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Schematic effects of explanation on subjective likelihood estimates: An investigation of self-reference versus other-reference and familiarity

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SCHEMATIC EFFECTS OF EXPLANATION ON
SUBJECTIVE LIKELIHOOD ESTIMATES:
AN INVESTIGATION OF
SELF-REFERENCE VERSUS OTHER-REFERENCE AND FAMILIARITY

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Schematic processing is one cognitive technique that social information processors employ. Schematic effects of explanation have been documented in the recent social psychological literature. Previous research has shown that when people are asked to explain the occurrence of some hypothetical event, they come to believe more strongly (than people who have not explained the event) that this event will actually occur. The purpose of the present investigation was to tease out possible mediating factors of this schematic effect on subjective likelihood estimates (SLEs) by manipulating familiarity and self-/other-reference of the information to be processed. Subjects read a script describing a person engaged in making a decision. Some subjects were exposed to a familiar script, while others were exposed to an unfamiliar script. In addition, some subjects were asked to imagine the events in the script happening to themselves and others were asked to imagine the events happening to another individual. Experimental subjects were asked to generate an explanation for a particular outcome. All subjects then provided SLEs of this event's occurrence. The hypothesized heightening of SLEs due to explanation did not occur, rendering impossible a conclusion that familiarity and self-/other-reference mediate the schematic effects of explanation. The lack of this effect does not, however, negate the findings which suggest differential processing of familiar and unfamiliar and of self-referent and other-referent information. A familiarity effect was revealed on SLEs, with greater subjective certainty in the unfamiliar condition. Also, higher SLEs resulted on other-referent than on self-referent questions. A confidence rating accompanied each SLE. Self-referent judgments were made with greater confidence, while greater confidence was indicated by those exposed to the other-referent script. The number of additional factors and personal experiences subjects thought should be considered increased with familiarity and self-reference. In general, the present investigation provides evidence of differential processing of familiar and unfamiliar and of self-referent and other-referent information. The results are discussed within a cognitive schema interpretation.
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Schematic Effects of Explanation on Subjective Likelihood Estimates: An Investigation of Self-Referent Versus Other-Referent and Familiarity

"Because people are capable of formal operations does not mean that they prefer them" (Abelson, 1976, p. 43). Biases in judgment arise from the perfectly human tendency to cut corners in expending cognitive effort. Striving to understand and function in complex social environments, people resort to cognitive strategies which ensure quantity of processing but not quality. Thus, social information processing is not flawless—in fact, it is far from it.

Schematic processing is one cognitive technique that social information processors employ. Schematic effects of explanation have been documented in the recent social psychological literature. More specifically, research has shown that when people are asked to explain the occurrence of some hypothetical event, they come to believe more strongly (than people who have not explained the event) that this event will actually occur. The purpose of the present investigation was to tease out possible mediating factors of this schematic effect by manipulating the subjects' familiarity with the information being processed. This study also assessed the effects of self-reference versus other-reference of the information being processed on subsequent subjective likelihood estimates.

Social Cognition

Attribution theorists such as Heider (1958), Jones & Davis
(1965), Kelley (1967), and Bem (1972) have proposed that people have a natural propensity to construct causal explanations in accounting for events and behavior they observe. These causal inferences are brought to bear in attempts to simplify and add coherence to social circumstances. According to Jones & Davis (1965), in assessing another person's behavior in a social interaction, a perceiver "seeks to find sufficient reason why the person acted and why the act took on a particular form" (p. 220, emphasis omitted). Such causal inferences are an integral part of the human striving to maintain control of the environment (Heider, 1958, p. 79). Social psychologists have long been interested in people's interpretations of past behavior. Recently, researchers have devoted their efforts more directly to investigating how people deal with future events and behavior. A growing wealth of literature in the area of social cognition has developed out of this line of inquiry.

Social cognition research examines the cognitive processes people apply to make sense out of their social environment. Taylor (1981) describes the social cognition literature as "work that emphasizes how an individual cognizes his or her world" (p. 195). Social cognition research borrows theory and methodology from cognitive psychology to investigate social psychological phenomena. Hamilton (1981) has emphasized that both cognitive structures and cognitive processes are of interest to social cognition researchers. The basic structure under investigation in social cognition is the cognitive schema.

The Cognitive Schema

The notion of a cognitive schema has been circulating within
psychology over the last quarter century. The schema concept was first introduced by Sir Henry Head (1920), who wrote of a process by which all conscious perceptions are related to past experience. Piaget (1926) used the term "schema" in discussing cognitive development shortly thereafter. In 1932 Bartlett reported his observations of the processes involved as experiences are organized schematically. Woodworth (1938) also referred to schemata in describing perceptual and memory processes in his classic experimental psychology text.

It is clear that the notion of the cognitive schema is not new. Its vast application within social psychology, however, is a relatively recent development. A surge in the employment of the cognitive schema within the last ten years is largely due to increased interest in artificial intelligence (Abelson, 1981; Minsky, 1975). Simulation modeling has been applied to increase understanding of complex cognitive activity and cognitive structures. The cognitive structure of particular interest to the social cognition researcher is the schema. The cognitive schema is the primary unit of knowledge in human information processing (Rumelhart & Norman, 1975).

Types of Schemata

Schemata are cognitive representations of information gathered from experience. The cognitive schema wears many guises. Social schemata are knowledge structures that represent stimuli in the social environment (Sentis & Burnstein, 1979). They are conceptual frameworks, consisting of preconceptions with regard to people, things, situations and their interrelations. Social schemata are of
four varieties: (1) person schemata, containing knowledge about other people's behavior; (2) self-schemata, containing information about one's own personality, appearance, and behavior; (3) role schemata, containing knowledge about broad social categories such as age, race, sex, and occupation; and (4) event schemata, containing knowledge about certain typical events or occurrences (Fiske & Taylor, 1984).

The schema, in the sense that it is being used here, is a knowledge structure, containing information about people, the self, roles, or events. A differentiation must be made between this use of the term schema and another use. Schemata have also been defined as content-free structures such as balance schemata, linear-ordering schemata, and causal schemata (Fiske & Taylor, 1984). These schemata do not contain specific informational elements, but they specify links between elements or rules for processing information. The causal schema, for example, has no specific informational content; rather, it determines relationships between causes and effects (see Tversky & Kahneman, 1982).

Other related terms may be found in the social psychology literature. These will be discussed briefly to further clarify the current use of the schema concept. There are specialized person schemata which contain informal beliefs about the association of traits (i.e., beliefs about how certain personality characteristics seem to be related). These have been called implicit personality theories (Schneider, 1973). Person schemata representing traits that characterize a particular personality type are called prototypes (Cantor & Mischel, 1979). A schema which contains information about
members of an identifiable group of people is a stereotype (Hamilton, 1981). The schema is a general concept, encompassing all of these more specialized forms of knowledge structures.

Within the realm of social psychology, an event schema is often referred to as a script. A script is a "coherent sequence of events expected by the individual, involving him either as a participant or an observer" (Abelson, 1976, p. 33). Scripts are learned throughout a lifetime, both by participation in event sequences and by observation of event sequences. A script is a cognitive structure, a schema, which organizes comprehension of events; it is a set of expectations as to how an event will elapse given a particular setting. For any familiar event, there is a script, or a set of shared expectations, regarding the sequence of occurrence. In a script "concrete events are organized into generic scenarios" (Landman & Manis, 1983, p. 89), specific instances are represented by a typical framework. Abelson (1981) suggests that scripts influence cognitive functioning by establishing general expectations for specific situations encountered in the future. A script, then, is a form of schema which consists of information about events.

Scripts provide us with a "proper" sequence in which actions are expected to occur in a given setting. We possess scripts for common life events. Scripts can be controlled by features of the situation at hand, as well as by features of the particular person involved (Schank & Abelson, 1977). Situation-driven scripts are those which are controlled by environmental variables. Our expectations for a trip to the library, for example, are very different from the
expectations we have for a party with friends. Scripts are also controlled by the societal role of the actor. These role-driven scripts arise from a set of expectations we learn to associate with certain roles. One might expect a professor to behave differently than one of her students, even when both are in the same situation. There are also scripts that are person-driven. These are learned for situations in which we have no traditional roles, therefore we express our own personal style. Person-driven scripts depend on a person’s self-concept; they are self-programmed behavior patterns which are consistent across situations.

The present work involves both person-related and event-related schemata. These will be referred to in general as schemata unless a specialized schema is being referenced. The schema of concern in the present work is that which represents knowledge gained through experience, is stored in memory, and is retrieved to be used as a processing aid in relevant social situations. Schemata of this nature have certain common characteristics. They are abstract representations of complex information which are induced from past experience. Fiske and Linville (1980) have defined schemata as “cognitive structures of organized prior knowledge, abstracted from experience with specific instances” (p. 543). A schema is not simply a collection of "photocopied" experiences. It is an abstraction, a cognitive generalization, which is strengthened and possibly revised by continual experiences. The revision of schemata will be discussed further on in this paper.

A second common characteristic of schemata is their function in
organizing incoming information. Hamilton, Katz, & Leirer (1980) shed some light on this feature of schemata, stating that "the information available to the perceiver is not processed into a vacuum. The perceiver brings with him some kind of 'knowledge structure' or 'schema structure' in terms of which the information is encoded. . . " (p. 123). The nature of the schema a person implements in a particular situation influences the information from that situation which will be processed. Schemata serve at the encoding stage to provide structure to features extracted from a situation, with connections between the various features. Hastie (1981) offers a definition of schemata which emphasizes these connections. Hastie's schema is an "abstract, general structure that establishes relations between specific events or entities" (p. 41).

Another common characteristic of schemata is that they possess "default values," or expected values, associated with specific features (Minsky, 1975; Rumelhart & Norman, 1978; Schank & Abelson, 1977; Taylor & Crocker, 1981). When a schema is not completely represented in experience, missing information will be "filled in" with these default values. People simplify social reality by interpreting specific situations in light of a more general schematic representation. Research has shown that people do indeed tend to fill in the gaps of missing information. In a study by Bower, Black, & Turner (1979), for example, subjects who were given scripts with certain details left out, incorrectly replaced absent information with information typical of a particular event.

Structure and Function of Schemata
Although there are different types of schemata and different names for schemata, they all serve the same general purpose—to simplify social information processing. Attribution theorists in the past have assumed that people are rational beings. This view of information processing upheld the belief that people use attribution processes to achieve accuracy in making judgments. This does not seem to be the case. Recent research has established distortions and biases in human information processing (for reviews, see Fiske & Taylor, 1984; Hastie, 1981; Nisbett & Ross, 1980; Taylor & Crocker, 1981). These biases and distortions are due to the functions of social schemata, which are employed largely because people are limited in their capacities to process information (Broadbent, 1958; Norman & Bobrow, 1975). Norman & Bobrow (1975) found that small amounts of simple information may be transmitted in original form. A large amount of more complex information, however, may not be processed in its entirety. Social situations are complex, eliciting a state of cognitive overload. In the case of system overload, perceivers become "cognitive misers," taking shortcuts in information processing (Fiske & Taylor, 1984). Information processing is characterized by strategies that move information quickly rather than thoroughly. Cognitive schemata serve to limit the amount of cognitive processing necessary in any given situation. They help social perceivers to organize, structure, and interpret new information as it is encountered. Schemata facilitate encoding, storage, and retrieval of relevant information. They allow for fast and efficient information processing, and supply inferences with regard to missing data. These
Schematic functions will be described further throughout this paper.

Schemata are formed through experience, although explicit models of the process are lacking (Crocker, Fiske, & Taylor, 1984). A number of theorists agree that a schema contains units of information and associations among these units (Bartlett, 1932; Fiske & Linville, 1980; Hastie, 1981; Hayes-Roth, 1977; Taylor & Crocker, 1981). A person encountering a novel stimulus will attend to specific features of that stimulus and encode these features with schematic organization. This schematic information is then stored in memory, available for application in the future. The schema waits in an inactive state to be cued by features of an appropriate situation. Theorists have postulated index tags which link new information to schematic information (Anderson, 1978; Schank, 1980).

Any number of one's stored schemata could have potential relevance to a given social situation. Which schemata will be implemented is determined by activation principles involving similarity between the features of incoming information and an existing schema, and the salience of those features. A feature comparison process has been postulated in which incoming information is compared in terms of similarity to previously formed schemata (Wyer & Srull, 1980). If a situation significantly overlaps a previously formed schema, that schematic information will be applied to aid in processing the new data.

A second activation principle is salience. Perceivers show a tendency to respond to the most salient stimuli in a situation, giving very little consideration to other less salient stimuli. Salient
features are not necessarily those of greatest importance. Taylor and Fiske (1978) have documented what they refer to as the "top of the head" phenomenon, noting that often the factors that affect people most are trivial, arbitrary, yet salient, situational factors. Due to this phenomenon, much human behavior is performed mindlessly. Salient stimuli are distinctive, available, and accessible (von der Plight & Eiser, 1982). Features that stand out in a set of circumstances call to mind a certain schema, which is then applied to the situation at hand. A distinctive stimulus may elicit a schema that is relevant to that distinctiveness. For example, an "old person" schema is likely to come into play when we encounter an elderly person in a group of otherwise young people. People are likely to use categories that make stimuli distinctive, and they are likely to attend to distinctive stimuli in making judgments. Features of the situational context may make a particular schema more accessible.

The accessibility of schemata varies. Two mechanisms that are likely to trigger schemata, making them readily accessible, are frequency and recency of activation (Higgins, Rholes, & Jones, 1977; Wyer & Srull, 1980). The more recently a schema has been activated, the more likely it is to be activated again in the near future. A study by Carlston (1980) illustrated that people's interpretations of a target's behavior were influenced by the judgments they had made previously. More specifically, subjects who had made prior judgments of dishonesty, assessed an ambiguous action as dishonest, while those who had previously made judgments of helpfulness, assessed the same action as helpful. Likewise, the more frequently a schema has been
activated in the past, the more likely it is to be implemented in future situations. Strong associations are postulated between features of a situation and frequently and recently activated schemata. Over time, frequent activation may be a factor in producing stable differences in the accessibility of a social perceiver's schemata.

Judgmental Biases

While schemata may aid in processing social information, they do not necessarily ensure accurate judgments. Cognitive processes involving schemata may, in fact, deter accurate processing. Schemata facilitate information processing by allowing a more general or typical case to fill in for a specific example. Biases in judgment result due to the expansion of schematic knowledge beyond the actual information at hand. A schema structure, once activated, exists independently of the initial information. Once it is activated it is applied wholeheartedly, including features relevant and irrelevant to the present situation. Schema activation is believed to be an all-or-none phenomenon (Hayes-Roth, 1977). All elements of a schema act as one via the associations established between them. This all-or-none activation accounts for the assumption that schemata serve to simplify information processing. Cognitive overload is alleviated since active processing is discontinued as an established knowledge structure, a schema, is applied. Schemata become stronger (i.e., associations between a schema's elements become increasingly well established) with additional experience in similar situations. Hayes-Roth (1977) refers to this strengthening of schemata as
"unitization." A unitized schema functions as a discrete knowledge structure.

