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THE RETRIEVAL OF ATTITUDINALLY-RELEVANT INFORMATION
FROM MEMORY: EFFECTS ON SUSCEPTIBILITY TO
PERSUASION AND ON INTRINSIC MOTIVATION

A Dissertation Presented

By

WENDY WOOD

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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Psychology

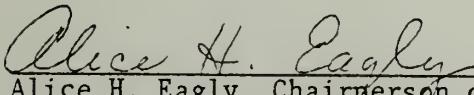
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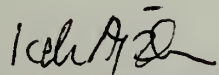
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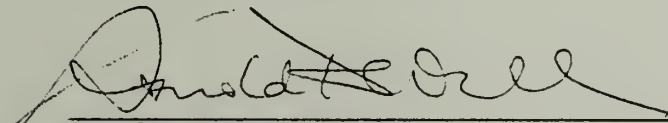
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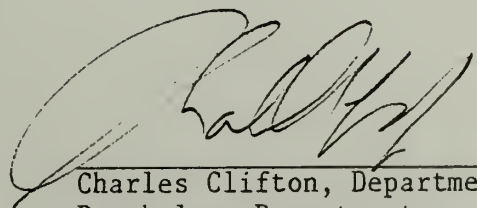
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ABSTRACT

THE RETRIEVAL OF ATTITUDINALLY-RELEVANT INFORMATION FROM
MEMORY: EFFECTS ON SUSCEPTIBILITY TO PERSUASION
AND ON INTRINSIC MOTIVATION

September 1980

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A comparison between attitude research conducted within the framework of attribution theory and more classic attitude research revealed two different perspectives on the nature of attitudes. Attribution approaches assume that attitude judgments are derived in large part from contextual cues whereas more traditional approaches postulate an underlying predisposition toward the attitude object. It was proposed that these perspectives identify two means of formulating attitude judgments. Attitudes can be derived primarily from contextual cues and recent behavior or primarily from the retrieval of attitudinally-relevant information from memory. It was hypothesized that new information that counters initial opinions toward the attitude object would have a greater impact on context-derived than memory-derived attitudes because context-derived attitudes are drawn relatively more from currently available data and less from prior experience and beliefs.

The distinction between memory- and context-derived judgments was operationalized in terms of subjects' retrieval of attitudinally-relevant information from memory. Subjects were given two minutes to list their beliefs about the topic, preservation of the environment, and two minutes to list their previous experiences with the topic. Checks revealed that these retrieval tasks appropriately represented the memory- versus context-derived distinction: Subjects who listed few, rather than many, behaviors perceived themselves to have experienced more thought, action, and feelings about preservation of the environment and to be more knowledgeable and informed. Results for beliefs were similar, though nonsignificant.

The impact of new information on attitudes was explored through a persuasion study and an intrinsic motivation study. In the persuasion research, subjects' opinions were assessed before and after exposure to a counterattitudinal message arguing against preservation of the environment. Consistent with a cognitive response analysis of persuasion, subjects who retrieved few, rather than many, behaviors produced more counterarguments and fewer thoughts favorable to the message. These thoughts mediated opinion change such that subjects who retrieved few, rather than many, behaviors and few, rather than many, beliefs showed less opinion change.

In the intrinsic motivation study, subjects' opinions were assessed before and after they decided to deliver a proattitudinal message on preservation of the environment. Subjects either

received a \$5 reward for their decision or no reward. Consistent with previous intrinsic motivation research, rewarded subjects changed their opinions more than not rewarded subjects. Further, the analysis yielded differences due to the number of behaviors subjects listed. Subjects who retrieved few behaviors inferred attitudes consistent with whether or not they were rewarded for the decision: Rewarded subjects, compared with those not rewarded, attributed their decision less to belief in preservation and subsequently became less favorable toward preservation. In contrast, in the many behaviors groups, rewarded subjects unexpectedly made a stronger attribution to their belief than not rewarded subjects. Yet, as predicted, the opinions of subjects who retrieved many behaviors remained relatively favorable toward preservation. These findings support the self-perception analysis (Bem, 1972) that when internal cues, such as prior experiences relevant to the attitude object, are not accessible, attitudes are inferred from behavior and the context in which it occurs.

The distinction between memory- and context-derived attitudes was discussed in terms of recent theories of how the presence or absence of a self-schema affects processing of schema-related information. It was argued that the retrieval measures employed in the present research are superior to the measures commonly used in the work of self-schemata (e.g., involvement, extremity of opinions) because extent of retrieval more directly reflects the degree to which people have access to relevant information in memory.

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C H A P T E R I

INTRODUCTION

Social psychological research on attitudes stems from at least two very different traditions. One of these employs the attitude construct in a manner analogous to traits, emphasizing the enduring dispositions that underlie an attitude judgment. For example, McGuire (1969), employing Allport's (1935) definition, proposed that an attitude is "a mental and neural state of readiness to respond, organized through experience, exerting a directive and/or dynamic influence on behavior" (McGuire, 1969, p. 142). Many classic theories of attitudes, such as learning theories (e.g., Staats, 1968) and cognitive consistency theories (e.g., Festinger, 1957), implicitly accepted this view. In contrast, the second tradition of research emphasizes the temporary nature of attitudes. According to this view, attitude expressions are often determined by the information available in the situation in which they are expressed. This approach has been adopted by attribution theory (Kelley, 1967, 1972) and self-perception theory (Bem, 1972), which frequently focus on an individual's construction of his or her attitude from the situational cues available immediately prior to assessment.

It is not surprising that attitudes have been conceptualized in several different ways. Given the complexity and versatility of

human cognitive processes that have been noted in other areas (e.g., Neisser, 1976), it is to be expected that the attitude literature would reveal that people can formulate attitudes in different ways, ranging from judgments which reflect stable orientations to more superficial judgments derived from currently available information.

Others have argued that Bem's (1972) self-perception theory conceptualizes attitudes in a different manner from more traditional theories. For example, Greenwald (1968) distinguished between the approaches in terms of the internal or external nature of the information on which the attitude is based. According to Greenwald, self-perception theory assumes that an individual's attitude can be derived from situational cues that can also be employed by an observer to infer the individual's attitude, and it assumes that changes in these external cues can lead to attitude change. In contrast, attitude theories commonly assume that an individual's attitude provides internal stimuli available only to him or her, and they have commonly linked attitude change to a corresponding change in the information internally available to the individual.

The present view integrates these two conceptualizations of attitude into a general framework that views attitude judgments in terms of the information on which the judgment is based. The traditional conceptualization of attitudes assumes that people learn a particular orientation toward the attitude object. Learned

orientations can be based on affective reactions toward the object, beliefs about it, and previously expressed positions in reference to it. It is important to note that the idea of a learned predisposition implies that attitude judgments are based in large part on information retrieved from memory. For this reason, such judgments will be called memory-derived attitudes. In contrast, attribution theory (Kelley, 1967, 1972) and self-perception theory (Bem, 1972) employ the term attitude to describe a judgment based on information derived from contemporaneous situational factors and one's recent behavior in relation to the attitude object. According to this perspective, people formulate an attitude judgment by focusing primarily on these contemporaneous cues, and they retrieve little cognitive support for the judgment. This type of judgment will be called a context-derived attitude because it emphasizes the information that is currently available in the situation. It is possible to explore the characteristics of memory- and context-derived judgments by contrasting research that considers an attitude judgment to be a reflection of a predisposition to respond with research that focuses on the way contemporaneous cues are incorporated into an attitude inference. Memory-derived attitudes will be examined through some of the classic attitude theories and through recent work on the cognitive schemata that may underlie self-perceptions. Context-derived attitude judgments will be explored in terms of attribution theory and self-perception theory.

Self-Attribution of Attitudes

Theories of self-attribution have generally focused on how perceivers infer their attitudes from a recent or salient behavioral incident (Bem, 1972; Kelley, 1972; Nisbett & Valins, 1972). These analyses assume that an attitude judgment is greatly influenced by contemporaneous cues such as recent behavior except in the infrequent case that the inference has been made repeatedly in the past. It is recognized that then people may invoke these previous judgments.

Research on attitude attribution has generally been concerned with attitude inference from behavior which is consistent or inconsistent with subjects' reports of their initial position on an issue. In order to simplify the present discussion, the analysis will draw primarily from research on proattitudinal behavior, rather than counterattitudinal, because the mechanisms underlying a proattitudinal inference may be relatively less complex. Attitude change following counterattitudinal behavior can be explained through several underlying mechanisms: It can be accounted for by an increase in cognitive discomfort and subsequent dissonance reduction through attitude change (Higgins, Rhodwalt, & Zanna, 1979; Zanna & Cooper, 1974), or, like a proattitudinal action, it can be explained through the self-perception process of inferring an attitude directly from behavior (Bem, 1972; Kleinke, 1978). Even though the processes underlying these two judgments may at times differ, the conclusions drawn from the present analysis should be

applicable to attitude inferences from either pro- or counter-attitudinal behavior. In both cases, the attitude judgment is derived from a recent behavioral incident rather than a stable, organized set of beliefs and affective reactions toward the attitude object.

