas the expected differences at T_2 were in fact significant.

In terms of deletions, uncertainty-oriented subjects were expected to delete more certainty-related than uncertainty-related, unambiguous descriptions, whereas the reverse was expected for certainty-oriented subjects. The expected deletion effects were found

only in the no characterization condition for both unambiguous descriptions and positive, unambiguous descriptions: In the characterization condition, the results were again totally opposite to expectation ($p < .05$ for unambiguous descriptions and $p < .03$ for positive descriptions). One could argue that the overt characterization task leads to "biased" deletion results (as will be discussed shortly) and that the predicted effects therefore only occur in the absence of this task.

In summary, the expected results for uncertainty orientation occurred only on the delayed reproduction measure (for distortions) and in the no overt characterization condition (for deletions). Results totally opposite to expectation were found in immediate reproductions and characterizations and for subjects in the overt characterization condition. One could argue that finding either predicted effects or more significant effects on delayed measures can be seen as support for the construct accessibility model of Higgins and King (1981), since accessible constructs are thought to have a stronger influence on memory and distortion over time. However, this does not explain the reversals at T_1 and in the characterization condition. We now turn to the discussion of a preliminary model of uncertainty and certainty schemata that attempts to explain both the expected and unexpected distortion and deletion effects.

(iii) A Model to Account for the Findings of Study 1: Bipolar Certainty and Uncertainty Schemata and the Distortion and Deletion of Congruent and Incongruent Information

(a) description of the model

According to the model to be presented here, uncertainty- and certainty-oriented individuals differ in their cognitive representations of uncertainty- and certainty-related information. Positive uncertainty-related information is thought to be most accessible for an uncertainty-oriented person, but negative certainty-related information is also thought to be relatively accessible due to dimensional connections (cf. the semantic network and spreading activation research by Collins and Loftus (1975) and Neely (1977)). In contrast, positive certainty-related information is thought to be most accessible for a certainty-oriented person, and negative uncertainty-related information is also relatively accessible due to dimensional connections. These differences in chronically accessible constructs are viewed as arising from past experiences in situations varying in degree of uncertainty as to the outcome.

So far, nothing new has been said about the cognitive representations of certainty- and uncertainty-oriented individuals. The chronic accessibility differences outlined above are precisely those that were thought to lead to memory differences in the present study. However, construct accessibility theory--at least as presently outlined (e.g., Higgins & King, 1981)--is concerned only with the content of cognitive representations. Cognitive representations of a particular domain (e.g., independent-dependent behavior) also have a structural component--which refers to the amount and/or degree of

articulation of stored information in that domain. For example, Markus (1977) views self-schemata as cognitive representations about the self in some behavioral domain that are highly differentiated and well-articulated. The notions of content and structure are both important in the present model of cognitive differences in orientation to certainty or uncertainty, since uncertainty- and certainty-orientation are viewed in terms of bipolar schemata that differ in the degree of differentiation and the nature of the affect associated with the certainty and uncertainty poles. Thus, both structure and content (including related affect) are seen as having implications for the efficiency of processing congruent, incongruent, and irrelevant information. This idea is not new. Markus (1977) and Schroder et al. (1967), among others, have argued for a relation between structure and process, and have provided evidence of this relation. What is new in this model, however, is the explicit integration of schema theory (Markus, 1977) and construct accessibility theory (Higgins & King, 1981; Higgins et al., 1982; Higgins & Rholes, 1978). The present model incorporates Markus' structural notions and views construct accessibility as the mechanism whereby schemata influence the processing of relevant information.

More specifically, relative differences in the degree of differentiation of certainty- and uncertainty-related information in memory are seen as related to the relative accessibility of certainty- and uncertainty-related constructs. Thus, structural differences reflect the relative importance of these two types of information and lead to differences in their relative accessibility. Affect is also a crucial part of this model. Positive affect is

thought to be associated with the more differentiated or more important pole of the certainty-uncertainty dimension, and the constructs in the less differentiated pole are thought to be tagged with negative affect. Due to these connections between the cognitive and affective systems (cf. Zajonc, 1980), then, negative affect is implicated in the processing of incongruent information (i.e., certainty-related information for uncertainty-oriented individuals and uncertainty-related information for certainty-oriented individuals).

In support of this bipolar schema model, there is some evidence that congruent and incongruent information are both processed faster and more efficiently than irrelevant information (e.g., Hastie & Kumar, 1979; Judd & Kulik, 1980; Kuiper, 1981; Smith, 1973). For instance, Kuiper (1981) found that self-ratings of adjectives that were extremely like or unlike the self had shorter latencies than judgments of moderately self-descriptive terms. Thus, both congruent information and incongruent information were processed more efficiently than irrelevant information, which led Kuiper (1981) to suggest that both types of information are cognitively represented in memory (cf. Judd & Kulik, 1980). There is also evidence that incongruent information is sometimes recalled best of all. Hastie and Kumar (1979) found that recall was highest for behaviors incongruent with a personality-trait impression, and that irrelevant or uninformative information was least well recalled. They in fact suggested that either a depth-of-processing model (Craik & Lockhart, 1972) or a schema model could be developed to account for their results.

In schema terms, one can interpret these studies as showing that information that "fits" one's schema or organizing knowledge structure

for making sense out of information (i.e., congruent or incongruent information) is recalled better and processed faster than information that doesn't fit one's schema (i.e., irrelevant information). This has been shown for various types of information and knowledge structures: memory for lists of congruent, incongruent, and neutral personality-related behavioral descriptions as a function of associated trait labels (Hastie & Kumar, 1979); reaction times for "describes me" or "doesn't describe me" responses to trait-adjectives as a function of ratings of their self-descriptiveness (i.e., extremely like, moderately like, and extremely unlike the self) (Kuiper, 1981); and, memory and reaction times for attitude statements as a function of their previously-obtained agreement ratings (i.e., extremely agree, moderately agree, and extremely disagree) (Judd & Kulik, 1980).

The schema model formulated here owes much to the research and theorizing of Hastie and Kumar (1979), Judd and Kulik (1980), and Kuiper (1981). It is a preliminary model that attempts to account for the characterization, distortion, and deletion results for uncertainty orientation as parsimoniously as possible. The reader should keep in mind, however, that this model likely will have to be modified as research in this area progresses.

As previously mentioned, uncertainty- and certainty-oriented individuals are thought to differ in their schemas representing uncertainty- and certainty-related situations, traits, and behaviors. These schemas may in fact be self-schemas reflecting knowledge of one's past behavior in situations involving varying degrees of certainty as to the outcome (cf. Markus, 1977). If this is the case, the uncertainty-oriented individual can be seen as having a knowledge

structure containing a large amount of positive, uncertainty-related information which is self-descriptive and a lesser amount of negative, certainty-related information (and perhaps some negative, uncertainty-related information) which defines what he or she is not like. In contrast, the certainty-oriented individual can be seen as having a schema containing a large amount of positive, certainty-related information (e.g., "I am cautious and careful") and a smaller amount of negative, uncertainty-related information (e.g., "I am not a foolish risk-taker"). This parallels Kuiper's (1981) proposal that self-schemata contain information about what the person is not like as well as what he or she is like. Thus, the self is defined in reference to two poles: "like me" and "not like me". For example, the uncertainty-oriented individual may define himself or herself as being "adventurous" (a positive, uncertainty-related trait) and as "not narrowminded" (a negative, certainty-related trait)--and perhaps as "not indecisive" (a negative, uncertainty-related trait). These self-schemata therefore contain congruent information that is tagged with positive affect (which defines what the person is like in this domain) and incongruent information that is tagged with negative affect (which defines what the person is not like). Thus, this model incorporates both structural and affective notions.

How can this model account for the results for uncertainty orientation? In terms of memory for unambiguous information in the stimulus essay, the expected difference between uncertainty- and certainty-oriented individuals was found in the no characterization condition and a reversal was found in the characterization condition. This was true for memory for both positive descriptions and for

positive and negative descriptions combined, but not for negative descriptions alone. Thus, in the absence of the overt characterization task, subjects showed better memory for positive, congruent information than for positive, incongruent information, as one would expect if they have self-schemas characterized by positively-tagged, congruent traits and phrases. The assumption here is that self-schemata enable schema-consistent information about others to be processed more efficiently (Markus & Smith, 1981) or, more specifically, that accessible constructs defining the self enable related information about others to be better recalled (Higgins & King, 1981). To account for the reversals in the overt characterization condition, we have to posit that something about the act of providing trait-labels for the behavioral descriptions in the overt characterization task made the schema-inconsistent information (i.e., positive incongruent and negative congruent information) more salient or distinctive. These findings are somewhat parallel to Hastie and Kumar's (1979) finding that descriptions that are incongruent with a personality-trait impression are often best recalled after a short delay period. However, in the present case, it is not material that does not fit with one's impression that is best remembered; rather it is material that is inconsistent with one's self-schema.

In terms of distortions, uncertainty-oriented subjects were found to make more relative distortions in the certainty-oriented direction than certainty-oriented subjects at T_1, and more relative distortions in the uncertainty-oriented direction than certainty-oriented subjects at T_2. This pattern was found for positive distortions, negative distortions (marginal), and all distortions

combined. The delayed distortion findings are thought to reflect the processing benefits of bipolar schemata composed of positive, congruent and negative, incongruent constructs and information, since both groups of subjects made more positive distortions of congruent material and more negative distortions of incongruent material. The reversals at T_1 (i.e., more negative distortions of congruent material and more positive distortions of incongruent material) can not simply be attributed to the fact that schema-inconsistent information (i.e., negative congruent and positive incongruent information) is more salient or distinctive when presented alongside schema-consistent material. If this was the case, one would expect only better initial memory for the schema-inconsistent, unambiguous descriptions--not more distortions of the descriptions in a schema-inconsistent manner. Thus, it seems most reasonable to argue that something about subjects' existing cognitive representations of certainty- and uncertainty-related information made schema-inconsistent labels more accessible when initially categorizing the stimulus information. This can perhaps be seen more clearly in subjects' overt characterizations of the evaluatively ambiguous behavioral descriptions. Here subjects tended to apply trait-labels to the descriptions in a schema-inconsistent manner (positive labels to incongruent descriptions and negative labels to congruent descriptions).

In sum, the results at T_2 and in the no characterization condition are entirely consistent with the bipolar self-schemata model proposed here. High and low scorers in uncertainty orientation displayed distortions and deletions of information about another

that fit with the view that they have self-defining knowledge structures containing positively-tagged, congruent information that defines what they are like and negatively-tagged, incongruent information that defines what they are not like (cf. Kuiper, 1981). The most reasonable explanation at present for the reversals seems to be that certainty- and uncertainty-oriented subjects are interpreting the stimulus material with reference to themselves when first exposed to it and when asked to overtly characterize the ambiguous behavioral descriptions. For example, the uncertainty-oriented individual who thinks of himself or herself as adventurous (a positive, uncertainty-related trait) and as not narrowminded (a negative, certainty-related trait) may somehow decide that the stimulus person is "the opposite of me" which leads him/her to make schema-inconsistent distortions and to focus on the schema-inconsistent descriptions. This is not thought to be a conscious judgment, but rather an unconscious activation of, perhaps, a "non-self" knowledge structure that is denotatively and connotatively opposite to the "self" structure representing the certainty-uncertainty domain. For the uncertainty-oriented individual, this "non-self" structure can be seen as containing positive, certainty-related constructs (e.g., cautious) and negative, uncertainty-related constructs (e.g., indecisive). It is too early to speculate why these evaluatively-opposite schemata are activated at T_1 and by the overt characterization task. It cannot simply be that schema-inconsistent descriptions are more salient or distinctive (after Hastie & Kumar, 1979) since this does not account for the schema-inconsistent distortions. Thus, some type of knowledge structure

seems to be playing a role by making schema-inconsistent trait-labels temporarily more accessible. The schema-consistent material is, however, being passively processed at the same time and shows its effects on the delayed measures. Over time, then, bipolar certainty-uncertainty schemata composed of chronically accessible constructs and information reveal their effects on memory and the schema-inconsistent trait labels and information are forgotten.

At this point, the reader should note that subjects are not simply trying to form a coherent impression at T_1 and in the overt characterization condition. If subjects were trying to form a coherent impression, then one would expect that the recalled information would be all in one domain (i.e., certainty-related or uncertainty-related) or all positive or all negative. This was not the case. Subjects recalled positive incongruent information and negative congruent information and made positive distortions and negative distortions of incongruent and congruent information, respectively. Thus, these results cannot be accounted for by impression formation at T_1 that fades over time so that the influence of self-schemata on information processing is then revealed. We turn now to a discussion of a number of findings that support the utility of a bipolar schema model rather than a motivational model in explaining the results of Study 1.

(b) <u>support for the model</u>

There are a number of reasons why a bipolar schema model fits the data better than a motivational model. (Please note that we are talking about a motivational model that holds that motivation has a <u>current</u> influence on subjects' reproductions--it is entirely

plausible that historical motivational differences may have created the schema differences that are seen as directly responsible for the observed effects.) To begin with, the stronger--and predicted--distortion effects that were found on the delayed reproduction measure are most parsimoniously accounted for by the cognitive model proposed here. A proponent of a motivational model would probably have to argue that motivation affects the initial encoding of the stimulus information and that chronic cognitive differences between certainty- and uncertainty-oriented individuals show their effects one week later because it does not seem plausible to account for the delayed reproduction effects in other than cognitive terms.

What about the initial reversals in distortions, then? Can they be accounted for motivationally? This does not seem to be the case because subjects made positive distortions of incongruent descriptions and negative distortions of congruent descriptions at T_1. From a motivational viewpoint, positive distortions of incongruent information would not be expected since subjects should, if anything, be avoiding incongruent information. Similarly, the congruent information should have been positively distorted rather than negatively distorted, according to a motivational viewpoint. As argued previously, the only way to account for the initial distortions and deletions seems to be in terms of a temporarily activated "non-self" knowledge structure or bipolar schema. Finally, a cognitive explanation of the reversals for uncertainty orientation makes most sense because it parallels Hastie and Kumar's (1979) and Kuiper's (1981) cognitive explanations of their data.

In conclusion, a bipolar schemata model of certainty- and uncertainty-related information appears to make most sense of the data. It can account for all of the major findings in Study 1: the stronger and predicted distortion effects at T_2; the reversals on immediate characterizations; and the deletion effects in the characterization and no overt characterization conditions. In addition, the basic propositions of the model regarding the role of affect, the relation between structure and process, the determinants of construct accessibility differences, and the efficiency of processing schema-consistent and schema-inconsistent information are all supported by current research and theory in the area of social cognition.

CHAPTER THREE

INDIVIDUAL DIFFERENCES IN CONSTRUCT ACCESSIBILITY AND ACTIVE VERSUS PASSIVE PROCESSING: A TEST OF TWO COGNITIVE STRUCTURAL APPROACHES TO UNCERTAINTY ORIENTATION

(1) Introduction

This study was essentially an extension of a study by Higgins, King, and Mavin (1982) which examined the effects of individual differences in construct accessibility on person memory and social judgment. "Construct accessibility" refers to the "readiness with which a stored construct is utilized in information processing" (Higgins & King, 1981, p. 71) and the accessibility of a construct is thought to be influenced by such factors as expectations, motivation, recency of activation, frequency of activation, salience, and relation to other accessible constructs (Higgins & King, 1981). In some cases, the influence on a construct's accessibility is momentary (as when recent activation of a construct through "priming" or unobtrusive exposure to a relevant personality trait term increases the accessibility of the associated construct temporarily, as was the case in a study by Higgins et al., 1977). In other cases, the influence on accessibility is prolonged (as when long-term goals result in prolonged increases in accessibility). Furthermore, construct accessibility can be mediated by active, controlled processing or by passive, uncontrolled processing (Higgins & King, 1981). Posner and Warren (Posner & Warren, 1972; Warren, 1972; Posner, 1978) have provided a useful and much needed distinction between active and passive processing. According to these researchers,

active processing involves conscious, deliberate strategies and control, whereas passive processing involves unconscious, automatic processes that are uncontrolled. Posner has proposed three criteria for automatic or passive processing: "the process may occur without intention, without giving rise to conscious awareness, and without producing interference with other ongoing mental activity" (Posner, 1978, p. 91).

In the Higgins et al. (1982) study on the effects of individual construct accessibility, it is important to distinguish between chronic individual differences in construct accessibility, which primarily involve the passive, automatic activation of constructs, and active set, an active process in which conscious attention is deliberately directed toward the expected event (Posner, 1978). In this study, subjects were given individually-tailored essays to read that described various behaviors of a stimulus person. One-half of the behaviors exemplified accessible traits for that subject whereas the remaining descriptions exemplified inaccessible traits. Analyses revealed that whereas subjects, in general, recalled significantly more accessible than inaccessible descriptions in their reproductions of the stimulus information, as expected, no such accessibility effect was found for subjects low in interpersonal differentiation in their use of the stimulus information on an impression measure. Higgins et al. (1982) hypothesized that low differentiation subjects have an active set to form positive impressions of others which overrides the primarily passive effects of chronic individual differences in construct accessibility. Post hoc analyses provided data in support of this notion since low differentiation

subjects were found to form primarily positive impressions of others.

A number of studies in the differentiation literature have indicated that low differentiation or low complexity subjects tend to form univalent impressions of others. For example, Nidorf and Crockett (1965) found that high complexity subjects tended to form integrated impressions of a target person described in conflicting or incongruent terms (i.e., they saw the target as both positive and negative) whereas low complexity subjects tended to form unintegrated or univalent impressions. Vannoy (1965) examined the relations between cognitive complexity and a number of other measures using a factor analytic approach, and found a number of factors, one of which he labelled "black vs. white" categorization. Both intolerance of trait inconsistency and low scores on Bieri's (1955) measure of cognitive complexity were found to load on the same pole of this factor, indicating that there is a relation between low differentiation/complexity and intolerance of trait inconsistency. In conjunction with Nidorf and Crockett's (1965) finding, these results suggest that low differentiation subjects form univalent impressions because they can't tolerate trait inconsistency. Schroder et al. (1967) have similarly stated that a low level of integrative complexity is characterized by an intolerance of ambiguity. If we assume, as do Schroder et al. (1967), that a person who is low in differentiation is also low in integrative complexity, then low differentiation subjects may strive to form evaluatively congruent impressions in order to avoid ambiguity. Rokeach (1960) also presents evidence of evaluative consistency in the impressions of dogmatic (or low differentiation) individuals. Compared to open subjects, closed

subjects were found to express less ambivalence toward their parents and to idolize them more. Thus, according to Rokeach (1960), closed (or low differentiation) individuals are more liable to distortion in memory than are open (or high differentiation) individuals. Finally, Crockett (1965), who views complexity as a function of differentiation and hierarchic organization, has suggested that complex subjects should more often use both positive and negative attributes in their descriptions of others than should low complex subjects. The reason for this, according to Crockett (1965), is that complex subjects have superordinate constructs which provide a rationale for the presence of two qualities of opposite valence in one person's behavior. Thus, there is ample reason to believe that low differentiation subjects do not exhibit an accessibility effect in impressions because they attempt to form a univalent impression of the stimulus person (either because they can not tolerate ambiguity or trait inconsistency, or because they lack higher-order integrating constructs) and so employ predominantly positive or negative traits in their impressions (regardless of whether they are accessible or inaccessible). In fact, Higgins et al. (1982) found evidence of a particular type of univalent bias--a positivity bias--in the impressions of low differentiation subjects.