Once schemata are formed through experience, these knowledge structures are tremendously resistant to change (Fiske & Taylor, 1984). The schema's ability to resist change is an advantage to the perceiver in that stable schemata provide structure and coherence to social situations which would otherwise be overwhelmingly complex. If social schemata were completely resistant to change, however, they would lead to immense dysfunctions of information processing. A discussion of schematic changes has been provided by Crocker, Fiske, & Taylor (1984). In general, maturing schemata evolve to accommodate specific instances as they are encountered by the perceiver and schemata change due to exposure to incongruent information.

Schema-incongruent information is information that is "improbable given the schema" (Crocker, Fiske, & Taylor, p. 198). Schematic changes based on incongruent information can occur within various elements of the schema. First, specific "variables" or features of a schema could be added or dropped. A second way that incongruent information can affect a schema is by changing the strength of association between a given variable and the schema itself. A third aspect of a schema that can change is the default value for a variable. Fourth, the interrelationships among variables can change due to exposure to incongruent information. Finally, the particular instances associated with a schema can change. If schemata show sensitivity to incongruent information in all of these ways, why then are they generally resistant to change? The answer to this question
is that incongruent information is only effective under certain circumstances.

Incongruent information has the potential to elicit schematic changes only when the social perceiver has the capacity and motivation to process the information sufficiently. Incongruent information may not be completely processed. One of the reasons for this is that incongruent information takes longer to process than congruent information (e.g., Brewer, Dull, & Lui (1981). Since extra processing time is necessary, social perceivers may not have the capacity to handle the processing of incongruent information. Schema-incongruent information is carefully processed only when the perceiver is not simultaneously faced with processing a lot of other information and when there is no pressure placed on the person to process the information quickly (Crocker, Fiske, & Taylor, 1984). In addition to these factors, incongruent information will be processed only after a person has sufficient understanding of schema-congruent information. Reference to differential processing in experts and novices is relevant here. Research in this area has shown that experts are better able to process schema-incongruent information (Fiske, Kinder, & Larter, 1983). Experts focus on incongruent information, display better memory for incongruent information, and moderate their judgments in accordance with incongruent information. A novice, on the other hand, tends to use a schema indiscriminately, whether it is consistent or inconsistent with the situation at hand. An explanation for this is that experts have more practice implementing their schema, developing it into a more compact unit in memory (Hayes-Roth, 1977).
Thus, experts process congruent information more efficiently than novices, and have a greater capacity to attend to incongruent information. Motivation of the perceiver is also a factor which determines whether incongruent information will be processed. When a perceiver's objective is to achieve accuracy at the expense of the stable schema, incongruent information is likely to be processed fully.

Although social schemata do have the potential of revision, the majority of research and theory in this area has emphasized the schema's resistance to change. Schemata are not equally responsive to incongruent information. Differences in responsiveness cause schemata to be more or less likely to resist change (Crocker et al., 1984). Schemata that are well-developed are unresponsive to schema-incongruent information and resist change. A well-developed schema (i.e., a schema relevant to a stimulus domain in which the perceiver has had a great deal of experience) contains more schema-congruent information, more details, and more specific instances than does a schema which is not well-developed (Linville, 1982; Linville & Jones, 1980). Schema-incongruent information is not able to effect change in this case because it is pitted against a vast amount of schema-congruent information.

People display a tendency to assimilate new data to fit an old schema, rather than to change the schema to encompass the new information. Bartlett (1932) noted that his subjects would unknowingly distort the details of the stories provided to them to better suit their own schema. The term "confirmation biases" has been
used to describe this tendency to process evidence in light of prior beliefs; to perceive more support for those beliefs than actually exists in the data at hand (e.g., Hastie & Kumar, 1979; Lord, Ross & Lepper, 1979).

Other works have shown that people falsely recognize schema-consistent details that have never been presented to them (Snyder & Uranowitz, 1978; Zadny & Gerard, 1974). Subjects in the latter study were shown videotapes of two students wandering around an apartment, discussing minor theft and drug violations. Subjects' later memories of the videotape contained confirmatory evidence for a schema that had been provided to them before viewing the videotape. Subjects were presumably convinced that they were watching a burglary, a drug deal, or two students waiting for a friend, depending on which schema was supplied to them at the outset. Providing the subjects with a schema before they processed the information (i.e., before they watched the videotape), allowed for schematic effects at encoding as well as in retrieval. Schematic effects may also occur in retrieval alone.

Snyder and Uranowitz (1978) provided their subjects with information about a person's life. After this had been processed by the subjects, their memories were influenced by schematic lifestyle information. Having been told that the person they read about was either homosexual or heterosexual, subjects later (mis)remembered schema-confirming evidence in the initial information. The results of this study suggest that people are capable of reinterpreting information they have already processed in light of schematic
structure provided them. Schematic effects occur at either the encoding or retrieval phases of processing. As one might expect, the results are more profound when a schema is provided beforehand, since this affects both encoding and retrieval (Sherman, Zehner, Johnson, & Hirt, 1983; Zadny & Gerard, 1974).

Schemata are so resistant to change that they persist even in the face of evidence to the contrary. This is called the perseverance effect (Ross, Lepper, & Hubbard, 1975). In two studies Ross et al. demonstrated that people cling to unwarranted beliefs. Subjects who were given false performance feedback on which to base their perceptions of themselves and others, showed no tendency to revise those perceptions even after the initial feedback had been retracted through extensive debriefing. Although these subjects reportedly understood and accepted the debriefing information, their predictions continued to be influenced by the discredited information.

In considering the biased processes that might underlie the perseverance effect, Ross et al. (1975) proposed that their results may be due to some cognitive processes their subjects engaged in upon encountering the initial information. The initial feedback purportedly activated or set in place a schema for the subjects. Subsequent judgments were based on the knowledge contained in the schema, rather than the original information as a whole. This schema continued to influence judgments even when the information contained in the schema was found to be invalid.

Explanation Effects on Subjective Likelihood Estimates

Ross, Lepper, Strack, & Steinmetz (1977) investigated the
possibility that people attempt to explain evidence as it is confronted. Ross and his associates speculated that this explanation served to firmly plant in mind the belief which arose from the initial information. This would strengthen the belief so that it could withstand the defacing of that information. Ross et al. (1977) had subjects read clinical case histories. Some subjects were asked to find evidence in the case history that would explain the future occurrence of an event (e.g., the target would either commit suicide or contribute financially to the Peace Corps). In general, those subjects who performed the explanation task showed heightened subjective likelihood estimates as compared to no-explanation control subjects. In other words, subjects who generated factors to explain suicide were more convinced that the suicide would occur than were subjects who had explained another event or nothing at all. This occurred even after subjects were reminded that the event they had explained was entirely hypothetical.

Again these findings may be accounted for by a cognitive schema explanation. Disconfirmed or unfounded beliefs persevere due to the activation of schemata or scripts. A schema interpretation of these heightened subjective likelihood estimates is in accordance with both Abelson's notion of scripts (Abelson, 1981; Schank and Abelson, 1977) and Tversky and Kahneman's analysis of the heuristic devices people use in making predictions (Tversky & Kahneman, 1973, 1977; Kahneman & Tversky, 1982). Abelson's script approach points out that through repetitious social interactions we develop a schematic conception of an event, or a script. This script provides understanding of events
encountered in the future. Abelson purports that once a script is engaged for any situation, it influences one's expectations, intentions, and interpretations of that situation. A script, then, provides for a plausible scenario which causes one to expect that a certain event will occur in the future.

In making judgments such as subjective likelihood estimates, people search for relevant factors in memory. They access those that are salient—highly available. The explanation task serves to make certain features of a situation salient. An entire script or sequence of events leading to a particular outcome may become salient. The schematic knowledge structure, not the original information, will be accessed in making future judgments. Once a schema is activated it exists autonomously; it is virtually unaffected by additional information. The experimenter's disclaimer in the Ross et al. (1977) study (e.g., "Remember, we do not actually know the outcome of this scenario") had little, if any, impact. Subjects continued to adhere to the belief that the explained outcome would occur.

Tversky and Kahneman (1973) have concluded, with empirical support, that predictions about future events are made largely on the basis of availability rather than more logically sound factors. That is, an event is judged likely if it is easily imaginable or cognitively available (i.e., comes easily to mind). Availability is not assessed according to frequency or probability, which leads to biases in the judgment process. When the likelihood of an event's occurrence is estimated due to the cognitive availability of the instance, an event that is highly available will be judged more likely
than an event of equal frequency that is less accessible. In addition, Tversky and Kahneman (1982) have emphasized that recency leads to availability. When information has been presented recently, there is a tendency to give a disproportionate amount of weight to this information. Once a particular outcome has been made salient to the subjects in the aforementioned study, it became highly available and heavily weighted as supportive evidence on which to base subsequent subjective likelihood estimates.

More recently a simulation heuristic was added to the conceptualization of judgmental biases (Kahneman & Tversky, 1982). These investigators purport that people judge the likelihood of events by reviewing a simulation model. This model produces a variety of possible scripts leading to a variety of possible outcomes. Judgments are based on the ease with which these scripts are generated. The number of highly available scripts which lead to a common outcome determines the outcome's subjective probability. The ease of construction and the number of scripts leading to an outcome is increased for a person who explains the script. This task should heighten subjective likelihood estimates for the outcome of the script. Tversky and Kahneman (1973) suspect that once a particular outcome is constructed, an individual will have difficulty considering any other possible scenarios, particularly those with different outcomes. Thus, the emergence of one specific script may inhibit others from accessibility.

Subjects in the Ross et al. (1977) study were asked, before reading the case history, to explain a designated outcome. This may
have established a bias for selective attention to information and for interpretations of ambiguous details consistent with the explained outcome. Consideration of one particular outcome, then, activates a schema with a given outcome. Consequently, this script is highly available and blocks the consideration of other scripts (especially those with conflicting outcomes), so that this outcome will be judged highly likely—thus, heightened subjective likelihood estimates.

Although the Ross et al. research implemented an explanation task to engage a script for the subjects, such a task may not be a necessary component of raising subsequent likelihood estimates. Carroll (1978) found that subjects who were induced simply to imagine the occurrence of an event, rather than generating an explanation, also subsequently demonstrated heightened subjective likelihood estimates. In Carroll's first experiment, subjects who imagined Jimmy Carter winning a presidential election were significantly less likely to believe Gerald Ford would win, and vice versa. In a second experiment, subjects who imagined a football team having a good season came to believe it was more likely that this team would receive a major bowl bid than control subjects who had not imagined a good season. These results suggest that explicit instructions to explain the occurrence of an event may not be necessary to produce heightened subjective likelihood estimates. This experiment also demonstrated that the explanation task did not yield any additional heightening of subjective likelihood estimates. It should also be pointed out, however, that this explanation task may be implicitly carried out, even in the absence of instructions to do so.
Self- and Other-Reference

Gregory, Cialdini, and Carpenter (1982) reported a series of four experiments which demonstrated that people who are led to imagine certain events will come to believe that these events will occur. Gregory et al. extended the phenomenon to include heightened beliefs of a personal nature. Subjects were induced to imagine a particular scenario occurring in their own lives (e.g., being arrested for armed robbery, winning a trip to Hawaii, or purchasing cable television). Subsequently, these subjects believed more strongly that this event would actually occur, relative to control subjects who did not imagine these events. As a result of imagining a script in which an event occurs, the entire script becomes salient and is likely to be used later in predicting the likelihood of that event's occurrence. That particular outcome is highly available, is presumed to be a frequent occurrence, and is judged to be highly likely to occur again in the future.

While schematic effects of explanation do exist in encounters with self-referent information, there may be differences in the processing of self- and other-referent information. Such process differences are reflected in consistent response time differences, with self-referent decisions being made more quickly than other-referent decisions (Kuiper & Rogers, 1979). Self-schemata are generalizations containing knowledge of the self, abstract representations of past experience with personal data. It is reasonable to assume that we know ourselves better than we know others. We spend a great deal of time observing our own behavior.
So, we might be considered experts on ourselves. Expertise affects quantity, organization, compactness, and use of schematic knowledge. In support of this, a recent study (Markus, Smith, & Moreland, 1983) likened self-schematic individuals (i.e., those possessing schemata relevant to a particular social domain) to experts, and likened aschematics (i.e., those lacking schemata relevant to a particular social domain) to novices. Schematics displayed the ability to organize schema-relevant information about others into larger units and showed more flexibility in organizing such information than did aschematics.

The schemata of experts in a particular domain, as well as self-schemata, are well-developed, are highly abstract, and are rich with instantiations of the schema. The relevant attributes of a social domain, the variables of a schema, are structured with interrelationships between them. Over time and experience with a given schema, the association between variables is strengthened. In the same light, the relationship between individual variables and the schema as a whole builds with experience. As we are experts on ourselves, with an abundance of experience in self-domains, our self-schemata feature these strong relationships. The implication of this is that when an individual engages in self-related judgments, these judgments will entail not only the information immediately presented, but also all of the stored information that is strongly associated with it.

Schemata have two structural levels of abstraction: vertical and horizontal (Crocker, Fiske, & Taylor, 1984). Vertical structure
refers to the number of levels of abstraction. This number may vary across schemata, and a schema with vertical structure will have a vast number of specific levels within it (Cantor & Mischel, 1977). An example of a schema with many levels of abstraction would be an individual with many different conceptualizations of a dinner engagement (with a friend, with a business client, with one's boss, with one's spouse, etc.). Vertical abstraction not only includes a general concept, such as a dinner engagement, but also typical features (e.g., going to a restaurant, eating, and paying the check) and relevant attributes, such as candlelight, dinner music, and a dinner companion (Crocker, Fiske, & Taylor, 1984). Horizontal structure refers to the number of these subcategories available to an individual at any given level of abstraction. A restaurant maître d', for example, has had vast experience in this domain and would be expected to have a great deal of horizontal structure, or subcategories for each level of vertical abstraction.

A schema may contain very specific information, such as various relevant instances or exemplars of the schema (Crocker, Fiske, & Taylor, 1984). The schemata of experts and self-schematic individuals contain a greater amount of these schema-relevant instances than do the schemata of novices or aschematics. This suggests that in making self-relevant judgments people have a vast amount of detailed information to consider, beyond the present information.

As personal information is encountered, self-schemata are activated to aid in information processing (Kuiper & Rogers, 1979; Markus, 1977). Self-schemata serve as mechanisms to determine what
self-related information is attended to and how much importance it is attributed. Research has determined that self-referent decisions are made more easily and with greater confidence than other-referent decisions. As other social schemata, self-schemata become increasingly resistant to change with added experience. Markus (1977) showed that schematic individuals (i.e., individuals with a relevant self-schema available) are resistant to counter-schematic information. The self-schema yields access to past experience, allowing for efficient interpretation of the present. Rogers, Kuiper, & Kirker (1977) found that subjects were better able to recall words they encountered in a self-referent rating task than words they encountered in a semantic rating task. In the semantic task, subjects simply indicated whether a given word had the same meaning as a target word. This judgment presumably did not elicit the activation of a self-schema. Consequently, the memory trace for these words was not as strong as that for those words presented in the self-reference task, in which the subject was required to judge whether the word was self-descriptive or not.

