

Retrieval of Attitude-Relevant Information From Memory: Effects on Susceptibility to Persuasion and on Intrinsic Motivation

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A distinction was drawn between (a) classic views of attitudes as stable dispositions based on beliefs and prior experiences accessed from memory and (b) the self-perception analysis of attitudes as relatively transitory responses dependent on current contextual cues. Access to relevant information in memory was assessed by the number of issue-related beliefs and prior experiences subjects could retrieve. To the extent that subjects could not retrieve information, they were expected to change their opinions to be consistent with new information and experiences concerning the attitude topic. In the first experiment, subjects read a counterattitudinal message. As expected, subjects with little access to beliefs and prior experiences, in comparison to those with greater access, changed their opinions to be more consistent with the message position. In the second experiment, subjects agreed to advocate a proattitudinal position for either a reward or no reward. As expected, subjects with access to little relevant information in memory inferred their attitudes from their decision to proselytize: Rewarded (vs. unrewarded) subjects explained their decision less in terms of their own belief in the advocated position and therefore inferred they were less in favor of this topic. In contrast, subjects who had greater access to information indicating that they were in favor of the stance taken in the message tended to attribute their decision to a belief in the topic, regardless of the presence or absence of the reward, and thus remained relatively favorable.

Social psychological research on attitudes appears to stem from at least two traditions. One of these uses the attitude construct in a manner analogous to traits, emphasizing the enduring dispositions that underlie an attitude judgment. For example, McGuire's (1969) well-known review employed Allport's (1935) definition of an attitude as "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). Consistent with this view, information processing

analyses (e.g., Fishbein & Ajzen, 1975) assume that attitude judgments are a function of one's learned response to the attitude object. A number of such approaches (e.g., Krech, Crutchfield, & Ballachey, 1962) have focused on how attitudes are derived from various informational components that comprise affective, cognitive, and conative dimensions. Relevant information from each of these domains is presumably stored in memory and accessed during the judgment process.

According to the second tradition of research, exemplified by self-perception theory (Bem, 1972), attitude judgments can represent on-the-spot assessments of one's recent behavior toward the attitude object and the context in which the behavior occurred. It is assumed that people often do not have direct access to internal dispositions (e.g., attitudes, emotions) and, to the extent that they lack such access, must infer internal states from external cues. Whether attitudes derived from current cues affect future judg-

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ments and behavior presumably depends on the accessibility of the initial attitude and the information on which it was based. The transitory nature of such judgments is suggested by subjects' tendency to recall prior attitudes as similar to their current opinions, even when they have recently shifted to new attitude positions (Bem & McConnell, 1970). Advocates of self-perception theory, then, tend to view attitudes as self-descriptive statements reflecting currently available external cues, rather than as stable dispositions drawn from such internal data as one's beliefs and prior experiences.

These two conceptualizations of attitudes can be incorporated into a comprehensive theoretical framework that recognizes the impact of both internal and external cue information on attitude judgments (Chaiken & Baldwin, 1981; Eagly & Himmelfarb, 1978).¹ Consistent with this approach, it is assumed that attitudes reflecting primarily internal data are derived from a relatively constant, stable source of information that essentially does not change with the situation. Certainly aspects of these data may become more or less salient (see Fishbein & Ajzen's [1975] discussion of salient beliefs) given certain situational constraints, but situationally dependent cues are not the primary source of information on which these attitudes are based. In contrast, when little attitude-relevant information can be retrieved from memory, an attitude judgment must be derived from other factors, such as perceived social desirability, recently received arguments supporting a particular position, or a recent behavior and the context in which it occurred. To the extent, then, that relevant internal data cannot be retrieved, attitudes should be relatively responsive to current cues concerning the appropriate position to take with respect to the attitude object.

The Present Research

The present research examined the relation between subjects' retrieval of attitude-relevant data from memory and their opinion change in response to new information concerning the attitude issue. The research first assessed subjects' retrieval of beliefs and

prior experiences relevant to the attitude topic, preservation of the environment. To measure access to beliefs, subjects were given two minutes to list characteristics and attributes of preservation. Similarly access to previous experiences was measured by the extent to which subjects could list relevant prior actions. The time limit restricted subjects to indicating only easily accessible beliefs and behaviors, not the extent of their knowledge concerning preservation. This assessment technique is compatible with recent theorizing in the area of social cognition (e.g., Taylor & Crocker, 1981; Wyer & Carlston, 1979). According to this perspective, access to social information in memory is a function of integrated knowledge structures, or schemata, which organize the data in a way that facilitates retrieval.