Further, our analysis will focus on intrinsic motivation in preference to other types of proattitudinal research because (a) intrinsic motivation research comprises a very large majority of work in the study of proattitudinal behavior and (b) subjects are required simply to engage in a behavior and not to develop or read a persuasive message supporting a position. When subjects are asked to develop or review arguments in favor of a position they may be forced to engage in a thorough, though perhaps biased, analysis of the issue. In the process, subjects may utilize information other than that currently available in the assessment situation.

Research on intrinsic motivation, along with other self-perception research, relies on the fact that behavior caused by non-attitudinal factors may be misperceived to be relevant to an attitude judgment. Kelley (1967) has noted that when subjects in these experiments are asked to perform an activity, they consider the behavior an indicator of their attitude because they underestimate the impact of experimental demand, which is the actual cause of the behavior. This misperception can lead perceivers to infer an attitude that is consistent with attitudinally-irrelevant behavior.

Intrinsic motivation research typically presents one group of subjects with a reward for performing a somewhat enjoyable task and another group engages in the task without the reward. The reward is then removed, and all subjects are asked to make a general evaluative rating of the task, commonly operationalized as interest and enjoyment (Deci, 1971), or preference for the task over others (Ross, 1975). Often subjects' behavioral performance on the task before and after the reward is also observed. Rewarded subjects are generally thought to engage in a causal analysis to determine whether their behavior is due to the reward or to a favorable attitude toward the task, whereas nonrewarded subjects have only their liking for the task as a plausible cause. The comparison between the rewarded and nonrewarded groups typically indicates that external rewards decrease favorability toward a task, presumably because rewarded subjects attribute their behavior to the reward and nonrewarded subjects attribute it to a favorable attitude.

Researchers of intrinsic motivation analyze the process by which perceivers identify a cause for their behavior in terms of the information currently available to perceivers. These analyses focus on Kelley's (1967, 1972) discounting principle, which follows Bem's (1972) self-perception theory when applied to inferences about one's own behavior. According to Bem, subjects often infer their favorability toward a task from their behavior when external causes for task performance are not available. In the presence of external rewards, subjects often attribute their performance to the

reward and assume it is not internally caused.

Self-perception research is frequently conducted with settings and stimuli that are unfamiliar to subjects (e.g., certain word-games or mathematical puzzles). Therefore, it is not surprising that they use contemporaneous cues when initially formulating an attitude. Indeed, Kelley (in Harvey, Ickes, & Kidd, 1978) has noted that self-perception research often involves "an experimental setting in which you're being asked about something you're experiencing for the first time, so you have no self-concept" in relation to the issue (p. 379).

There is evidence, however, to suggest that people rely on contemporaneous cues to infer their attitude even when they have previous experience with the attitude object. For example, Lepper, Greene, and Nisbett (1973) either rewarded or did not reward children for drawing pictures with magic markers. The children were then given an opportunity to draw pictures without the reward, and the amount of time they spent on the task was interpreted as their liking for the activity. Since all children probably had a chance to draw pictures prior to participating in the experiment, they could have invoked this previous experience when evaluating their attitude. According to Kelley's (1972) covariance analysis, the task behavior would be attributed to the cause with which it covaries, that is, subjects' liking for the activity. Yet those children who received a reward, compared with those who did not, spent less time on the activity after the reward was removed. This

finding would not have been obtained if subjects had conducted a covariance-type analysis. It appears that subjects instead focused primarily on the current situation, and rewarded subjects considered the reward a plausible cause of their behavior. A similar analysis can be applied to studies utilizing a within-subjects design, in which participants were first asked to perform a task, then were given a reward for performing it, and finally were asked to perform it again without the reward (e.g., Green, Sternberg, & Lepper, 1976). Subjects in these experiments could utilize the experiences of performing the task with and without a reward in formulating their attitude. Yet subjects showed a decrement in task performance when the reward was removed, presumably because they utilized their most recent experience of performing the task for a reward, and considered the reward a plausible cause for performance. Research on self-perception theory therefore suggests that when evaluating their attitude, people may focus on the information currently available in the situation to the exclusion of other data.

In order to understand how people can infer an attitude from an assessment of contemporaneous cues such as a recent behavior, it is helpful to consider the self-perception process in detail. Bem (1972) suggests that we observe our behavior and infer that an action without obvious external cause must correspond to an internal attitude. But this view of self-perception does not specify the information on which an attitude judgment is based or the

process by which this information is identified. The present analysis will attempt to address these two issues. It will be argued that the self-attribution process can be understood in terms of three steps: (1) perceivers identify the plausible causes for their behavior, (2) they attribute the behavior to a particular cause(s), and (3) they infer an attitude on the basis of the identified cause(s). These steps may not always occur as independent sequential processes. For example, if only one cause is identified, the first and second steps would be conducted simultaneously.

Identification of causes. Inherent in our culture's definition of causality is a general perspective concerning the variety of causal factors that can produce particular effects. These a priori causal theories can lead us to favor certain types of explanations for events (Nisbett & Wilson, 1977). These theories also appear to be very robust: Intuitive notions about the probable causes for an event may be employed to the exclusion of causes which have a more reliable statistical relationship to the event (Ajzen, 1977).

Causal salience may also affect which causal factors are likely to be identified. Taylor and Fiske (1978) and Pryor and Kriss (1977) argue that in their attributional processing, perceivers may often employ the most salient causal factor to the exclusion of other plausible causes.

The interpretation of one's own behavior does appear to be affected by causal salience: Subjects in intrinsic motivation research appear to identify a reward as the cause for their task

performance only when the reward is salient (Ross, 1975). When the reward is present but not salient, subjects appear to explain their behavior primarily in terms of a favorable attitude toward the task. Other evidence of the impact of salience is provided by research on proattitudinal advocacy (Kiesler, Nisbett, & Zanna, 1969; Zanna & Kiesler, 1971). Kiesler, Nisbett, and Zanna (1969) asked subjects to proselytize an attitude-consistent position on the topic of air pollution. Those who heard another participant remark that his or her participation reflected a belief in the issue (i.e., enhancing the salience of belief as a cause) appeared to infer that their behavior must also indicate a favorable attitude, whereas subjects overhearing a remark that participation reflected a desire to support good research (i.e., enhancing the salience of a desire for social good) may have inferred that their behavior was not relevant to their attitude, and indicated a less favorable position on the issue.

The attitude inference process may not always be affected by situational factors enhancing the salience of a particular cue(s). It has been suggested that people's preconceived rules identifying certain types of information as relevant or salient may also influence the causes that are identified (Salancik & Conway, 1975). Salancik and Conway assessed subjects' attitudes toward a college course after an experimental manipulation had enhanced the salience of subjects' previous behaviors favorable or unfavorable toward the course. Course majors appeared to infer their attitude from

whichever behaviors were salient. Nonmajors' attitudes, however, were not affected by the manipulation. Apparently, they inferred their attitude from their course grade. For nonmajors, liking for the course may not have been a salient or relevant cause for their course-related behavior. Favorably-oriented behaviors, such as working hard in the course, could be the result of an inspiring instructor or their own good study habits, whereas liking depended on the grade they received.

There may also be conditions under which people are not affected by the salience of plausible causes. Taylor (1975) provides evidence to indicate that the salience of information relevant to subjects' self-perceptions is quite important when involvement is low, but has little effect with high involvement. Under high involvement conditions, subjects appear to conduct a comparatively systematic analysis of relevant information that utilizes both salient and nonsalient cues. Taylor and Fiske (1978) have argued that these findings do not minimize the importance of salience effects because low involvement behavior may be characteristic of daily activities.

Plausibility and salience are certainly not the only mechanisms affecting preferred causal factors. We have argued that perceivers may sometimes limit their search to contemporaneous causes, and not conduct a detailed analysis drawing on past experience. In addition, the familiarity of a causal factor may, under some conditions, make it a likely candidate for inclusion in a causal analysis. Perceivers may also have idiosyncratic reasons for favoring one type of causal

explanation over another.

The number of causal factors that are commonly identified in the process of explaining an event has recently received some consideration. One view holds that plausibility and salience serve to weight particular causal factors more than others. This analysis suggests that more than one cause is initially identified, but the one likely to be chosen is the one most salient and/or plausible (cf. Anderson, 1971).

Another analysis suggests that salience and plausibility affect which cause(s) is initially recognized. According to this view, only the most salient and/or plausible cause features in perceivers' causal analyses. This perspective has been associated with theoretical analyses of salience, which hold that perceivers often focus on one salient cause to the exclusion of other causes (Pryor & Kriss, 1977; Taylor & Fiske, 1978). Others have also noted that causal analyses may be limited to consideration of one causal factor. Fischhoff (1976) interprets the social prediction literature to indicate that people are generally not able to handle multivariate, conditional thinking. Similarly, Kanouse (1972) argues that subjects discontinue their search for explanation as soon as a sufficient cause has been identified, rather than continue the analysis until the best explanation is achieved. He suggests that this phenomenon reflects a general bias to view unitary events as having unitary causes. In a study providing indirect support for this analysis, subjects were asked to describe two personal failure

or rejection experiences and to indicate why the experience occurred (Janoff-Bulman, Note 1). For 59 percent of the incidents listed, only one causal factor was identified. The majority of incidents were explained in terms of a single cause that sufficiently accounted for the event.

The question of how many causes are commonly invoked during perceivers' preattribution information search is difficult to resolve. Research methodologies which provide subjects with a list of plausible causes cannot be used to assess whether subjects spontaneously infer more than one cause. Other approaches, such as having subjects list possible causes for an event, do not provide unambiguous results. For example, subjects may only list one cause because of disinterest in the task or inability to recall anything but the factor finally chosen as the cause.