The conclusion that can be drawn based on this research is that self-reference is a very potent device, due to the mechanism by which self-knowledge is applied in information processing--the self-schema. The research cited above suggests that there are either two separate systems involved in processing self- and other-referent information or there are important differences in the two types of processing. Such differences have not yet been assessed in subjective likelihood estimates following explanation. In developing expectations for these
Schematic Effects

When people are asked to make probability judgments, they assess the information at hand in light of the relevant schematic knowledge that they retrieve. If a particular outcome is made salient at this point, the schematic knowledge retrieved is likely to be relevant to this outcome. The explanation task will serve to plant firmly in mind evidence in support of the suggested outcome. Confirmatory biases will be in effect, leading these people to interpret the information presented to them in a manner which will confirm the experimenter-prompted schema. Following the explanation task the experimenter retracts the initial outcome suggestion with a disclaimer, stating that no information other than that they received is available. Thus, it is made clear to these people that there is no reason to believe that the outcome they explained is more likely than any other possible outcome. Even after this disclaimer, it is expected that the explained outcome will remain highly available and supported in the minds of these people, heightening their estimates of its occurrence relative to a no-explanation control group.

What is expected of people who are asked to make self-referent judgments? It has previously been reported that people have a tendency to go beyond the information available to them in generating their explanations (Anderson, Lepper, & Ross, 1980). In processing self-referent information, people are not likely to consider only those features made salient and available by the experimenter's
suggestion. Other features may be highly available due to their personal nature (Kuiper & Rogers, 1979). Information that is self-referent will engage an individual's self-schemata. Self-referent judgments are more likely to entail consideration of one's self-conceptions, past experiences, and previous knowledge. Self-schemata feature a rich supply of detail, specific exemplars of the schema, and strong associations between schematic variables. The strong associations between schematic variables and between the variables and the schema itself are expected to be instrumental in reducing the biasing effects of the explanation task. Characteristics of the self-referent information provided to people is strongly associated with an entire schema full of relevant information. The schema will be triggered so that all of the strongly interrelated variables it contains will be considered in making self-referent judgments. People making self-referent judgments should be striving for accuracy, more so than those making other-referent judgments, and therefore should be more motivated to take into consideration all available relevant information. Judgments made with reference to another person are made without all of this additional information to be considered. An experimenter-prompted outcome and an explanation generated in its support, should have a much greater effect on other-referent judgments than on self-referent judgments. The results of a study conducted by Tybout & Yalch (1980) support this, suggesting that mere salience does not have a clear cut effect on self-referent information. Self descriptions made salient to an individual, influenced that individual's self-perceptions and future behavior only
when the salient cues were consistent with the individual's existing self-schema.

Familiarity

Due to our life experiences we become familiar with certain social situations and roles, and not with others. Social perceivers vary in the amount of experience they have acquired in a particular domain and the extent to which they have well-developed schemata for particular stimulus domains (Markus, 1977). The degree of an individual's expertise in a particular social domain can range from absolutely no experience, to very little experience (i.e., the novice), to a great deal of experience (i.e., the expert). Degree of expertise has an impact on the quantity, organization, compactness, and the use of schematic knowledge. An individual's schemata relevant to a social domain with which the individual is highly familiar will be more complex than schemata relevant to an unfamiliar social domain. Complexity of a schema refers to the amount and nature of information it contains (e.g., the number of variables, their interrelations, and the amount of vertical and horizontal abstraction). A schema originates as a collection of single features and events and grows into a well-integrated structure with strong associations between its features (Fiske & Dyer, 1985). Information which is familiar is stored differently from that which is unfamiliar. Unfamiliar information, is not well-integrated. Components of unfamiliar information are weakly linked. Because of this, when a schema is triggered by specific features of an unfamiliar situation the impact is not as great as in a familiar situation. Individual variables of a
schema for a familiar domain are closely associated. When one variable is deemed applicable, it brings with it a barrage of other information, which will also be considered in making judgments regarding a familiar social domain.

As mentioned earlier the schemata of experts contain more information, but this information is stored and implemented very efficiently. This provides experts with the ability to process greater amounts of information more quickly than novices, allowing experts to consider more diversified information in making judgments. A person asked to make judgments in an unfamiliar domain is likely to be overwhelmed by the amount of information at hand. In this case the individual can not rely on a store of knowledge to assist in making judgments. Rather, the individual attempts to process the total amount of information available at present. The result is cognitive overload, which may be alleviated by adhering to highly salient evidence. A person making likelihood estimates in an unfamiliar social domain is apt to rely on experimenter-suggested outcomes, muster supportive evidence through the explanation task, and subsequently believe strongly that this particular outcome will occur.

Schemata are most likely to affect judgments when information is complex and the processor's knowledge is limited. When the information available to a person is minute, it may be supplemented by schematic knowledge.

Support for differential information processing of familiar and unfamiliar social domains can be found in the literature. Read (1983) found that similarity of the present situation to a past experience
was relied on in making predictions of future occurrences. Read's subjects were more likely to make their prediction based on a single similar instance as circumstances became more complex (more difficult to understand). An individual bombarded with complex information about an unfamiliar other, implements a highly available script in making judgments. An individual processing information about a more familiar other, in contrast, has available abstract knowledge stored in schemata. In this case, judgments are likely to be used on general knowledge stored in schemata as well as the script which has been made salient by the experimenter.

Fiske and Cox (1979) had subjects freely describe familiar and unfamiliar others. They found that people were able to give abstract and inferential descriptions of a more personal nature in describing familiar others. Descriptions of unfamiliar others included concrete behavioral instances and contextual information. These results provide support for the contention that familiarity allows for greater levels of abstraction in social information processing.

Research examining the "complexity-extremity effect" and judgments regarding in-group versus out-group members lends further support for differences in processing familiar and unfamiliar information (Linville, 1982; Linville & Jones, 1980). These studies demonstrated that people have more complex schemata for individuals belonging to their own group than for those belonging to another group. This is explained by the fact that people usually have had more contact with others in their own social group. Their schemata must encompass a larger amount of diverse instances collected over
experience. Linville (1982) contends that the greater complexity of in-group schemata is due to familiarity and experience in a social domain. Complexity was assessed by having subjects complete a sorting task. Subjects were indeed able to form more independent dimensions when the person they were describing was a member of their own social group. This research further demonstrated that the greater complexity involved in in-group judgments leads to more moderate judgments. In evaluating law school applicants, for example, subjects judged out-group targets with weak credentials more negatively than in-group targets with identical credentials, and vice versa. The lack of complexity involved in out-group judgments leads people to be influenced by isolated incidents, as opposed to the representative sample of evidence involved in in-group judgments. On the basis of the complexity-extremity effect, as demonstrated in this work, it is reasonable to predict that people will make more moderate likelihood estimates in a social domain with which they are familiar, and more extreme likelihood estimates in social domains with which they are unfamiliar.

The most directly relevant investigation of the effects of familiarity was provided by Hirt and Sherman (1985). These researchers hypothesized that knowledgeable subjects should be easily able to make initial judgments or predictions in a given area; while subjects who are not knowledgeable should have more difficulty. Hirt and Sherman (1985) predicted that knowledgeable subjects would form a strong initial judgment based on prior knowledge. These subjects were expected to be resistant to biases imposed by an explanation task.
Subjects who were not knowledgeable were expected to display biased judgments subsequent to explanation. Their first of two experiments employed subjects who were either familiar or unfamiliar with the game of football. The second experiment included all football knowledgeable subjects, but they were given information about unfamiliar or familiar teams. The results of their investigation confirmed that judgments were not biased by an explanation task when subjects were knowledgeable and were given an initial impression set. It has been shown previously that the biasing effects of explanation could be reduced by having subjects form an initial impression based on information they received prior to the explanation task (Sherman, Zehner, Johnson, & Hirt, 1983). Subjects with prior knowledge and those given information that was familiar to them appeared to be able readily to form an initial impression, thus resisting the biasing effects of explanation (Hirt and Sherman, 1985).

Present Study

The present research endeavor investigated the schematic effects of explanation on subjective likelihood estimates. Subjects read a script (a sequence of events), describing a person engaged in making a decision. Experimental subjects were asked to generate an explanation for a particular outcome (i.e., a specified decision being made). All subjects then rated the likelihood of this event’s occurrence.

The cover story for the current investigation presented it as a study of the relationship between imagination and decision processes. Subjects were asked to participate in an imaginal exercise while reading the script. They were asked to “picture the events described
actually taking place" and to do their best to imagine each experience occurring. While this imaginal exercise facet of the experiment is a fitting cover story, it was also a second way of heightening the schematic effects of explanation. Experimental subjects imagined, as well as explained, a particular outcome.

In the present study, the effects of explanation on subsequent subjective likelihood estimates were assessed within both self-referent and other-referent domains. Self-reference was achieved by using second person pronouns in the scripts provided to the subjects (e.g., "Picture yourself" . . . "Imagine yourself considering" . . . etc.). Thus, subjects in the self-referent condition read a script which described themselves experiencing these events. Subjects in the other-referent condition read a script describing someone else's experiences. They were asked to imagine another person experiencing these events. Male subjects were led to imagine a male character in the script, and female subjects were led to imagine a female character.

In addition to self- and other-reference, the current investigation examined the effects of the subject's familiarity in a social domain on subjective likelihood estimates following explanation. Familiarity was manipulated by having subjects read a script describing either a familiar or unfamiliar situation. The familiar situation, since all of the subjects were students, involved a student considering the various advantages and disadvantages of registering for a reduced class load. The unfamiliar situation involved a clinical psychologist considering the advantages and
disadvantages of requesting a reduced client load. This situation was chosen on the assumption that no undergraduates had experienced this set of circumstances.

Half of the subjects in each condition were asked to explain a particular outcome. After reading a script all subjects completed a "Decision Questionnaire". (Refer to Appendix D for the Decision Questionnaire for each condition). There were two versions of this questionnaire, one for the self-referent and another for the other-referent condition. Subjects in the self-referent condition were asked to predict how likely they felt it was that they would make the decision in question, given the events in the script. In addition, these subjects were asked to predict the likelihood that other people in general would make this decision. Subjects in the other-referent condition were also asked to predict the likelihood that they would make the decision in question themselves and that other people in general would make this decision. A third likelihood estimate was requested of the subjects in the other-referent condition. They were asked to predict the likelihood that the character in the script would make the decision in question.

Since the differences in subjective likelihood estimates for self- and other-referent domains and familiar and unfamiliar domains may be subtle, some other measures were included in an effort to lend clarity to the conclusions drawn from this study.

One of these additional measures was a confidence rating. Following each of the likelihood estimates, subjects were asked to indicate the degree to which they felt confident in their predictions.
Previous research has shown that social perceivers rate other-referent judgments as more difficult to make than self-referent judgments (Kuiper & Rogers, 1979; Markus, Crane, Bernstein, & Siladi, 1982). An additional finding of these studies is that self-referent judgments are made with greater confidence.

Another measure which is commonly looked at in self-schema research is the amount of personal evidence cited by the subjects in the various conditions. This was assessed in the current investigation as well. Subjects were asked to "list any additional factors (factors not mentioned in the script) that... should be considered in making this decision." In addition they were asked to describe any personal experiences from their past which may have influenced the likelihood estimates they made. Markus (1977) found that self-schematic individuals were able to supply more specific examples to support their judgments than aschematic individuals. Markus et al. (1982) reported the same differences in amount of personal examples provided by their subjects who were self-schematic with regard to gender. The factors and experiences cited by the subjects provided a measure of articulation of the activated schema. Well-developed schemata, for instance self-schemata and the schemata of experts in a particular domain, contain an abundance of easily retrievable relevant exemplars.

Subjects were asked for an indication of the degree to which they imagined themselves in the script they read. This provided a check on the manipulation of self- versus other-reference.

Two checks on the manipulation of familiarity were also included.
Subjects were asked to indicate how familiar the situation described in the script was to them and also how frequently they had been exposed to a situation similar to that described in the script.

Finally, subjects were queried about the ease with which they were able to imagine the occurrence of the events in the script.

Method

Subjects

Subjects were 160 male and female undergraduates at the University of Montana who received partial credit toward an introductory psychology course requirement. Subjects participated in groups of 10. They signed up for a particular session, then a predetermined schedule was used to assign session to experimental condition, with the number of males and females equal in each.

Materials

Two closely parallel scripts (approximately 600 words each) were written for the purposes of the experiment. The scripts provided a rich source of information for the subjects to draw on in the explanation and prediction tasks. These scripts allowed for the manipulation of familiarity and self-versus other-reference. Six forms of the scripts were devised: a familiar self-referent script, an unfamiliar self-referent script, a familiar other-referent script with a female character and the same with a male character, an unfamiliar other-referent script with a female character, and an unfamiliar other-referent script with a male character. All scripts are presented in Appendix B.

Familiar script. The familiar scripts, since all of the subjects
were students, involved a student contemplating the advantages and disadvantages of registering for a reduced course load.

Considerations such as financial status, a delayed graduation, losing touch with school friends, and having more free time were brought to the subject's attention. This familiar script was written in both self-referent and other-referent forms. The self-referent familiar script used second person pronouns (e.g., "You consider the fact that a reduced course load would enable you to take on a part-time job so that you would not always be so strapped for money."). The other-referent familiar scripts used third person pronouns of one gender (e.g., "He(she) considers the fact that a reduced course load would enable him(her) to take on a part-time job so that he(she) would not always be so strapped for money."). Male subjects were given a script with a male character and females were given a script with a female character.

Unfamiliar script. The unfamiliar script involved a clinical psychologist considering various advantages and disadvantages of requesting a reduced client load. Factors such as motivation, free time, family, salary, recreation and therapeutic relationships were brought to the subject's attention. As the familiar script, the unfamiliar script was written in both self-referent and other-referent forms. The scripts were designed to be sufficiently ambiguous, so as not to make one particular outcome seem apparent. They provided a multitude of pros and cons which could be construed as supportive of more than one final decision. The information in the scripts should have fit more than one schema equally well.
Procedure

The experimental design was a 2 (control/experimental) X 2
(self-reference/other-reference of the script) X 2
(familiar/unfamiliar script) X 2 (self-reference/other-reference of
the question on the Decision Questionnaire). Because it was necessary
to provide different oral instructions to subjects in each condition,
these conditions were run separately. Separate sessions were
necessary for conditions in order to ensure that the subjects were
clearly aware of the nature of their task.

Upon their arrival subjects were seated and an experimenter
conveyed a brief introduction. The study was introduced as an
"investigation into the relationship between imagination and decision
processes." The subjects were told that following an imaginal
exercise, they would be asked to make some decisions and to provide
some information about the decision process. It was explained that
the effects of imagination on the decision process would be assessed
in this way. Instructions for all of the conditions are presented in
Appendix A.

Subjects were given a script, and were asked to read it,
imagining the events described actually occurring. They were induced
to imagine either themselves or another person of their own gender as
the character in the script.

Explanation conditions. Twenty subjects were assigned to each of
the four explanation conditions (self-referent familiar,
other-referent familiar, self-referent unfamiliar, other-referent
unfamiliar). Subjects in the self-referent familiar condition were
asked to read the script which involved a student contemplating a decision to register for a reduced course load. They were induced to imagine themselves experiencing the events in the script. Those subjects assigned to the self-referent unfamiliar condition read a script involving a clinical psychologist who was deciding whether to request a reduced client load. These subjects were induced to imagine themselves in the role of the character in the script. Subjects participating in the other-referent familiar condition read the script involving the student and imagined the events described occurring in the life of a student of their gender. In the other-referent unfamiliar condition, subjects read and imagined the script which described a clinical psychologist of their gender making the decision whether to request a reduced client load. Prior to reading the script, all subjects in the explanation conditions were informed of a particular outcome (i.e., that the character in the script decides to take a reduced course or a reduced client load). It was explicitly stated in the initial instructions that they would be asked to write down a list of as many factors as they could remember from the script to explain why this particular decision might be made.