(a) <u>design</u>

The method of Study 2, discussed in detail shortly, was almost identical to that of the second study conducted by Higgins et al. (1982)--the study mentioned above. The major difference was that the present study attempted to extend the previous findings over time. Approximately one week after completing the reproduction, impression, and attitude measures, subjects were asked to complete these measures

once again. In addition, the following personality measures were obtained for each subject: resultant uncertainty orientation, integrative complexity, self-schemata in the certainty-uncertainty domain, interpersonal differentiation, and differentiation in the certainty-uncertainty domain.

(b) predictions

This study examined the validity of two cognitive structural conceptualizations of uncertainty orientation. It was thought to be an unambiguous test of whether an integrative complexity model or a schema model provided a better basis for a cognitive conceptualization of uncertainty orientation. As mentioned in the introductory section on the interrelations between the variables of interest, it is theoretically impossible for both models to be valid since a certainty-oriented subject can not be both low in integrative complexity and a certainty Schematic. This is because to be a Schematic implies a well-organized and well-articulated cognitive structure (see e.g., Markus, 1977; Markus & Sentis, 1982; Markus & Smith, 1981) whereas to be integratively simple implies just the opposite.

1. Predictions for the impression measure

The predictions associated with a conceptualization of uncertainty orientation in terms of integrative complexity will be considered first. Since integrative complexity and differentiation are closely related variables (Schroder et al., 1967), one would expect subjects low in integrative complexity to function like low differentiation subjects and display a positivity bias--an active set to form a positive impression which overrides the passive accessibility effect. In a pilot study, a correlation of .34 ($p < .003$, $n = 66$) was found

between integrative complexity and differentiation. This correlation supports the notion that integratively complex individuals are high in differentiation whereas integratively simple individuals are low in differentiation.

With regard to hypotheses, a conceptualization of uncertainty orientation in terms of integrative complexity would be supported if: (1) uncertainty-oriented subjects tend to be high scorers in integrative complexity and certainty-oriented subjects tend to be low scorers in integrative complexity (as has been shown in pilot data), and (2) both certainty-oriented and integratively simple subjects display a positivity bias rather than an accessibility effect in their impressions. According to this reconceptualization, then, low levels of cognitive structure are thought to be associated with an affective bias that is mediated by active processing.

A conceptualization in terms of Markus' notion of self-schemata in the domain of certainty-uncertainty does not involve the notion of an affective bias in impressions that is mediated by active processing. Although a number of researchers had discussed the role of affect in self-reference, in particular the view that the self structure contains both a cognitive and an affective system (e.g., Markus & Sentis, 1982; Rogers, 1981), these researchers have been discussing an affective system characterized by passive as opposed to active processing. For example, Markus and Sentis (1982) state that incoming data are automatically processed for self-relevance. In the present study, the term "affective bias" is used to refer to an <u>active</u> process such as set or expectancy. Since no active processing is explicitly involved in a schema viewpoint,

one would expect passive processing (i.e., construct accessibility) to mediate subjects' impressions (cf. Posner, 1978). Although Markus views the information processing consequences of self-schemata as due to the well-articulated and well-differentiated nature of these self-schemata (Markus, 1977; Markus & Sentis, 1982; Markus & Smith, 1981), it also is possible to view the faster processing of self-relevant information, the better ability to retrieve behavioral examples, etc., of Schematics (compared to Aschematics) as due to differences in construct accessibility. Thus, Schematics in a particular behavioral domain can be seen as individuals with accessible constructs in that domain, whereas Aschematics are individuals without accessible constructs in that domain. It follows that a conceptualization of uncertainty orientation in terms of self-schemata would be supported if: (1) uncertainty-oriented subjects are uncertainty Schematics, certainty-oriented subjects are certainty Schematics, and moderates in uncertainty orientation are Aschematics, and (2) subjects high and low in uncertainty orientation, as well as both types of Schematics and the Aschematics, display passive accessibility effects. Thus, according to this conceptualization, there should be no differences between the uncertainty-oriented and certainty-oriented subjects in terms of active versus passive processing.

2. Predictions for the delayed impression measure

For the delayed impression measure, the same passive processing predictions are made for a conceptualization of uncertainty orientation in terms of self-schemata in the certainty-uncertainty domain, but the effects are expected to be stronger. Bartlett (1932)

suggested that the delayed influence of categorization on reproduction and judgment may be greater than the immediate influence, since the actual stimulus information is likely to be forgotten more rapidly than the categorization of the information. A number of studies by Higgins (e.g., Higgins & Rholes, 1978; Higgins et al., 1977; Higgins & King, 1981) have found greater delayed than immediate effects. For example, in the first study by Higgins et al. (1982) there was a much stronger effect of individual differences in construct accessibility on delayed reproductions, although both the immediate and delayed effects were significant. Thus, according to an interpretation in terms of self-schemata, the predicted accessibility effects for both uncertainty-oriented and certainty-oriented subjects should be stronger over time.

With regard to the integrative complexity conceptualization, the predicted accessibility effect for uncertainty-oriented subjects should be stronger on the delayed measure since, as mentioned above, the categorization of information in terms of one's accessible constructs should exert more influence on impressions (and recall) over time (e.g., Bartlett, 1932). However, it is not clear whether the positivity bias predicted for certainty-oriented subjects in impressions will become stronger over time or even remain constant. Although subjects may forget the details of the stimulus information and have to rely on their positive impression of the stimulus person, i.e., their categorization (cf. Bartlett, 1932; Higgins et al., 1977), it is also possible that subjects may tend to discount their positive impression as a biased one and recall the more "objective" information they had not employed previously when forming their

impression (Higgins et al., 1977; Hovland, Lumsdaine, & Sheffield, 1949). For example, Higgins et al. (1977) found evidence that subjects discounted their impressions and recalled more "objective" information, but it should be noted that this only occurred on an immediate impression measure and not on a delayed measure.

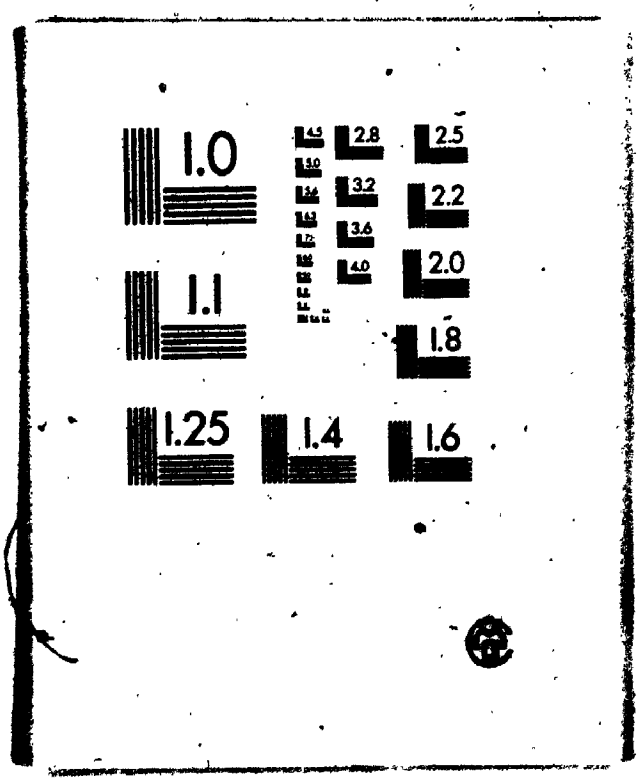
In conclusion, Study 2 examined the relative validity of two cognitive structural conceptualizations of uncertainty orientation, both of which have important implications for the theory of uncertainty orientation. If the model based on Schroder's notion of integrative complexity receives support, then an important processing difference will have been found for subjects high and low in uncertainty orientation. So far, no individual differences in active versus passive processing have been uncovered that were predicted a priori, and so this finding could have a large impact on the field of social cognition. Even if the conceptualization in terms of integrative complexity is not supported, replicating the processing difference for subjects high and low in differentiation will be an important finding. Since there has been little research on individual differences in construct accessibility and on the nature and consequences of uncertainty orientation, the present research should be an important and meaningful contribution because it attempts to integrate these two diverse areas.

3. List of predictions

(1) If the integrative complexity model of uncertainty orientation is correct: (a) There should be a significant correlation between uncertainty orientation and integrative complexity scores.

(b) Certainty-oriented and integratively simple subjects

2



should display weaker accessibility effects in their impressions (i.e., lower relative recall or use of accessible vs. inaccessible descriptions) than should uncertainty-oriented and integratively complex subjects, respectively.

(c) Certainty-oriented and integratively simple subjects should make impressions higher in overall judged positivity than should uncertainty-oriented and integratively complex subjects, respectively.

(2) If the self-schema model of uncertainty orientation is correct: (a) A chi-square analysis should reveal that uncertainty-oriented subjects are uncertainty Schematics, certainty-oriented subjects are certainty Schematics, and moderates in uncertainty orientation are Aschematics.

(b) Subjects high and low in uncertainty orientation, as well as both types of Schematics and the Aschematics, should display accessibility effects in their impressions.

(3) Accessibility effects should be stronger at T_2 than at T_1.

(4) Low differentiation subjects should have weaker accessibility effects in their impressions than should high differentiation subjects.

(5) Low scorers in uncertainty-certainty differentiation should have weaker accessibility effects in their impressions than should high scorers in uncertainty-certainty differentiation.

(2) Method

Ninety-five University of Western Ontario undergraduates participated as subjects in this study. One subject was omitted from the analyses for failing to return for the third session. The study

involved three sessions held one week apart. The sessions lasted one and a half hours, one hour, and one half hour, respectively. Subjects were run in 10 groups of approximately 10 subjects each. Questionnaires and materials used in this study that are without copyrights are included in Appendix I.

Subjects were led to believe that they were participating in two supposedly unrelated studies conducted by two different experimenters. This two unrelated studies paradigm also was used by Higgins et al. (1982). Subjects were told by the first experimenter (a male) that his study--ostensibly concerned with the relations among different measures of personality and cognitive style--would involve one session, whereas the second study--ostensibly concerned with psycholinguistics--would involve the other two sessions. The cover story was that the two experimenters were interested in relating the results of the two studies. That is, they were interested in examining the relations between personality and the interpretation of written material (i.e., psycholinguistics), and so they wanted subjects to participate in both studies. The different nature of the tasks reinforced the notion that there were in fact two separate studies and enhanced the credibility of the cover story.

In the initial session, the experimenter first administered two timed tests--the projective measure of "need" for uncertainty, followed by Schroder et al.'s (1967) measure of integrative complexity. Subjects then completed four questionnaires at their own pace, in the following order: (1) a modified form of Zajonc's (1960) measure of interpersonal differentiation, in which subjects were asked to list the traits of various types of persons (a type that they liked,

a type that they disliked, a type that they sought out, a type that they avoided, and a type that they frequently encountered), and which was used to determine subjects' accessible constructs as well as their level of differentiation, (2) a modified form of the Gough-Heilbrun (1965) Adjective Check List (modified to include more uncertainty- and certainty-related adjectives), which was used to determine self-schemata, (3) the Byrne and Lamberth (1971) acquiescence-free measure of authoritarianism, and (4) a measure assessing both subjects' positions on various personality dimensions and the importance of these dimensions to their self-descriptions, after Markus (1977). (See Appendix II for a detailed description of this latter measure and its method of development.)

In the second session, which was run by a second experimenter (a female) and which was ostensibly the beginning of a second, two-session study, subjects were given an individually-tailored, one-page essay to read. Each essay contained 12 descriptions of various behaviors of a stimulus person. Of these 12 descriptions, six exemplified a given subject's accessible constructs in the domain of interpersonal perception, and the other six exemplified inaccessible constructs for that person. A subject's accessible traits were determined on the basis of the traits elicited in the first session using the modified form of Zajonc's (1960) card sorting technique, and an accessible trait was defined as the first characteristic listed by a subject. One accessible trait came from each of the four affect questions in the Zajonc task (like, dislike, seek, and avoid) and two traits came from the frequently encounter question. The inaccessible traits of one subject were selected from

the accessible traits of the other subjects (see Higgins et al., 1982).

After reading their individually-tailored essays, subjects performed a 15-minute, nonverbal, interference task (Raven's Advanced Progressive Matrices), that also was used to obtain a measure of intelligence for each subject. Subjects then completed a reproduction measure, followed by an impression measure and an attitude measure (with the order of the impression and attitude measures counterbalanced across subjects). The reproduction and attitude measures were described in the method for Study 1. The impression measure involved having subjects write down, as fully as they could, the sort of person they thought the target person was.

In the third session, subjects were asked to complete the reproduction, impression, and attitude measures once again. Each subject received the latter two measures in the same order as they were given in the previous session. As a final task, they were given a measure of differentiation in the uncertainty-certainty domain. This measure involved having subjects form an impression of a job applicant from a job interview transcript, and then having them list characteristics of this applicant on a separate sheet of paper (following the procedure used by Zajonc (1960)). The job interview transcript contained statements by the applicant about his/her behavior and job climate preferences that exemplified certainty-related and uncertainty-related personality traits from the Personality Research Form (Jackson, 1974). (The uncertainty-certainty differentiation measure and its method of construction are described in more detail in Appendix III.) Subjects then were thanked for their participation and debriefed.

(i) Content Analysis of Independent Variables

Two independent variables in this study required content analysis --"need" for uncertainty (measured by the TAT) and integrative complexity (measured by the Paragraph Completion Test). The "need" for uncertainty measure used in this study was determined on the basis of the following TAT sentence lead: "A person is sitting, wondering about what may happen ...". One rater scored each subject's story written in response to this sentence lead for the presence of uncertainty imagery. This was done using a scoring system developed by Fredrick and Sorrentino (Note 4). This particular rater had a rho of over .90 with the rankings made by an expert scorer on a number of story sets. A second rater scored 20 randomly-selected protocols to check for scoring reliability. The rank-difference correlation (or rho) between the ranks of the two raters was .88.

One rater also scored all the Paragraph Completion Test protocols according to Schroder et al.'s (1967, Appendix 2) structural scoring system. A second rater also scored the Paragraph Completion Test responses of 10 randomly-selected subjects (a total of 50 ratings). The correlation between the two raters' scores on the mean overall measure of integrative complexity was .82. Thus, each subject's integrative complexity score reflected the average complexity of his/her responses to the five sentence leads in the Paragraph Completion Test.

(ii) Description of Measures

The following variables were independent variables in this study: "need" for uncertainty, uncertainty orientation, integrative

complexity, self-schemata in the certainty-uncertainty domain, differentiation, and uncertainty-certainty differentiation. Thus, all individual difference variables were treated as independent variables whereas the deletion and attitude measures were the dependent variables in this study.

(a) the schema measure

After extensive piloting and a factor analysis of subjects' position ratings on a measure of the importance of various bipolar scales (described in detail in Appendix II), a measure of self-schemata in the certainty-uncertainty domain was computed. This measure is described in detail in Appendix II and will be only briefly described here. Following the procedure for determining schemata originally used by Markus (1977), subjects had been given an "Importance Measure" in which they indicated both where they fell on 10 bipolar scales with certainty-related and uncertainty-related poles, and the importance of each of these dimensions to their self-description. They also had been given a modified form of the Gough-Heilbrun (1965) Adjective Check-List in which they indicated the self-descriptiveness of 10 certainty-related and 10 uncertainty-related words (in a list of 200 words). Based on the results of a factor analysis of subjects' position ratings on the importance measure (see Appendix II), only eight scales in the importance measure were involved in the determination of self-schemata. Also, only the eight adjectives in the check-list that matched the poles of the scales selected by factor analysis were used in the classification procedure.

Subjects were classified as uncertainty Schematic if they had

extreme position ratings (points 1-4 or points 8-11 on an 11-point scale) and extreme importance ratings (points 8-11 on an 11-point scale) on at least two more uncertainty-related scales than certainty-related scales, and if they checked at least two more uncertainty-related adjectives than certainty-related adjectives as self-descriptive. (This criterion of a majority of two scales of one type was decided on a priori as a general rule. A majority of two seemed both reasonable and not overly stringent.) Similarly, subjects were classified as certainty Schematic if they had extreme position ratings and extreme importance ratings on at least two more certainty-related scales than uncertainty-related scales, and if they checked at least two more certainty-related adjectives than uncertainty-related adjectives as self-descriptive. Subjects were classified as Aschematic if they had moderate position ratings (points 5-7 on an 11-point scale) and low importance ratings (points 1-6 on an 11-point scale) on at least three of the eight dimensions, and if they did not check either two more uncertainty-related than certainty-related adjectives or two more certainty-related than uncertainty-related adjectives as self-descriptive.

(b) computation and description of the dependent variables

Each subject's immediate and delayed reproduction of his/her individually-created essay was scored in terms of number of deletions of accessible descriptions and number of deletions of inaccessible descriptions. The same procedure was followed for each subject's immediate and delayed impression of the person described in the stimulus essay. A second rater scored 20 randomly-selected protocols from each of the four sets (immediate reproductions, immediate

impressions, delayed reproductions, and delayed impressions). The correlations between the scores of the two raters were .90, .90, .87, and .81, for the immediate reproductions, delayed reproductions, immediate impressions, and delayed impressions, respectively.

(3) Results

The results pertaining to the predicted relations between uncertainty orientation, self-schemata in the uncertainty-certainty domain, and integrative complexity will be presented first. The deletion results for reproductions and the deletion results for impressions will then be presented for each of the above variables (and for "need" for uncertainty--one component of uncertainty orientation). Reproduction and impression deletions were analyzed using repeated measure analyses of variance, with accessibility (accessible vs. inaccessible descriptions) as a within-subjects factor, extreme groups on a variable (high vs. low) as a between-subjects factor, and time (immediate vs. delayed) as the repeated measure factor. Multivariate repeated meausre analyses of variance (MANOVAs) were performed for each individual difference variable separately in order to examine the effect of using two types of dependent variables (reproduction and impression deletions) on Type 1 error rate. These repeated meausre analyses involved extreme group splits on an independent variable (except in the case of the self-schemata measure) since the focus was on whether the high and low scorers on a variable differ significantly in the strength of their accessibility effects. Auxiliary analyses involving the variables of differentiation and uncertainty-certainty differentiation are presented in a separate section, as are non-predicted findings involving attitudes, overall memory, and relative memory for accessible vs.

inaccessible descriptions.

(i) Predicted Relations Among Variables

Since significant effects tended to be found only for "need" for uncertainty rather than uncertainty orientation, only the findings for the former will be presented in this section. This can be justified on the grounds that Sorrentino et al. (in press) found highly similar results for both variables. A tertile split was performed on "need" for uncertainty scores to form the--unfortunately quite unequal--high (n= 13), moderate (n=20), and low (n=61) "need" for uncertainty subgroups.