Attribution to identified cause(s). At this stage in perceivers' analysis, an explanation is formulated from the plausible causal factor(s). If more than one cause has been identified, Kelley's (1972) discounting principle, augmentation principle, or another causal schema may be applied to arrive at an explanation. If only one cause has been recognized, perceivers probably explain the behavior in terms of this factor.

Attitude inference. The next stage in perceivers' analysis concerns the inference of an attitude from the chosen cause(s). Attribution researchers often assume that attributing behavior to an internal

cause (oneself) leads to the inference of an attitude evaluatively consistent with the behavior whereas attribution to an external cause (the environment) does not allow a clear attitude inference. However, attitudes cannot clearly be labeled an internal phenomenon because they are generally assumed to represent a relation between a person (internal) and an object (external). According to the present analysis, an attitude inference can result from the location of cause in either the person or the attitude object, but not in aspects of the situation, such as time and modality, which can vary independently of the attitude object (Kelley, 1967).¹

In order to distinguish the present causal taxonomy from others less appropriate (e.g., internal vs. external), location of cause in the person or the object will be labeled an intrinsic attribution, and location in the situation will be termed an extrinsic attribution. Although little consensus exists concerning the appropriate use of these terms in attribution theorizing, there is some precedent for the present definition. Researchers of intrinsic motivation (e.g., Ross, 1976) implicitly consider an intrinsically motivated activity to be in response to a feature of the attitude object (i.e., the task) and an extrinsically-motivated activity to be in response to an aspect of the situation which can vary independently of the attitude object (i.e., the reward).

To understand the link between causal attributions and attitudes, it is helpful to consider the attitudinal implications of identifying a particular cause for a behavior. An interesting study by Salancik

(1976) suggests that different kinds of attitudinally-relevant information are retrieved from memory depending on whether one makes an intrinsic or extrinsic attribution.

Salancik (1976) elicited subjects' reactions to a college course for which they had received a high grade. In the experimental conditions that are most relevant to the present analysis, subjects recalled particular aspects of their experiences with the course, which included their course-related behavior. Some subjects were then encouraged to attribute their course behaviors to extrinsic features of the course (e.g., the course grade, credit toward graduation) whereas others were not encouraged to make this attribution. Subjects' attitudes toward the course were then assessed.

As would be expected, those subjects who did not attribute their behavior extrinsically employed their behavior as an indicator of their attitude toward the course. But it appears that these subjects did not infer their attitudes directly from their behavior. Instead, subjects seem to have recalled a subset of the course characteristics (e.g., lectures, subject matter) which was evaluatively consistent with the behavior, and based their attitudes on these features. Also as predicted, subjects who did make an extrinsic attribution did not use their course-related behaviors to infer their attitude. Instead, they inferred attitudes consistent with their behaviors toward factors extrinsic to the course--behaviors instrumental in getting a good grade but not necessarily a reflection of liking for the course itself. The recall and use of the

extrinsically-oriented behaviors appeared to be associated with lack of recall for the characteristics of the course. Subjects who made an extrinsic attribution, compared with those who did not, were found to have less favorable attitudes toward the course, perhaps because they were unable to recall course characteristics, from which favorable attitudes develop.

It appears that attributing behavior on a likeable task to extrinsic rewards may inhibit the recall of task characteristics, and may enhance the salience of experiences extrinsic to the task. Because positive task characteristics are not available to inform the judgment, a relatively unfavorable attitude results. A similar analysis can perhaps be applied to an attribution to intrinsic causes of task performance. The characteristics of the likeable activity may be selectively retrieved, and a favorable attitude results.

To summarize, attitude judgments can be based primarily on contemporaneous cues such as one's recent behavior. Research on intrinsic motivation indicates that recent behavior can be used to infer one's attitude toward an activity. This analysis may consist of several stages: On the basis of causal salience or plausibility, a cause(s) is identified for the behavior. When more than one cause is identified, perceivers employ attribution rules, such as the causal schemata proposed by Kelley (1972), to arrive at an explanation. If the cause reflects something about the person's orientation toward the activity or something about the activity, then attribution to the cause may lead to selective retrieval of characteristics of

the activity. When task characteristics are positive, a relatively favorable attitude may be inferred. Conversely, if the cause is extrinsic to the activity, then attribution to the cause leads to retrieval of extrinsic rather than intrinsic features. When the task is attractive, a relatively unfavorable attitude is inferred because positive task characteristics are not available to be incorporated into the attitude judgment.

The inference of an attitude from behavior is one means of constructing an attitude judgment from contemporaneous cues. The initial expression of this attitude will not generally reflect a stable orientation toward the attitude object because it is not based on a coherent set of beliefs and affective reactions. Instead, the inference is linked to the particular cues available in the situation at the time when the inference is made. Reliance on contemporaneous cues can lead to predictable biases in judgment. The review of intrinsic motivation research indicated that the inference may not take into account the full impact of the situational determinants of behavior and it can be based primarily on salient causal factors.

Memory-Derived Attitudes

The theoretical analyses and empirical findings in intrinsic motivation and self-perception are in sharp contrast to the approach taken by more traditional attitude theories. According to the latter view, an attitude judgment is not usually fundamentally determined by contemporaneous cues that vary with each assessment. Although people

incorporate new information into their attitude judgment, and the opinions they express may be sensitive to situational constraints, the attitude judgment is still thought to primarily be a function of one's learned response to the attitude object. For example, cognitive consistency theories (e.g., Festinger, 1957) focus on the relationship between the existing cognitive structure underlying one's attitude toward an object and new experiences with the object that may be consistent or inconsistent with these prior cognitions. According to this view, changing one's attitude to be consistent with new experiences is only one of several ways of achieving cognitive consistency. The major difference between the self-perception view of attitudes and that taken by some traditional attitude theorists appears to be the presence of an existing cognitive structure in relation to an attitude object. Self-perception research focuses on attitude inferences which are based on information derived from contemporaneous cues, whereas traditional views of attitude judgments assume that cognitive structures in memory provide an orientation toward the attitude object and that this orientation is reflected in the attitude inference. In order to understand this distinction, it is helpful to consider the nature and function of the cognitions which can underlie an attitude judgment.

McGuire (1969) distinguished between two general formulations of the informational components hypothesized to underlie attitudes. According to the expectancy-value model, an attitude is a function of one's beliefs (Fishbein & Ajzen, 1975; Rosenberg, 1956). Fishbein

and Ajzen argue that only a limited set of a person's total beliefs are salient at any one time, and the attitude indicated depends on which beliefs are salient. Further, salient beliefs are thought to be arranged hierarchically in memory in terms of the subjective probability that the belief is correct. The second formulation of attitude structure assumes that attitudes are comprised of three components: cognitive, affective, and conative. The cognitive component consists of beliefs about the object and perceptual responses, the affective pertains to feelings of liking or disliking about the object, and the conative refers to behavioral tendencies toward the object. It has been suggested that some attitudes are composed primarily of one component, whereas others contain strong elements of several components (Katz, 1960).

The two formulations of attitude structure represent divergent viewpoints. The expectancy-value model is concerned specifically with the cognitive component of attitudes, and it is usually validated through its correlation with affect. Proponents of this view have argued that cognitive, affective, and conative components are not independent constructs but merely alternate ways of assessing attitudes (Fishbein & Ajzen, 1975). Some supporters of a multi-component view have recently argued that although behavioral tendencies may in part reflect the other two components, the cognitive and affective components represent differentiable aspects of attitudes (Bagozzi & Burnkrant, 1979; Norman, 1975). Despite these different perspectives, it is generally agreed that cognition and affect, and

perhaps behavior, can contribute to an attitude judgment. Although the components may encompass redundant information, an attitude can be drawn from these different types of information.

In addition to considering the information that can be incorporated into an attitude judgment, an examination of the structure of attitudinally-relevant information in memory is helpful to understand the cognitions that underlie an attitude. Social psychologists have not traditionally been concerned with the way information is stored in memory and how it is accessed during attitude assessment. However, recent work on social cognition illustrates that cognitive theories can increase our knowledge of social psychological phenomenon. Wyer and Carlston (1979) argue that network models of semantic memory can provide some insight into the way socially-relevant information may be stored and accessed.

Network models of semantic memory (e.g., Collins & Loftus, 1975) suggest that concepts are organized hierarchically in memory, and may be represented as nodes in a network. The concepts that are stored in semantic memory may take many forms--ranging from nouns to complex patterns of behavior, such as "what to do if you see a red light." Nodes which represent an individual's experience can encompass descriptions of past experiences as well as thoughts. Properties of the concepts are signified by labeled relational paths between nodes. For example, a concept and its superordinate may be connected by a link with the label "is a." The meaning of a concept is contained in the network of these relations, which link it to

other concepts. Excitation flows between two concepts when they are connected in thought, and the association becomes stronger with the frequency and the recency excitation has been transmitted along the linking paths. Therefore, how often a person thinks about or uses a property of a concept can affect how easily that feature is retrieved.