After reading the script and imagining the events taking place, subjects completed the explanation task (see Appendix C). When the explanation task was completed by the subjects, all materials were picked up and the "Decision Questionnaire" (see Appendix D) was distributed to the subjects.

No explanation conditions. Each of the explanation conditions had a no explanation control group to match it. There were 80 control
subjects (20 in the self-referent familiar condition, 20 in the self-referent unfamiliar condition, 20 in the other-referent familiar condition, and 20 in the other-referent unfamiliar condition). These subjects simply read the script and imagined the events occurring, either in their own lives or in someone else's. After reading the scripts, control subjects completed the "Decision Questionnaire".

Dependent measures. All subjects completed a "Decision Questionnaire" (see Appendix D). Before doing so, they were reminded that no decision was known to be the best or most likely decision. They were told that the relationship between imagination and decision processes was being measured, and they were asked simply to make predictions based on the information provided in the script. In addition, subjects were asked to rate how easy it was for them to imagine the events in the script. Each estimate was made using a 9-point Likert-type scale, ranging from -4.0 to +4.0.

Of particular interest to this investigation was the likelihood estimates made regarding the decision either to register for a reduced course load or to request a reduced client load. The questions tapping this on the "Decision Questionnaire" were, "How likely do you feel it is that you would make the decision to register for a reduced course load (request a reduced client load)?" and "How likely do you feel it is that other people in general would make the decision to register for a reduced course load (request a reduced client load)?" Subjects in the other-referent conditions were asked an additional question of interest. The question was, "How likely do you feel it is that the character in the script will make a decision to register for
a reduced course load (request a reduced client load)?" Following each of these three likelihood estimates, subjects were asked to indicate the confidence with which they made their judgment. It was expected that self-referent judgments would be made with greater confidence than other-referent judgments.

All subjects were asked to list any additional factors (factors not mentioned in the script) which they felt should be considered in making the decision in question. They were also asked to indicate the degree to which they imagined themselves in the script. This provided a check on the manipulation of self-versus other-reference. Those who imagined themselves as the character in the script should presumably have been able to list more additional reasons and factors to be considered than those subjects who did not project themselves into the script.

The final question on the "Decision Questionnaire" asked subjects to describe any experiences from their own past which may have influenced their responses. Subjects familiar with the situation in the script were expected to have been able to describe more experiences from their own past which entered into their responses. Those familiar with the situation in the script should also have been able to list more additional factors which they felt should have been considered.

Following the "Decision Questionnaire" subjects were debriefed. They were told of the true nature of the experiment, given a brief background of the literature, and told of the expected results of the current study. The debriefing statement is provided in Appendix E.
Results

Pilot Work

Pilot work was conducted to determine whether the manipulation of familiarity was accomplished with the two scripts. Familiarity was manipulated by having subjects read a script describing either a familiar or an unfamiliar situation. The familiar situation was that of a student considering the possibility of registering for a reduced course load. The unfamiliar situation involved a clinical psychologist considering the possibility of requesting a reduced client load. This situation was chosen on the assumption that undergraduates would not have experienced the latter situation. This assumption was tested and confirmed in pilot work. Pilot subjects in the unfamiliar condition indicated that the situation described in the script was indeed less familiar to them ($M=-.33$) than the script read by subjects in the familiar condition ($M=2.69$). These ratings were made on a -4.0 to +4.0 Likert-type scale.

The scripts were also piloted to assure that one particular decision was not dominant. The pilot data revealed a slight bias across scripts in favor of the decision to take a reduced client load or register for a reduced course load ($M=.85$ on a -4.0 to +4.0 scale). This was not judged to be problematic.

Manipulation Checks

Analysis of the data for this experiment included a series of analyses of variance. The first analyses reported are those which provided checks on the experimental manipulations. All of the ratings
subjects made were on a 9-point Likert-type scale, ranging from -4.0 to +4.0.

Ease of Imagining. In line with the cover story, subjects were asked to indicate how easy it was to imagine the events in the script. These ratings were subjected to a 2 X 2 X 2 ANOVA with three between-subjects factors (experimental condition, control/experimental; familiarity of the script, familiar/unfamiliar; and reference of the script, self/other; see Table F-1). There were no significant differences between conditions on this measure. More specifically, there was no control/experimental effect, $F(1,152)=.52$, $p=.52$, no effect of the self-/other-reference manipulation, $F(1,152)=.04$, $p=.83$, and no effect of the familiarity manipulation, $F(1,152)=.04$, $p=.83$. Overall, subjects indicated that it was easy for them to imagine the events occurring (see Table F-2).

Self-/Other-Reference of the Script. A check on the manipulation of self-/other-reference was included on the Decision Questionnaire. Subjects were asked to rate the degree to which they imagined themselves in the script. This item was analyzed in a 2 (control/experimental) X 2 (familiar/unfamiliar) X 2 (self/other reference) ANOVA (see Table F-3). There was no significant control/experimental difference revealed by this analysis, $F(1,152)=1.31$, $p=.25$. In addition, there was no main effect for familiarity, $F(1,152)=.45$, $p=.51$. With regard to self-/other-reference, subjects who read the self-referent script were expected to project themselves into the script to a greater extent than those who read the other-referent script. These data revealed a
main effect for self-/other-reference, $F(1,152)=39.39, p=.00$. The self-referent condition yielded a mean of 2.46, while the other-referent mean was .48. This main effect must be qualified, however, by an interaction between self-/other-reference and familiarity, $F(1,152)=5.42, p=.02$. On this item, the self-/other-reference difference was significantly greater in the unfamiliar condition than in the familiar condition (see Figure 1).

**Figure 1**

Extent to which subjects placed themselves into the script

In the self-referent condition, the extent to which subjects placed themselves into the script increased in the unfamiliar condition, relative to the familiar condition. In the other-referent condition, the extent to which subjects placed themselves into the script decreased in the unfamiliar condition, relative to the familiar
Familiarity. Two checks on the manipulation of familiarity with the script were implemented as well. Subjects were asked to indicate how familiar the situation described by the script was to them and how frequently they had experienced a situation similar to the one described. These two items were each subjected to a 2 (control/experimental) X 2 (familiar/unfamiliar) X 2 (self-/other-reference) analysis of variance (see Tables F-4 and F-5). As anticipated, a familiar/unfamiliar main effect was found on the familiarity item, \( F(1,152)=138.08, \alpha=.00 \). The familiar script was rated as significantly more familiar (\( \bar{M}=2.06 \)) than the unfamiliar script (\( \bar{M}=-.81 \)).

A familiar/unfamiliar main effect was also revealed on the question addressing how frequently the subjects had experienced a situation similar to the one described in the script, \( F(1,152)=72.01, \alpha=.00 \). The script read in the familiar condition was rated by subjects as being much more frequently experienced (\( \bar{M}=6.63 \)) than the script read in the unfamiliar condition (\( \bar{M}=-2.74 \)). Thus, it appears that the manipulation of familiarity was accomplished successfully.

A main effect for the control/experimental condition was also revealed on the familiarity item, \( F(1,152)=4.66, \alpha=.03 \). The explanation condition yielded higher ratings of familiarity (\( \bar{M}=1.36 \)) than did the no-explanation control condition (\( \bar{M}=.69 \)). This effect was qualified by an interaction between self-/other-reference and control/experimental conditions, \( F(1,152)=4.32, \alpha=.04 \). The self-/other-reference difference in familiarity ratings was greater in
the experimental condition than in the control condition (see Figure 2).

In the explanation condition, self-referent subjects indicated greater familiarity than did other-referent subjects. There was a slight reversal in the no-explanation control condition, with other-referent subjects indicating greater familiarity than self-referent subjects.

There was no control/experimental effect on the item addressing how frequently the subjects had experienced a situation similar to the one described in the script $F(1, 152) = .17, p = .69$, nor was there a self-/other-reference effect, $F(1, 152) = .22, p = .64$.

**Figure 2**

Familiarity with situation in script

Subjective Likelihood Estimates

Having supported successful manipulation of the independent
variables, the major analyses for this experiment were undertaken. A series of analyses was performed on the likelihood estimates provided by subjects. The first was a $2 \times 2 \times 2 \times 2$ ANOVA with three between-subjects factors (experimental condition, control/experimental; familiarity of the script, familiar/unfamiliar; and reference of the script, self-/other-reference) and one within-subject factor (reference of the question on the Decision Questionnaire, self-/other-reference; see Table F-6). All subjects estimated the likelihood that the decision in question (i.e., either to request a reduced client load or to register for a reduced course load) would be made. Again, all ratings were made on a 9-point Likert scale, ranging from -4.0 to +4.0.

Control/Explanation Effect. It was predicted, based on previous research, that subjective likelihood estimates would be heightened in the explanation condition relative to the no-explanation control condition. This hypothesis was not confirmed by the present data, $F(1,152)=1.06, p=.31$. The means for the no-explanation control and the explanation conditions were $\bar{M}=0.84$ and $\bar{M}=1.15$, respectively.

Another analysis of variance was performed to account for the additional question asked of subjects in the other-referent condition. The dependent measure for this condition included a question addressing the behavior of the character-in-the-script, as well as self and others in general. These data were examined in a 2 (control/experimental) $\times$ 2 (familiar/unfamiliar) $\times$ 2 (self-referent question/question addressing the character in the script) ANOVA (see Table F-7). These data did not yield a significant heightening of
subjective likelihood estimates for the explanation condition ($M=1.43$) relative to the no-explanation control condition ($M=1.03$), $F(1,76)=.59$, $p=.59$. This extra analysis for the other-referent condition will hereafter be referred to as the self-/character-referent analysis. The main $2 \times 2 \times 2 \times 2$ analysis described in the above paragraph will be referred to as the self-/other-referent analysis. The self-/other-referent analysis includes both self- and other-referent conditions. The two analyses will be discussed in conjunction in order to assess the effects of familiarity and self-/other-reference. Though an effect due to explanation was predicted and not found, of particular interest in this investigation were the effects of familiarity and self-/other-reference.

Familiarity Effect. It was anticipated that an unfamiliar domain would lead to more extreme heightening of likelihood estimates than would a familiar domain, since a familiar domain is likely to entail the incorporation of schematic knowledge, and resist the biases instilled by the experimenter. The self-/character-referent analysis revealed a significant familiarity effect, $F(1,76)=5.53$, $p=.02$ (see Table F-7). This analysis showed greater heightening of subjective certainty in the unfamiliar condition ($M=1.84$) than in the familiar condition ($M=1.61$). Thus, the above hypothesis was supported in this analysis. This main effect of familiarity did not appear in the self-/other-referent analysis, $F(1,152)=1.44$, $p=.23$ (see Table F-6). It appears that familiarity had a significant effect in the analysis including only the other-referent condition, not in the analysis which
included both self- and other-referent conditions. Perhaps the potency of self-reference diluted the overall effect of familiarity.

Self-/Other-Reference of the Script. It was anticipated that exposure to an other-referent domain would lead to more extreme heightening of likelihood estimates than would exposure to a self-referent domain. This effect did not, however, occur in the present data. There was no main effect due to exposure to self- and other-referent scripts, $F(1,152) = .32, p = .58$.

Self-/Other-Reference of the Question on the Decision Questionnaire. Differential heightening of subjective likelihood estimates due to reference of the question on the Decision Questionnaire was hypothesized. It was predicted that greater subjective certainty would result on other-referent questions than on the self-referent question. Self-referent judgments are believed to be made on the basis of a wealth of self-schematic information which is called into play by the self-referent question. Other-referent judgments would be more likely to be influenced by information provided by the experimenter. Other-referent judgments, then, should have exhibited more biasing of subjective likelihood estimates. Evidence of this effect was present in the self-/other-referent analysis, $F(1,76) = 3.40, p = .06$ (see Table F-7). The difference in subjective likelihood estimates for the self ($M = .95$) and those for the character-in-the-script ($M = 1.5$) approached significance, with a trend in the expected direction. The same trend did not occur in the self-/other-referent analysis, $F(1,152) = 1.54, p = .21$.

Interaction Between Familiarity and Self-/Other-Reference of the
Question on the Decision Questionnaire. In the self-/other-referent analysis, an interaction was found between familiarity and reference of the question on the Decision Questionnaire, $F(1,152)=5.10$, $p=.02$. Familiarity had a greater effect on self-referent estimates of subjective certainty than on other-referent estimates. On the self-referent question, the unfamiliar script led to heightened subjective certainty relative to the familiar script. A slight reversal occurred on the other-referent question. Subjective likelihood estimates on this item were slightly higher in the familiar condition than in the unfamiliar condition. These data are summarized.

Figure 3
Subjective Likelihood Estimates: Self-/Other-referent Analysis
Schematic Effects

in Figure 3. This interaction was revealed at a marginally significant level in the self-/character-referent analysis of this item, $F(1,76)=2.03$, $p=.15$.

Confidence Ratings

Along with their likelihood estimates, confidence ratings were also requested of the participants in this study. Subjects were asked to rate the degree to which they felt confident in their prediction. These ratings were subjected to a 2 (control/experimental) x 2 (familiar/unfamiliar) x 2 (self-/other-reference of the script) x 2 (self-referent question/other-referent question) analysis (see Table F-8). This analysis is parallel to the self-/other-referent analysis of subjective likelihood estimates; it will be referred to as the self-/other-referent confidence analysis. An analysis of confidence ratings parallel to the self-/character-referent analysis of subjective likelihood estimates was also performed (see Table F-9). Again, the two analyses will be discussed in conjunction in order to assess the effects of self-/other-reference and familiarity.

Control/Explanation and Familiarity Effect. Neither the self-/character-referent confidence analysis nor the self-/other-referent confidence analysis suggested differential effects of reading familiar and unfamiliar scripts, $F(1,152)=2.69$, $p=.10$ and $F(1,76)=1.54$, $p=.22$, respectively (see Table F-8 and F-9). A control/experimental effect was absent in both analyses as well, $F(1,152)=.28$, $p=.61$ and $F(1,76)=2.80$, $p=.09$, respectively (see Tables F-8 and F-9).

Self-/Other-Reference of the Script. Further support for the
expected differential effects of self-/other-reference was revealed by the confidence ratings. It was predicted that ratings of confidence would be higher in the self-referent condition than in the other-referent condition. Reading the self-referent script was expected to trigger a great deal of self-schematic information, on which judgments could be more easily and more confidently formed. Other-referent subjects, being limited to the information provided in the script, were expected to display less confidence in their judgments. Just the opposite was found. A main effect of self-/other-reference of the script occurred on the self-/other-referent confidence analysis, \( F(1,152) = 4.14, p = .04 \) (see Table F-8). Subjects in the other-referent condition indicated greater confidence in their predictions (M=2.69) than did those in the self-referent condition (M=2.31). Since the self-/character-referent confidence analysis included only the other-referent condition, no self-/other-reference comparisons were made in that analysis.