(a) "need" for uncertainty and integrative complexity

According to the integrative complexity reconceptualization of uncertainty orientation, one would expect a positive correlation between "need" for uncertainty and integrative complexity scores. No significant correlation was found. However, a marginally significant, tertile groups chi-square was found between these two variables ($\chi^2(4)= 9.04$, $p<.06$). The contingency table on which this chi-square was based is presented in Table 3. Looking at Table 3, one can see evidence of a curvilinear relation between "need" for uncertainty and integrative complexity. High "need" for uncertainty subjects tended to have high scores rather than low scores in integrative complexity. Moderates tended to have low scores rather than moderate scores, and low "need" for uncertainty subjects tended to have moderate rather than low scores in integrative complexity. Thus, high "need" for uncertainty subjects tended to be high in integrative complexity, as expected according to the integrative complexity model, but moderates in "need" for uncertainty

Table 3

Study 2: Contingency Table for High, Moderate, and Low Levels of "Need" for Uncertainty as a Function of Levels of Integrative Complexity (Mean Overall Measure)

"Need" for Uncertainty	Integrative Complexity: High	Moderate	Low	n
High	6 (4.43)[a]*	4 (4.01)	3 (4.56)*	13
Moderate	6 (6.81)	2 (6.17)*	12 (7.02)*	20
Low	20 (20.77)	23 (18.82)*	18 (21.42)*	61
n	32	29	33	94

[a] expected cell frequencies appear in brackets

* cells with largest discrepancies between observed and expected frequencies

tended to be low in integrative complexity, and low "need" subjects tended to be moderate in integrative complexity.

(b) "need" for uncertainty and self-schemata in the certainty-uncertainty domain

According to the self-schemata conceptualization of uncertainty orientation, one would expect high "need" for uncertainty subjects to be uncertainty Schematics, low "need" for uncertainty subjects to be certainty Schematics, and moderate "need" for uncertainty subjects to be Aschematics. A significant chi-square ($\chi^2(4)= 12.47$, $p<.02$) was in fact found between the "need" for uncertainty measure and the schema measure. The contingency table on which this chi-square analysis was based is presented in Table 4. As can be seen in this table, high "need" for uncertainty subjects tended to be uncertainty Schematics, as expected, but moderates in "need" for uncertainty tended to be certainty Schematics, and low "need" for uncertainty subjects tended to be Aschematics.

(ii) Deletion Results for Uncertainty Orientation

A multivariate repeated measure analysis of variance (MANOVA) was performed on reproduction and impression deletions together. This MANOVA employed accessibility (accessible vs. inaccessible descriptions), extreme groups in uncertainty orientation (high vs. low), and time (immediate vs. delayed) as factors. It revealed the following significant effects: a main effect for time (Hotelling's $T^2= 71.69$, $F(2,55)= 35.21$, $p<.00001$), a main effect for accessibility (Hotelling's $T^2= 70.70$, $F(2,55)= 34.72$, $p<.00001$), and a three-way interaction between uncertainty orientation, accessibility, and

Table 4

Study 2: Contingency Table for High, Moderate, and Low Levels of "Need" for Uncertainty as a Function of Levels of Self-Schemata in the Certainty-Uncertainty Domain

"Need" for Uncertainty	Self-Schemata: High	Moderate	Low	n
High	4 (2.33)*	3 (3.50)	0 (1.17)*	7
Moderate	3 (2.67)	1 (4.00)	4 (1.33)*	8
Low	5 (7.00)	14 (10.50)*	2 (3.50)	21
n	12	18	6	36

[a] expected cell frequencies appear in brackets

* cells with largest discrepancies between observed and expected frequencies

time (Hotelling's T^2= 6.43, $F(2,55)$= 3.16, $p<.05$). Thus, significant univariate effects paralleling those above can be considered not to be spurious.

The univariate repeated measure ANOVA on reproduction deletions revealed a main effect for time ($F(1,56)$= 48.55, $p<.00001$). This main effect for time indicated that fewer deletions were made at T_1 (M= 2.89) than at T_2 (M= 3.46). A main effect for accessibility was also found ($F(1,56)$= 27.57, $p<.00001$), which showed that subjects made fewer deletions of accessible descriptions (M= 2.59) than of inaccessible descriptions (M= 3.76). Finally, a significant three-way interaction was found between uncertainty orientation, accessibility, and time on reproduction deletions ($F(1,56)$= 6.27, $p<.02$). According to the integrative complexity conceptualization of uncertainty orientation, one would expect an interaction between uncertainty orientation, accessibility, and time on impressions, but not on reproductions as was the case here. The cell means for this three-way interaction are presented in Table 5. Looking at Table 5, one can see that uncertainty-oriented subjects had weaker accessibility effects on the immediate measure (M= 2.28 for accessible deletions and M= 3.24 for inaccessible deletions; D= .96) than low scorers in uncertainty orientation (M= 2.21 for accessible deletions and M= 3.83 for inaccessible deletions; D= 1.62), whereas low scorers had weaker accessibility effects on the delayed measure (M= 3.14 and M= 4.10 for accessible and inaccessible deletions, respectively; D= .96) than high scorers in uncertainty orientation (M= 2.72 and M= 3.86 for accessible and inaccessible deletions, respectively; D= 1.14). Were these differences significant, however? That is, did uncertainty-

Table 5

Mean Reproduction Deletion Scores in the Uncertainty Orientation X Accessibility X Time Interaction

		Mean Number of Deletions of Accessible Descriptions	Mean Number of Deletions of Inaccessible Descriptions	Difference Between Mean Number of Inaccessible and Accessible Deletions
Immediate Reproductions	Uncertainty-Oriented Subjects (n=29)	2.28	3.24	.96
	Certainty-Oriented Subjects (n=29)	2.21	3.83	1.62
Delayed Reproductions	Uncertainty-Oriented Subjects (n=29)	2.72	3.86	1.14
	Certainty-Oriented Subjects (n=29)	3.14	4.10	.96

oriented subjects display significantly weaker accessibility effects than certainty-oriented subjects at T_1, but significantly stronger accessibility effects at T_2? Since examination of the relative strength of accessibility effects was planned, and since it was predicted that relative differences would be stronger at T_2, comparisons were performed using Dunn's multiple comparison procedure (Kirk, 1968, p. 79). Specialized linear functions of the means for high and low scorers in uncertainty orientation were examined at both T_1 and T_2. These orthogonal comparisons tested the null hypothesis that the difference between the number of accessible and inaccessible deletions for one group of subjects was equal to the difference between number of accessible and inaccessible deletions for the other group. Only the comparison between uncertainty- and certainty-oriented subjects at T_1 was found to be significant ($D = -.66$, $p < .05$ two-tailed). Thus, uncertainty-oriented subjects displayed significantly weaker accessibility effects than certainty-oriented subjects in their immediate reproductions. The reversal at T_2 was nonsignificant.

A repeated measure ANOVA employing extreme groups in uncertainty orientation, accessibility, and time as factors was also performed on impression deletions. This analysis revealed both a main effect for time ($F(1,56) = 15.27$, $p < .0005$), in which fewer deletions were made at T_1 ($M = 4.03$) than at T_2 ($M = 4.48$), and a main effect for accessibility ($F(1,56) = 68.41$, $p < .00001$), which showed that subjects made fewer deletions of accessible descriptions ($M = 3.69$) than of inaccessible descriptions ($M = 4.82$). No significant interaction between uncertainty orientation and accessibility was

found on impressions, although such an interaction had been predicted according to the integrative complexity model of uncertainty orientation.

(iii) Deletion Results for "Need" for Uncertainty

A MANOVA employing extreme groups in "need" for uncertainty, accessibility of descriptions, and time as factors was performed on reproduction and impression deletions together. It revealed the following significant multivariate effects: a main effect for time (Hotelling's T^2= 39.88, $F(2,65)$= 19.64, $p<.00001$), a main effect for accessibility (Hotelling's T^2= 39.61, $F(2,65)$= 19.50, $p<.00001$), a main effect for "need" for uncertainty (Hotelling's T^2= 6.64, $F(2,65)$= 3.27, $p<.05$), and a marginally significant "need" for uncertainty by time interaction (Hotelling's T^2= 4.97, $F(2,65)$= 2.45, $p<.09$).

The univariate repeated measure ANOVA on reproduction deletions revealed all of the above effects. Subjects made more deletions at T_2 (M= 3.65) than at T_1 (M= 2.93), as one would expect ($F(1,66)$= 30.94, $p<.00001$). A strong accessibility effect was also shown ($F(1,66)$= 13.67, $p<.0005$), with subjects making more deletions of inaccessible descriptions (M= 3.77) than of accessible descriptions (M= 2.81). The unexpected main effect for "need" for uncertainty ($F(1,66)$= 6.57, $p<.01$) revealed that high scorers in "need" for uncertainty made fewer deletions (M= 2.83) than the low scorers (M= 3.40). Finally, a significant "need" for uncertainty by time interaction ($F(1,66)$= 4.97, $p<.03$)--marginally significant in the MANOVA--showed that high "need" subjects made fewer deletions on immediate reproductions (M= 2.65) and on delayed reproductions (M=

3.00) than low "need" for uncertainty subjects ($\underline{M}$= 2.99 and $\underline{M}$= 3.80 for immediate and delayed reproductions, respectively). A posteriori comparisons between the two groups at T_1 and T_2, using Scheffe's procedure (Kirk, 1968, p. 90), revealed that the difference between high and low "need" for uncertainty subjects in number of deletions was significant only on the delayed reproduction measure ($\underline{F}(1,66)$= 14.88, $\underline{p}<.05$).

A repeated measure ANOVA employing extreme groups in "need" for uncertainty, accessibility, and time as factors was also performed on impression deletions. Only a main effect for time ($\underline{F}(1,66)$ = 10.69, $\underline{p}<.002$) and a main effect for accessibility were found ($\underline{F}(1,66)$= 39.60, $\underline{p}<.00001$). Subjects made more deletions at T_2 ($\underline{M}$= 4.43) than at T_1 ($\underline{M}$= 4.00), and more deletions of inaccessible descriptions ($\underline{M}$= 4.81) in their impressions than of accessible descriptions ($\underline{M}$= 3.63).

(iv) Deletion Results for Integrative Complexity

As was the case for the other variables of interest, a MANOVA was performed on the reproduction and impression deletions together. This extreme groups in integrative complexity X accessibility X time MANOVA showed a main effect for time (Hotelling's $\underline{T}^2$= 89.38, $\underline{F}(2,57)$= 43.92, $\underline{p}<.00001$), a main effect for accessibility (Hotelling's $\underline{T}^2$= 85.77, $\underline{F}(2,57)$= 42.14, $\underline{p}<.00001$), and an interaction between integrative complexity and accessibility (Hotelling's $\underline{T}^2$= 6.84, $\underline{F}(2,57)$= 3.36, $\underline{p}<.04$).

The univariate repeated measure ANOVA on reproduction deletions showed a main effect for time ($\underline{F}(1,58)$= 53.42, $\underline{p}<.00001$), in which

fewer deletions were made at T_1 (M= 2.84) than at T_2 (M= 3.53), and a main effect for accessibility ($F(1,58)$= 16.58, $p<.0001$), in which subjects made fewer deletions of accessible descriptions (M= 2.72) than of inaccessible descriptions (M= 3.65). No other effects were found on reproductions.

The ANOVA on impression deletions also showed the two main effects for time ($F(1,58)$= 26.02, $p<.00001$) and accessibility ($F(1,58)$= 85.54, $p<.00001$). Subjects made more deletions at T_2 (M= 4.59) than at T_1 (M= 4.01) and they deleted more inaccessible descriptions (M= 4.90) than accessible ones (M= 3.70). According to the integrative complexity structural model proposed here, it was expected that low scorers in integrative complexity would display weaker accessibility effects in their impressions than would high scorers in integrative complexity. This predicted interaction between integrative complexity and accessibility was found ($F(1,58)$= 5.96, $p<.02$). The cell means in this interaction are presented in Table 6. Low integrative complexity subjects showed weaker accessibility effects in this interaction (M= 3.83 for accessible deletions, and M= 4.72 for inaccessible deletions; D= .89) than the highs (M= 3.57 for accessible deletions, and M= 5.08 for inaccessible deletions; D= 1.51). Since this interaction had been predicted, a t-ratio (Kirk, 1968, p. 73) was used to determine whether high scorers in integrative complexity had significantly stronger accessibility effects than low scorers in integrative complexity. This planned orthogonal comparison tested the null hypothesis that the difference between number of accessible and inaccessible deletions for integratively complex subjects was equal to the difference

Table 6

Mean Impression Deletion Scores in the Integrative Complexity X Accessibility Interaction

	Mean Number of Deletions of Accessible Descriptions	Mean Number of Deletions of Inaccessible Descriptions	Difference Between Mean Number of Inaccessible and Accessible Deletions
High Scorers in Integrative Complexity (n=30)	3.57	5.08	1.51
Low Scorers in Integrative Complexity (n=30)	3.83	4.72	.89

between number of accessible and inaccessible deletions for integratively simple subjects. As predicted according to the integrative complexity model, this planned comparison revealed that integratively complex subjects displayed significantly stronger accessibility effects in their impressions than integratively simple subjects ($t(58) = 1.69$, $p < .05$ one-tailed).

(v) Deletion Results for Self-Schemata in the Certainty-Uncertainty Domain

A MANOVA performed on reproduction and impression deletions revealed a main effect for time (Hotelling's $T^2 = 25.18$, $F(2,29) = 12.17$, $p < .0001$), a main effect for accessibility (Hotelling's $T^2 = 22.97$, $F(2,29) = 11.10$, $p < .0005$), and a marginal schema by accessibility interaction (Roy's Largest Root = .23, $p < .07$). We turn now to the univariate ANOVAs.

The repeated measure ANOVA on reproductions employed tertile groups in self-schemata (uncertainty Schematics, Aschematics, and certainty Schematics), time, and accessibility as factor. Significant main effects for time ($F(1,30) = 17.72$, $p < .0002$) and accessibility ($F(1,30) = 12.93$, $p < .001$) indicated that subjects made more deletions at T_2 ($M = 3.62$) than at T_1 ($M = 3.02$), and more inaccessible description deletions ($M = 3.76$) than accessible description deletions ($M = 2.88$), respectively. A marginal schema by accessibility interaction was also found on reproductions ($F(2,30) = 2.58$, $p < .09$). No such interaction had been predicted according to the proposed self-schema model of uncertainty orientation. This interaction showed that the Aschematics tended to have weaker accessibility effects ($M = 3.21$ and

M= 3.71 for accessible and inaccessible deletions, respectively; D= .50) than either the uncertainty Schematics (M= 2.82 and M= 3.55, respectively; D= .73) or the certainty Schematics (M= 2.70 and M= 3.60, respectively; D= .90). No a posteriori comparisons were performed because of the marginal nature of this interaction.

The ANOVA on impressions revealed only a main effect for time ($F(1,39)= 7.84$, $p<.01$) and a main effect for accessibility ($F(1,30)= 21.26$, $p<.0001$). As was the case in all previous analyses, subjects deleted more descriptions in their delayed impressions (M= 4.53) than in their immediate impressions (M= 4.05), and more inaccessible descriptions (M= 4.91) than accessible ones (M= 3.67).

(vi) Auxiliary Analyses Involving the Variables of Differentiation and Uncertainty-Certainty Differentiation

(a) relations between the differentiation measures and the primary variables of interest

1. The differentiation variables and "need" for uncertainty

Relations are presented here with "need" for uncertainty rather than with uncertainty orientation because significant results tended to be found only for "need" for uncertainty. The reader should also note that the measure of interpersonal differentiation was moderately related to the more specific measure of interpersonal differentiation in the uncertainty-certainty domain: a high, positive correlation ($r(93)= .44$, $p<.0001$) was found between the two measures.

As one would expect according to the integrative complexity model of uncertainty orientation, "need" for uncertainty was

correlated (although marginally) with both differentiation ($r(93)$= .16, $p<.06$ one-tailed) and uncertainty-certainty differentiation ($r(93)$= .15, $p<.07$ one-tailed). Thus, higher scores in "need" for uncertainty tended to be associated with more differentiated cognitive structures in the interpersonal domain and the more specific uncertainty-certainty, interpersonal domain. Because these correlations were rather low, however, chi-square analyses were performed in order to see if curvilinear relations existed between the variables. These chi-square analyses revealed that "need" for uncertainty was significantly related, in a curvilinear manner, to both differentiation ($\chi^2(4)$= 11.04, $p<.03$) and uncertainty-certainty differentiation ($\chi^2(4)$= 16.26, $p<.003$). The contingency table for "need" for uncertainty and differentiation is presented in Table 7. Looking at this table, one can see that high "need" for uncertainty individuals tend to be moderate in differentiation more often than expected, that moderates tend to be high in differentiation, and that low "need" for uncertainty individuals tend to be low in differentiation. The contingency table for "need" for uncertainty and uncertainty-certainty differentiation is presented in Table 8. Here, one sees that high "need" for uncertainty subjects tend to be high in uncertainty-certainty differentiation, moderates tend to be low in uncertainty-certainty differentiation, and low "need" for uncertainty subjects tend to be moderate in uncertainty-certainty differentiation more often than expected.

2. The differentiation variables and integrative complexity

Contrary to expectation and a significant correlation ($r(66)$= .34, $p<.003$ one-tailed) found in a pilot study, interpersonal

Table 7

Study 2: Contingency Table for High, Moderate, and Low Levels of "Need" for Uncertainty as a Function of Levels of Interpersonal Differentiation

"Need" for Uncertainty	Differentiation: High	Moderate	Low	n
High	5 (4.56)[a]	7 (3.87)*	1 (4.56)*	13
Moderate	10 (7.02)*	6 (5.96)	4 (7.02)*	20
Low	18 (21.42)*	15 (18.17)*	28 (21.42)*	61
n	33	28	33	94

[a] expected cell frequencies appear in brackets

* cells with largest discrepancies between observed and expected frequencies

Table 8

Study 2: Contingency Table for High, Moderate, and Low Levels of "Need" for Uncertainty as a Function of Levels of Uncertainty-Certainty Differentiation

"Need" for Uncertainty	Uncertainty-Certainty Differentiation: High	Moderate	Low	n
High	7 (3.60)[a]*	5 (4.98)	1 (4.43)*	13
Moderate	4 (5.53)	3 (7.66)*	13 (6.81)*	20
Low	15 (16.87)	28 (23.36)*	18 (20.77)	61
n	26	36	32	94

[a] expected cell frequencies appear in brackets.

* cells with largest discrepancies between observed and expected frequencies

differentiation and the mean overall measure of integrative complexity showed no relation whatsoever ($r(93) = -.002$, n.s.). The uncertainty-certainty differentiation measure showed only a marginal correlation with the measure of integrative complexity ($r(93) = .14$, $p < .09$ one-tailed). Thus, higher integrative complexity scores tended to be related to higher differentiation scores in the uncertainty-certainty domain. Chi-square analyses between the differentiation variables and integrative complexity were not significant.

3. The differentiation variables and self-schemata in the certainty-uncertainty domain

The relations between the differentiation variables and self-schemata in the certainty-uncertainty domain were examined with contingency tables only since the schema measure is a categorical rather than continuous variable. Neither chi-square analysis reached significance.