Concepts and experiences can be stored in memory at varying levels of abstraction. Abelson's (1976) script theory suggests that initial exposure to an event tends to be stored at a relatively concrete level, but with increasing knowledge about the incident, storage and processing tend to occur at more abstract levels. Applying this analysis to attitude judgments, it would be expected that inferences derived from a particular situation will be stored in memory on a relatively concrete level. As the context-specific judgment is invoked to guide or explain behavior in new situations, it may gradually develop beyond its narrow implications into a relatively abstract concept.

If abstract inferences are to be useful to the perceiver, they should be linked to a wide range of more concrete judgments and experiences. Links which spread excitation from the abstract concept to the concrete may be invoked when perceivers search for specific support for a generalization. Links allowing excitation to flow from the concrete to the abstract can provide perceivers with a general explanation of specific inferences and experiences.

It is likely that memory-derived attitudes will be represented in memory in an abstract form. The attitude concept stored in memory most likely represents a relationship between oneself and an object or class of objects. Because these attitudes probably develop in relation to well-known domains, they will probably have received a large amount of thought, and they may be linked to an evaluatively-consistent (Tesser, 1978) set of supporting experiences, affective reactions and beliefs.

Attitudes as schemata. An attitude judgment can be considered an evaluative inference about oneself, in that it represents a judgment about one's orientation toward a particular object(s). In this sense, the attitude construct has much in common with self-theories. Recent developments in the study of the self have identified self-theories with cognitive structures called schemata. According to Markus (1977), schemata "represent the way the self has been differentiated and articulated in memory" (p. 64). They are cognitive representations of personal characteristics, which can be a function of a specific event or a function of the repeated categorization and evaluation of one's behavior.

From the standpoint of the present analysis, it is useful to consider the attitudes which are derived from supporting cognitions to be a kind of self-schema. Research on schemata is generally conducted from a cognitive perspective and it employs dependent variables such as reaction time and recall. It may therefore provide some insight into the information processing functions of attitudes.

Research on self-schemata generally identifies those subjects with a schema along a particular trait dimension (schematics) and those without (aschematics). Then both groups engage in a task which utilizes their self-knowledge about this attribute. The criteria employed to differentiate schematics and aschematics have generally been limited to self-reports of extremity in a particular trait, self-reports of the importance of the trait, or simply ratings of whether the trait is self-descriptive (Markus, 1977; Rogers, Rogers, & Kirker, 1979). The research results indicate that schematics are faster at deciding whether schema-related information correctly describes them and they make these decisions with more confidence and less difficulty, they can provide more behavioral examples to support their relevant self-perception, they predict a greater likelihood of engaging in consistent behavior along the dimension, and they are less likely to believe fictitious feedback about the particular attribute (Kuiper & Rogers, 1979; Markus, 1977; Rogers, Kuiper, & Kirker, 1977). Other possible functions of schemata can perhaps be inferred from research that has employed a similar experimental paradigm, but has not invoked the schema concept. For example, Bem and Allen (1974) found that subjects who initially reported their behavior stable along a particular trait dimension, compared with those who reported themselves unstable, subsequently showed higher correlations between their relevant behaviors and a description of themselves in terms of the attribute. Similarly, in a study on attitudes, Norman (1975) found that subjects with

evaluatively consistent affective and cognitive attitudinal components were more likely to act in accord with their stated opinion than subjects without consistent components.

Several theorists have conceptualized attitudes in terms of a cognitive structure (Abelson, 1976; Tesser, 1978). Abelson (1976) has argued that "true" attitudes develop in relation to domains that one has personally experienced, and may take the form of social scripts. Tesser (1978) provides evidence to suggest that thinking about an attitude object for which one has a schema can polarize evaluation of the object.

The cognitive theories previously discussed may provide more detailed insight into the characteristics of schematic attitudes. Extrapolating from a network model of memory, it may be that attitudes which function as schemata are represented in memory as abstract concepts, linked to a substructure of more concrete concepts, which consist of related beliefs and previous experiences. As suggested by the research on schemata, such attitudes may affect the encoding, storage, and/or retrieval of relevant information. The distinction made previously between a context-derived attitude, based on contemporaneous cues, and a memory-derived attitude, reflecting detailed cognitive support, can perhaps be equated with the absence and presence of a cognitive schema. The finding that subjects who are aschematic on a particular dimension are relatively susceptible to fictitious feedback about their standing on the dimension (Markus, 1977) is consistent with this perspective. Aschematics would be

expected to utilize fictitious feedback along with other contemporaneous cues to formulate their judgment.

The Present Research

The present research explores the postulated differences in cognitive support underlying memory- and context-derived attitudes, and examines how differences in informational content underlying attitude judgments are related to the impact of recent behavioral incidents on these judgments and to their susceptibility to persuasion.

According to the present analysis, perceivers expressing memory-derived attitudes may be able to retrieve from memory previous actions, beliefs, and affective reactions relevant to the attitude object, whereas those indicating context-derived attitudes probably do not have easy access to such detailed information. If asked to indicate their beliefs about the attitude object by generating a list of its characteristics (cf. Fishbein & Ajzen, 1975), or if asked to indicate their recall of previous experiences with the object by listing their prior actions in regard to it, people who derive their attitude from contextual cues may experience difficulty providing the required information, whereas those with memory-derived attitudes may have data of both types readily available. Consequently, if only a short amount of time is provided for generating these lists, individuals with memory-derived attitudes may be more successful at this task.

Susceptibility to persuasion. Perceivers deriving attitude judgments from memory may be little affected by persuasive messages when compared with those who do not have this basis of support. According to a cognitive response view of persuasion (Petty & Cacioppo, 1979), message persuasiveness is a function of the nature of the thoughts recipients generate in response to the communication. Attitudes derived from supporting cognitions may be little affected by counterattitudinal messages because information is available for the effective generation of counterarguments to the material presented. Individuals who commonly derive their attitude on an issue from contemporaneous cues may be less resistant to persuasion because they have little information available for counterarguing the message. Such message recipients may generate primarily favorable thoughts in reaction to the message. Consistent with the definition of context-derived attitudes, the judgments may be derived, at least in part, from the position suggested in the message.

Intrinsic motivation. The degree of cognitive support underlying an attitude may also affect whether perceivers' judgments are dependent on recent or salient behavioral incidents. In intrinsic motivation research, recent behaviors appear to have a sizeable impact on attitudes. However, attitudes with detailed cognitive support may be less affected by recent behavior because the behavior is only one piece of information on which the judgment is based. Some support for this analysis is provided by a study on counterattitudinal behavior (Snyder & Ebbesen, 1972). In this experiment, subjects who were

asked to organize their thoughts about the attitude issue before they engaged in a relevant behavior did not rely heavily on the behavior when subsequently indicating their attitude. Other subjects who did not organize their thoughts inferred attitudes consistent with the behavior. Snyder and Ebbesen (1972) suggest that when a person has recently formulated an opinion on an issue, he or she simply supplies the same opinion to the current assessment. Although previous judgments may certainly be employed as a basis for present opinions it is also likely that thinking about their position encouraged subjects to retrieve and organize supportive beliefs and affective reactions. Subjects may have relied partially on this information when expressing their opinions.

C H A P T E R I I

METHOD

First Experimental Session

Subjects. A total of 166 University of Massachusetts psychology students participated for extra credit. Seven of these were eliminated because they did not complete the second-half of the experiment.

Procedure. Subjects were recruited to participate in a two-session experiment on attitudes and opinions. It was explained that a variety of instruments would be used to assess participants' opinions on social issues. Subjects participated in groups ranging from ten to fifteen.

Subjects completed a questionnaire assessing their opinions and other responses to seven issues, including the message topic, preservation of the environment (see below). They then responded to a questionnaire which elicited their beliefs and their previous behaviors in regard to five of the issues, including preservation of the environment. Finally, subjects indicated whether they had participated in various organizations, and provided background information (e.g., sex, class). Subjects returned approximately one week later to participate in one of the two experiments comprising the second experimental session.

Measuring instruments.

Opinions. Subjects indicated their initial opinions on the topic "preservation of the environment" on a 15-point scale anchored by "Very favorable" and "Very unfavorable."

Self-reports of previous reactions. On 15-point scales, subjects indicated how frequently in the past few years they had thought about preservation of the environment, taken some action in regard to it, and had positive or negative feelings about it. To assess subjects' knowledge about preservation, they were asked to rate on a 15-point scale how well-informed they were. They were also asked to rate how frequently in the past few years they had talked with others about the topic, read articles and books on it, taken relevant courses, and watched TV programs on it. Ratings of these specific information-gathering behaviors were averaged, and each subject was assigned a mean score. Subjects' ratings of how well-informed they were proved to be highly correlated with this mean score ($r = .71$), and the two measures were summed into an index representing subjects' knowledge about the topic.

Involvement. Subjects rated on two 15-point scales how personally important and how involved they were in preservation of the environment. Responses to these two items were highly correlated ($r = .62$), and were summed into an index representing degree of involvement in the issue.

Belief retrieval. To determine the ease with which subjects could retrieve attitudinally-relevant cognitions, they were asked to list

on a questionnaire the characteristics and facts they believed to be true about preservation of the environment. The opinion topic was listed at the top of the page, and six boxes were provided underneath. Subjects were told to write only one belief in each box. Several examples of beliefs about noncritical topics were provided. Subjects were told that if they did not have six beliefs to list about a topic, they should leave the boxes blank. Subjects were then given two minutes to list their beliefs about the topic. The number of discrete beliefs each subject listed about preservation of the environment was judged by two independent raters ($\underline{r} = .91$). In addition, to explore the relations between opinion change on preservation, the retrieval of topic-relevant beliefs, and the retrieval of beliefs on other topics, the number of discrete beliefs subjects listed concerning psychological research was judged by two raters ($\underline{r} = .94$).