Self-/Other-Reference of the Question on the Decision Questionnaire. Regarding the reference of the question on the dependent measure, it was predicted that greater confidence would be associated with self-referent judgments than with other-referent judgments. Self-referent judgments, based on self-schematic information as well as the information provided by the script, should be made with greater confidence than other-referent judgments that are based on the script alone. This hypothesis held true in both analyses. A main effect of the reference of the question on the Decision Questionnaire was revealed in the self-/character-referent
confidence analysis, $F(1,76)=17.30, p=.00$ (see Table F-9). Confidence ratings were higher for the self-referent question ($M=3.35$) than for the character-in-the-script ($M=2.54$). The same main effect was present in the self-/other-referent confidence analysis, $F(1,152)=39.39, p=.00$ (see Table F-8). Again, self-referent judgments were made with greater confidence ($M=2.95$) than were other-referent judgments ($M=2.05$). This main effect is qualified, however, by an interaction between self-/other-reference of the script and self-/other-reference of the Decision Questionnaire item, $F(1,152)=8.38, p=.00$ (see Figure 4). The self-/other-reference difference was greater on the self-referent question than on the other-referent question. The self-referent question yielded heightened confidence, particularly in the other-referent condition. The other-referent question yielded lower confidence ratings than the self-referent question, regardless of self-/other-reference of the script.

**Additional Factors and Personal Experiences**

The effects of self-/other-reference and familiarity were also assessed by having subjects list any additional factors (factors not mentioned in the script) which they felt should be considered in making the decision in question. In addition, they were asked to describe any experiences from their own past which may have influenced their subjective likelihood estimates. The number of factors listed and the number of experiences offered were determined by having two coders, blind to experimental condition, independently count responses. Counts were performed systematically, implementing
pre-established rules for item inclusion and exclusion. These rules

**Figure 4**

Confidence ratings: Self-/Other-referent Analysis

![Graph showing confidence ratings for Self-referent and Other-referent Script.

Self-referent Question  | Other-referent Question
---|---
3.0 | (3.35)
2.5 | (2.55)
2.0 | (2.06)
1.5 | (2.04)
1.0 | Self-referent script
0.5 | Other-referent Script
0.5 |

were evolved by reviewing pilot data, which yielded several response
categories to assist in the counting procedure. Initial interrater
agreement was calculated by a Pearson Product-Moment Correlation;
$r = .84$. Upon disagreement the two raters negotiated to reach 100%
agreement, resulting in the counts subjected to analysis. The total
number of factors listed and the total number of experiences described
were analyzed in two separate 2 (control, experimental) X 2
(familiar/unfamiliar) X 2 (self-/other-reference of the script) ANOVAs
(see Tables F-10 and F-11). It was predicted that more factors and
more experiences would be provided by subjects participating in the
familiar than in the unfamiliar condition; and more in the self-referent than in the other-referent condition.

Additional Factors. On the additional factors item a main effect for self-/other-reference was revealed, $F(1,152)=9.83$, $p=.00$ (see Table F-10). Consistent with the prediction, more additional factors were provided in the self-referent condition ($M=2.99$) than in the other-referent condition ($M=2.26$).

A main effect for familiarity also appeared, $F(1,152)=18.88$, $p=.00$ (see Table F-10). It was expected that more factors and more experiences would be provided by subjects in the familiar condition than by those in the unfamiliar condition. Counter to the predictions made, more additional factors were listed in the unfamiliar condition ($M=3.13$) than in the familiar condition ($M=2.14$). These main effects are qualified by an interaction between self-/other-reference and familiarity, $F(1,152)=10.53$, $p=.00$ (see Table F-10). The difference between the number of additional factors provided by subjects in the self-referent and the other-referent conditions was greater in the unfamiliar condition than in the familiar condition (see Figure 5). The number of additional factors listed was lower in the familiar condition, whether the script read was self-referent or other-referent. There was no control/experimental effect on this item, $F(1,152)=.87$, $p=.65$ (see Table F-10).

Personal Experiences. The personal experiences item resulted in a main effect for self-/other-reference, $F(1,152)=4.46$, $p=.03$ (see Table F-11). As predicted, significantly more personal experiences were listed in the self-referent condition ($M=3.25$) than in the
other-referent condition ($M=2.73$). This main effect may be qualified by a marginally significant interaction between self-/other-reference and familiarity, $F(1,152)=3.65, p=.05$ (see Figure 6). There was a greater difference between self- and other-reference of the script conditions in the familiar condition than in the unfamiliar condition. Fewer personal experiences were listed by subjects exposed to the familiar script, when it was other-referent than when it was self-referent or when it was unfamiliar. The number of personal experiences offered was amplified for the self-referent condition, regardless of familiarity with the script. There was no main effect of familiarity on this item, $F(1,152)=2.27, p=.13$ (see Table F-11).
There also was no control/experimental effect, $F(1,152) = .01$, $p = .92$ (see Table F-11).

**Figure 6**

Mean number of personal experiences listed

Sex Effects

Finally, each one of the aforementioned measures were analyzed to determine whether any sex effects occurred in the data. Only two of these analyses yielded an effect of sex, the self-reference manipulation check and the you versus others analysis of subjective likelihood estimates (see Tables F-12 and F-13).

Interaction Between Familiarity and Sex on Ease of Imagining Item. A $2$ (control/experimental) X $2$ (familiar/unfamiliar) X $2$ (self-/other-reference of the script) X $2$ (male/female) ANOVA of the
check on the manipulation of self-/other-reference revealed an interaction between familiarity and sex of subject, $F(1,144)=3.96$, p=.05 (see Table 13). Ease of imagining differed due to familiarity. This difference occurred to a greater extent for males than for females (see Figure 7).

**Figure 7**

Extent to which subjects placed themselves into script

Females were much less affected by exposure to the familiar versus unfamiliar scripts. In addition, the direction of the difference between the familiar and unfamiliar conditions was reversed for males and females. Males indicated that they placed themselves into the script to a greater extent when it was familiar than when it was unfamiliar. Females indicated that they placed themselves into the script slightly more in the unfamiliar condition than in the familiar
condition.

Self-/Other-Reference of the Script X Control/Explanation

Condition X Sex Interaction on Subjective Likelihood Estimates. A sex effect was found in an analysis of subjective likelihood estimates for those subjects who read the self-referent script. A 2 (control/experimental) X 2 (familiar/unfamiliar) X 2 (self-/other-reference of the script) X 2 (male/female) X 2 (self-/other-reference of the question on the Decision Questionnaire) ANOVA of the subjective likelihood estimates revealed a triple-order interaction between self-/other-reference of the script, the

Figure 8

Subjective likelihood estimates for males:
Self-/Other-referent

![Graph showing subjective likelihood estimates for males: Self-/Other-referent](image)
control/experimental condition, and sex of subject, $F(1,144)=4.43$, $p=.03$ (see Table 16). For males (see Figure 8), the difference in subjective likelihood estimates due to explanation was greater in the self-referent condition than in the other-referent condition. In the self-referent condition, the subjective likelihood estimates of males were higher in the explanation condition than in the no-explanation control condition. In the other-referent condition, males' subjective likelihood estimates were slightly higher in the no-explanation control condition than in the explanation condition. Further, the subjective likelihood estimates of males were relatively low in the other-referent condition, but were elevated in the self-referent
condition. For females (see Figure 9), the difference in subjective likelihood estimates due to explanation was greater in the other-referent condition than in the self-referent condition. In addition, there was a slight reversal for self- and other-referent conditions. In the self-referent condition, the subjective likelihood estimates of females were higher for the no-explanation control condition than for the explanation condition. In the other-referent condition, the opposite occurred. The subjective likelihood estimates of females were higher for the explanation condition than for the no-explanation control condition.

Discussion

Manipulation Checks

The results of the first four analyses reported indicate that the experimental manipulations implemented in this research were successful. Manipulation of familiarity and of self-/other-reference was accomplished by having subjects read a script and imagine the events described occurring. Thus, it was important that participants were able to imagine as they read the script. The results suggest that participants felt it was possible to read the script and imagine the events occurring, and that the ease with which they did so did not differ as a function of experimental condition (means fell between 2.3 and 3.0 on a scale ranging from -4.0 to +4.0).

In addition, it appears that self-/other-reference was manipulated effectively. Subjects who read the self-referent script indicated that they imagined themselves experiencing the events described to a greater extent than did those who read the
other-referent script. This was particularly prominent in the unfamiliar condition. In other words, there was even more of a discrepancy between self- and other-reference when the script read was also unfamiliar. Subjects indicated that they placed themselves into the self-referent script to a greater extent than the other-referent script, regardless of familiarity. In the self-referent condition, the extent to which subjects placed themselves into the script increased in the unfamiliar condition, relative to the familiar condition. In the other-referent condition, in contrast, the extent to which subjects placed themselves into the script decreased in the unfamiliar condition relative to the familiar condition.

Subjects in this experiment were asked to imagine the events described. Perhaps those who were asked to imagine themselves in the script did so to a greater extent in the unfamiliar condition in order to facilitate imagining of the script. The unfamiliar script may have been more difficult to imagine. In the unfamiliar condition, subjects may have more fully placed themselves into the script to "involve themselves" in the imagining task. Those subjects who were not asked to place themselves into the script (i.e., self-referent subjects) did not when the script was unfamiliar. In the familiar condition, however, subjects indicated that they did place themselves into the script to a certain extent. This could suggest a general tendency to imagine oneself in situations being imagined, which is manifest mainly when the situation imagined is familiar.

The experimental manipulation of familiarity was also deemed
successful in the present investigation. The item assessing how familiar the script was to participants revealed that the familiar script was indeed more familiar to them than the unfamiliar script. The question addressing how frequently subjects had experienced a situation similar to the one described in the script also showed a general familiarity effect. Those in the familiar condition indicated that they had had significantly more experiences similar to the one described than those in the unfamiliar condition. Overall, it seems that the experimental manipulations were effective in differentiating familiarity and self-/other-reference of the script. An interesting interaction between self-/other-reference of the script and control/experimental conditions occurred on the familiarity item. Subjects who generated an explanation based on a self-referent script indicated greater familiarity with the situation described in the script than did subjects who generated an explanation based on an other-referent script. There was a slight reversal in the no-explanation control condition, with other-referent subjects indicating slightly greater familiarity than did the self-referent subjects. The explanation task appears to have conjured up feelings of familiarity for self-referent subjects more than for other-referent subjects. This is likely due to the schematic information implemented in the self-referent situation. Schematic information contains exemplars from past experience which may make the situation described in the script seem more familiar as it is carefully considered through the act of explanation.
Subjective Likelihood Estimates

Control/Explanation Effect. It was anticipated, based on previous research, that subjective likelihood estimates would be heightened due to the explanation task. This effect did not occur in the present data, neither in the self-/other-analysis nor in the self-/character-analysis. Some subjects were asked to imagine that a particular decision had been made (i.e., either to request a reduced client load or to register for a reduced course load) and to explain why that decision might have been made. It was anticipated that this explanation task would serve to plant this occurrence firmly in mind, so that it could withstand the defacing of that information (i.e., Subjects were told that we do not actually know which decision is the best decision or which is the most likely to be made in this particular situation.) Previous research, such as Ross et al. (1977), has demonstrated the effects of explanation on subjective likelihood estimates. In the Ross et al. (1977) experiment, subjects read clinical case histories and were asked to generate an explanation for an event (e.g., the target would either commit suicide or contribute financially to the Peace Corps). Ross et al. (1977) reported that those subjects who performed the explanation task showed heightened subjective likelihood estimates as compared to no-explanation control subjects.

According to a cognitive schema interpretation which has been offered to account for the effects of explanation, perseverance of beliefs is due to the activation of schemata or scripts (Tversky &
Kahneman, 1973, 1977; Schank & Abelson, 1977; Abelson, 1981; Kahneman & Tversky, 1982). In making judgments such as subjective likelihood estimates, people search for relevant factors in memory. They access those that are salient—highly available. The explanation task is intended to make certain features of a situation salient, so that a particular outcome is salient. One potential account for the lack of an effect of explanation is that the scripts used in the present investigation were too simplistic to have necessitated the aid of a network of schematic information in making judgments. In other words, the scripts may have been too easy to imagine; it may not have required enough effort on the part of subjects to process the information in the scripts. In comparison, the clinical case histories used by Ross et al. (1977) may have provided information which was much more difficult to process and to organize in memory, requiring the implementation of the cognitive schema, the most highly available schema, that with an outcome which had been explained. Perhaps the information provided in the scripts in the present endeavor was so easily processed that it did not require such a cognitive mechanism. If a cognitive schema was not called upon in making likelihood judgments, then greater subjective certainty with regard to the explained outcome would not be expected.

The findings of Hirt and Sherman (1985) lend some credence to this explanation. In their study an explanation task led to heightened subjective certainty except when knowledgeable subjects were given an initial impression set; they were told at the outset that they would be asked certain questions after reading, so they
should try to form an impression of what might happen. It can be assumed that knowledgeable subjects found the material they read easier to process and to organize cognitively. Perhaps the simplistic nature of the scripts provided in the present study made all subjects comparable to subjects in the knowledgeable condition in the Hirt and Sherman (1985) study. Subjects in this condition formed an impression of the outcome which they clung to, without being affected by the explanation task.

Familiarity Effect. Although the expected effects of explanation did not occur, the present investigation did yield some interesting findings with regard to self-/other-reference and familiarity. Since there was no control/experimental effect, it appears that merely reading the script was sufficient to produce self-/other-reference and familiarity effects. Indeed, the results of the present investigation suggest that this was the case. Greater heightening of subjective certainty was revealed in the unfamiliar condition than in the familiar condition. This familiarity effect occurred in the self-/character-analysis, but not in the self-/other-analysis. Perhaps this is due to the fact that the self-/character-referent analysis included only the other-reference condition, while the self-/other-referent analysis included both self-referent and other-referent conditions. It may be that familiarity was highlighted in the other-referent condition. This familiarity effect may have been washed out in the self-/other-referent analysis, which also included the self-referent condition. It makes sense that familiarity was a less important factor in making judgments in the self-referent
condition. In this case a wealth of self-schematic knowledge was believed to be accessed due to self-reference, which may have downplayed the schematic knowledge which is believed to arise from familiar information.

Since the familiarity effect was no greater in the experimental than in the no-explanation control condition, it suggests that exposure to either familiar or unfamiliar scripts was sufficient to differentially influence subjects' judgments. This finding lends support to the work of Markus (1977), which suggests that individuals with expertise in a particular domain possess well-developed schemata which they call upon in making judgments. A well-developed schema is more complex; it contains more information than undeveloped schemata. Also, a well-developed schema contains information which is highly integrated, so that when certain essential features are recognized, the entire wealth of schematic knowledge becomes available. The present data further support the notion that although the schemata of knowledgeable individuals contain more information, this information is stored and implemented efficiently. It is the unfamiliar individual who is overwhelmed in processing, and is more likely to experience information overload. The results presented here suggest that this is the case. Individuals in the unfamiliar domain may have experienced cognitive overload in processing the information and making judgments. In making these judgments they opted to rely on experimenter-suggested outcomes, which appears to have been accomplished in the present study by having subjects read the script.