(b) deletion results for differentiation

A multivariate repeated measure analysis of variance (MANOVA) involving extreme groups in differentiation, accessibility, and time as factors revealed a significant multivariate F for time (Hotelling's $T^2 = 88.32$, $F(2,56) = 43.38$, $p < .00001$), for accessibility (Hotelling's $T^2 = 95.92$, $F(2,56) = 47.12$, $p < .00001$), and for differentiation (Hotelling's $T^2 = 13.65$, $F(2,56) = 6.70$, $p < .005$). Both univariate ANOVAs revealed these three main effects.

The ANOVA on reproduction deletions showed the main effect for time ($F(1,57) = 69.05$, $p < .00001$), in which fewer deletions were made at T_1 ($M = 2.86$) than at T_2 ($M = 3.55$), and the main effect for

accessibility ($F(1,57)= 21.98$, $p<.00001$), in which subjects made more deletions of inaccessible than accessible descriptions ($M=$ 3.75 and $M=$ 2.65, respectively). Of most interest was the obtained main effect for differentiation ($F(1,57)= 13.64$, $p<.0005$) in which high differentiation subjects were found to make fewer deletions ($M=$ 2.90)--or to have better overall memory for interpersonal information--than low differentiation subjects ($M=$ 3.50).

Similarly, the ANOVA on impression deletions revealed a main effect for time ($F(1,57)= 15.96$, $p<.0002$), with more deletions made at T_2 ($M=$ 4.45) than at T_1 ($M=$ 3.99), a main effect for accessibility ($F(1,57)= 95.86$, $p<.00001$), in which more deletions of inaccessible descriptions were made ($M=$ 4.87) than of accessible descriptions, and a main effect for differentiation ($F(1,57)= 4.60$, $p<.04$), in which high differentiation subjects made fewer deletions ($M=$ 4.04) than low differentiation subjects ($M=$ 4.39). On both reproductions and impressions, then, high differentiation subjects displayed better overall memory for and use of interpersonal information than subjects low in differentiation. Higgins et al. (1982) had found a differentiation by accessibility interaction in subjects' impressions and the same had been predicted in the present study. Contrary to prediction, no such interaction was found on either impressions or reproductions in the present study.

(c) deletion results for uncertainty-certainty differentiation

The MANOVA for extreme groups in uncertainty-certainty differentiation showed significant multivariate F's only for time (Hotelling's $T^2= 82.23$, $F(2,49)= 40.29$, $p<.00001$) and accessibility (Hotelling's $T^2= 81.68$, $F(2,49)= 40.02$, $p<.00001$).

For both reproductions and impressions, the univariate ANOVAs revealed a main effect for time ($F(1,50)= 72.35$, $p<.00001$ for reproductions and $F(1,50)= 10.95$, $p<.002$ for impressions) in which more deletions were made at T_2 ($M= 3.57$ and $M= 4.41$ for reproductions and impressions, respectively) than at T_1 ($M= 2.78$ and $M= 3.99$, respectively). Both ANOVAs also revealed main effects for accessibility ($F(1,50)= 48.95$, $p<.00001$ and $F(1,50)= 68.29$, $p<.00001$, respectively), with subjects making more deletions of inaccessible descriptions ($M= 3.91$ and $M= 4.85$, respectively) than of accessible descriptions ($M= 2.43$ and $M= 3.56$, respectively). No other significant effects were found.

(d) deletion results for differentiation X integrative complexity

Since the predicted interaction with accessibility had been found for integrative complexity, but not for differentiation, we wondered whether the differentiation by accessibility interaction found by Higgins et al. (1982) may have been due to the low scorers in both differentiation and integrative complexity--rather than the low scorers in differentiation per se. In other words, we reasoned that differentiation and integrative complexity may have been highly correlated in the study by Higgins et al. (1982)--as they were in a pilot study for the present research--and that the absence of a correlation between the two variables may be underlying the absence of a differentiation by accessibility interaction in impressions in the present study. Accordingly, analyses were performed using extreme groups in differentiation, extreme groups in integrative complexity, accessibility, and time as factors. The MANOVA on reproduction and impression deletions revealed significant

multivariate F's for the same main effects and interactions found to be significant in the analyses for differentiaton and for integrative complexity alone. In addition, however, a significant four-way interaction was found between differentiation, integrative complexity, accessibility, and time (Hotelling's T^2= 8.04, $F(2,38)$= 3.91, $p<.03$). This four-way interaction was found on reproduction deletions ($F(1,39)$= 5.16, $p<.03$)--not impression deletions, as had been expected. The cell means for this interaction are presented in Table 9. Using Dunn's multiple comparison procedure (Kirk, 1968, p. 79), the strength of the accessibility effects for the high-high vs. low-low groups of subjects were examined in order to determine whether there were significant differences between these groups at T_1 and at T_2. Thus, each of these planned comparisons tested the null hypothesis of no difference in the number of inaccessible minus accessible deletions for high differentiation-high integrative complexity subjects compared to low differentiation-low integrative complexity subjects. Only the comparison at T_2 was found to be significant (D= 1.29, $p<.01$). High scorers in both differentiation and integrative complexity therefore displayed stronger accessibility effects on delayed reproductions than low scorers in both differentiation and integrative complexity--who actually recalled more inaccessible descriptions than accessible ones.

(vii) Auxiliary Analyses Involving Relations Between Overall Memory and Memory for Accessible Versus Inaccessible Descriptions

According to the integrative complexity model of uncertainty orientation, low differentiation subjects were expected to have

Table 9

Mean Reproduction Deletion Scores in the Differentiation X Integrative Complexity X Accessibility X Time Interaction

		Mean Number of Deletions of Accessible Descriptions	Mean Number of Deletions of Inaccessible Descriptions	Difference Between Mean Number of Inaccessible and Accessible Deletions
Immediate Reproductions	High Diff.-High Complexity Subjects (n=13)	2.00	2.85	.85
	High Diff.-Low Complexity Subjects (n=10)	1.70	3.20	1.50
	Low Diff.-High Complexity Subjects (n=10)	3.00	3.90	.90
	Low Diff.-Low Complexity Subjects (n=10)	3.10	3.50	.40
Delayed Reproductions	High Diff.-High Complexity Subjects (n=13)	3.00	3.69	.69
	High Diff.-Low Complexity Subjects (n=10)	2.20	4.10	1.90
	Low Diff.-High Complexity Subjects (n=10)	3.30	4.40	1.10
	Low Diff.-Low Complexity Subjects (n=10)	4.20	3.60	-.60

weaker accessibility effects in impressions than high differentiation subjects. Although an interaction between "need" for uncertainty and accessibility on impression deletions wasn't explicitly predicted, such an interaction also would have been expected according to this model. Interactions with accessibility were not found for either variable. However, low differentiation subjects were found to have worse memory than high differentiation subjects, and low scorers in "need" for uncertainty were found to have worse memory than high scorers (particularly at T_2). This led us to wonder whether overall memory was related to relative memory for accessible vs. inaccessible descriptions. In order to make this kind of comparison, two different kinds of scores were calculated. First of all, a relative memory for accessible vs. inaccessible descriptions measure was computed for each subject by subtracting the number of accessible deletions from the number of inaccessible deletions. Higher scores on this measure therefore indicated better relative memory for accessible descriptions (or accessible constructs). Second, straight memory scores were calculated by simply adding together the number of accessible and inaccessible deletions for each subject. Higher scores on this measure therefore indicated more deletions, or worse overall memory.

Looking first at subjects' reproductions of the stimulus essay, the memory measure for delayed reproductions was found to be significantly correlated with the relative accessibility measure for immediate reproductions ($\underline{r}(84)= -.23$, $\underline{p}<.04$ two-tailed), and marginally correlated with the relative accessibility measure for delayed reproductions ($\underline{r}(84)= -.19$, $\underline{p}<.08$ two-tailed). These

negative correlations indicate that fewer deletions on delayed reproductions--or better memory on this measure--was related to stronger accessibility effects on both immediate and delayed reproductions. Since the memory measure was composed of both accessible and inaccessible deletions, one would expect significant correlations with separate measures of accessible and inaccessible deletions, but one would not expect a relation between overall memory and relative memory for accessible versus inaccessible information.

As was the case for delayed reproductions, the memory measure for delayed impressions correlated significantly with the relative accessibility measure for delayed impressions ($r(84) = -.28$, $p < .01$ two-tailed). Thus, higher overall memory in delayed impressions was related to stronger accessibility effects in delayed impressions. In both delayed impressions and delayed reproductions, then, stronger accessibility effects were related to better overall memory. In addition, stronger accessibility effects in immediate reproductions were related to better memory in delayed reproductions.

(viii) Auxiliary Analyses Involving Attitudes

As in Study 1, an attitude change score was calculated for each subject by subtracting his/her immediate attitude score from his/her delayed attitude score (after Higgins et al., 1977). Despite a general constancy in attitudes over time ($M = .44$ for initial attitudes and $M = .44$ for delayed attitudes), a significant negative correlation was found between initial attitude scores and the attitude change scores ($r(91) = -.25$, $p < .02$ two-tailed). A

similar correlation was found in Study 1. Since high scores on both measures reflect more positive attitudes, the negative correlation indicates that positive initial attitudes were associated with negative change over time and vice versa. A significant, positive correlation between delayed attitude scores and attitude change scores ($r(91) = .26$, $p < .01$ two-tailed) also indicated that positive delayed attitudes were associated with positive change over time. Thus, time did not just have a moderating influence on attitudes in this study, as it did in Study 1. Positive initial attitudes became less positive over time, and negative attitude change was related to more negative attitudes at T_2; conversely, negative initial attitudes became more positive over time, and positive attitude change was related to more positive attitudes at T_2. These results indicate both a moderating effect over time and a slight crossover at T_2 (bear in mind, however, that the initial and delayed attitude measures were positively correlated, $r(91) = .87$, $p < .0001$ two-tailed). Of course, one has to be careful in how these effects are interpreted since it is likely that regression effects may have led or contributed to the results.

Since both weaker accessibility effects and positivity biases had been expected in the impressions of subjects low in level of cognitive structure according to the integrative complexity model of uncertainty orientation, the overall relation between attitudes towards Donald and relative accessibility scores was examined. Negative correlations were expected since these would indicate that weaker accessibility effects were associated with more positive attitudes. Contrary to expectation, significant positive correlations

were found between the relative accessibility measure for immediate reproductions and initial attitudes ($r(93) = .21$, $p < .05$ two-tailed). and between the same relative accessibility measure and delayed attitudes ($r(91) = .24$, $p < .02$ two-tailed). Both positive initial attitudes and positive delayed attitudes therefore were associated with stronger accessibility effects in immediate reproductions, and negative attitudes were associated with weaker accessibility effects on this measure.

(4) Discussion of Results Relating to Specific Predictions for Uncertainty Orientation, Integrative Complexity, and Self-Schemata in the Certainty-Uncertainty Domain

This study had a somewhat different focus than Study 1. The first study was concerned with the processing of personality-relevant information (certainty-related and uncertainty-related) that was congruent or incongruent with an individual's general orientation towards certainty or uncertainty whereas the present study was concerned with the effect of individual differences in accessible, interpersonal constructs on memory for trait-related information. The emphasis here was therefore on the role played by cognitive structure rather than content in the processing of accessible vs. inaccessible information. Despite these differences in focus, the two studies lead to similar conclusions regarding the cognitive structural nature of uncertainty orientation. A general processing model that integrates the results of the two studies will be presented at the end of the present chapter. The basic findings of Study 2 are discussed next. As was the case in Study 1, the reader

should note that none of the results to be discussed here were mediated by intelligence since analyses of covariance controlling for the effect of intelligence (measured by Raven's Advanced Progressive Matrices) were not different from the analyses of variance.

(i) Accessibility Effects in Reproductions

According to the integrative complexity model of uncertainty orientation, weaker accessibility effects were expected in the impressions of low scorers--compared to high scorers--in uncertainty orientation and integrative complexity (as well as in differentiation and uncertainty-certainty differentiation). More specifically, low levels of cognitive structure in the interpersonal domain were thought to be related to an active set or bias to view others in a positive manner, which overrode the primarily passive effects of chronic differences in accessibility and resulted in weaker relative use of accessible versus inaccessible information in impressions. As predicted according to this model, low integrative complexity subjects did in fact display significantly weaker accessibility effects in their impressions than did integratively complex subjects ($p < .05$).

However, a number of variables displayed interactions with accessibility on reproductions rather than impressions. A three-way interaction between uncertainty orientation, accessibility, and time on reproduction deletions showed that certainty-oriented subjects had stronger accessibility effects than uncertainty-oriented subjects at T_1, but that uncertainty-oriented subjects had stronger

accessibility effects at T_2 ($p<.02$). A marginal interaction between self-schemata and accessibility ($p<.09$) was also found on reproductions. This interaction showed that Aschematics in the certainty-uncertainty domain tended to have weaker accessibility effects than the certainty and uncertainty Schematics. Finally, an auxiliary analysis exploring the absence of the expected differentiation by accessibility interaction revealed a four-way interaction between differentiation, integrative complexity, accessibility, and time ($p<.03$), in which low differentiation-low integrative complexity subjects displayed significantly weaker accessibility effects than high differentiation-high integrative complexity subjects in delayed reproductions ($p<.01$). Since the integrative complexity model predicted interactions between cognitive structural variables and accessibility only on impressions, and the self-schemata model led us to expect only main effects for accessibility on both reproductions and impressions, the obtained data on reproductions does not fit with either proposed model and leads us to a new interpretation of the effects of cognitive structure in a domain on memory for behavioral instances in that domain. This new interpretation will be discussed in detail after the predictions and results for the two proposed conceptualizations of uncertainty orientation are considered.

(ii) Two Possible Conceptualizations of Uncertainty Orientation

(a) a conceptualization in terms of self-schemata

Two predictions followed from a structural approach to uncertainty orientation in terms of self-schemata. First, for this conceptualiza-

tion to be valid, uncertainty- and certainty-oriented subjects should be uncertainty and certainty Schematics, respectively, and moderates in uncertainty orientation should be Aschematics. A significant relation was found between the schema measure and "need" for uncertainty ($p < .02$), but not between self-schemata and uncertainty orientation. High "need" for uncertainty subjects tended to be uncertainty Schematics, as expected, but the moderates in "need" for uncertainty tended to be certainty Schematics and the low "need" for uncertainty subjects tended to be Aschematics. Thus, the moderate scorers in "need" for uncertainty tended to be certainty Schematics (rather than Aschematics, as had been expected) whereas the low scorers in "need" for uncertainty tended to be Aschematics. At first glance, one might think that this reversal is due to "moderates effects", the tendency for moderate scorers to fall either above high scorers or below low scorers in level of performance or behavior on some other variable (Sorrentino & Short, 1977). However, this explanation is not too likely in this case because of the nature of self-schemata: Uncertainty Schematics, Aschematics, and certainty Schematics do not comprise a behavioral continuum of any sort. It seems more reasonable to account for this reversal by arguing that low scorers in "need" for uncertainty reflect the absence of an uncertainty schema rather than the presence of a certainty schema. If the TAT "need" for uncertainty measure is viewed as a measure of uncertainty construct accessibility, then low scores mean that uncertainty is not an accessible construct. In more general terms, it could be argued that moderates on a <u>bipolar</u> variable are Aschematic in that domain (as in the case of uncertainty

orientation, which is a resultant measure based on "need" for uncertainty and authoritarianism), whereas low scorers on a unipolar variable are Aschematic (as in the case of "need" for uncertainty). This ties in with the view that being Aschematic in a domain indicates that the domain is unimportant. Moderate scores on a bipolar variable can be seen as indicating that neither pole is relevant. However, moderate scores on a unipolar variable can be seen as representing a moderate amount of some trait or behavior, and low scores as indicating the relative unimportance of the same trait or behavior. Markus (1977) has suggested that Aschematics may display the most variable behavior of all, and the view that Aschematics = moderates = the most variable individuals was discussed in Chapter One. It is interesting to note that the schemata domains Markus has investigated are all bipolar in nature (e.g., independence-dependence, masculinity-femininity, fat-thin). One would therefore expect a relation between being Aschematic and being a moderate scorer only on a bipolar dimension.

In line with the argument that low scorers on a unipolar variable are Aschematic, McClelland and Liberman (1949) examined the identification thresholds of success and failure words for high, moderate, and low scorers in need for achievement (a unipolar variable) and concluded that moderate need for achievement individuals were concerned with avoiding failure. They argued that low need for achievement individuals are unconcerned (i.e., Aschematic) with respect to success or failure and that increasing levels of motivation first lead to an avoidance of failure and then to a concentration on success. The parallels with the present argument are obvious.

However, although the argument that low scorers in "need" for uncertainty are Aschematic makes conceptual sense and can account for the pattern of results in the present study, it should be noted that Sorrentino and Short (1977) found "moderates" effects (i.e., inconsistencies in the behavior of the moderates) for the moderates on other presumably unipolar variables, such as need for achievement and need for affiliation. If it is the low scorers on unipolar variables that are Aschematic, then variable behavior would be expected for these subjects and not for the moderates. Thus, the argument presented here is not totally consistent with existing data and needs to be explored further. The questions that need to be resolved concern the nature of these "moderates" effects: Are they due to statistical artifacts resulting from performing tertile splits on a variable or are they psychologically meaningful effects?; Is the unipolar vs. bipolar distinction a meaningful one?; Are moderates effects found for cognitive as well as motivational variables?

In conclusion, there is evidence that high "need" for uncertainty individuals tend to be uncertainty Schematics, as one would expect according to the self-schemata model of cognitive differences in uncertainty orientation. It was suggested that the discrepant results obtained for moderate and low "need" for uncertainty individuals may be best accounted for in terms of a distinction between unipolar and bipolar measures.

The second prediction from a self-schemata conceptualization was that high and low uncertainty orientation subjects and all Schematics and Aschematics should display only accessibility effects

in their impressions. As predicted, only main effects for accessibility were found in impression analyses involving uncertainty orientation, "need" for uncertainty, and schemata as independent variables. All three types of analyses revealed a strong overall accessibility effect on impressions ($p < .0001$). Thus, the impression results for uncertainty orientation, "need" for uncertainty, and self-schemata do support a conceptualization in terms of self-schemata in the certainty-uncertainty domain rather than an integrative complexity interpretation. However, relatively weak accessibility effects were found on reproductions for high scorers in uncertainty orientation (at T_1) and Aschematics (in a marginal analysis). These results were not expected from a schema approach to uncertainty orientation--but neither were they expected according to the integrative complexity model.

(b) a conceptualization in terms of integrative complexity

Two predictions were also made from the point of view of a conceptualization in terms of integrative complexity. First, a significant correlation was expected between complexity and uncertainty orientation. A significant correlation was not found between uncertainty orientation and integrative complexity ($r(93) = -.01$, n.s.) although a significant correlation had been found in a pilot study ($r(130) = .26$, $p < .001$ one-tailed). However, a marginal curvilinear relation ($p < .06$) was found between "need" for uncertainty and integrative complexity in a chi-square analysis. High "need" for uncertainty subjects tended to be high in integrative complexity, moderates tended to be low in complexity, and low "need" for uncertainty subjects tended to be moderate in complexity. Thus, the moderates in "need" for uncertainty were lower than the lows in integrative

complexity. It is possible that this reversal was due to the moderates phenomenon (Sorrentino & Short, 1977). At any rate, even though the above relation wasn't linear, high "need" for uncertainty individuals were high in integrative complexity, as predicted. The identical pattern to that given above was also found in a chi-square analysis between "need" for uncertainty and differentiation in the certainty-uncertainty domain ($p < .003$).