Behavior retrieval. Subjects' recall of attitudinally-relevant behaviors was assessed in a manner similar to the belief retrieval task. Subjects were asked to list specific instances of times when they had engaged in actions related to the topic. The number of discrete behaviors each subject listed about preservation of the environment and about psychological research was judged by two independent raters ($\underline{r}_s = .89$ and $.90$, respectively).

Group membership. In order to provide information on the concurrent validity of the belief and behavior retrieval tasks, subjects were asked to indicate whether they belonged to environmental

organizations which would provide them with relevant experiences.

Second Experimental Session: Susceptibility to Persuasion

Subjects. A total of 65 subjects returned in groups of about 12 to complete this second session.

Procedure. In this session, subjects again expected to indicate their opinions in a variety of formats. The rationale, adapted from Jones and Brehm (1967), for preceding the opinion questionnaire by a persuasive message was that being exposed to someone else's opinion and the arguments he or she uses to support this opinion gets people in the "right frame of mind to be critical and careful about evaluating their own opinions" and therefore makes it possible to measure their opinions more accurately.

The experimenter next gave each subject a handout containing further information about the persuasive message. The handout explained that each subject would read a transcript of an interview (actually hypothetical) that had been tape-recorded as part of an opinion survey conducted on campus. Participants in this survey, including students, faculty, staff, and visitors, had (supposedly) been asked to give an opinion on an issue and then support that opinion with evidence. The handout stated that over 100 different interviews covering 10 topics were available and that, by random selection, almost everyone would get a different interview to read. The handout also stated that participants may read an interview in which the opinion expressed was quite different from their

own since the interviews represented a wide sampling of opinions.

The experimenter then gave each subject an interview transcript, which contained the persuasive message. The transcript began with an interviewer asking an interviewee (source), Jim H., for some background information. Jim H. was portrayed as a graduate student in biology who was very interested in the issue of environmental preservation. In response to the interviewer's question, Jim stated that, "I am not very strongly in favor of current efforts to preserve our environment . . . we have to recognize that preservation has negative effects." Jim then went on to state four arguments against preserving the environment: (a) preservation has a negative impact on the economy, (b) the energy problem justifies lowering environmental standards to allow the burning of coal, (c) the preserved land is needed for housing and for farm land, and (d) it is not necessary to preserve the environment because it is possible to clean up pollution.

After allowing about six minutes for reading the transcripts, the experimenter distributed a questionnaire on which subjects stated their opinions on a variety of social issues. Two of these issues were identical to the ones subjects rated earlier. One topic concerned preservation of the environment. Next, the experimenter explained that she was also interested in subjects' reactions to the interviews. Subjects completed a questionnaire which elicited their thoughts about the interview transcript, along with other responses (see below).

Measuring instruments.

Opinions. Subjects' final opinions on preservation of the environment were assessed on the opinion scale described above.

Cognitive response measures. Subjects were given two-and-a-half minutes to list their thoughts about what the communicator said in the message. The questionnaire, similar to that used by Petty and Cacioppo (1979), listed the instructions at the top of the page, with seven boxes underneath. Two independent raters judged the number of positive ($\underline{r} = .93$), negative ($\underline{r} = .80$), and neutral ($\underline{r} = .53$) thoughts each subject produced.

Perceptions of the communicator. Subjects rated the communicator on ten fifteen-point bipolar scales, with positive poles, consistent, honest, sincere, non-opportunistic, non-manipulative, non-compliant, open-minded, unbiased, objective, and likeable.

Message comprehension. Subjects were asked to summarize each argument the communicator used to support his position, and two independent judges determined the number correctly recalled ($\underline{r} = .88$). Subjects were also asked to write down the overall position the communicator took in the interview. Only two subjects were not able to correctly recall the message position.

Suspicion. At the end of the experiment, subjects were asked to describe in their own words the purpose of the study, and these responses were coded for suspicion of persuasive intent. Because elimination of the seven suspicious subjects had little effect on the results, they were retained in the analysis.

Second Experimental Session: Intrinsic Motivation

Subjects. A total of 94 subjects participated in this second session. One of these was eliminated because she declined to deliver the persuasive message. Three more were eliminated because they were suspicious of the cover story; they did not believe they would deliver the persuasive arguments.

Procedure. Subjects reported individually to a second session concerned with attitude change. The apparent purpose of this study was to determine the optimal number of arguments to use in a persuasive message.

The procedure was adapted from an experiment by Kiesler, Nisbett, and Zanna (1969). Subjects were asked to present some arguments, previously prepared by the experimenter, to two people on campus. It was explained that a number of students were needed as communicators so that the specific personality characteristics of a single communicator did not affect the results. Subjects believed that after presenting the arguments they would ask the message recipients whether they were willing to sign a petition in favor of the message position. Subjects expected to rehearse before leaving to conduct the task.

After describing the purpose and procedure of the study, the experimenter (ostensibly) randomly assigned one of the topics subjects had rated in the first session. In reality, all subjects were asked to argue in favor of environmental preservation.

At this point it was mentioned to half of the subjects (Reward condition) that they would receive \$5.00 for agreeing to participate in this phase of the experiment. The money was placed in front of the subjects and remained visible throughout the rest of the session. Half of the subjects were not offered a monetary reward for their participation (No reward condition). Subjects were then asked if they agreed to present the persuasive message.

The experimenter then remarked that before the subjects start to practice the communication, it would probably be a good idea to get a measure of how they felt right now about the issue. After indicating their opinions, subjects responded to a questionnaire assessing their explanations for agreeing to present the message.

After completing the questionnaire, subjects were asked if they believed they would present the message. They were then debriefed and excused. Subjects in the reward condition received the five dollars.

Measuring instruments.

Opinions. Subjects indicated their opinions on preservation of the environment on the opinion scale described above.

Attributions. On 15-point scales, subjects rated the importance of several reasons for agreeing to persuade others to sign the petition: (a) receiving experimental credit or payment, (b) convincing others about a topic the subject really believed in, and (c) any other reason the subject cared to mention.

C H A P T E R I I I

RESULTS

First Experimental Session

The number of beliefs subjects indicated ranged from 2 to 7, with an average of 3.75, and the number of behaviors ranged from 0 to 6, with an average of 2.83. Median splits were performed on both variables (medians = 3.70 and 2.73, for beliefs and behaviors, respectively) and Number of Beliefs Retrieved from Memory (few vs. many) X Number of Behaviors Retrieved (few vs. many) analyses of variance were calculated,² along with appropriate contrasts.

Self-perception of past experiences and involvement. As expected, subjects' perceptions of their past experiences and their involvement concerning preservation of the environment corresponded to the number of beliefs and the number of behaviors they listed. As shown in table 1, subjects who listed many behaviors, compared to those who listed few, rated that they had thought more about preservation, $F(1,157) = 14.31$, $p < .001$, had engaged in more action, $F(1,157) = 12.26$, $p < .001$, and had experienced more feelings, $F(1,157) = 15.67$, $p < .001$. In addition, subjects who listed many behaviors, compared with those who listed few, indicated that they knew more about the topic, $F(1,157) = 20.15$, $p < .001$, and perceived themselves to be more involved, $F(1,157) = 21.80$, $p < .001$. Although

TABLE 1

MEAN SELF-PERCEPTIONS OF THOUGHTS, BEHAVIORS, FEELINGS, KNOWLEDGE,
AND INVOLVEMENT: FIRST EXPERIMENTAL SESSION

	Few behaviors retrieved from memory		Many behaviors retrieved from memory	
	Few beliefs retrieved from memory	Many beliefs retrieved from memory	Few beliefs retrieved from memory	Many beliefs retrieved from memory
Frequency of previous thought	9.83	10.67	12.15	11.84
Frequency of previous action	7.15	8.52	9.96	9.84
Frequency of previous feelings	10.39	10.56	12.74	11.74
Degree of knowledge	15.75	17.60	20.01	20.29
Extent of involvement	18.44	20.26	23.22	22.69

Note: Higher numbers indicate more frequent thought, action, and feelings,
greater knowledge, and more involvement concerning preservation of the environment.

no significant effects on these variables were obtained for the beliefs factor, differences between subjects who listed few beliefs and those who listed many were in the predicted direction.

Group membership. Participants who belonged to environmental groups such as the Sierra Club and the Audubon Society listed more behaviors (19 listed many behaviors vs. 6 listed few) than participants who did not belong to such organizations (70 listed many behaviors vs. 62 listed few), $\chi^2 = 4.52$, $p < .05$. Parallel results were obtained for the belief factor, although they were not significant.

First Experiment: Susceptibility to Persuasion

The hypotheses were explored by a 2 (few vs. many beliefs) X 2 (few vs. many behaviors) design.³ Because analyses including subject sex as an additional variable yielded no differences between males' and females' persuasibility and no systematic differences across other measures, this variable is not included in the following analyses.