Differential processing of familiar and unfamiliar information
has been reported in previous research (Hirt & Sherman, 1985) as well. In the first of two experiments, these researchers used subjects who were either knowledgeable or unknowledgeable with regard to the game of football. Their knowledge in this domain was assessed with two initial "knowledge of football" measures designed by the experimenters. In the second experiment all subjects were knowledgeable with regard to football in general, but some were given information about unfamiliar teams and players. In each experiment subjects read information about two teams which were to meet each other in competition. Subjects were asked to explain a hypothetical victory of one of these teams. Some subjects were told of this explanation task prior to reading the materials provided and some were told only after. Subjects who were told of the explanation task only after reading, were introduced to the reading material in one of two ways. Some subjects were instructed to recall as many details as possible, while others were instructed to form a general impression while reading.

After reading the information and completing the explanation task, subjects made predictions about the game which was to occur between the two teams described, including an estimate of the likelihood that a particular team would win the game and a prediction of the final score. All subjects displayed biasing effects of the explanation task except knowledgeable subjects who were asked to form an initial impression and who were given information that was readily integrated with prior knowledge. The judgment of all other subjects was significantly affected by the explanation task. In addition to
the subjective likelihood measures, recall data were collected in the Hirt and Sherman (1985) investigation. These data demonstrated biased recall of facts, supporting the explained outcome (i.e., more favorable facts were recalled for the team which was victorious in the explanation task).

Self-/Other-Reference of the Script. Subjective likelihood estimates were expected to offer support for differential processing of self-referent and other-referent information. No evidence of such differences appeared in the subjective likelihood estimates collected in the present investigation. It was hypothesized that when processing self-referent information, subjects would go beyond the information available in the script in generating an explanation. This additional information was expected to have made self-referent experimental subjects less susceptible to biased subjective likelihood estimates. Since the anticipated differences in control and experimental conditions did not occur, it is impossible to assess whether reference of the script would heighten that difference. The present data did not reveal a difference in subjective likelihood estimates due simply to exposure to self-referent and other-referent scripts, as was found for familiarity.

Self-/Other-Reference of the Question on the Decision Questionnaire. In addition to the effect of self-/other-reference of the script, another self-/other-reference difference was predicted. It was hypothesized that greater subjective certainty would result on other-referent questions than on the self-referent question. The self-referent question is likely to engage an individual's
self-schematic information, self-conceptions, past experiences, and previous self-knowledge. People making self-referent judgments should be striving for greater accuracy than those making other-referent judgments, so they should be more motivated to take into account all available information. The self-referent judgment, although believed to enlist a vast amount of schematic information, should not lead to cognitive overload due to the compactness of the well-developed self-schema. Other-referent judgments, in contrast, are made without consideration of this additional information and are, thus, more likely to be biased by experimental manipulation. The self-/character- analysis supported this prediction, with marginal significance, but the self-/other- analysis did not. This could be seen as evidence that the explanation task is not necessary to bias judgments. Merely reading the script influenced subjective likelihood estimates. The self-/character-referent analysis included only the other-referent condition (i.e., subjects read only the other-referent script). This analysis yielded an effect of self-/other-reference of the question on the Decision Questionnaire. The self-/other-analysis, which included both self- and other-referent conditions (i.e., some subjects read a self-referent script, while others read an other-referent script), did not yield the same effect. It may be that subjects exposed to the self-referent script displayed bias on the self-referent question, while those exposed to the other-referent script displayed bias on the other-referent question. If this is the case, then a general effect of self-/other-reference of the question would be expected only in the self-/character-referent analysis, which
included only those exposed to other-referent material. This is what
was found.

Interaction Between Familiarity and Self-/Other-Reference of the
Question on the Decision Questionnaire. The present investigation
also offers some suggestion that familiarity has a greater impact on
subjective certainty when making self-referent judgments than when
making other-referent judgments. On the self-referent question, the
unfamiliar condition led to higher subjective certainty than the
familiar condition. The other-referent question displayed a reversal.
The familiar condition yielded slightly higher subjective likelihood
estimates than the unfamiliar condition. In addition, exposure to the
unfamiliar script led to greater subjective certainty on the
self-referent question than the unfamiliar script on the
other-referent question, the familiar script on the self-referent
question, or the familiar script on the other-referent question.
Perhaps subjects call upon a vast amount of self-schematic information
in making self-referent judgments. This schematic information is
well-developed and well-integrated so it is efficient and effective in
resisting the biases of the script. When the information to be
processed is unfamiliar, however, the individual is overwhelmed by the
task of integrating schematic and unfamiliar information in making
judgments. This would lead to heightened subjective certainty in
self-referent judgments in the unfamiliar condition. This interaction
was present in the self-/other-referent analysis, but not in the
self-/character-referent analysis. The interaction occurred in the
results of the analysis which examined both self-referent and
other-referent conditions. When the information subjects were exposed to was only other-referent (i.e., in the self-/character-referent analysis) there was no differential heightening of subjective certainty due to familiarity. So the present data yield some evidence of differential cognitive processing of familiar and unfamiliar information, based on subjective likelihood estimates.

It is interesting to note that the hypothesized familiarity and self-/other-reference main effects which resulted, did so only in the self-/character analysis. Familiarity and self-/other-reference of the question on the Decision Questionnaire had a significant effect when the subjective likelihood estimates of subjects who read only the other-referent script were analyzed. Neither of these main effects occurred when the subjective likelihood estimates of subjects who read both self-referent and other-referent scripts were analyzed.

Confidence Ratings

Hypothesized self-/other-reference and familiarity differences were expected to be subtle on subjective likelihood estimates. In an effort to further investigate potential differences, other measures were included on the Decision Questionnaire. For each likelihood estimate subjects made, they were asked to indicate the degree of confidence with which they made it. Based on previous research (Kuiper & Rogers, 1979; Markus et al., 1982), it was anticipated that self-referent judgments would be made with greater confidence than other-referent judgments. Previous findings have shown that subjects rate other-referent judgments as more difficult to make than self-referent judgments, and that self-referent judgments are made
with greater confidence. This hypothesis was confirmed in the present investigation. Self-referent judgments were made with greater confidence in both the self-/other- analysis and the self-/character- analysis.

In addition, an interaction was revealed between self-/other-referent judgments and self-/other-reference of the script. The self-/other-reference difference was greater on the self-referent question than on the other-referent question. The other-referent question yielded lower confidence than the self-referent question, regardless of self-/other-reference of the script. Heightened confidence on the self-referent question may be explained by the schematic knowledge which provides a strong basis for making such judgments. The self-referent script may also have triggered self-schematic knowledge. The self-referent script condition produced lower ratings of confidence than the other-referent script condition. It is possible that the wealth of self-schematic information assists in making self-referent judgments, while at the same time it also calls attention to the vast number of other possible outcomes. Thus, the self-referent question was answered with confidence and the self-referent script produced lower confidence than the other-referent script, regardless of the nature of the question (although, the difference in self- and other-reference ratings was minimal on the other-referent question). So, self-referent judgments were made with greater confidence, and an interaction was suggested between self-/other-referent judgments and self-/other reference of the script.
Differential effects on confidence ratings were predicted due to exposure to self-referent and other-referent scripts. Based on the self-schema explanation mentioned earlier, when processing self-referent information, individuals should refer to self-schematic information, which means a vast amount of information is to be considered. When other-referent information is processed, in contrast, very little information other than that provided in the script should be considered. Thus, self-referent subjects would be expected to be more confident in their judgments than other-referent subjects. Just the opposite occurred in the present investigation. Subjects exposed to the other-referent script indicated greater confidence in their predictions than did subjects exposed to the self-referent script. The speculation outlined above applies here as well. The self-referent script may call to attention the many alternatives possible besides the target behavior. This would be expected to lower confidence in the subjective likelihood estimate regarding that particular behavior.

Additional Factors and Personal Experiences

Two additional measures were included on the Decision Questionnaire. Subjects were asked to list factors not mentioned in the script which they felt should be considered in making the target decision and to describe any personal experiences from their past which may have influenced the likelihood estimates they made. It was predicted that more additional factors and more personal experiences would be provided by subjects who were exposed to the self-referent script than by those who were exposed to the other-referent script.
Both items revealed this effect. As discussed earlier, exposure to the self-referent script was expected to elicit a multitude of details, additional considerations, and stored exemplars of the situation presented. It was also anticipated, with similar reasoning as above, that more additional factors and more personal experiences would be provided along with exposure to the familiar script, as opposed to the unfamiliar script. The analysis of personal experiences showed no main effect of familiarity. The analysis of additional factors did reveal a familiarity effect, but it was in direct opposition to the prediction. More additional factors were listed in the unfamiliar condition than in the familiar condition. In particular, those who were exposed to an unfamiliar script that was self-referent listed more additional factors than those who read an unfamiliar script that was other-referent. When the script was familiar, self- and other-reference had a very slight effect on the number of additional factors listed. When the information was self-referent, it is believed to have triggered from memory an entire network of self-schematic information. Perhaps this schematic information was limited by a familiar situation. Familiarity with the situation may have served to narrow the number of factors available from schematic information, since some of this information was deemed irrelevant. A person who was unfamiliar with the situation may have been more likely to consider additional factors even though these factors were not clearly relevant.

An interaction between familiarity and self-/other-reference of the script also occurred on the personal experiences item. In this
case self-/other-reference of the script had a greater effect in the familiar condition. Fewer personal experiences were listed by subjects exposed to the familiar script when it was other-referent than when it was self-referent or when it was unfamiliar. The number of personal experiences listed was higher in the self-referent condition, regardless of familiarity with the script. This relationship is difficult to explain. It makes some sense to apply the explanation offered for the results of the additional factors item. Could it possibly be that familiarity limits the amount of personal experiences that are believed to be relevant to a particular situation? This explains the finding that less personal experiences were listed in the other-referent familiar condition than in either self- or other-referent unfamiliar conditions. The difference between self- and other-referent familiar conditions seems to be readily explained by the proposition that self-referent information brings to mind a large quantity of self-schematic information. This information would lead to the listing of more personal experiences in the self-referent than in the other-referent condition. That is what occurred in the familiar condition in the present data.

It was expected that a control/experimental effect would appear on the additional factors and personal experiences items, with experimental subjects having given the decision greater thought in performing the explanation task. If more extensive cognitive work was put forth by experimental subjects, they would be expected to be able to conjure up more additional factors and personal experiences. This was not the case in the present investigation. There was no
control/experimental effect on these items.

Sex Effects

No predictions were made about the effects of sex on any of the items. There were, in fact, no expected differences between males and females on the measures included. Previous research has not indicated that such predictions would be warranted. Despite this, two of the measures in the present study revealed significant differences between the responses of males and females. The check on the manipulation of self-/other-reference revealed an interaction between familiarity and sex of subject. Females were affected to a lesser extent by exposure to familiar versus unfamiliar scripts than were males. Males indicated that they placed themselves into the script to a greater extent in the familiar condition than in the unfamiliar condition. Females, however, indicated that they placed themselves into the script slightly more in the unfamiliar condition than in the familiar condition. Perhaps for males familiar information called into play schematic information, which consisted of exemplars from their own previous experience. This may have led them to place themselves into the familiar script to a greater extent. Females, on the other hand, may have placed themselves into the script as a tool, in an attempt to give themselves an advantage in processing information, to counter their lack of knowledge. Further research investigating the relationship between familiarity and sex of subject is necessary before any firm conclusions can be formed.

A second sex effect occurred on the subjective likelihood estimates for subjects exposed to the self-referent script. An
interaction between self-/other-reference of the script, the control/experimental condition, and sex of subject was found on this item. Males and females displayed a direct reversal of responses. The subjective certainty indicated by males was affected by the explanation task to a greater extent in the self-referent condition than in the other-referent condition. Females showed greater impact of explanation in the other-referent condition than in the self-referent condition. In the self-referent condition, the subjective likelihood estimates of males were higher in the explanation condition than in the no-explanation control condition. In the other-referent condition, the estimates of males were slightly higher in the no-explanation control condition than in the explanation condition. Also, males' subjective likelihood estimates were relatively low in the other-referent condition, and elevated in the self-referent condition. In the self-referent condition, the subjective certainty of females was higher for the no-explanation control condition than for the explanation condition. In the other-referent condition, the subjective likelihood estimates of females were higher for the explanation condition than for the no-explanation control condition.

This suggests that the best test for effects of explanation on subjective likelihood estimates is different for males and females. For males an explanation task based on a self-referent script heightened subjective certainty, relative to the no-explanation control. For females, in contrast, an explanation task based on an other-referent script heightened subjective certainty, relative to the
no-explanation control. The use of an equal number of males and females in each experimental condition in this investigation may have served to cancel out explanation effects across self- and other-referent conditions. Here again, conclusions about differential male and female processing of self-referent and other-referent information would be premature. The present results offer some suggestion of such a difference, but further research is necessary in order to clarify the nature of this relationship.

Conclusion

In summary, the present investigation was an attempt to tease out possible mediating factors of the schematic effects of explanation. The explanation task implemented did not serve to heighten subjective certainty as predicted. This shortcoming makes it impossible to conclude that familiarity and self-/other-reference of the script are mediators of the schematic effects of explanation based on the present data. The lack of heightened subjective certainty due to explanation does not, however, negate the findings which suggest differences in processing of familiar and unfamiliar information, and self-referent and other-referent information.

The present investigation revealed a familiarity effect on subjective likelihood estimates, with greater subjective certainty in the unfamiliar condition. In addition, an effect of self-/other-reference of the question on the Decision Questionnaire was revealed in the likelihood estimates, with greater subjective certainty resulting in the other-referent questions than in the self-referent questions. Confidence ratings provided evidence of an
effect of self-/other-reference of the question on the Decision Questionnaire also, with self-referent judgments being made with greater confidence. An effect of self-/other-reference of the script was also revealed on the confidence ratings, with greater confidence indicated by those exposed to the other-referent script. Both a familiarity effect and an effect of self-/other-reference of the script were revealed in the number of additional factors and personal experiences provided by subjects in this experiment. In general, the results of the present investigation provide evidence of differential processing of familiar and unfamiliar information and of self-referent and other-referent information. Also suggested is differential processing in making self-referent and other-referent judgments. Further research is necessary to evaluate whether self-/other-reference and familiarity do, in fact, mediate the effects of explanation on subjective likelihood estimates.
Appendix A

Initial Oral Instructions

All Conditions

"This experiment is an investigation into the relationship between imagination and decision processes. You will be asked to participate actively in an exercise using your imagination. You will each be given a script to read. As you read it, you should try to picture the events described actually taking place. Some people are better at imagining than others. I want to see how good you are at using your imagination. Please do your best to imagine each experience occurring as you read the script."

"Following this imaginal exercise, you will be asked to make some predictions and to provide some information about the decision process."

"In this way, the effects of imagination on the decision process will be studied." (Subjects will get further oral instructions according to which condition they have been assigned.)

Self-referent Familiar Condition

Explanation

"The script involves a student who is trying to make a decision between two alternatives. The decision to register for a regular course load for the quarter could be made, or the decision to register for a reduced course load for the quarter could be made. Advantages and disadvantages are being weighed in the script.

"You are to read the script and imagine yourself experiencing the
events described."