Contrary to prediction and to a significant correlation found in a pilot study ($r(65) = .34$, $p < .003$), differentiation and integrative complexity were not found to be related. However, the differentiation measure was found to be related to "need" for uncertainty, as expected ($p < .03$). A contingency table revealed a curvilinear relation, but not the same as had been found with both integrative complexity and uncertainty-certainty differentiation. Low "need" for uncertainty individuals tended to be low in differentiation, the moderates tended to be high in differentiation, and the highs tended to be moderates in differentiation. Once again, the relation between the measure of uncertainty orientation and the differentiation measure failed to reach significance.

In summary, high "need" for uncertainty was related to high integrative complexity and high scores in uncertainty-certainty differentiation, both of which were expected from a cognitive structural approach to uncertainty orientation in terms of integrative complexity. Also, high "need" for uncertainty subjects tended to be higher in differentiation (they tended to be moderates) than low "need" for uncertainty subjects. Thus, there is some suggestive, but inconclusive evidence, that high "need" for uncertainty subjects

are higher in level of cognitive structure in the interpersonal domain than are low "need" for uncertainty subjects.

The second prediction from the point of view of an integrative complexity conceptualization was that both certainty-oriented and integratively simple subjects (as well as low differentiation and low uncertainty-certainty differentiation subjects) would display weak accessibility effects and positivity biases in their impressions. As predicted, integratively simple subjects had weaker accessibility effects than integratively complex subjects on the impression measure ($p < .02$). However, no interaction with accessible vs. inaccessible deletions was found for uncertainty orientation in impressions, although such an effect had been found in reproductions. The relatively weak accessibility effects for low integrative complexity subjects were not further examined to determine whether or not these individuals also displayed a positivity bias. This was because the relatively weak accessibility effects found for some subject groups on reproductions, but not on impressions, indicated that an encoding bias or active set to form consistent impressions was not what was underlying the relatively weak accessibility effects. In addition, positive attitudes were associated with uncertainty-oriented distortion in Study 1 (i.e., both positive immediate and delayed attitudes were related to uncertainty-oriented distortions, $p < .02$ and $p < .05$, respectively), and also were related to stronger accessibility effects in immediate reproductions in the present study ($p < .05$ for initial attitudes and $p < .02$ for delayed attitudes). Both of these findings are contrary to the prediction that certainty-oriented individuals have a positivity bias in their impressions of others.

(c) conclusions regarding the relative utility and validity of the two proposed structural approaches to uncertainty orientation

Before discussing the relative merits of the two different cognitive structural approaches, an important caveat for the conclusions should be made. First, significant relations with the structural variables were found for "need" for uncertainty but not for uncertainty orientation. One might wonder why significant relations were not found for the more complex measure. The answer may have something to do with the method used to determine resultant uncertainty orientation scores. Uncertainty-oriented subjects are those with high scores on "need" for uncertainty and low scores in authoritarianism whereas certainty-oriented subjects are those with low scores on "need" for uncertainty and high scores in authoritarianism. If higher scores in both "need" for uncertainty and authoritarianism are related to more differentiated and well-articulated cognitive structures, as the schema model might lead one to suggest, then high scores on one variable and low scores on the other might, in effect, "cancel" each other out and result in no significant differences between uncertainty- and certainty-oriented subjects on the cognitive structural measures. However, one would still expect to find differences between uncertainty- and certainty-oriented subjects on the non-structural recall and distortion measures used in Study 1, as was the case.

The evidence in support of the self-schema and integrative complexity conceptualizations has already been reviewed. Basically, both models received support from the data. High "need" for uncertainty subjects tended to be uncertainty Schematics (as one would expect according to the self-schema model) and to be higher than low scorers in "need" for uncertainty--although not significantly so--on three

different measures of degree of cognitive structure in interpersonal perception (as one would expect according to the integrative complexity model). The results involving the processing of accessible versus inaccessible interpersonal information are perhaps more supportive of the integrative complexity model since integratively simple subjects displayed weaker accessibility effects in impressions than integratively complex subjects, as predicted. However, several variables showed differential memory for accessible versus inaccessible descriptions in the recall of the stimulus information. These interactions were not predicted from the viewpoint of either model. Consequently, a new model will be proposed here in order to account for these reproduction effects. This model provides a new explanation for the observed relations between cognitive structure and memory for accessible versus inaccessible information that bypasses the notion of an active set to form positive impressions. According to this explanation, low levels of structure in a domain are directly related to relatively weak memory for accessible information in that domain, and to relatively poor overall memory as well. Structurally-speaking, the model is a schema model that amalgamates elements from both initially-proposed models. For instance, it will be proposed that certainty-oriented and uncertainty-oriented subjects have schema-like cognitive representations of certainty- and uncertainty-related traits, behaviors, and information that are well-differentiated, but that the schemas of uncertainty-oriented individuals are more highly differentiated and well-articulated than those of certainty-oriented individuals.

At this point, the reader might well ask how the results could

support both viewpoints when the study was thought to provide a critical test. It was argued that, on theoretical grounds, certainty-oriented individuals could not be both certainty Schematics and low in integrative complexity or differentiation because to be Schematic implies that one possesses a highly differentiated cognitive structure. In the present study, however, there was no evidence to support the view that Schematics have more differentiated cognitive representations than the Aschematics--no significant relations were found between the self-schema measure and the two differentiation measures. In retrospect, this may have been because the self-schema measure reflects "cognitive generalizations about the self ... that organize and guide the processing of self-related information" (Markus, 1977, p. 64) whereas both differentiation measures tap degree of detail in the perception of others.

(iii) A General Information Processing Model: A Cognitive Structural Model of Accessibility Differences for Interpersonal Information

(a) overview of model

This model attempts to explain the observed relations between uncertainty orientation, cognitive structure, accessibility, memory, and attitudes in the two studies, but particularly in Study 2. It is primarily a cognitive structural model that integrates the schema and integrative complexity approaches towards uncertainty orientation, but the content of cognitive representations is also of importance in this model. For example, the bipolar model of certainty-uncertainty schemata that was presented previously can be seen as one part of this more general processing model. It focused

on the observed relations between uncertainty- vs. certainty-orientation and the relative accessibility of schema-consistent vs. schema-inconsistent information, and it proposed relations with degree of structure and affect to account for these findings. The content and organization of the cognitive representations of certainty- and uncertainty-oriented individuals were therefore the focus of this bipolar schema model. The present model provides evidence of direct links between personality (one's orientation to certainty or uncertainty) and degree of cognitive structure, and extends the scope of concern to the strength of the influence of chronic differences in accessible, interpersonal constructs on memory.

The model holds that uncertainty orientation, cognitive structure, accessibility, memory, and attitudes are related to one another in a multifaceted manner. One's orientation to certainty or uncertainty and the structural representation of these domains are thought to be the causal factors. Thus, personality and related structural differences are thought to give rise to the observed differences in accessibility, memory, and attitudes. More specifically, uncertainty orientation and more differentiated cognitive structures representing the interpersonal domain (which are thought to be related) are viewed as leading to the greater accessibility of accessible information in that domain (i.e., stronger accessibility effects), better general memory for information in that domain, and positive attitudes towards others. The evidence for each of these specific relations will be presented next.

(b) evidence for the proposed relations

1. "Need" for uncertainty and cognitive structure

There was some suggestive but inconclusive evidence that high "need" for uncertainty individuals have more differentiated cognitive structures in both the uncertainty-certainty, interpersonal domain and the more global interpersonal domain than do low "need" for uncertainty individuals. For instance, they tended to be higher in integrative complexity in the social domain, interpersonal differentiation, and differentiation in the uncertainty-certainty domain. In addition, they tended to be uncertainty Schematics whereas low "need" for uncertainty individuals tended to be Aschematics. All of the above effects were found in chi-squares that included the moderates, however, and so one can not conclude that high "need" for uncertainty individuals were significantly higher in degree of cognitive structure than the lows. Also suggestive, but inconclusive, were marginal, positive correlations between "need" for uncertainty scores and the two differentiation measures ($p < .06$ and $p < .07$ for differentiation and uncertainty-certainty differentiation, respectively). Thus, there was a large amount of suggestive evidence indicating that a focus on uncertainty tends to be related to a larger and more well-articulated store of interpersonal information in memory.

2. Orientation, cognitive structure, and accessibility effects

Low levels of cognitive structure were related to weaker relative memory for accessible versus inaccessible behavioral descriptions about another than were high levels of cognitive structure. For instance, integratively simple individuals displayed significantly weaker accessibility effects in their impressions than integratively

complex individuals. Aschematics tended to display weaker accessibility effects in reproductions of the stimulus essays than either uncertainty or certainty Schematics (in a marginal analysis, however). An auxiliary analysis revealed that low differentiation-low integrative complexity individuals had significantly weaker accessibility effects in delayed reproductions than high differentiation-high integrative complexity individuals. In all of these cases, then, low levels of cognitive structure were related to worse relative memory for behavioral descriptions supposedly exemplifying "accessible" traits. In addition, a significant interaction between uncertainty orientation, accessibility, and time revealed that certainty-oriented subjects tended to have weaker accessibility effects than uncertainty-oriented subjects on delayed reproductions (a nonsignificant difference, however), whereas uncertainty-oriented subjects had significantly weaker accessibility effects than certainty-oriented subjects in immediate reproductions.

Why do the expected effects occur on delayed reproductions, and, most important of all, why do some variables display interactions with accessibility on reproductions but not impressions, and others on impressions but not reproductions? The answer probably lies in the nature of the variables producing the effects. That is, the differentiation variables affect only reproductions because they can be seen as memory measures that reflect the wealth or amount of stored information, whereas integrative complexity affects only impressions because it is a measure of differentiation in impressions. (In this regard, it should be noted that "The Impression Formation Test" is an alternate measure of integrative complexity in

the interpersonal domain.) However, what about the weaker accessibility effects on the impression measure for low differentiation subjects in the study by Higgins et al. (1982)? In answer to this, it is possible that this finding was mediated by a relation between differentiation and integrative complexity. In other words, a third variable (integrative complexity) may have caused the observed weaker accessibility effect in impressions for low differentiation subjects in the study by Higgins et al. (1982).

The above explanation can account for the locus of the accessibility interactions with certain variables, but it does not explain why low levels of cognitive structure were generally related to weaker accessibility effects in the interpersonal domain than were high levels of cognitive structure. The most parsimonious explanation is that a person's level of structure in a domain reflects the importance of that domain to him/her and is related to the relative accessibility or importance of his/her accessible constructs compared to those of others. Thus, the "accessible" constructs of an individual high in differentiation are seen as more accessible or important to that individual than the "accessible" constructs of a person low in differentiation are to that type of individual. In support of such a functional viewpoint, Markus (1977), Bieri (1955), and Crockett (1965), among others, have suggested that frequently met and functionally important domains tend to be more differentiated than less important domains. When a particular domain is important to an individual, then, he/she will have developed a well-differentiated

and well-articulated cognitive representation or schema of events and behaviors comprising that domain and the constructs exemplifying that structural representation can be seen as very accessible or salient--relatively more accessible to that individual than the accessible constructs exemplifying a less well-differentiated representation are to the individual with this type of representation. This is essentially a restatement of the self-schemata position, with two important differences. First, the present results implicate construct accessibility as the mechanism by which schemata influence information processing. According to Rogers (1981), the mechanisms responsible for the influence of the self on encoding have yet to be identified or modeled. It appears that accessibility may play an important role here. Second, the cognitive structures in the present research were of two types: self-schemata and structural representations of others. Therefore, one could argue that this research reveals general processing principles that encompass both self-perception and the perception of others. The important questions are, of course, the extent to which accessible constructs are self-relevant, and the extent to which structural representations of others overlap with the self system.

Does self-relevance or importance per se underlie the stronger accessibility effects of high differentiation subjects? In other words, does degree of interpersonal differentiation reflect a difference in the use of self-relevant terms to describe others? It is possible that high differentiation individuals' accessible constructs for describing others are self-relevant, and this is what leads to stronger accessibility effects for these individuals.

In fact, there is evidence that the same traits are used in self- and other-perception (e.g., Kuiper & Rogers, 1979; Lemon & Warren, 1974; Shrauger & Patterson, 1974) and that personally-relevant traits tend to be listed earlier in free descriptions of other people (Shrauger & Patterson, 1974). Thus, there appears to be good evidence that self-reference is involved in the perception of others. Alternatively, affect (rather than self-relevance or importance per se) may underlie the stronger accessibility effects of high differentiation subjects. For example, Warr, Schroder, and Blackman (1969) found that the first adjective listed by subjects in a free response task was highly related to evaluation for nearly everyone. The most important or accessible constructs in a domain therefore may be affectively-tagged rather than self-relevant. Similarly, Leventhal and Singer (1964) have postulated that more extreme emotional tone increases the strength or salience of constructs. Unfortunately, the present research is unable to distinguish between affect, self-relevance, and importance per se as the means by which certain constructs become relatively more accessible than others.

3. Orientation, cognitive structure, accessibility, and memory

An additional finding of interest in Study 2 was that weaker accessibility effects were related to worse overall memory in both subjects' reproductions and impressions. In both delayed impressions and delayed reproductions, weaker accessibility effects were related to worse overall memory ($p < .01$ and $p < .08$, respectively). In addition, and perhaps of most interest, weaker accessibility effects in immediate reproductions were related to worse overall

memory in recall measured one week later ($p < .04$).

These observed relations between how much one remembers and how much accessible information one remembers help us to account for why high and low scorers in "need" for uncertainty and differentiation showed no differences in relative memory for accessible versus inaccessible information. Low scorers in "need" for uncertainty had worse overall recall than high scorers ($p < .01$) and low differentiation subjects had worse overall recall than high differentiation subjects ($p < .0005$). (A significant interaction between "need" for uncertainty and time ($p < .03$) showed that low "need" for uncertainty individuals had worse recall than the high scorers particularly at T_2, but this interaction was only marginally significant ($p < .09$) in the MANOVA for "need" for uncertainty.) In addition, low differentiation subjects included fewer behavioral descriptions in their impressions than did subjects high in differentiation ($p < .04$). According to the proposed cognitive structural model of accessibility differences in the recall of interpersonal information, relatively weak accessibility effects would have been expected for low "need" for uncertainty and low differentiation subjects--as was the case for low scorers on other measures of cognitive structure. It may be that the low levels of recall for these subjects precluded finding a significant difference in the amount of accessible versus inaccessible information recalled.

Why does the general relation between accessibility effects and memory occur? For both reproductions and impressions, this relation generally occurred at T_2. However, there was some evidence on the reproduction measure that weaker accessibility effects at T_1

were related to poorer memory at T_2. It appears, then, that the strength of the accessibility effect may be determining amount of memory over time. Since construct accessibility helps a person process accessible information more efficiently, it would not be surprising if individuals who displayed stronger accessibility effects also had better overall recall. These individuals would recall as much inaccessible information as others, but they would recall more accessible information as well. Hence, they would have better memory in general as well as better relative memory for accessible information. Alternatively, one might want to argue that the accessibility effect is a bias introduced by the need to be selective due to the wealth of information being processed by high differentiation individuals. In this view, accessibility can be seen as a screening device for memory. Whether accessibility is seen as leading to the memory effects or whether accessibility is seen as a screening device for memory (i.e., the amount being processed leads to both effects), there is intriguing evidence that low level of cognitive structure is related to weak accessibility effects and bad memory, whereas high level of cognitive structure is related to strong accessibility effects and good memory. Thus, it seems that both effects are ultimately due to structural differences in individuals.

Researchers in the area of cognitive complexity also have found memory differences for individuals high and low in complexity. For instance, O'Keefe, Delia, and O'Keefe (1977) and Mahood (1971) both found that high complex subjects used more constructs or attributes in their impressions of others than did low complex subjects.

Crockett (1965) also found that high complex subjects used more constructs in their impressions and therefore made longer descriptions of others than did lows. In light of the fact that the present results did not support an explanation of the weaker accessibility effects of low differentiation subjects in terms of an active bias to form univalent impressions of others--which was suggested by Higgins et al. (1982) after a review of the literature--it is interesting to note that Crockett (1965) states that the finding of univalent impressions for low complex subjects in his study was confounded by the fact that these subjects gave shorter descriptions than the highs since the probability of a bivalent description increases with the number of constructs in the description. Thus, the univalent impressions found for low differentiation subjects in Higgins et al. (1982) may have been due to the fact that these subjects simply tend to use fewer constructs in their impressions because the stimulus domain is not very important to them.

4. Attitudes and accessibility

Attitudes were found to be related to the strength of accessibility effects. Negative immediate and delayed attitudes were related to weaker accessibility effects on immediate reproductions, whereas positive attitudes were related to stronger accessibility effects on this measure ($p < .05$ and $p < .02$ for immediate and delayed attitudes, respectively). Affect was controlled for in determining subjects' accessible constructs and so the association between more positive attitudes and stronger accessibility effects was not due to this type of confound. There are two possible explanations for this relation. First, this relation may have been mediated by

personality variables. A second, not unrelated possibility, is that the relation may have been due to the fact that positive affect, accessible descriptions tend to be particularly well remembered. This was seen in the study by Higgins et al. (1982). If positive, accessible descriptions were particularly well remembered, this might have led to the formation of positive attitudes, and so the fewer positive descriptions recalled, the more negative the person's attitude. In passing, it should be noted that Zajonc's (1980) view that affective judgments tend to be irrevocable is not supported by the general finding that attitudes became less extreme over time. This finding supports the common sense notion that strong likes and dislikes tend to "cool down" when one has not interacted with the liked or disliked other for a period of time but, of course, one can't rule out the effects of regression here.

In conclusion, a cognitive structural model was proposed to account for differences in both relative memory for accessible versus inaccessible information and overall memory. According to this model, the more well-differentiated the interpersonal domain is for an individual, the more likely they will be to recall information about another that is related to the traits or constructs they commonly use to make sense out of the behavior of others, and the better memory they will have for information about that person in general. Conceivably, the same relation would hold for other domains (e.g., self-perception) and for more specific ones (e.g., friendly behavior and dependent behavior).