Opinions. Analysis of covariance was conducted on the postopinions, with preopinions as the covariate. That the covariance analysis was appropriately conducted was suggested by (a) the test for homogeneity of the covariate regression coefficients indicated that the coefficients did not differ across experimental conditions, and (b) the covariate accounted for a significant amount of variance in the analysis on postopinions, $F(1,61) = 6.97$, $p < .02$, $\eta = .34$.

Analysis of variance indicated that preopinions were more pro-environment in the many ($\underline{M} = 14.15$) than few behaviors conditions ($\underline{M} = 13.22$, $p < .05$), and that preopinions ($\underline{M} = 13.71$) differed significantly from postopinions ($\underline{M} = 11.85$, $p < .01$).

Opinion means, which are the postopinion scores adjusted on the basis of the analysis of covariance, appear in table 2. Analysis of these data indicated that, as predicted, subjects who listed many behaviors changed their opinions less in response to the persuasive message than those who listed few behaviors, $F(1,61) = 7.91$, $p < .01$, $\eta = .47$. Also, those who listed a large number of beliefs changed their opinions less than those who indicated few beliefs, $F(1,61) = 4.43$, $p < .05$, $\eta = .34$.

The above analysis does not reveal whether subjects' attitude change was a function of the retrieval of topic-specific information (i.e., beliefs and behaviors concerning preservation of the environment) or whether it represented a general cognitive style which provided easy or difficult access to relevant information about the self. To explore these possibilities, subjects' retrieval of beliefs and behaviors on a second topic, psychological research, was employed as a predictor of opinion change on preservation of the environment. The analysis suggested that the opinion change may have been a function of topic-specific retrieval: No effects were obtained on the belief measure. Although subjects who indicated few behaviors concerning psychological research became less proenvironment ($\underline{M} = 11.39$) than those who indicated many ($\underline{M} = 12.66$, $p < .02$),

TABLE 2
 MEAN POSTOPINIONS: PERSUASION EXPERIMENT

Number of beliefs retrieved from memory	<u>Number of behaviors retrieved from memory</u>	
	Few behaviors	Many behaviors
Few beliefs	10.32	12.08
Many beliefs	11.67	12.74

Note: Means are adjusted postopinion scores on a 15-point scale on which higher numbers indicate greater favorability toward preservation of the environment.

this effect could be due to the correlation between the number of behaviors listed about the environment and about psychological research ($r = .45$, $p < .001$). Indeed, when a stepwise regression analysis was conducted, which predicted opinion change from behaviors concerning psychological research after the variance due to behaviors concerning preservation was removed, the research measure was no longer significant ($p > .20$).

Self-perceptions as predictors of opinion change. A hierarchical regression analysis was performed to determine whether subjects' self-perceptions significantly contributed to the prediction of opinion change, after the variance due to the belief and behavior retrieval factors was removed. The self-perception variables proved to be marginal or significant predictors when each was entered into a separate regression equation, after the belief and behavior factors: thought ($B = .19$, $p < .10$), behavior ($B = .29$, $p < .01$), feelings ($B = .36$, $p < .001$), involvement ($B = .50$, $p < .001$), and knowledge ($B = .21$, $p < .07$).

A hierarchical regression analysis was also computed by first entering each self-perception measure into a separate equation and then entering the belief and behavior retrieval variables. The analyses revealed that the belief and behavior factors remained significant predictors of opinion change ($ps < .05$), except that when knowledge was included in the equation, the behavior factor was only marginally significant ($p < .08$).

Informational responses to the communicator's message.

Cognitive responses. Subjects' thoughts about the communicator's message are presented in table 3. Subjects who indicated many behaviors, compared with those who listed few, generated a smaller number of favorable thoughts, $F(1,61) = 5.86$, $p < .05$, $\eta = .33$, and a greater number of counterarguments, $F(1,61) = 8.10$, $p < .01$, $\eta = .39$. No effects were obtained on the analysis of neutral thoughts.

Evidence for these responses as mediators of opinion change was provided by the correlations between favorable thoughts and adjusted postopinions ($r = -.23$, $p < .08$), and between counterarguments and adjusted postopinions ($r = .41$, $p < .01$). The mediational role of these responses was further explored through hierarchical regression. When counterarguments were entered into the analysis before the retrieval factors, the beliefs factor became only a marginally significant predictor of opinion change, $F(1,59) = 3.04$, $p < .10$, and the behaviors factor became a less effective predictor, $F(1,59) = 4.56$, $p < .05$. The favorable thoughts measure was not a significant predictor of opinion change in the regression analysis.

Message comprehension. Analysis of the number of message arguments subjects recalled yielded no effects, and the correlation between the number recalled and the adjusted postopinions was not significant.

TABLE 3

MEAN COGNITIVE RESPONSES: PERSUASION EXPERIMENT

	Few behaviors retrieved from memory	Many behaviors retrieved from memory	Many behaviors retrieved from memory
Cognitive responses	Few beliefs retrieved from memory	Many beliefs retrieved from memory	Many beliefs retrieved from memory
Counterarguments	1.06	1.92	2.50
Favorable thoughts	1.75	1.25	0.70
			2.67
			0.85

Note: Higher numbers indicate a greater number of responses.

Perception of the communicator. A factor analysis (varimax rotation) of the source ratings yielded three rotated factors. The factors, which accounted for 28.9%, 18.2%, and 10.8% of the variance, were labeled "Unbiased" (open-minded, unbiased), "Sincere" (honest, sincere, likeable), and "Objective" (objective, unbiased), respectively. Factor scores were computed for each subject and then treated by analysis of variance. The source was judged less biased by subjects who listed few beliefs ($\underline{M} = .40$), compared with those who listed many ($\underline{M} = -.27$), $\underline{F}(1,61) = 8.03$, $p < .01$. In addition, the source was perceived as more sincere by subjects who listed few behaviors ($\underline{M} = .33$), compared with those who listed many ($\underline{M} = -.29$), $\underline{F}(1,61) = 7.22$, $p < .01$. No effects were obtained in the analysis on the objective factor.

The consistent, nonopportunistic, nonmanipulative, and non-compliant scales, which failed to load highly on any of these factors, were analyzed separately. Only the analysis of the non-manipulative variable yielded significant effects. Subjects who listed few beliefs perceived the source to be more nonmanipulative ($\underline{M} = 8.56$) than those who listed many beliefs ($\underline{M} = 7.27$), $\underline{F}(1,61) = 4.89$, $p < .05$.

Subjects tended to change their opinions to the extent that they perceived the source as unbiased and nonmanipulative ($\underline{r}_s = -.24$ and $-.26$, respectively, $\underline{p}_s < .06$). However, because these perceptions were not significant predictors of opinion change when entered into a hierarchical regression analysis before the retrieval

factors, perceptions did not mediate opinion change.

Second Experiment: Intrinsic Motivation

The hypotheses were explored by a 2 (few vs. many beliefs) X 2 (few vs. many behaviors) X 2 (reward vs. no reward) design and appropriate contrasts. Because analyses including subject sex as an additional variable yielded no differences between males' and females' persuasibility and no systematic differences across other measures, this variable is not included in the following analyses.

Opinions. Similar to Experiment 1, analysis of covariance was conducted on the postopinions, with preopinions as the covariate. Again, the test for homogeneity of the covariate regression coefficients indicated that the coefficients did not differ across experimental conditions, and the covariate accounted for a significant amount of variance in the prediction of opinion change, $F(1,79) = 43.08$, $p < .001$, $\eta = .53$. Analysis of variance indicated that preopinions did not vary across experimental conditions, and that preopinions ($M = 14.03$) differed significantly from postopinions ($M = 12.81$, $p < .05$).

Opinion means, which are the postopinion scores adjusted on the basis of the analysis of covariance, appear in table 4. The results replicated the findings typically obtained in self-perception research: Subjects who received a reward changed their opinions to be less favorable toward preservation of the environment than subjects in the no reward conditions, $F(1,79) = 7.66$, $p < .01$, $\eta = .19$.

TABLE 4
 MEAN POSTOPINIONS: INTRINSIC MOTIVATION EXPERIMENT

Number of beliefs retrieved from memory	Few behaviors retrieved from memory		Many behaviors retrieved from memory	
	Reward	No reward	Reward	No reward
Few beliefs	11.47	13.15	13.21	13.52
Many beliefs	11.43	12.66	13.26	13.14

Not: Means are adjusted postopinion scores on a 15-point scale on which higher numbers indicate greater favorability toward preservation of the environment.

Further, the results provided support for the present hypotheses. Subjects who indicated few behaviors showed more change than those who indicated many behaviors, $F(1,79) = 17.22, p < .001, \eta = .41$. Also, a Reward X Number of Behaviors interaction, $F(1,79) = 6.87, p < .02, \eta = .21$, indicated that the difference between the reward and the no reward conditions was significant for subjects who listed few behaviors, $F(1,79) = 17.59, p < .001$, but not for those who listed many ($F < 1$). Post hoc comparisons among means, by the Sheffé method, revealed that the opinion means of rewarded subjects who indicated few behaviors and few beliefs or many beliefs differed significantly ($p < .05$) from all other opinion means.

Similar to Experiment 1, to determine whether subjects' attitude change was indeed a function of the retrieval of topic-specific information, subjects' retrieval of beliefs and behaviors on psychological research was employed as a predictor of opinion change on preservation of the environment. Neither beliefs nor behaviors concerning psychological research proved to be predictors of opinion change ($F_s < 1$).