"You realize that we do not actually know whether the decision to register for a reduced course load or to register for a regular course load is more likely in this particular situation. For the purpose of this experiment, I want you to imagine as you read the script that your final decision is to register for a reduced course load. When you have finished reading the script you will be asked to write down all the reasons or factors you find in the script to explain why you might make this decision to register for a reduced course load."

"Please complete the entire script and the explanation task, then turn them over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

**Self-referent familiar condition**

No explanation control

"The script involves a student who is trying to make a decision between two alternatives. The decision to register for a regular course load for the quarter could be made, or the decision to register for a reduced course load for the quarter could be made. Advantages and disadvantages are being weighed in the script."

"You are to read the script and imagine yourself experiencing the events described."

"Please complete the imaginal task, read the script and imagine the events occurring. Then turn the script over and wait quietly for the others to finish. When all have finished the final questionnaire will be distributed."
"Are there any questions? You may begin."

**Self-referent Unfamiliar Condition**

**Explanation**

"The script involves a clinical psychologist who is trying to make a decision between two alternatives. The decision to continue with a regular client load could be made, or the decision to request a reduced client load could be made. Advantages and disadvantages are being weighed in the script."

"You are to read the script and imagine yourself experiencing the events described."

"You realize that we do not actually know whether the decision to request a reduced client load or to continue with a regular client load is more likely in this particular situation. For the purpose of this experiment, I want you to imagine as you read the script that your final decision is to request a reduced client load. When you have finished reading the script you will be asked to write down all the reasons or factors you find in the script to explain why you might make the decision to request a reduced client load."

"Please complete the entire script and the explanation task, then turn them over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

**Self-referent Unfamiliar Condition**

**No Explanation Control**

"The script involves a clinical psychologist who is trying to make a decision between two alternatives. The decision to continue
with a regular client load could be made, or the decision to request a reduced client load could be made. Advantages and disadvantages are being weighed in the script."

"You are to read the script and imagine yourself experiencing the events described."

"Please complete the imaginal exercise, read the script and imagine the events occurring. Then turn the script over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

Other-referent Familiar Condition

Explanation

"The script involves a student who is trying to make a decision between two alternatives. The decision to register for a regular course load for the quarter could be made, or the decision to register for a reduced course load for the quarter could be made. Advantages and disadvantages are being weighed in the script."

"You are to read the script and imagine the events actually occurring to another person of your own sex--not yourself."

"You realize that we do not actually know whether the decision to register for a reduced course load or to register for a regular course load is more likely in this particular situation. For the purpose of this experiment, I want you to imagine as you read the script that the character in the script makes a final decision to register for a reduced course load. When you have finished reading the script you will be asked to write down all of the reasons or factors you find in
the script to explain why this decision to register for a reduced course load might be made."

"Please complete the entire script and the explanation task. Then turn them over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

Other-referent Familiar Condition

No Explanation Control

"The script involves a student who is trying to make a decision between two alternatives. The decision to register for a regular course load for the quarter could be made, or the decision to register for a reduced course load for the quarter could be made. Advantages and disadvantages are being weighed in the script."

"You are to read the script and imagine the events actually occurring to another person of your own sex—not yourself."

"Please complete the imaginal exercise, read the script and imagine the events occurring. Then turn the script over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

Other-referent Unfamiliar Condition

Explantion

"The script involves a clinical psychologist who is trying to make a decision between two alternatives. The decision to continue with a regular client load could be made, or the decision to request a reduced client load could be made. Advantages and disadvantages
are being weighed in the script.

"You are to read the script and imagine the events actually occurring to another person of your sex—not yourself."

"You realize that we do not actually know whether the decision to request a reduced client load or to continue with a regular client load is more likely in this particular situation. For the purpose of this experiment, I want you to imagine as you read the script that the character in the script will make the final decision to request a reduced client load. When you have finished reading the script you will be asked to write down all the reasons or factors you find in the script to explain why this decision to request a reduced client load might be made."

"Please complete the entire script and explanation task, then turn them over and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."

Other-referent Unfamiliar Condition

No Explanation Control

"The script involves a clinical psychologist who is trying to make a decision between two alternatives. The decision to continue with a regular client load could be made, or the decision to request a reduced client load could be made. Advantages and disadvantages are being weighed in the script.

"You are to read the script and imagine the events actually occurring to another person of your own sex—not yourself."

"Please complete the imaginal task. Then turn the script over
and wait quietly for the others to finish. When all have finished, the final questionnaire will be distributed."

"Are there any questions? You may begin."
Appendix B

Self-referent Familiar Script

Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Try to picture, as clearly as possible, all of the events described in this script actually taking place. Try to imagine these events taking place in your life.

Begin this imagination task by picturing yourself for a moment. Get a mental image of yourself. Take notice of the characteristics of your appearance...your height, your weight, skin color, etc. Try to make this mental image of yourself as detailed as possible.

Now that you have created this image, try to picture yourself experiencing the following events.

First imagine yourself graduating from high school. Try to put yourself into the role. Imagine that after high school your goal is to attend college and receive a degree in business. You eventually plan to take over the accounting responsibilities for your parents' business. Picture yourself going to college for several quarters. After this period of attending college, you begin to experience some problems. Your main problems are lack of motivation and lack of funds. Imagine yourself considering whether to take a normal course load or to take a reduced course load for the next quarter.

You find yourself mentally listing the various pros and cons of registering for a reduced course load. You consider the fact that a reduced course load would enable you to take on a part-time job. You would not be so strapped for money. You remember that after paying your tuition last quarter, you had barely enough money to pay the rest of your bills. You had very little left over for recreational activities. You have found in the past that if you manage your time, even as a full-time student, you have plenty of time for recreation.

You also begin to worry that if you are around campus less often you will lose touch with the friends you have made at school. You would not be hanging around when social plans are being made, so you probably would get left out quite often. Even though college has had its ups and downs for you, the one aspect that has really been positive is the number of good friends you have made. You don't know if it would be worth it to register for a reduced load, if it would mean loss of contact with these friends.

You also consider that if you get a job, you will be making some new friends and you could actually end up with even more good friends.

You realize that if you take a reduced course load this quarter you will either have to take summer school to make up the credits, or you will have to adjust your plans and graduate later than expected. You know that your family is opposed to the idea of you putting off your graduation. They have been anxiously awaiting your involvement in the family business. Waiting any longer than necessary is hard for them to accept. Your parents have even offered to pay for your schooling to avoid the delay.
You do not feel comfortable accepting money from them so that would have to be a last resort solution.

You have considered summer school at some length. By taking summer classes, you would avoid the problem of having to take an extra quarter of classes beyond your expected graduation. Summer school, however, would tie you up so that you would not be able to take your usual summer job. You feel it would be difficult to pass up a job that you enjoy and that pays so well to go to summer school.

It is clear that you have a lot of factors to consider and a difficult decision to make.
Self-referent Unfamiliar Script

Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Get your imagination working. Try to picture as clearly as possible, all of the events described in this script actually taking place. Try to imagine these events taking place in your life.

Begin this imagination task by picturing yourself for a moment. Get a mental image of yourself. Take notice of the characteristics of your appearance...your height, your weight, skin color, etc. Try to make this mental image of yourself as detailed as possible.

Now that you have created this image, try to picture yourself experiencing the following events.

First, imagine yourself graduating from college. Try to put yourself into this role. Imagine that after college you attend graduate school in clinical psychology. You complete a doctoral degree. Eventually you would like to have your own private practice. Imagine yourself completing four years of graduate training and then going on to a one-year clinical internship. During this year you get a great deal of practical experience in doing therapy. You are supervised in therapy by clinical psychologists and psychiatrists.

Imagine that when your internship is completed, you are asked to join a clinical practice with some members of the staff you had been working with. You accept the position. You enjoy your work, but after some time you begin to experience a lack of motivation for your work. You figure that this is the "burn out" experience that you have heard about. Many social service professionals go through periods during which they are less productive. You feel this might be what you are experiencing. Imagine yourself considering whether to continue with your present work load or to request a reduced client load.

You find yourself mentally listing the pros and cons of this decision. You consider the fact that a reduced client load would enable you to do many of the things you have been wanting to do for so long. You feel that it would be nice to be able to spend more time with your family. You would be able to attend more of your children’s school activities. Also, with a reduced client load, you feel you and your spouse could go out together more often and enjoy each other more.

Another thing you consider is that if you reduce your client load you are also reducing your salary. You will then have less money to spend on recreational activities such as dinner, movies, and travel. The salary reduction will probably put a strain on your family finances.

You consider that a reduced client load would finally enable you to join a health club. You have been wanting to join a health club for quite some time. You feel like all of those hours of sitting in an office have been bad for your health. With a bit of free time you could get some exercise, which would certainly be beneficial.

Again you think about the fact that you will be making less money
with a reduced client load. Health club memberships cost money. If you reduce your load you may not have the money to spare for something like that.

You have considered at some length taking a loan. You then would have more free time and enough money to enjoy it. Loans, however, must be paid back. You would be setting yourself back financially by taking out a loan as well.

One of your main considerations in deciding whether to reduce your client load is that it would mean you would have to drop clients you have been seeing for months. You will lose contact with some clients with whom you have built strong therapeutic relationships. It would be difficult for you to stop seeing a client who has been making progress with you.

You also feel that a reduction in your client load could have a positive effect on your therapy. With the time you free up, you will be able to do a great deal of reading. You could learn some new therapy techniques which you would be able to use in your practice.

You have a lot of factors to consider and a difficult decision to make.
Other-referent Familiar Script (Female Subject)

Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Get your imagination working. Try to picture as clearly as possible, all of the events described in this script actually taking place.

Begin this imagination task by picturing for a moment a female student, any female student other than yourself. Get a mental image of this female student. Take notice of the characteristics of her appearance...her height, weight, skin color, etc. Try to make this mental image of her as detailed as possible.

Now that you have created this image, try to picture her experiencing the following events.

First, imagine her graduating from high school. Try to put her into the role. Imagine that after high school her goal is to attend college and receive a degree in business. She eventually plans to take over the accounting responsibilities for her parents' business. Picture her going to college for several quarters. After this period of attending college, she begins to experience some problems. Her main problems are lack of motivation and lack of funds. Imagine her considering whether to take a normal course load or to take a reduced course load for the next quarter.

She finds herself mentally listing the various pros and cons of registering for a reduced course load. She considers the fact that a reduced course load would enable her to take on a part-time job. She would not be so strapped for money. She remembers that after paying her tuition last quarter, she had barely enough money to pay the rest of her bills. She had very little left over for recreational activities. She has found in the past that if she manages her time, even as a full-time student, she has plenty of time for recreation.

She also begins to worry that if she is around campus less often she will lose touch with the friends she has made at school. She would not be hanging around when social plans are being made so she probably would get left out quite often. Even though college has had its ups and downs for her, the one aspect that has really been positive is the number of good friends she has made. She doesn't know if it would be worth it to register for a reduced load if it would mean risking loss of contact with these friends.

She also considers that if she gets a job, she will be making some new friends and she could actually end up with even more good friends.

She realizes that if she takes a reduced load this quarter she will either have to take summer school to make up the credits or she will have to adjust her plans and graduate later than expected. She knows that her family is opposed to the idea of putting off her graduation. They have been anxiously awaiting her involvement in the family business. Waiting any longer than necessary is hard for them to accept. Her parents have even offered to pay for her schooling to avoid the delay.
She does not feel comfortable accepting money from them so that would have to be a last resort solution.

She has considered summer school at some length. By taking summer classes, she would avoid the problem of having to take an extra quarter of classes beyond her expected graduation.

Summer school, however, would tie her up so that she would not be able to take her usual summer job. She feels it would be difficult to pass up a job that she enjoys so much and that pays so well to go to summer school.

It is clear that she has a lot of factors to consider and a difficult decision to make.
Other-referent Familiar Script (Male Subject)

Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Get your imagination working. Try to picture as clearly as possible all of the events described in this script actually taking place.

Begin this imagination task by picturing for a moment a male student, any male student other than yourself. Get a mental image of this male student. Take notice of the characteristics of his appearance...his height, weight, skin color, etc. Try to make this mental image of him as detailed as possible.

Now that you have created this image, try to picture him experiencing the following events.

First imagine him graduating from high school. Try to put him into the role. Imagine that after high school his goal is to attend college and receive a degree in business. He eventually plans to take over the accounting responsibilities for his parents' business. Picture him going to college for several quarters. After this period of attending college, he begins to experience some problems. His main problems are lack of motivation and lack of funds. Imagine him considering whether to take a normal course load or to take a reduced course load for the next quarter.

He finds himself mentally listing the various pros and cons of registering for a reduced course load. He considers the fact that a reduced load would enable him to take on a part-time job. He would not be so strapped for money. He remembers that after paying his tuition last quarter, he had barely enough money to pay the rest of his bills. He had very little left over for recreational activities. He has found in the past that if he manages his time, even as a full-time student, he has plenty of time for recreation.

He also begins to worry that if he is around campus less often he will lose touch with the friends he has made at school. He would not be hanging around when social plans are being made so he probably would get left out quite often. Even though college has had its ups and downs for him, the one aspect that has really been positive is the number of good friends he has made. He doesn't know if it would be worth it to register for a reduced course load if it would mean risking loss of contact with these friends.

He also considers that if he gets a job, he will be making some new friends and he could actually end up with even more good friends.

He realizes that if he takes a reduced course load this quarter he will either have to take summer school to make up the credits or he will have to adjust his plans and graduate later than expected. He knows that his family is opposed to the idea of putting off his graduation. They have been anxiously awaiting his involvement in the family business. Waiting any longer than necessary is hard for them to accept. His parents have even offered to pay for his schooling to avoid the delay.

He does not feel comfortable accepting money from them so that
would have to be a last resort solution.

He has considered summer school at some length. By taking summer classes, he would avoid the problem of having to take an extra quarter of classes beyond his expected graduation.

Summer school, however, would tie him up so that he would not be able to take his usual summer job. He feels it would be difficult to pass up a job he enjoys so much and that pays so well to go to summer school.

It is clear that he has a lot of factors to consider and a difficult decision to make.
Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Get your imagination working. Try to picture as clearly as possible, all of the events described in this script actually taking place.

Begin this imagination task by picturing for a moment a female student, any female student other than yourself. Get a mental image of this female student. Take notice of the characteristics of her appearance...her height, weight, skin color, etc. Try to make your mental image of her as detailed as possible.

Now that you have created this mental image, try to picture her experiencing the following events.

First, imagine her graduating from college. Try to put her into this role. Imagine that after college she attends graduate school in clinical psychology. She completes a doctoral degree. Eventually she would like to have her own private practice. Imagine her completing four years of graduate training and then going on to a one-year clinical internship. During this year she gets a great deal of practical experience in doing therapy. She is supervised in therapy by clinical psychologists and psychiatrists.

Imagine then when her internship is completed, she is asked to join a clinical practice with some members of the staff she had been working with. She accepts the position. She enjoys her work, but after some time she begins to experience a lack of motivation for her work. She figures that this is the "burn out" experience that she has heard about. Many social service professionals go through periods during which they are less productive. She feels this might be what she is experiencing. Imagine her considering whether to continue with her present work load or to request a reduced client load.

She finds herself mentally listing the pros and cons of this decision. She considers the fact that a reduced client load would enable her to do many of the things she has been wanting to do for so long. She feels that it would be nice to be able to spend more time with her family. She would be able to attend more of her children's school activities. Also, with a reduced client load, she feels she and her husband could go out together more often and enjoy each other more.