This model is very similar to Markus' (1977) theory of self-schemata and owes much to her work on how self-schemata influence

the processing of information about others (e.g., Markus & Smith, 1981). There are a number of important differences between her model of self-schemata and the structural model presented here. First, the present model is more global in nature. It refers to the largest possible social domain--that of social behavior--whereas Markus' notion of self-schemata refers to more specific behavioral domains, such as the domain of independent and dependent behavior. In this regard, the uncertainty-certainty domain is seen as being a major subset of the interpersonal domain. Many of the trait labels and categories that we use to make sense out of the behavior of others can be seen as having a component of either certainty or stability (e.g., careful, persistent, boring, compulsive, dependent, orderly) or of uncertainty or change (e.g., adventurous, unpredictable, anxious, independent, achievement-oriented, indecisive). In other words, the uncertainty-certainty dimension can be seen as a fundamental aspect of the way in which we categorize the behaviors of others. Second, the present model is not thought to be a model or cognitive representation of the self based on self-knowledge. The model refers to individual differences in the wealth of stored information about others in general rather than about the self in a particular content domain. Essentially, people are thought to differ in both how much they notice about others as well as in what they notice about others. Some people are highly interpersonally-oriented whereas others pay relatively little attention and process relatively little information about others, perhaps because their processing capacity is occupied by attention to the self. Interpersonally-oriented individuals would therefore have a larger amount of interpersonal

information stored in memory; their cognitive structures representing the behavior of others are therefore more highly differentiated and well-articulated. Individuals alsb differ in the particular content of the behaviors they notice and remember, and this is where the notion of chronic differences in accessible interpersonal constructs or traits comes in. This is a third way in which the present model differs from Markus' notion of self-schemata. Self-schemata lead to processing benefits for schema-relevant information through the influence of structure alone (Markus, 1977). Thus, cognitive structure in a domain and chronically accessible constructs both play a role in the processing of interpersonal information according to the model proposed here. Only when the interpersonal domain is important, as evidenced by a more complex cognitive structure, will an individual's "accessible" constructs be truly accessible (i.e., come easily to mind) and be used to categorize behavior. Thus, the proposed model can be seen as an amalgamation of the construct accessibility and self-schemata approaches.

CHAPTER FOUR

GENERAL CONCLUSIONS REGARDING BOTH INVESTIGATIONS

(1) Summary of the Models

The major aims of this dissertation were to determine whether differences in uncertainty orientation can be conceptualized in terms of differences in the accessibility of certainty- and uncertainty-related constructs (Study 1), and to determine whether a cognitive structural conceptualization of uncertainty orientation in terms of self-schemata or in terms of integrative complexity made most sense (Study 2). The results of Study 1 indicate that differences in uncertainty orientation can be conceived of as differences in the cognitive accessibility of certainty-related and uncertainty-related information. In Study 1, certainty- and uncertainty-oriented individuals displayed differential recall and distortion of behavioral descriptions about another that exemplified certainty- and uncertainty-related traits. For example, in the absence of the overt characterization task, uncertainty-oriented subjects deleted more certainty-related than uncertainty-related, unambiguous descriptions whereas the reverse was true for certainty-oriented subjects. Exactly the opposite pattern of results was found when subjects were asked to provide a one-word label for the ambiguous descriptions (i.e., in the overt characterization condition). Also, uncertainty-oriented subjects made more relative distortions in the uncertainty-oriented direction on a delayed reproduction measure given one week later whereas certainty-oriented subjects made more relative distortions in the certainty-oriented direction

on this measure. Exactly the opposite pattern of results was found at T_1. Over time and when not asked to make overt characterizations, then, certainty- and uncertainty-oriented individuals displayed the expected patterns of distortion and deletion of behavioral information about another in the certainty-uncertainty domain. It was argued that the activation of a "non-self" knowledge structure led to the schema-inconsistent distortions and deletions at T_1 and in the overt characterization condition for these subjects. A model of bipolar certainty and uncertainty schemata was therefore proposed to account for the distortion and deletion of positive and negative, congruent and incongruent information. Since the TAT measure of "need" for uncertainty can be seen as a measure of construct accessibility, it is not surprising that uncertainty orientation differences can be conceived of in terms of differences in accessibility.

In Study 2, "need" for uncertainty was found to be related to various measures of cognitive structure and to differences in overall memory for information about another (not just certainty- and uncertainty-related information) whereas uncertainty orientation was related to differences in relative memory for accessible vs. inaccessible information about another. The results did not unambiguously favor a conceptualization of uncertainty orientation in terms of either integrative complexity or self-schemata in the certainty-uncertainty domain, but high "need" for uncertainty individuals tended to have higher scores on various cognitive structural measures than did low "need" for uncertainty individuals, as the integrative complexity approach would lead one to expect. A cognitive structural

model of accessibility and memory differences for interpersonal information was presented which can be seen as a more general processing model than the one used to explain the distortion and deletion results of Study 1. The bipolar model of uncertainty-certainty schemata is concerned with the organization, in memory, of positively- and negatively-labelled, certainty- and uncertainty-related constructs, and with their influence on the processing of related information, whereas the more general processing model related differences in the degree of articulation of certainty- and uncertainty-related information (i.e., cognitive structural differences) to differences in the processing of interpersonal information in general (of which certainty- and uncertainty-related traits and behaviors are a part).

In sum, the results of both investigations support a conceptualization of uncertainty orientation in cognitive structural terms. In the next two sections, the importance of the models and implications of the findings will be discussed. This will be followed by a discussion of several problems with the present research and suggestions for future studies.

(ii) Importance of the Models

The findings and the models proposed to account for them are important in many ways. First, both models relate process to structure, as does the research by Markus (e.g., Markus, 1977; Markus & Smith, 1981). The first model relates general differences in the accessibility of positive and negative, certainty- and uncertainty-related constructs to differences in self-schemata and

thereby integrates Higgins' accessibility theory with Markus' schemata theory. Construct accessibility is therefore seen as the mechanism underlying the more efficient processing and better memory for schema-relevant information that is found for Schematics (e.g., Markus, 1977).

The more general processing model can be seen as an important extension of previous research relating process to structure in a number of ways. First, it integrates accessibility notions and schemata notions with the large body of research on integrative complexity and cognitive differentiation (as well as the performance research involving uncertainty orientation). Second, it extends the research on schemata by examining and providing evidence for a much more global type of schema than has been previously examined. Third, although specific processing differences were not found for high versus low complex individuals (i.e., one group did not display an entirely different processing strategy than the other), relative differences in the strength of the primarily passive process of accessibiility were found. Thus, structural differences led to differences in the strength of the accessibility effect, as well as to differences in overall memory. There is an obvious parallel here with Markus' research. According to this research (e.g., Markus, 1977), one should not expect the same efficiency in the processing of domain-relevant information for Schematics (individuals for whom the domain is important and who therefore have a large number of constructs representing this domain) and Aschematics (individuals for whom the domain is essentially irrelevant and who therefore have not developed well-articulated

cognitive structures representing this domain). There is an important difference in the present research, however. Markus' research involves schemas and schema-relevant information from the same domain. The present research has shown that self-schemata in the certainty-uncertainty domain, structural variables tapping degree of complexity and differentiation in perceptions of others, and uncertainty orientation (which is concerned with the self and the domain of uncertain and certain events) all show similar differences in the efficiency of processing accessible vs. inaccessible interpersonal information. Thus, it appears that a variable may be either self-relevant or interpersonally-relevant, as well as relevant to either the uncertainty-certainty domain or the interpersonal domain, and yet it still affects the processing of accessible vs. inaccessible interpersonal information. It seems as though a very general relation between structure and process has been shown in the present research, whereas Markus' research deals with a much more specific relation. Therefore, the present research is concerned with both a more global type of schema and a more general structure-process relation than has been examined previously.

In addition to extending past research on the relation between structure and process, the bipolar certainty-uncertainty schema model is important in that it contains both structural and affective notions. Theories of behavior often try to explain various phenomena in primarily cognitive (e.g., Nisbett & Ross, 1980; Schroder et al., 1967; Scott, Osgood, & Peterson, 1979) or affective/motivational terms (e.g., Atkinson & Birch, 1978) but, increasingly, it has been realized that an integration of cognition, affect, and motivation

is necessary for a comprehensive explanation of behavior. The bipolar schema model incorporates the notion of affect since certainty- and uncertainty-oriented individuals are thought to differ in the affective tags associated with certainty- and uncertainty-related constructs. For instance, uncertainty-oriented individuals are viewed as having positively-tagged, uncertainty-related constructs and negatively-tagged, certainty-related constructs. These accessible constructs are seen as having a direct influence on the distortion and recall of interpersonal information. Thus, there is evidence that uncertainty orientation can be viewed in terms of differences in accessible constructs that are organized into schemata. This is not to deny the importance of motivation in the development of these accessibility differences, however. As mentioned previously, motivational differences in uncertainty orientation may have given rise to the observed cognitive differences since motivation is thought to be a determinant of construct accessibility (Higgins & King, 1981). However, motivation is not seen as having a current or direct influence on subjects' memory for information about another. A number of reasons were given for the superiority of a cognitive explanation rather than a motivational explanation for the observed effects.

If motivation is seen as a determinant of construct accessibility; how does a cognitive explanation differ from a motivational one? The main difference appears to be whether cognitions are given a secondary or primary role in determining behavior. Cognitive theorists emphasize the role played by cognitive structures and processes whereas motivational theorists, such as Atkinson and Birch (1978), emphasize

the role played by motivation and view cognitions as secondary phemonema or epiphenomena. The aim of the present research was to see whether uncertainty- and certainty-oriented individuals process information about another in ways indicative of cognitive differences in content and structure. There was strong evidence of cognitive differences being associated with differences in uncertainty orientation. Whether one views these cognitive differences as secondary or primary will depend on one's theoretical orientation. However, there is no denying the importance of the findings in and of themselves. Individuals who differ in uncertainty orientation can have quite disparate recollections about the behavior of another, and their immediate recall can be quite different to their recall one week later.

Finally, the present findings are important in the context of past research on uncertainty orientation. The results complement Sorrentino and Hewitt's (Note 2) finding that uncertainty-oriented subjects are more cognitively attuned to situations involving new information than are certainty-oriented subjects, and can be viewed as support for Sorrentino et al.'s (in press) cognitive conceptualization of uncertainty orientation. According to Sorrentino et al.'s conceptualization, uncertainty- and certainty-oriented individuals differ in the cognitive relevance of certainty and uncertainty. The present research provides more detailed information about the nature of their cognitive representations--at least in the domain of interpersonal perception since Sorrentino et al.'s (in press) research dealt with the influence of uncertainty orientation on performance whereas the focus here was on the perception of others. Despite

these differences in focus, an interesting parallel was found in the performacne and initial perceptions of certainty-oriented individuals. Sorrentino et al. (in press) found that certainty-oriented individuals, who were also failure-threatened, performed best in the most uncertain situation--when the probability of success was .5. In Study 1, certainty-oriented subjects displayed schema-inconsistent distortions at T_1 but schema-consistent distortions at T_2, relative to the distortions made by uncertainty-oriented subjects (who also showed the above pattern). In Study 2, a reversal was also found in immediate recall, with certainty-oriented subjects displaying stronger accessibility effects than uncertainty-oriented subjects. Although the relative measures used in the present research do not permit us to say that the reversals are due to the certainty-oriented subjects alone, these subjects appear to be acting like uncertainty-oriented subjects in all three cases. It is too early to speculate why this might be the case in all three experimental paradigms. However, the possibility that failure-threatened, certainty-oriented individuals find uncertainty-related information to be more cognitively relevant or distinctive than certainty-related information needs to be examined more thoroughly.

(iii) Implications of the Present Research

The present research has important implications for an accessibility vs. self-relevance approach to information processing, and for research on the processing of congruent versus incongruent information (e.g., Hastie & Kumar, 1979; Judd & Kulik, 1980). This research has a number of implications for the self-relevance

vs. accessibility issue. First, it illustrates a general approach that can be taken in future research aimed at resolving this issue. Rather than focusing on differences between self-referent and nonself-referent processing, as research has generally done to date, the structural nature of self-schemata and schemata representing the behaviors of others can be examined to determine general similarities and differences. The present research indicates that there may be a large degree of overlap in the structural complexity of cognitive representations of the self and others. This can be viewed as evidence that the self is involved in the perception of others as a standard of comparison (see e.g., Markus & Sentis, 1982) or, conversely, that the content and processing mechanisms associated with the self structure are not unique. Second, the present research can be seen as an integration of the self-schemata and accessibility models. It provides some support for a self-schemata viewpoint in that degree of structure was found to be important in determining the strength of accessibility effects, but this does not necessarily mean that self-relevance is the crucial feature underlying accessibility effects and there is no reason why an accessibility model cannot incorporate structural differences (as has been done here). Also, in support of the view that the processing effects associated with self-schemata are just one instance of the larger accessibility phenomenon, chronic individual differences in construct accessibility were found to have important and lasting effects on memory for others' behavior and on impressions formed of them. One wonders whether it is necessary to view self-relevance as playing a role in these effects. Perhaps the most interesting finding, however,

was that Aschematics tended to display weaker accessibility effects in recall than uncertainty Schematics and certainty Schematics. Although this finding was only marginal ($p < .09$), it suggests both that structure is important in the processing of accessible versus inaccessible information, as self-schemata theory would hold (e.g., Markus, 1977), and that construct accessibility is the mechanism that leads to processing differences for schematics and aschematics, as construct accessibility theory would hold (e.g., Higgins & King, 1981). Of course, the crucial question still remains: Does all processing of social information involve reference to the self? At any rate, the present research highlights the essential compatability of the self-schemata and construct accessibility theories and indicates that an integration of elements from both may be the most fruitful approach to take in future research.

Past research has shown that behavioral descriptions that are incongruent with an initial personality-trait impression are recalled better than congruent and irrelevant information, particularly when the set size of the incongruent information is small relative to the other information (Hastie & Kumar, 1979) and when the incongruent information is highly incongruent (Hastie & Mazur, 1978). Under equal set size, recall of incongruent behaviors is still significantly higher than that for congruent behaviors (Hastie & Kumar, 1979). Hastie (1980a) accounts for these findings in terms of the notion of "event" informativeness: incongruent information is more striking, surprising, and informative and is consequently recalled better. Anderson and Hastie (1978) found these initial recall differences to hold over delays ranging from five minutes to

two weeks in length. This was not the case in Study 1 in the present research since schema-inconsistent distortions and recall were found after a 15-minute retention interval whereas schema-consistent distortions and recall were found after a one week delay. Why was this the case? One could argue that the experimental paradigm in Study 1 is a more complicated situation than the paradigm used by Hastie and Kumar (1979). In Hastie's research (e.g., Hastie, 1980a), subjects' initial impressions are supplied by the experimenter. In the present research, subjects are seen as differing in the nature of their chronically accessible constructs. Thus, their processing of the stimulus information is influenced both by chronic accessible constructs or schemas (that show a delayed effect on recall) and by momentarily accessible constructs or schemas (that show an initial effect on recall). According to Higgins and King (1981), momentary differences in construct accessibility (such as "primed" differences) are capable of temporarily overriding chronic differences. The present findings make sense according to such an analysis. Hastie's research (e.g., Hastie, 1980a, 1980b) is important in that it shows that schema-congruent information is not always remembered better than schema-incongruent information--contrary to a traditional type of schemata theory (e.g., Bartlett, 1932)--due to the importance of context. The present research also reveals the importance of context on immediate memory for information about another, but shows that chronic accessibility differences have important effects on memory one week later. Thus, distinctive information about someone can have strong effects on what one initially notices about them, but this information can be replaced,

over time, by information that fits one's schema, if this schema is naturally-occurring and not situationally-induced. The findings of Study I therefore appear to have important implications for what one remembers about others based on the nature of one's relevant schemas (i.e., whether they are chronically accessible or situationally-induced).

(iv) Problems with the Present Research and Directions for Future Research

Before concluding, a number of criticisms of the present research and a number of directions for subsequent research will be briefly mentioned. One major problem with the present research arises from what can be seen as one of its strengths. Multiple measures tapping self-preference for certainty or novelty and level of cognitive structure were used in order to assess the relations among the various measures and to provide convergent validity for any effects found. What were thought to be parallel measures were, in general, found to be related to one another. However, in a number of instances effects were found using one variable but not another. For example, significant relations were found between "need" for uncertainty and all the cognitive structural measures in Study 2, but no significant relations were found for the measure of uncertainty orientation. Unfortunately, there is no truly adequate way of explaining why one variable shows an effect whereas a second, related variable does not. Every attempt has been made, however, to draw these inconsistencies to the reader's attention and to stress which variable shows which effects, so confusion of the various

measures does not result. Other criticisms of the present research are addressed in the following discussion on directions for future research.

In terms of the results of the first study, the obvious next step would be to directly examine the accessible constructs of certainty- and uncertainty-oriented subjects by means of a Stroop-like procedure (Stroop, 1935). Reaction times in color-naming and later recall of certainty- and uncertainty-related words presented on various-colored backgrounds (where the task is to ignore the word and to name the color of the background as quickly as possible) would provide information about the relative accessibility of certainty- and uncertainty-related constructs. In Study 1, it is assumed that certainty- and uncertainty-oriented individuals have different types of accessible constructs and that these are mediating the observed results. The exact nature of their accessible constructs therefore needs to be directly examined. Hopefully, such an investigation would provide support for the proposed bipolar schemata model of uncertainty- and certainty-orientation. The obvious next step in following up the results of Study 2 would be to further examine the relations between structure, accessibility, memory, and attitudes in the proposed model. In particular, the validity of the structural explanation proposed to account for weak accessibility effects and poor overall memory needs to be examined. Another direction for future research would be to relate the present findings to the research concerned with the effects of uncertainty- vs. certainty-orientation on performance. We have already noted the parallel between Sorrentino et al. 's (in

press) finding that certainty-oriented subjects, who are also failure-threatened, perform best in an uncertain situation (i.e., when the probability of success is .5) and the finding here that certainty-oriented subjects (and uncertainty-oriented subjects) make positive distortions of incongruent information and negative distortions of congruent information (i.e., schema-inconsistent information) when first presented with it. What is it about these variables that leads to this focus on schema-inconsistent information? Are there direct links between schema-generated expectancies and performance, then? Does construct accessibility mediate this relation? All of these questions need to be directly examined in subsequent research.

The importance of individual differences (in uncertainty orientation and in cognitive structure) has been an underlying theme in the present investigations. As expected, individual differences in uncertainty orientation were related to significant differences in the recall and distortion of trait-related information about others. These effects were not confined to certainty- and uncertainty-related behavioral descriptions (Study 1). Significant differences were found in overall memory for trait-related information of all types and in relative memory for information exemplifying a given subject's accessible versus inaccessible traits (Study 2). Given these wide-ranging and important effects, it is felt that researchers in many different areas could benefit by including the cognitive structural variable of uncertainty orientation in their studies. For instance, researchers in the areas of social information processing should take into account the fact that

differences in uncertainty orientation appear to mediate both the strength of accessibility effects and the total amount of interpersonal information recalled. Research in the areas of impression formation and decision-making could also forseeably benefit by taking differences in uncertainty orientation into account. Finally, Sorrentino et al. (in press) have demonstrated the usefulness of this variable in understanding when and why people perform poorly on various achievement tasks.

In conclusion, the present research has indicated that differences in uncertainty orientation can be conceptualized in terms of differences in cognitive structure and the chronic accessibility of constructs. It has extended research on uncertainty orientation to the cognitive realm as well as to the interpersonal domain, whereas previous research has dealt almost exclusively with the effects of uncertainty- and certainty-orientation on performance. Uncertainty- and certainty-orientation have been shown to have strong and important effects on the interpretation and remembrance of certainty- and uncertainty-related information about others, and on the processing and remembrance of interpersonal information in general.