Self-perceptions as predictors of opinion change. As in Experiment 1, a hierarchical regression analysis was performed to determine whether subjects' self-perceptions contributed to the prediction of opinion change, after the variance due to the belief and behavior retrieval factors, the reward manipulation, and the Reward X Number of Behaviors interaction was removed. Each of the self-perceptions was a significant predictor: thoughts

($\underline{B} = .26, p < .01$), behavior ($\underline{B} = .30, p < .001$), feelings ($\underline{B} = .28, p < .01$), involvement ($\underline{B} = .36, p < .001$), and knowledge ($\underline{B} = .25, p < .01$).

A step-wise regression analysis was also computed by first entering each of the self-perception measures into separate equations along with the reward manipulation, and then adding the belief and behavior retrieval variables and the Reward X Behaviors interaction in the second step. The analyses revealed that in all equations the behavior factor and the Reward X Behaviors interaction were significant ($p < .05$) or marginally significant ($p < .10$) predictors of opinion change.

Attributions. As shown in table 5, subjects who were rewarded attributed the decision to deliver the persuasive arguments more to the reward than subjects who did not receive the reward, $\underline{F}(1,79) = 3.08, p < .09, \eta = .20$.

Subjects who listed many beliefs attributed the decision marginally more to belief in preservation than subjects who listed few beliefs, $\underline{F}(1,79) = 3.62, p < .06, \eta = .23$ (see table 5). In addition, a Reward X Number of Behaviors interaction, $\underline{F}(1,79) = 8.20, p < .01, \eta = .29$, revealed that in the few behaviors groups, subjects who were not rewarded attributed the decision more to their belief in the issue than those who received a reward, $\underline{F}(1,79) = 3.81, p < .05$, but in the many behaviors groups, rewarded subjects made a stronger attribution to their belief than not rewarded subjects, $\underline{F}(1,79) = 3.62, p < .06$.

TABLE 5

MEAN CAUSAL ATTRIBUTIONS: INTRINSIC MOTIVATION EXPERIMENT

	Few behaviors retrieved from memory		Many beliefs retrieved from memory		Many behaviors retrieved from memory		Many beliefs retrieved from memory		Many behaviors retrieved from memory	
	Reward	No reward	Reward	No reward	Reward	No reward	Reward	No reward	Reward	No reward
Attribution of decision to reward	12.17	10.33	10.17	10.50	10.70	10.67	11.33	10.05	11.33	10.05
Attribution of decision to belief	9.17	11.08	10.67	11.00	11.50	8.83	12.07	11.16	12.07	11.16

Note: Higher numbers indicate greater attribution to causal factors.

Evidence that attribution to belief mediated opinion change was provided by a hierarchical regression analysis. When attribution to belief was entered into the analysis before the behavior retrieval factor, the reward manipulation, and the Reward X Behaviors interaction, the behaviors factor was no longer a significant predictor of opinion change, $F(1,82) = 2.63$, $p < .12$, and the reward manipulation and the interaction were only marginally significant, $F(1,82) = 3.51$, and $F(1,82) = 3.62$, respectively, $ps < .07$. Attribution to reward was not a significant predictor of opinion change in the regression analysis.

C H A P T E R I V

DISCUSSION

According to the proposed distinction between memory- and context-derived attitudes, individuals who can retrieve attitudinally-relevant information from memory will employ this information, in preference to contextual cues, to assess how favorable they are toward the attitude object. In contrast, individuals who do not have easy access to such information in memory will rely relatively more on contextual cues and recent behavior to assess their attitude. New information that counters initial opinions was expected to have a greater impact on context- than memory-derived attitudes because context-derived attitudes are drawn more from the data that is currently available and less from prior experiences and beliefs.

The present research appears to have been an appropriate site for exploring differences between memory- and context-derived attitudes. The distinction between these two attitudes was operationalized in terms of whether few or many beliefs and few or many behaviors relevant to preservation of the environment were indicated in the listing tasks. For the retrieval of beliefs and behaviors to reflect this distinction, they should correspond to other measures which reflect access to attitudinally-relevant cognitions and prior experiences. Indeed, subjects who listed many behaviors, compared with those who listed few, perceived themselves to have experienced

more thought, action, and feelings about preservation and to be more knowledgeable and involved. Results for the belief measure were similar, though nonsignificant. Further, subjects who belonged to environmental groups such as the Sierra Club or the Audubon Society indicated more behaviors than those not members of such groups.

Impact of Belief and Behavior Retrieval on Opinions

Persuasion experiment. Subjects, who were generally in favor of preservation of the environment, were presented with a persuasive message that argued against preservation. Those who retrieved from memory many beliefs relevant to preservation, compared with few beliefs, and many behaviors, compared with few behaviors, showed less opinion change.

Consistent with a cognitive response analysis of persuasion (Petty & Cacciopo, 1979), the cognitive responses appeared to be mediators of the effects of belief and behavior retrieval on opinion change. In the experiment, the cognitive responses produced were a function of the extent to which subjects could retrieve relevant experiences from memory. Subjects who retrieved many behaviors produced thoughts favorable to the message and more counterarguments than those who retrieved few behaviors. The cognitive responses were then found to be appropriately related to opinion change. Both favorable thoughts and counterarguments were significantly correlated with change. Further evidence that these responses mediated acceptance of the persuasive message was suggested by a hierarchical

regression analysis predicting opinion change. When the counter-arguments variable was entered first into the equation, the factor representing belief retrieval was no longer a significant predictor, and the factor representing behavior retrieval became a less effective predictor. It thus appears that attitudes which were derived from beliefs and behaviors retrieved from memory were little affected by the persuasive message because information was available for the effective production of counterarguments to the material presented.

Perceptions of the communicator yielded effects similar to the cognitive response measures, although perceptions were not clearly mediators of opinion change. The source was perceived as more biased and manipulative by subjects who retrieved many, than few, beliefs, and was perceived as less sincere by subjects who retrieved many, than few, behaviors. Although perceptions of bias and manipulation were correlated with opinion change, regression analyses suggested that they did not mediate the effects of belief and behavior retrieval on persuasion.

Intrinsic motivation experiment. Subjects were either rewarded or not rewarded for deciding to deliver arguments in favor of preservation of the environment to students on campus. That the reward was successfully manipulated was suggested by the fact that rewarded subjects attributed their decision marginally more to the reward than not rewarded subjects.

The opinion change of subjects who retrieved few behaviors conformed to the results typically obtained in self-perception research:

Subjects who were rewarded for deciding to argue in favor of preservation inferred a less positive attitude than subjects who were not rewarded for their decision. In contrast, subjects who retrieved many behaviors showed little opinion change in either reward or no reward conditions. These results suggest that when little cognitive support underlies an attitude, perceivers' judgments are highly affected by recent behavioral incidents. However, attitudes with detailed cognitive support are less affected by recent behavior, most likely because the behavior is only one piece of information on which the judgment is based.

Subjects' explanations for their decision to present the arguments supported the attribution interpretation of opinion change. It should be recalled that intrinsic attributions reflect an explanation in terms of one's belief in an issue, whereas extrinsic attributions reflect explanations in terms of cues independent of the attitude object, such as the reward in the present experiment. That in the few behaviors groups, rewarded subjects, compared with those not rewarded, made a less intrinsic attribution was indicated by the fact that they attributed their decision relatively less to belief in preservation. This finding parallels the difference obtained on opinion change between rewarded and not rewarded subjects. In contrast, in the many behaviors groups, differences between rewarded and not rewarded subjects were unexpectedly in the opposite direction: Those who received a reward, compared with those who did not, attributed the decision more to their

belief. This result is not reflected in the opinion change findings.

The extent to which subjects explained their decision in terms of belief in preservation appeared to mediate opinion change. A hierarchical regression analysis indicated that when attribution to belief was entered first into an equation predicting opinion change, the behavior retrieval factor was no longer a significant predictor, and the reward manipulation and the Reward X Behaviors interaction became only marginally significant predictors. Thus, the reward and the retrieval of prior experiences affected opinion change primarily through the mediation of subjects' explanations. Subjects who had access to relevant experiences incorporated this information into their explanations and inferred a relatively favorable opinion. In contrast, the mediation of opinion change for subjects without access to relevant experiences conformed to the hypothesized process by which attitudes are inferred from behaviors. After identifying the plausible cause(s) for their decision, subjects who were not rewarded, compared with those who were, made attributions more to belief in preservation and subsequently inferred a more favorable attitude.

These mediational findings support the self-perception analysis that when internal cues, such as prior experiences relevant to the attitude object, are not accessible, attitudes are inferred from behavior and the context in which it occurs (Bem, 1972). The present analysis extends this theory by providing an a priori means of determining when attitudes will reflect primarily experiences retrieved

from memory or primarily explanations of recent or salient behavior.

The attribution findings are also informative concerning subjects' access to their causal analysis. The fact that subjects were able to report on the attributional factor that mediated opinion change suggests that they may have had access to higher order processing. However, it has been argued that people report on such processing not because they have access to it, but because the reports reflect a priori theories of causality (Nisbett & Wilson, 1977). Reports of processing are thought to be accurate only when intuitive theories of causality correspond to actual analyses. Thus it is unclear whether subjects in the present research truly had access to their processing.