Another thing she considers is that if she reduces her client load she is also reducing her salary. She will then have less money to spend on recreational activities such as dinner, movies, and travel. The salary reduction will probably put a strain on her family finances.

She considers that a reduced client load would finally enable her to join a health club. She has been wanting to join a health club for quite some time. She feels like all of those hours of sitting in an office have been bad for her health. With a bit of free time she could get some exercise, which would certainly be beneficial.

Again she thinks about the fact that she will be making less
money with a reduced client load. Health club memberships cost money. If she reduces her load she may not have the money to spare for something like that.

She has considered at some length taking a loan. She then would have more free time and enough money to enjoy it. Loans, however, must be paid back. She would be setting herself back financially by taking out a loan as well.

One of her main considerations in deciding whether to reduce her client load is that it would mean she would have to drop clients she has been seeing for months. She will lose contact with some clients with whom she has built strong therapeutic relationships. It would be difficult for her to stop seeing a client who has been making progress with her.

She also feels that a reduction in her client load could have a positive effect on her therapy. With the time she frees up, she will be able to do a great deal of reading. She could learn some new therapy techniques which she would be able to use in her practice.

She has got a lot of factors to consider and a difficult decision to make.
Other-referent Unfamiliar Script (Male Subject)

Make yourself comfortable...relax. Allow yourself to get into an imagining frame of mind. Get your imagination working. Try to picture as clearly as possible, all of the events described in this script actually taking place.

Begin this imagination task by picturing for a moment a male student, any male student other than yourself. Get a mental image of this male student. Take notice of the characteristics of his appearance...his height, weight, skin color, etc. Try to make this mental image of him as detailed as possible.

Now that you have created this image, try to picture him experiencing the following events.

First, imagine him graduating from college. Try to put him into this role. Imagine that after college he attends graduate school in clinical psychology. He completes a doctoral degree. Eventually he would like to have his own private practice. Imagine him completing four years of graduate training and then going on to a one-year clinical internship. During this year he gets a great deal of practical experience in doing therapy. He is supervised in therapy by clinical psychologists and psychiatrists.

Imagine that when his internship is completed, he is asked to join a clinical practice with some members of the staff he had been working with. He accepts the position. He enjoys his work, but after some time he begins to experience a lack of motivation for his work. He figures that this is the "burn out" experience that he has heard about. Many social service professionals go through periods during which they are less productive. He feels this might be what he is experiencing. Imagine him considering whether to continue with his present work load or to request a reduced client load.

He finds himself mentally listing the pros and cons of this decision. He considers the fact that a reduced client load would enable him to do many of the things he has been wanting to do for so long. He feels that it would be nice to be able to spend more time with his family. He would be able to attend more of his children's school activities. Also, with a reduced client load, he feels he and his wife could go out together more often and enjoy each other more.

Another thing he considers is that if he reduces his client load he is also reducing his salary. He will then have less money to spend on recreational activities such as dinner, movies, and travel. The salary reduction will probably put a strain on his family finances.

He considers that a reduced client load would finally enable him to join a health club. He has been wanting to join a health club for quite some time. He feels like all of those hours of sitting in an office have been bad for his health. With a bit of free time he could get some exercise, which would certainly be beneficial.

Again he thinks about the fact that he will be making less money with a reduced client load. Health club memberships cost money. If he reduces his client load he may not have the money to spare for
something like that.

He has considered at some length taking a loan. He then would have more free time and enough money to enjoy it. Loans, however, must be paid back. He would be setting himself back financially by taking out a loan as well.

One of his main considerations in deciding whether to reduce his client load is that it would mean he would have to drop clients he has been seeing for months. He will lose contact with some clients with whom he has built strong therapeutic relationships. It would be difficult for him to stop seeing a client who has been making progress with him.

He also feels that a reduction in his client load could have a positive effect on his therapy. With the time he frees up he will be able to do a great deal of reading. He could learn some new therapy techniques which he would be able to use in his practice.

He has got a lot of factors to consider and a difficult decision to make.
Appendix C

Other-referent Familiar

Explanation Task

List all the reasons or factors you find in the script to explain why the character in the script might make the decision to register for a reduced course load.

Write down the main reason or factor to explain why the character in the script might make the decision to register for a reduced course load.
Self-referent Familiar

Explanation Task

List all the reasons or factors you find in the script to explain why you might make the decision to register for a reduced course load.

Write down the main reason or factor to explain why you might make the decision to register for a reduced course load.
Explanation Task

List all the reasons or factors you find in the script to explain why the character in the script might make the decision to request a reduced client load.

Write down the main reason or factor to explain why the character in the script might make the decision to register for a reduced client load.
Self-referent Unfamiliar

Explanation Task

List all the reasons or factors you find in the script to explain why you might make the decision to request a reduced client load.

Write down the main reason or factor to explain why you might make the decision to request a reduced client load.
Appendix D

Decision Questionnaire Instructions

"This questionnaire is designed to investigate several aspects of imagination and decision processes."

"Remember that we do not actually know anything more about this decision than the information you had in the script. We do not know which decision is the best decision or which is most likely to be made. At this time I ask that you simply make some predictions regarding this decision."

"Please carefully read the instructions at the top of the page before you begin. When you have finished, turn your questionnaire over and wait quietly for the others to finish. You may begin."
Instructions: Please circle only one number in answer to each of the scaled items. Then provide as many responses as possible to Questions #7 and #8. When you have finished, turn your Decision Questionnaire over and wait quietly for the others to finish.

1. How easy was it for you to imagine the events in this script?

   Extremely Difficult -4 -3 -2 -1 0 1 2 3 4 Extremely Easy

2. How likely do you feel it is that you personally would make the decision to register for a reduced course load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely Likely

   How confident do you feel in the estimate you made in Question #2?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Completely

3. How likely do you feel it is that other people in general would make the decision to register for a reduced course load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely Likely

   How confident do you feel in the estimate you made in Question #2?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Completely

4. As you read the script you were asked to imagine yourself experiencing the events described. Some people find this helpful when participating in an imagination task. People vary in the extent to which they imagine themselves in a role. Rate the degree to which you imagined yourself in this script.

   Not at all -4 -3 -2 -1 0 1 2 3 4 Completely

5. The longer a person is in a particular role, the more familiar that role becomes. How familiar are you with the role of a student?

   Extremely Unfamiliar -4 -3 -2 -1 0 1 2 3 4 Extremely Familiar

6. How frequently have you thought about registering for a reduced course load?

   Never -4 -3 -2 -1 0 1 2 3 4 Very Frequently
7. Please list any additional factors (factors not mentioned in the script) which you feel should be considered in making the decision to register for a reduced course load.

8. Please describe any experiences from your own past which may have influenced responses you gave in the first five questions.
Instructions: Please circle only one number in answer to each of the scaled items. Then provide as many responses as possible to Questions #7 and #8. When you have finished, turn your Decision Questionnaire over and wait quietly for the others to finish.

1. How easy was it for you to imagine the events in this script?

   Extremely Difficult -4 -3 -2 -1 0 1 2 3 4 Extremely Easy

2. How likely do you feel it is that you personally would make the decision to request a reduced client load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely Likely

   How confident do you feel in the estimate you made in Question #2?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Extremely Confident

3. How likely do you feel it is that other people in general would make the decision to request a reduced client load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely Likely

   How confident do you feel in the estimate you made in Question #3?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Extremely Confident

4. As you read the script you were asked to use your imagination. You were asked to imagine yourself experiencing the events described. Some people find it helpful to imagine themselves in a role when participating in an imagination task. People vary in the extent to which they imagine themselves in a role. Rate the degree to which you imagined yourself in this script.

   Not at all -4 -3 -2 -1 0 1 2 3 4 Completely

5. Even though you are not a clinical psychologist, you may know someone who is a clinical psychologist. How familiar are you with the role of a clinical psychologist?

   Extremely Unfamiliar -4 -3 -2 -1 0 1 2 3 4 Extremely Familiar

6. How frequently have you encountered a clinical psychologist thinking about requesting a reduced client load?

   Never -4 -3 -2 -1 0 1 2 3 4 Very Frequently
7. Please list any additional factors (factors not mentioned in the script) which you feel should be considered in making the decision for a reduced course load.

8. Please describe any experience from your own past which may have influenced responses you gave in the first five questions.
Instructions: Please circle only one number in answer to each of the scaled items. Then provide as many responses as possible to Questions #8 and #9. When you have finished, turn your Decision Questionnaire over and wait quietly for the others to finish.

1. How easy was it for you to imagine the events in this script?

   Extremely Difficult -4 -3 -2 -1 0 1 2 3 4 Easy

2. How likely do you feel it is that the character in the script would make the decision to register for a reduced course load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely

   How confident do you feel in the estimate you made in Question #2?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Extremely

3. How likely do you feel it is that you personally would make the decision to register for a reduced course load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely

   How confident do you feel in the estimate you made in Question #3?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Extremely

4. How likely do you feel it is that other people in general would make the decision to register for a reduced course load?

   Not at all Likely -4 -3 -2 -1 0 1 2 3 4 Extremely

   How confident do you feel in the estimate you made in Question #4?

   Not at all Confident -4 -3 -2 -1 0 1 2 3 4 Completely

5. As you read the script you were asked to use your imagination. You were not asked to imagine yourself experiencing the events described. Some people find it helpful to imagine themselves in a role when participating in an imagination task. People vary in the extent to which they imagine themselves in a role. Rate the degree to which you imagined yourself in this script.

   Not at all Completely -4 -3 -2 -1 0 1 2 3 4 Completely
6. The longer a person is in a particular role the more familiar that role becomes. How familiar are you with the role of a student?

| Extremely Unfamiliar | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | Extremely Familiar |

7. How frequently have you thought about registering for a reduced course load?

| Never | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | Very Frequently |

8. Please list any additional factors (factors not mentioned in the script) which you feel should be considered in making the decision to register for a reduced course load.

9. Please describe any experiences from your own past which may have influenced responses you gave in the first five questions.
Instructions: Please circle only one number in answer to each of the scaled items. Then provide as many responses as possible to Questions #8 and #9. When you have finished, turn your Decision Questionnaire over and wait quietly for the others to finish.

1. How easy was it for you to imagine the events in this script?
   - Extremely
   - Extremely Difficult -4 -3 -2 -1 0 1 2 3 4 Easy

2. How likely do you feel it is that the character in the script would make the decision to request a reduced client load?
   - Not at all
   - Extremely Likely -4 -3 -2 -1 0 1 2 3 4 Likely

   How confident do you feel in the estimate you made in Question #2?
   - Not at all
   - Extremely Confident -4 -3 -2 -1 0 1 2 3 4 Confident

3. How likely do you feel it is that you personally would make the decision to request a reduced client load?
   - Not at all
   - Extremely Likely -4 -3 -2 -1 0 1 2 3 4 Likely

   How confident do you feel in the estimate you made in Question #3?
   - Not at all
   - Extremely Confident -4 -3 -2 -1 0 1 2 3 4 Confident

4. How likely do you feel it is that other people in general would make the decision to register for a reduced load?
   - Not at all
   - Extremely Likely -4 -3 -2 -1 0 1 2 3 4 Likely

   How confident do you feel in the estimate you made in Question #4?
   - Not at all
   - Extremely Confident -4 -3 -2 -1 0 1 2 3 4 Confident

5. As you read the script you were asked to use your imagination. You were not asked to imagine yourself experiencing the events described. Some people find it helpful to imagine themselves in a role when participating in an imagination task. People vary in the extent to which they imagine themselves in a role. Rate the degree to which you imagined yourself in this script.
   - Not at all
   - Completely -4 -3 -2 -1 0 1 2 3 4
6. Even though you are not a clinical psychologist, you may know someone who is a clinical psychologist. How familiar are you with the role of a clinical psychologist?

Extremely Unfamiliar Very Familiar

7. How frequently have you encountered a clinical psychologist thinking about requesting a reduced client load?

Never Very Frequently

8. Please list any additional factors (factors not mentioned in the script) which you feel should be considered in making the decision to register for a reduced course load.

9. Please describe any experiences from your own past which may have influenced responses you gave in the first five questions.
Debriefing

"Thank you very much for participating in this study. Before you leave, I would like to take a few minutes to explain to you what I am doing and what I am looking for, in this experiment. I also want to answer any questions you might have.

There is some very interesting research in the recent psychology literature which suggests that when people are led to explain or imagine a certain event occurring, it leads them to feel more certain that this event will actually occur than if they did not explain or imagine it. For example, it has been shown that if you get a person to think about the possibility of UM winning its annual home basketball game against MSU--and perhaps to speculate on some of the reasons that victory could occur--those people who have considered this particular possibility will be more convinced that UM will win than people who have not carefully considered the possibility.

One of the goals of this study is to investigate this finding in the context of reading and imagining a sequence of events in a script. Some of the subjects in this experiment read the script while considering the possibility that one particular decision had been made. These subjects were asked to write down all the reasons or factors they could find in the script to explain why that decision might have been made. Other subjects in this experiment happened to be assigned to a control group; they didn't generate any explanations. Control group people simply read the script, imagined the events
occurring, and then completed the final questionnaire. My aim is to compare the results of the control group subjects and the subjects who explained each of these possibilities.

Two different scripts were used so that some of you would be exposed to a familiar role (i.e., that of a student, which all of you are), and some to an unfamiliar role (i.e., that of a clinical psychologist). It is believed that those who are dealing with an unfamiliar situation will be more likely to cling to the outcome they were asked to explain. Those who are familiar with the situation—so-called "experts"—should be better able to consider all of the factors in the script and will be less likely to be influenced by the outcome which the experimenter provided.

I hope this gives you some understanding of what I am studying, and of what you have been asked to do. It is very important in research of this sort that all subjects who participate begin the experiment with no previous knowledge of the procedures involved. Because of that, I ask you not to discuss this experiment in any way with others who may be planning to participate. I will be finished running the experiment by the end of the quarter—after that you are free to discuss it.

Again please, I ask you not to talk about the experiment until that time. It is very important for my research.

Are there any questions?

Thank you again for your participation."
### Table F-1

Analysis of the Ease of Imagining Item

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*Note: p<.05*
Table F-2

Means for Experimental Conditions on Ease of Imagining Item

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* Ratings were made on a 9-point Likert-type scale, ranging from -4.0 to +4.0.
Table F-3
Analysis of Extent to Which Subjects Put Themselves Into the Script

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*p<.05
Table F-4

Analysis of Familiarity With Situation in Script

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*p<.05
### Table F-5

**Analysis of Frequency of Similar Experience**

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Table F-6

Analysis of Subjective Likelihood Estimates: Self-/Other-Analysis

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Table F-7

Analysis of Subjective Likelihood Estimates: Self-/Character-Analysis

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Table F-8

Analysis of Confidence Ratings: Self-/Other-Analysis

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Table F-10

Analysis of Number of Additional Factors Listed

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Analysis of Number of Personal Experiences Listed

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Analysis of Sex Effects on the Ease of Imagining Item

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Analysis of Sex Effects on Subjective Likelihood Estimates:
Self-/Other- Analysis

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References


Kuiper, N. A., & Rogers, T. B. (1979). Encoding of


Schematic Effects