APPENDIX I

EXPERIMENTAL QUESTIONNAIRES AND MATERIALS

Name _____

PLEASE READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY

1. On the following page you will find the description of a type of person. Think of a specific type of person that fits this description. On the page underneath the description list, one below another, the characteristics that you think describe that particular type of person. Put down whatever comes to mind since there is no one list of characteristics that can be considered "correct". Every one of us sees things in a slightly different way. Put down as many characteristics as you feel are necessary to describe the type of person adequately. Work rapidly and read no further until this is done.

2. On the next page you will find a short task to do. After completing this task, go on to the next description of a type of person on the following page. Think about a particular type of person that fits this description and then follow the above procedure once again. Do not refer back to previously-listed characteristics. In all, there are FIVE DESCRIPTIONS OF TYPES OF PERSONS, EACH (EXCEPT FOR THE LAST) FOLLOWED BY A SHORT TASK.

A TYPE OF PERSON THAT YOU DISLIKE

In this task we would like you to add up the number of d's and the number of b's in the following matrix.

Number of d's _____

Number of b's _____

t	a	s	f	t	u	z	r	k	m	z	y	p	r	b	u	v	z	l	s
e	f	z	g	p	q	u	v	t	f	d	e	z	r	q	c	d	e	s	k
b	r	t	z	f	l	q	s	t	z	f	c	d	b	r	m	n	d	k	f
b	q	r	p	o	r	v	i	o	r	i	q	a	n	m	p	t	z	q	j
m	i	a	k	r	b	z	o	c	t	n	l	m	k	s	u	e	c	d	m
t	t	u	n	b	d	a	f	v	q	p	p	m	c	y	c	o	l	i	z
i	s	q	p	l	b	d	b	s	n	l	r	z	y	o	u	t	e	b	d
b	j	t	z	r	r	y	b	g	f	l	q	d	d	q	w	q	s	u	j
m	q	r	o	z	l	e	c	d	t	e	a	d	b	w	f	t	r	e	b
p	t	r	y	s	j	n	e	l	f	a	e	a	q	q	f	t	m	p	z
q	b	s	u	t	n	k	i	e	t	m	r	f	t	b	f	b	d	z	r
f	l	d	r	v	u	l	b	s	c	o	g	w	x	o	t	f	b	r	f
g	i	m	r	o	t	y	d	e	y	t	a	i	y	k	u	j	l	o	c
d	r	v	z	d	q	s	m	g	f	t	o	a	d	c	z	e	t	s	h
l	j	c	z	i	j	i	i	s	t	m	n	y	o	s	c	d	d	b	d
p	x	g	f	u	p	v	w	n	s	e	q	u	o	j	v	c	d	s	d
a	z	i	k	i	z	s	i	f	b	v	k	e	j	i	i	g	g	q	c
i	e	w	g	j	n	f	y	r	z	z	s	z	a	q	h	i	p	j	n
s	c	f	x	i	j	e	d	b	d	r	f	w	t	s	m	n	f	m	n
w	r	g	v	j	u	i	d	b	w	d	b	d	g	j	u	v	x	c	v

....A TYPE OF PERSON THAT YOU LIKE

In this task we would like you to add up the number of i's and the number of j's in the following matrix.

Number of i's _____

Number of j's _____

(the same matrix used previously appeared here)

A TYPE OF PERSON THAT YOU SEEK OUT

In this task we would like you to add up the number of o's and the number of c's in the following matrix.

Number of o's _____

Number of c's _____

(the same matrix used previously appeared here)

A TYPE OF PERSON THAT YOU AVOID

In this task we would like you to add up the number of s's and the number of z's in the following matrix.

Number of s's _____

Number of z's _____

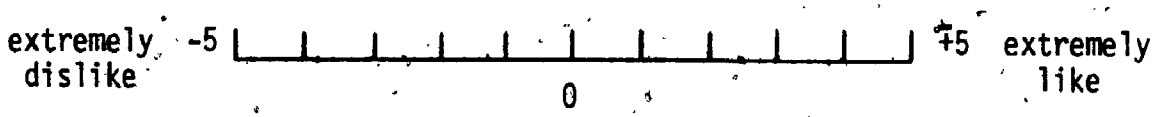
(the same matrix used previously appeared here)

A TYPE OF PERSON THAT YOU FREQUENTLY ENCOUNTER

On this sheet we would like you to reproduce exactly--word for word--the description of Donald.

On this sheet we would like you to write down - as fully as you can - what sort of person you think Donald is.

Circle the appropriate point on the following scale which best reflects how you feel about Donald.



PERSONALITY INVENTORY

Name _____

INSTRUCTIONS

In this booklet we would like you to indicate where you fall on a number of personality dimensions. We would also like you to indicate the importance of each of the personality dimensions to your self-description. Please indicate your judgments by circling the numbers below the scales. Treat each personality scale as a continuum going from one personality trait to a neutral point to the opposite personality trait.

EXAMPLE:

organized _____ disorganized
1 2 (3) 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all _____ very important
1 2 3 4 5 6 7 8 (9) 10 11

This person has circled 3 on the organized-disorganized scale, indicating that he/she is moderately organized. If he/she had circled 9, this would indicate that he/she is moderately disorganized. The two end-points (1 and 11) indicate that the person is extremely organized or extremely disorganized, respectively. Circling the midpoint of the scale (the number 6) would indicate a neutral position on the dimension ((i.e., neither organized nor disorganized, but equal amounts of both).

In the example given, the person has circled 9 on the second scale to indicate that the organized-disorganized dimension is moderately important to his/her self-description. In other words, he/she sees this dimension as a moderately important aspect of his/her personality.

In making your judgments, use your first impressions and do not ponder too long on any one judgment. Be sure not to skip any of the scales.

artistic _____ inartistic
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

flexible _____ persistent
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

excitable _____ calm
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

cautious _____ daring
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

insensitive _____ sensitive
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

nosey — uninquisitive

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

relaxed — tense

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

opinionated — unopinionated

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

adventurous — unadventurous

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

shy — outgoing

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

serious — humorous

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

prefer familiarity — prefer novelty

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

egotistic — altruistic

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

dependent — independent

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

accepting of change — resistant to change

1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important — very important

1 2 3 4 5 6 7 8 9 10 11

competitive _____ cooperative
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

believing _____ skeptical
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

timid _____ reckless
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

thrifty _____ wasteful
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

like uncertainty _____ like certainty
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension to your self-description

not at all important _____ very important
1 2 3 4 5 6 7 8 9 10 11

sociable _____ unsociable
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension
to your self-description

not at all _____ very important
important 1 2 3 4 5 6 7 8 9 10 11

rational _____ emotional
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension
to your self-description

not at all _____ very important
important 1 2 3 4 5 6 7 8 9 10 11

nonrisk-taker _____ risk-taker
1 2 3 4 5 6 7 8 9 10 11

importance of the above dimension
to your self-description

not at all _____ very important
important 1 2 3 4 5 6 7 8 9 10 11

APPENDIX II

CONSTRUCTION AND DESCRIPTION OF THE CERTAINTY-UNCERTAINTY SCHEMA MEASURE USED IN STUDY 2

An initial measure of self-schemata in the certainty-uncertainty domain was developed and examined in a pilot study. This measure involved subjects' position ratings on seven bipolar scales that were highly intercorrelated, that had moderate, mean scale scores (between 4.5 and 7.5 on an 11-point scale), and that had high loadings on four factors revealed by a factor analysis of subjects' position scores (these four factors were interpreted as Tolerant vs. Intolerant, Open to Change vs. Closed to Change, Physical Bravery vs. Cowardice, and Rigid vs. Yielding). Using the above criteria, the following seven scales were chosen: unadventurous-adventurous, resistant to change --accepting of change, prefer familiarity--prefer novelty, brave--not brave, daring-timid, nonrisktaker-risktaker, and cowardly-courageous. Classification of subjects as certainty Schematic, uncertainty Schematic, or Aschematic was then done using their position and importance ratings on these seven scales, as well as their endorsement/nonendorsement of five certainty- or uncertainty-related adjectives (adventurous, courageous, cowardly, daring, and timid) as self-descriptive. This method of classification followed the traditional procedure for determining self-schemata developed by Markus (1977).

In the pilot study (N=66), the above scales and adjectives resulted in a relatively small number of certainty Schematics (n=7) compared to uncertainty Schematics (n=13). This appeared to be due to the fact that the uncertainty-related adjectives and scale poles generally were seen as more socially desirable than the certainty-related ones. Thus, the classification of subjects as uncertainty Schematic seems to have been confounded with social desirability, even though active attempts were made to avoid this occurring.

In Study 2, an attempt was made to rectify this problem. Once again, word pairs were generated that were as equal as possible in frequency of usage and social desirability. The major aim was to find more socially desirable, certainty-oriented adjectives in order to enable more subjects to be classified as certainty Schematics. The following 10 scales were selected for inclusion in the importance measure on the basis of the pilot measure results and the concern with social desirability: accepting of change - resistant to change, prefer novelty - prefer familiarity, risktaker- nonrisktaker, opinionated-unopinionated, timid-reckless, cautious-daring, like certainty - like uncertainty, flexible-persistent, uninquisitive-nosey, and adventurous-unadventurous. The certainty-related and uncertainty-related poles of these scales were inverted in order to control for response biases, and these 10 scales then were randomly presented in a 23-scale "Personality Inventory" in which subjects indicated both where they fell on the 23 personality dimensions, and the importance of each of these dimensions to their self-description (following the procedure used by Markus, 1977). Subjects also were given a modified form of the Gough-Heilbrun Adjective Check-List in which they were asked to place a check mark beside those words that were self-descriptive in a list of 200. Twenty of these words were certainty-related or uncertainty-related words, some of which matched the poles of the 10 bipolar scales in the importance measure.

Once again, a factor analysis was performed on subjects' position ratings on the 10 scales in the importance measure. Four factors had eigenvalues greater than one, and a varimax rotation was performed on these factors. Factor # 1 was interpreted as a Physical Uncertainty

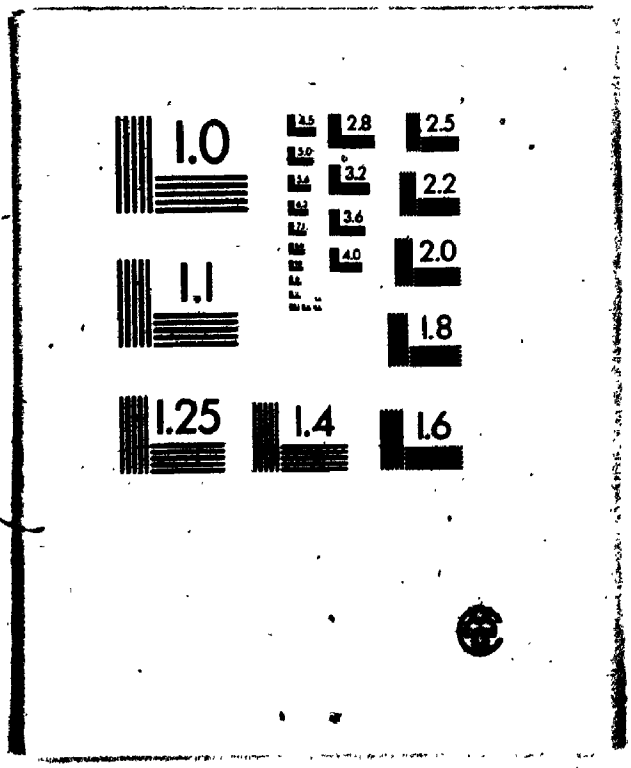
vs. Certainty Orientation Factor and was most similar to the Physical Bravery vs. Cowardice Factor in the pilot data. The following scales had high positive loadings on this factor: cautious-daring (.82), nonrisktaker-risktaker (.82), timid-reckless (.63), and prefer familiarity - prefer novelty (.50). High scores on all of these scales reflect uncertainty-orientation and, with the possible exception of the prefer familiarity - prefer novelty scales, all have to do with physical activity. The adventurous-unadventurous scale had a high negative loading on this factor (-.69), which makes sense since high scores on the scale reflect certainty-orientation in the physical domain (i.e., unadventurousness). Factor # 2 was interpreted as a Preference for Uncertainty vs. Certainty Factor and was most similar to the Open vs. Closed to Change Factor in the pilot data. The positive exemplars were opinionated-unopinionated (.69) and prefer familiarity-prefer novelty (.26), both of which were uncertainty-related. That is, high scores on these scales reflected uncertainty orientation. The like uncertainty - like certainty scale had a very high, negative loading (-.84). Thus, this factor was interpreted as reflecting differences in preferences for uncertainty and certainty. The third factor was an Open vs. Closed to Change Factor. An identical factor was found in the factor analysis of pilot subjects' position ratings. Prefer familiarity - prefer novelty (U-R) had a high, positive loading (.56), whereas accepting of change - resistant to change (C-R) and nosey-uninquisitive (C-R) had negative loadings (-.85 and -.35, respectively). Since the accepting of change - resistant to change scale had the highest loading, this factor was interpreted in terms of openness vs. closedness to change. The fourth factor to emerge from this analysis was essentially

uninterpretable. Certainty-related and uncertainty-related scales (i.e., scales where high scores reflected certainty- or uncertainty-orientation) did not load on opposite poles of this scale. The flexible-persistent (C-R) scale had a very high, negative loading (-.82), and the nosey-uninquisitive (C-R) scale had a high, positive loading (.63). Although one might argue that this factor is an active vs. passive factor, with nosiness and persistence reflecting activity, and uninquisitiveness and flexibility reflecting passivity, it seems to make the most sense to interpret it as a "garbage" factor. In such factors, unrelated items or scales cluster together because, relative to the other clusters of items, they are unrelated. In other words, clustering is relative. As proof that Factor # 4 is a garbage factor made up of two unrelated scales that were even more unrelated to the other scales in the factor analysis, flexible-persistent and nosey-uninquisitive were found to be only slightly correlated (r= -.14). Thus, these two scales made up a fourth factor because they were relatively unrelated to the other eight scales. Accordingly, these two scales were excluded from the measure of self-schemata in the certainty-uncertainty domain.

By way of comparison, the three interpretable factors emerging from this analysis were quite similar to the pilot study factors. The Open vs. Closed to Change and Physical Bravery vs. Cowardice factors showed up again. In fact, the Open vs. Closed to Change factor was broken down into two more refined factors in the present study--the like uncertainty--like certainty and opinionated-unopinionated scales loaded on a Preference for Uncertainty vs. Certainty Factor and the prefer familirity--prefer novelty and accepting of change--resistant

to change scales loaded on an Open vs. Closed to Change Factor. However, there were no Tolerant vs. Intolerant and Rigid vs. Yielding factors since there were not enough scales with the right content to define these factors. The tolerant-intolerant and rigid-yielding scales were not used because of their social desirability bias in the uncertainty-oriented direction. Accepting of change - resistant to change and adventurous-unadventurous were expected to make up a Tolerant vs. Intolerant factor, but were also expected to load on other factors (which they did). Similarly, flexible-persistent and risktaker-nonrisk-taker were expected to make up a Rigid vs. Yielding factor, but this was not the case.

Based on the results of the factor analysis of subjects' position ratings, only eight scales in the importance measure were involved in the determination of self-schemata. Markus' (1977) measure of self-schemata (in the domain of independence-dependence) led to the classification of a subject as an independent Schematic, for example, if he/she checked "independent" as self-descriptive in the Gough-Heilbrun Adjective Check List, rated himself/herself at the extreme end (points 8-11 on an 11-point scale) on at least two of three independence-related scales, and also rated these two dimensions as important (points 8-11 on an 11-point scale). An individual was classified as Aschematic if he/she did not check either "dependent" or "independent" as self-descriptive, rated himself/herself in the middle range (points 5-7) on at least two of the three scales, and fell in the lower portion of the distribution on the importance measure. Since eight scales/dimensions were used to define the more global domain of uncertainty-certainty orientation, a modification of the above procedure



was employed. First, only the eight adjectives (four certainty-related and four uncertainty-related) that matched the poles of scales selected by factor analysis were used in the classification procedure. (These were: cautious, timid, unadventurous, opinionated, daring, reckless, adventurous, and unopinionated.)

Subjects were classified as uncertainty Schematic if they had extreme position ratings (points 1-4 or points 8-11 on an 11-point scale) and extreme importance ratings (points 8-11 on an 11-point scale) on at least two more uncertainty-related scales than certainty-related scales, and if they checked at least two more uncertainty-related adjectives than certainty-related adjectives as self-descriptive. (This criterion of a majority of two scales of one type was decided on a priori as a general rule. A majority of two seemed both reasonable and not overly stringent.) Similarly, subjects were clsssified as certainty Schematic if they had extreme position ratings and extreme importance ratings on at least two more certainty-related scales than uncertainty-related scales, and if they checked at least two more certainty-related adjectives than uncertainty-related adjectives as self-descriptive. Subjects were classified as Aschematic if they had moderate position ratings (points 5-7 on an 11-point scale) and low importance ratings (points 1-6 on an 11-point scale) on at least three of the eight dimensions, and if they did not check either two more uncertainty-related than certainty-related adjectives or two more certainty-related than uncertainty-related adjectives as self-descriptive. The classification procedure described above led to 12 subjects being classified as uncertainty Schematic, 6 as certainty Schematic, and

18 as Aschematic. That is, 36 out of the 94 subjects in this study (or 38.30%) were found to be uncertainty Schematic, certainty Schematic, or Aschematic using this procedure.

APPENDIX III

NATURE AND DESCRIPTION OF THE DIFFERENTIATION MEASURES USED IN STUDY 2

Two different measures of differentiation were employed in Study 2. A modified form of Zajonc's (1960) card sorting technique was used to determine subjects' accessible constructs as well as their degree of interpersonal differentiation. Interpersonal differentiation was determined by adding up the number of constructs a subject listed as characteristic of each of four different types of people (a type of person that they liked, a type of person that they disliked, a type of person that they sought out, and a type of person that they avoided), and then calculating the mean number of characteristics.

The certainty-uncertainty differentiation measure was the second measure used. It was a measure of interpersonal differentiation in the certainty-uncertainty domain, and therefore was a more specific measure of interpersonal differentiation than that provided by the modified card sorting technique. The nature and development of this measure will be described in some detail here since this measure has not been used previously. A measure of differentiation in the domain of certainty and uncertainty was needed in order to provide a fair test of the hypothesis that uncertainty orientation could be reconceptualized in terms of self-schemata in the certainty-uncertainty domain. From Markus' viewpoint (e.g., Markus, 1977; Markus & Smith, 1981), one would expect

both certainty and uncertainty Schematics to be highly differentiated in the certainty-uncertainty domain, but perhaps not in the more general interpersonal domain. Therefore, a more specific measure of interpersonal differentiation was needed. No such measure was found in a review of the differentiation and cognitive complexity literature, but both Streufert and Streufert (1978) and Zajonc (1960) state that, since degree of differentiation reflects the number of attributes constituting a given cognitive structure, then empirical measures of differentiation can be obtained by various methods that analyze subjects' perceptions of a given stimulus in terms of its characteristics (e.g., adjective check lists, rating scales, etc.). In the first experiment reported by Zajonc (1960), subjects were given copies of a job applicant letter, were told to try to get a general idea of what kind of person the applicant was, and then were asked to list characteristics describing the person. Streufert and Streufert (1978) say that any kind of description could be used in this free response procedure.