Other Issues

The analyses consistently yielded significant differences due to the number of behaviors listed but only in a few instances did the beliefs factor yield significant effects. It is possible that the extent to which relevant behaviors can be retrieved is, in general, a more important contributor to opinions than the retrieval of relevant beliefs. Indeed, it has been argued that attitudes based primarily on information obtained through indirect experiences with the attitude object (i.e., information acquired second hand) are relatively unclear and not confidently held (Fazio & Zanna, in press). Attitudes which are based on the information obtained through prior action, however, are thought to be well-defined and

held confidently.

Another possible reason why the beliefs measure is a less effective predictor of opinions than the behaviors measure is because it may be a less perfect indicator of subjects' retrieval. That subjects listed on the average a greater number of beliefs than behaviors could suggest that they were not only indicating beliefs stored in memory but were also generating new beliefs during the listing task. The act of retrieving beliefs may have spontaneously resulted in newly perceived relations between preservation and other constructs stored in memory. The retrieval of behaviors, however, may be less likely to generate newly perceived instances because recall of specific examples of previous experiences is required. The beliefs measure may therefore have contained a greater degree of error, which would make it a less effective predictor of opinion change in the analysis. Other means of operationalizing the belief and behavior constructs, however, may find that access to both is equally important in determining opinions.

Self-perceptions and the retrieval factors. Analysis of the self-perception measures suggested that subjects were informed about the degree of organization of their beliefs and prior experiences. Self-perceptions of retrievable information were systematically related to the belief and behavior retrieval factors, which represented relatively direct measures of access. For example, subjects who retrieved many, rather than few, behaviors considered themselves to have experienced more thought and to be more knowledgeable.

Although it has been argued that people often do not have access to cognitive processing (Nisbett & Wilson, 1977), subjects in the present study appeared to be aware of this processing to the extent that they reported accurately on the stored information.

Self-perceptions were not based entirely on access to attitudinally-relevant information. A hierarchical regression analysis revealed that even though the retrieval factors and the self-perception measures accounted for some of the same variance in predicting opinion change, they were also independent contributors. Thus, self-perceptions were derived from information (such as temporary mood states) which was related to opinion change independent of the retrieval of beliefs and prior experiences.

Comparisons between the effectiveness of self-perceptions and retrieval factors as predictors of opinion change suggest that, in general, the retrieval factors yield the results which are most consistent with the hypotheses. Although self-perceptions, especially behaviors, feelings, and involvement, often yielded effects greater in magnitude than the retrieval factors, the results of analyses that incorporated self-perceptions instead of these factors did not strictly conform to the hypotheses. In the intrinsic motivation experiment, separate regression equations predicting opinion change from each self-perception measure, a term representing the interaction between the self-perception and reward, and the reward manipulation revealed that none of the Reward X Self-Perceptions were significant ($F_s < 1$). Since the interaction between reward and retrieval of behaviors was critical to the

interpretation of the opinion change results, self-perception measures cannot effectively be substituted for this retrieval factor.

Attitudes as Schemata

Self-schemata have commonly been considered a representation of the organization of information about the self on a particular personality or attitude dimension, and not the organization of information about the self in general (Markus, 1977; Rogers, Kuiper, & Kirker, 1977). This analysis implies that in the present research, opinion change on preservation of the environment should not necessarily be related to the cognitive structure underlying subjects' opinions on other issues. Indeed, it was found that opinion change was not effectively predicted from the retrieval of beliefs and behaviors concerning psychological research. Thus, consistent with theories of cognitive schemata, it appears that opinion change was a function of topic-specific retrieval and not general accessibility to information in memory.

Attitude schemata have been conceptualized in terms of attitude extremity (Judd & Kulik, 1980), and consistency between affective and cognitive components of attitudes (Chaiken & Baldwin, Note 1). The present findings suggest that attitude extremity is not necessarily related to the organization of information concerning an attitude issue. Although in the persuasion experiment, subjects who indicated many behaviors had more polarized attitudes than those who indicated

few, analysis of covariance adjusted for extremity of initial opinions, and the results remained supportive of the hypothesized effects of retrieval on opinion change.

Affective-cognitive consistency theory and the present analysis of access to attitudinally-relevant information have identified similar relations between consistency or retrieval and opinion change. Chaiken and Baldwin (Note 1) found that attitudes composed of low consistency components, compared with high, were more likely to reflect salient behaviors. This finding is comparable to the fact that in the intrinsic motivation experiment, the attitudes of subjects who could retrieve few behaviors, compared with many, were derived more from recent behavior and the context in which it occurred. It is not surprising that findings from these two studies are similar. In terms of the present framework, affective-cognitive consistency may be one by-product of a well-organized cognitive structure. Consistency, then, may be related to retrieval because these variables may both tap the organization of attitudinally-relevant information. However, measures of access to prior experiences and cognitions should in general be a better predictor of opinions because they more directly measure this organization.

Measuring the number of beliefs and behaviors subjects indicate in a limited period of time is only one means of identifying the cognitive structure underlying attitude judgments. Other open response measures can be devised to assess to what extent attitudinally-relevant information is organized in memory, and thus

to what extent it is retrievable. A hierarchical perspective of memory would suggest that the order in which relevant beliefs and experiences are indicated can reveal the degree of organization. For example, a hierarchical structure would be indicated if the abstract cognitions subjects list are followed by related, more concrete instances. Subjects who list only unrelated, abstract cognitions are less likely to have such a structure. This kind of assessment of the content of subjects' beliefs and experiences would be expected to have effects on opinion change similar to both the retrieval measures employed in the present research and the measures of cognitive schemata employed by other researchers.

Related Conceptions of Attitudes

It should be noted that the idea of attitude schemata is not the only conception of attitudes which is related to the present distinction between memory- and context-derived judgments. For example, Rokeach (1970) proposed that attitudes "are arranged along a central-peripheral dimension wherein the more central . . . are more salient or important, more resistant to change, and if changed exert relatively greater effects on other parts" (p. 117). However, it is unclear how attitude centrality would be operationalized because little systematic research has been conducted on this proposition. In addition, Rokeach did not focus on the information that might underlie central vs. noncentral attitudes. The concept of centrality was conceived within the tradition of cognitive consistency theories,

and thus does not explore the storage and retrieval of attitudinally-relevant information, which is the focus of the present cognitive approach.

Another conceptualization of attitudes which has some similarity to the present analysis is McGuire's (1968) work on the inoculation approach to resistance to persuasion. McGuire recognized that attitudes such as those represented by cultural truisms (e.g., it's good to brush your teeth twice a day) have little underlying cognitive support and thus are very susceptible to persuasive attempts. However, the focus of the inoculation work was on conferring resistance to persuasion, and did not analyze the information underlying attitude judgments.

Conclusion

The findings of the two studies highlight the importance of distinguishing between two types of attitudes: (a) attitudes derived from prior experiences and beliefs organized in memory, and (b) those derived from contextual cues and behavior. In both the persuasion and intrinsic motivation experiments, subjects' opinion change was a function of the degree to which they had access to relevant information. This approach, which focuses on access to topic-specific information, is concerned with the immediate antecedents of change on particular issues. It is in contrast to research which has generally been unsuccessful in predicting opinion change from global personality traits, such as

self-esteem (Eagly, in press).

The present analysis of the immediate antecedents of opinion change does not specify how other determinates, such as one's prior experiences, may affect the organization in memory of a self-construct, and ultimately opinions. The fact that membership in environmental groups was related to behavior retrieval indicates that the retrieval factors reflect some differences in prior behavior. Yet membership proved to have a direct impact on opinion change only in the intrinsic motivation experiment, $F(1,83) = 7.00$, $p < .02$. Further research is needed to determine to what extent differences in experiences and beliefs underlie differences in access to attitudinally-relevant information in memory, and thus what impact these prior experiences have on opinion change.

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² Chaiken, S., & Baldwin, M. Affective-cognitive consistency and attitude inference from salient behavioral information. University of Toronto, 1980.

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FOOTNOTES

¹ Although an attitude inference can result from attribution to oneself or to the attitude object, perceivers' confidence in their attitude judgments may depend on the causal factor that is identified (Kelley, 1967). When assessing the validity of their perceptions, people may infer that attitudes derived from self attributions reflect something idiosyncratic about themselves whereas attitudes derived from entity attributions may be perceived as consensual reactions which reflect a characteristic of the attitude object. Kelley (1967) suggests that entity attributions enable perceivers to feel relatively confident in their judgments.

² The number of behaviors and the number of beliefs subjects listed were correlated ($r = .30, p < .05$). Independent variables that are correlated have been termed collinear. The degree of relationship between these variables in the present study is small, thus collinearity can be expected to result in somewhat conservative, though not particularly biased, tests of significance.

³ Although the persuasion study was initially constructed so that subjects received persuasive messages on one of two issues, preservation of the environment or energy conservation, preliminary data analyses indicated that only the environmental message produced any measurable opinion change. It may be that subjects did not change their opinions on energy conservation because most of them were able

to retrieve a large amount of energy-related information from memory. Indeed, the fact that subjects listed on the average a greater number of beliefs and behaviors relevant to energy ($\bar{M}_s = 4.22$ and 3.87 , respectively) than to environment could be due to the recent national publicity campaign emphasizing conservation. The energy topic was therefore dropped from the analysis of the persuasion study and was not included in the intrinsic motivation study.