Accordingly, a job interview transcript was written that contained both uncertainty- and certainty-related information about a job applicant. This transcript was an amalgamation of two scripts, written to exemplify two different job applicant target types (an accountant type and an advertising type), and used in research by Rothstein and Jackson on the relation between personality and job performance (e.g., Rothstein & Jackson, 1980; Rothstein, Note 5). A factor analysis of the 22 Personality Research Form (PRF) scales (Jackson, 1974) with the Strong Vocational Interest Blank (SVIB) scales previously had been performed by Siess and Jackson (1970). Among the seven factors revealed by this analysis was an Impulse Control vs.

Expression Factor, on which loaded several PRF scales and the occupational interest scales for accountant and advertising executive. The accountant type was characterized by positive cognitive structure and order, and negative autonomy, change, and impulsivity. The advertising type was characterized by the opposite personality traits: negative cognitive structure and order, and positive autonomy, change, and impulsivity. Rothstein (Rothstein & Jackson, 1980; Rothstein, Note 5) created a number of self-referent statements for an advertising job applicant and an accountant job applicant from the definitions of the congruent scales of the PRF. Two scripts were written, one for each job applicant target type, in which an interviewer asked several standard questions taken from interview practitioners' manuals. Embedded in the applicant's responses to these questions were the self-referent statements reflecting the relevant personality traits for each target type. Rothstein and Jackson (1980) found that subjects reliably and accurately perceived the personality characteristics exemplified by the self-referent statements.

As previously mentioned, portions of the two scripts were amalgamated for use in the present research. The job applicant therefore described himself in both certainty-related terms (i.e., as high in cognitive structure and order, and low in impulsivity) and uncertainty-related terms (i.e., as high in change and high in autonomy). Thus, insofar as possible, an attempt was made to reduce inconsistency by having the uncertainty- and certainty-related statements refer to different personality domains. The uncertainty- and certainty-related statements (two of each) were presented alternately in the interview transcript, and two orders of the alternating statements were determined

as randomly as possible. Subjects were randomly given one of these two interviews. On the first page of a two page questionnaire, subjects were given the following instructions, which were similar to those used by Zajonc (1960):

> Please read over this transcript of a segment of a job interview and get a general idea of what sort of person the job applicant is. Just try to imagine what kind of individual he is, and what are some of the things which are characteristic of him. But please do not try to memorize the letter - you will not be tested for memory. Just try to get a general picture of what the job applicant is like. Please put this transcript into your envelope when you have finished reading it.

One form of the job interview excerpt printed on the second page of the questionnaire is presented in Table 10. Then, on a separately distributed page, subjects were asked to "list the characteristics that you think describe the job applicant. ... Put down as many characteristics as you feel are necessary to describe the applicant adequately." The number of distinct characteristics (i.e., not synonyms) listed by a subject determined his/her score for degree of differentiation in the certainty-uncertainty domain.

Table 10

One Form of the Job Interview Transcript Used to Measure Certainty-Uncertainty Differentiation in Study 2

Interviewer: ... Okay, now I know why you want to work for our company. But tell me, why do you want to leave the job you have now?

Applicant: Well, I think there are several main reasons. The company I'm working for now is very poorly organized ... the office is always in a state of total confusion and clutter. I guess I find this type of an atmosphere very hard to work in ... it's kind of disorienting.

Interviewer: ... Okay, now tell me a bit more about your personal work habits ... likes, dislikes, idiosyncracies, etc.

Applicant: Well, I actually like a little ambiguity or indefiniteness on the job ... I guess I find it challenging to have to make a decision about something when all the information I need isn't just laid out in front of me. Besides this, well, I'm not the kind of person who, when confronted with a question or problem at work, blurts out the first thing that comes to mind. I prefer to think over a problem pretty carefully before coming up with a solution.

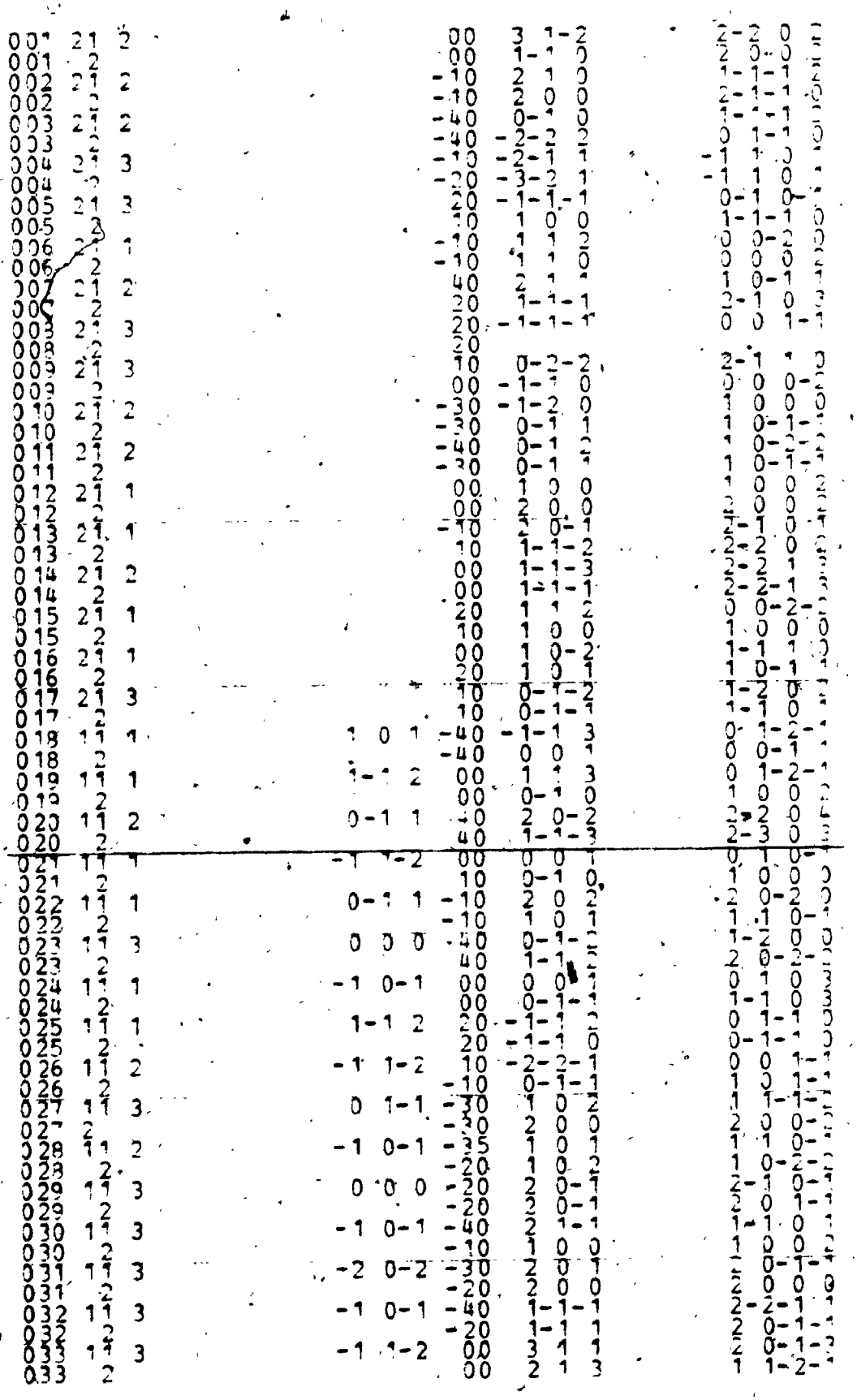
Interviewer: What are some other things that are important for you about a job? What is it about a job that gives you satisfaction?

Applicant: Well, I really don't like to do the same job over and over again ... I prefer a little variety in my work. I tend to adapt quite well to changes and I think this aspect of a job is important to me.

APPENDIX IV

DATA FOR STUDY 1

VARIABLE NAME	COLUMNS	ROW	DESCRIPTION OF LEVELS
characterization condition	5	1	1= overt characterization 2= no overt characterization
time 1	6	1	
time 2	6	2	
resultant uncertainty orientation	8	1	1= uncertainty-oriented 2= moderate 3= certainty-oriented
positive characterizations	20-21	1	
negative characterizations	22-23	1	
overall characterizations	24-25	1	
immediate attitudes	27-29	1	
delayed attitudes	27-29	2	
immediate unambiguous deletions	31-32	1	
delayed unambiguous deletions	31-32	2	
immediate positive deletions	33-34	1	
delayed positive deletions	33-34	2	
immediate overall distortions	35-36	1	
delayed overall distortions	35-36	2	
immediate negative deletions	44-45	1	
delayed negative deletions	44-45	2	
immediate positive distortions	46-47	1	
delayed positive distortions	46-47	2	
immediate negative distortions	48-49	1	
delayed negative distortions	48-49	2	
immediate evaluative distortions	50-51	1	
delayed evaluative distortions	50-51	2	



034	1	1	3	-2	0	-2	10	-1	-1	0	0	0	0	4
034		2					00	0	-1	0	1	0	0	4
035	1	1	2	-2	1	-3	-20	3	1	0	2	-1	-1	-2
035		2					-30	3	1	-2	2	-1	1	0
036	1	1	2	-1	0	-1	-20	-1	-1	1	0	1	0	3
036		2					-10	1	-1	-2	0	2	0	2
037	1	1	2	1	0	1	10	1	0	0	1	0	0	2
037		2					00	0	-1	1	1	0	-1	1
038	1	1	2	0	0	0	-30	-1	-1	1	0	1	0	-1
038		2					-30	-1	-1	0	0	0	0	0
039	1	1	1	0	-1	1	-20	2	0	2	2	0	-2	-2
039		2					-20	2	0	-2	2	-2	0	2
040	1	1	1	0	0	0	-25	1	-1	-3	2	-3	0	3
040		2					00	0	-1	0	1	0	0	0
041	1	1	1	2	-1	3	00	1	0	4	1	2	-2	0
041		2					00	1	0	1	1	1	0	1
042	1	1	3	0	-1	1	-10	3	1	0	2	0	0	2
042		2					-10	2	0	1	2	0	-1	1
043	2	1	2				00	-1	0	1	-1	1	0	1
043		2					00	-1	0	-1	-1	0	1	-1
044	1	1	2	-1	1	-2	00	2	1	4	1	3	-1	2
044		2					00	1	0	0	1	1	1	0
045	1	1	2	0	0	0	25	1	0	-4	1	-3	1	2
045		2					-35	1	-1	-1	2	0	1	-1
046	1	1	2				00	1	0	0	1	0	0	0
046		2					-10	0	-1	0	1	0	0	0
047	1	1	2	0	0	0	-20	2	1	-1	1	-1	0	-1
047		2					00	2	1	-2	1	-1	1	0
048	2	1	1				-10	2	0	-2	2	-2	0	2
048		2					-10	2	0	1	2	1	0	1
049	2	1	3				-05	0	1	0	-1	0	0	2
049		2					-05	1	0	0	1	0	0	0
050	2	1	3				-40	2	0	0	2	0	0	2
050		2					-40	3	1	0	2	0	0	2
051	2	1	1				-20	2	0	-1	2	-1	0	1
051		2					-20	2	0	-1	2	-1	0	1
052	2	1	3				-20	2	1	2	1	1	-1	2
052		2					-20	2	0	1	2	0	-1	-1
053	2	1	2				00	0	-1	1	1	1	0	3
053		2					10	-2	-1	0	-1	0	0	0
054	2	1	1				10	-2	0	2	-2	2	0	2
054	2						00	-2	0	1	-2	1	0	1
055	2	1	3				-20	2	1	-2	1	-2	0	4
055		2					-10	2	0	0	2	0	0	0
056	2	1	1				10	3	1	2	2	1	-1	2
056		2					-10	1	-1	-2	2	-2	0	4
057	2	1	3				-10	2	0	1	2	1	0	1
057		2					-10	2	0	-1	2	-1	0	3
058	2	1	3				00	2	1	2	1	2	0	2
058		2					00	1	1	0	0	1	1	0
059	2	1	3				10	1	0	0	1	0	0	0
059		2					10	-1	-1	-1	0	-1	0	1
060	2	1	3				10	0	0	-1	0	-1	0	1
060		2					10	1	0	-1	1	-1	0	1
061	2	1	2				-40	1	0	3	1	0	-3	-3
061		2					-30	-2	-1	1	-1	0	-1	-1
062	2	1	2				-10	0	-1	-1	1	-1	0	1
062		2					-10	0	-1	1	1	0	-1	-1
063	2	1	3				-40	-1	-1	1	0	0	-1	-1
063		2					-30	0	-1	0	1	0	0	0
064	2	1	2				15	1	0	-1	1	-1	0	1
064		2					15	1	0	1	1	0	-1	-1
065	2	1	2				25	0	-1	-1	1	-1	0	1
065		2					15	1	0	2	1	0	-2	-2
066	2	1	1				30	3	1	-2	2	-2	0	2
066		2					00	[illegible]	1	-2	1	-2	0	2

APPENDIX V

DATA FOR STUDY 2

VARIABLE NAME	COLUMNS	ROWS	DESCRIPTION OF LEVELS
time 1	4	1	
time 2	4	2	
resultant uncertainty orientation	5	1	1= uncertainty-oriented 2= moderate 3= certainty-oriented
"need" for uncertainty	6	1	1= high; 2= moderate; 3= low
self-schemata in the certainty-uncertainty domain	7	1	1= uncertainty Schematic 2= Aschematic 3= certainty Schematic
interpersonal differentiation	8	1	1= high; 2= moderate; 3= low
uncertainty-certainty differentiation	9	1	1= high; 2= moderate; 3= low
integrative complexity (mean overall measure)	10	1	1= high; 2= moderate; 3= low
immediate attitudes	19-21	1	
delayed attitudes	19-21	2	
# deletions of accessible descriptions in immediate reproductions	26	1	
# deletions of accessible descriptions in immediate impressions	27	1	
# deletions of inaccessible descriptions in immediate reproductions	28	1	
# deletions of inaccessible descriptions in immediate impressions	29	1	
# deletions of accessible descriptions in delayed reproductions	30	1	
# deletions of accessible descriptions in delayed impressions	31	1	

VARIABLE NAME	COLUMNS	ROWS	DESCRIPTION OF LEVELS
# deletions of inaccessible descriptions in delayed reproductions	32	1	
# deletions of inaccessible descriptions in delayed impressions	33	1	

01	1111322	-20	35333445
01	2	-30	
02	123 121	20	24263335
02	2	20	
03	1123133	10	12453654
03	2	10	
04	133 213	-40	34445645
04	2	-40	
05	1232222	-20	34236645
05	2	00	
06	122 233	30	25222424
06	2	30	
07	111 223	30	43654456
07	2	40	
08	111 131	-20	33253445
08	2	-30	
09	123 122	-10	23553555
09	2	20	
10	122 231	10	35163566
10	2	10	
11	122 111	30	12233425
11	2	30	
12	1233332	10	03460565
12	2	10	
13	1232232	20	22953165
13	2	20	
14	113 232	-20	34434444
14	2	-30	
15	1322233	00	34464345
15	2	10	
16	122 131	30	22551456
16	2	20	
17	1232213	50	33346555
17	2	40	
18	112 332	00	24463466
18	2	10	
19	1111122	-40	23462334
19	2	-40	
20	123 322	-30	33335444
20	2	-30	
21	133 333	10	23343334
21	2	10	
22	111 221	30	23132335
22	2	20	
23	123 232	10	44444444
23	2	10	
24	123 333	10	14554555
24	2	10	
25	1112111	-30	34124425
25	2	-40	
26	1331111	20	24363154
26	2	20	
27	1112112	20	13432432
27	2	10	
28	133 122	00	24452345
28	2	-10	
29	1232331	00	53464466
29	2	20	
30	111 213	00	25345535
30	2	20	
31	123 333	-10	56145 3
31	2	-10	
32	1331131	-10	15363446
32	2	-10	
33	123 332	00	14364436
33	2	00	

34	133 111	-20	6546
34	2	-10	
35	133 312	40	02432134
35	2	40	
36	1123231	10	14442455
36	2	20	
37	1132321	-10	54164426
37	2	-05	
38	133 233	10	02431446
38	2	00	
39	1332322	-40	22462466
39	2	00	
40	1132332	20	12452255
40	2	10	
41	133 123	-40	15362 4
41	2	-40	
42	1332331	-10	22442345
42	2	-10	
43	112 111	-30	23353445
43	2	-30	
44	123 313	00	44455444
44	2	10	
45	1231223	-30	32452355
45	2	-20	
46	133 212	30	44654465
46	2	30	
47	1331321	20	34664645
47	2	20	
48	111 113	10	02440245
48	2	10	
49	1121223	-10	34343536
49	2	-40	
50	132 133	30	13660466
50	2	30	
51	122 133	-10	23153336
51	2	-10	
52	1112221	20	02450336
52	2	10	
53	113 221	-30	24463656
53	2	-20	
54	133 212	40	24353436
54	2	30	
55	122 332	30	12453445
55	2	30	
56	133 222	-30	34245344
56	2	-40	
57	1332323	30	54355525
57	2	50	
58	133 123	20	13332333
58	2	10	
59	112 333	30	35453444
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60	123 311	20	22562466
60	2	20	
61	1331333	30	4335
61	2	00	
63	1232332	10	2 5 4
63	2		
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64	2	-40	
65	1232313	00	34444345
65	2	-10	
66	112 113	20	12230544
66	2	20	

57	133 123	20	23353435
57	2	10	
58	133 322	10	45465566
58	2	00	
69	133 121	10	22344334
69	2	10	
70	1121323	00	43344635
70	2	00	
71	133 112	00	25253 6
71	2	00	
72	123 323	00	34345434
72	2		
73	123 112	20	23453344
73	2	10	
74	123 232	00	12463456
74	2	00	
75	1232323	20	35235535
75	2	10	
76	1232121	00	43444346
76	2	00	
77	133 123	00	35454556
77	2	00	
78	123 111	00	23343435
78	2	00	
79	123 331	00	35564356
79	2	40	
80	1133112	30	33343546
80	2	00	
81	1123133	00	33453355
81	2	00	
82	123 321	10	33254535
82	2	00	
83	133 321	00	12550456
83	2	20	
84	1123131	00	35443 4
84	2	00	
85	1111212	00	35353345
85	2	10	
86	1121123	20	33254435
86	2	10	
87	133 321	00	12433445
87	2	00	
88	133 222	50	35754534
88	2	00	
89	133 222	00	13323324
89	2	00	
90	133 111	00	13452355
90	2	00	
91	112 213	00	14462556
91	2	00	
92	123 131	10	13233346
92	2	00	
93	111 211	00	33353345
93	2	00	
94	133 321	00	56356546
94	2	40	
95	1111211	20	24352635
95	2	20	

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