In the second stage of this research, subjects' responses to new information from one of two sources were examined: (a) a persuasive message or (b) a recent behavior and the context in which it occurred.

Susceptibility to Persuasion

According to a cognitive response analysis (e.g., Greenwald, 1968; Petty & Cacioppo, 1979), message persuasiveness is a function of the nature of thoughts recipients generate in response to the communication. Attitudes derived from one's own supporting beliefs and experiences may be little affected by a counterattitudinal message because information is available for the effective generation of counterarguments to the material presented. Individuals who have little access to such attitude-relevant information in

¹ Differences between the self-perception analysis and more traditional analyses of attitudes cannot be explained by assuming that they address different stages of the attitude formation process. Kelley (in Harvey, Ickes, & Kidd, 1978) suggested that participants in self-perception studies may have had little opportunity to formulate previously an opinion about the attitude object, and thus they are affected by the context in which the first encounter occurs. Self-perception research, however, that has been conducted with familiar attitude objects, such as drawing pictures (Lepper, Greene, & Nisbett, 1973), and research that has provided participants with prior experiences with the attitude object (Greene, Sternberg, & Lepper, 1976) have still found attitudes to be a function of contextual cues.

memory may be less resistant to persuasion because they cannot effectively counterargue the message and, instead, may generate primarily favorable responses. Thus to the extent subjects could retrieve relevant data from memory, they were expected to generate more counterarguments and fewer thoughts favorable to the message and therefore to show less opinion change.

Intrinsic Motivation

Research on intrinsic motivation has commonly found that attitudes are affected by recent behavior and the context in which it occurs (e.g., Condry, 1977; Deci, 1971). Typically in this research, subjects perform an attractive task for either a reward or no reward, and rewarded (vs. unrewarded) subjects are subsequently found to be less favorable toward the task. These findings are commonly interpreted in terms of the discounting principle (Kelley, 1972), which suggests that unrewarded subjects indicate a relatively favorable opinion because they have only their liking for the task as a plausible explanation for task performance. Rewarded subjects, however, have two potential explanations, a favorable opinion and the reward. The presence of the reward lessens the plausibility of a favorable attitude as the cause, and thus rewarded subjects indicate less favorable opinions. Interpretation of the opinion change findings in terms of subjects' attributions for their behavior has remained tentative, however, because researchers have rarely assessed the supposed attributional mediators. One study that directly measured subjects' attributions did not obtain clear linkage among the presence or absence of the reward, attributions, and opinion change (Kruglanski, Alon, & Lewis, 1972).

It was anticipated that people with access to attitude-relevant data in memory, in comparison to those with little access, would be less affected by current cues such as a recent behavior and the context in which it occurred. In support of this analysis, rewarding subjects for task performance does not appear to reduce their favorability toward the task if subjects are reminded that they previously performed the task for no reward (Fazio, 1981).

To further explore the relation between access to internal cues and intrinsic motivation, the present study used a procedure adapted from Kiesler, Nisbett, and Zanna (1969), in which subjects were rewarded or not rewarded for deciding to deliver proattitudinal arguments. Subjects who could retrieve data indicating that they were in favor of the advocated position were expected to attribute their decision to a belief in the issue, regardless of whether they received a reward. Explanations in terms of belief were expected to lead both rewarded and unrewarded subjects to maintain their initially favorable opinions on the message topic. However, subjects with little access to information indicating that they were in favor of the advocated position were expected to explain their behavior in terms of currently available cues. These subjects were expected to exhibit the classic intrinsic motivation effect: Rewarded, compared with unrewarded, subjects were expected to attribute their behavior more to the reward and less to their belief in the issue and thus to show greater opinion change away from the advocated position.

Method

Overview

Subjects participated in a two-session study ostensibly concerned with attitude assessment. In the preliminary session subjects completed questionnaires assessing their opinions and other reactions to seven social issues, including the message topic, preservation of the environment. One to 2 weeks later, subjects returned to participate in one of the following experiments. In the persuasion study, subjects read a counterattitudinal message arguing against preservation and then indicated their final opinions on this topic. In the intrinsic motivation study, subjects agreed to present a proattitudinal message arguing in favor of preservation for a \$5 reward or no reward and then indicated their opinions.

Preliminary Session

Subjects

One hundred sixty-six University of Massachusetts psychology students participated for extra course credit. Seven of these were eliminated because they did not complete the second half of the experiment.

Procedure

Subjects participated in the first session in groups of about 12. They completed questionnaires assessing their

opinions and other responses to seven social issues, including preservation of the environment (see below). In addition, subjects provided background information about themselves (e.g., sex, class). They were then assigned to participate in one of the experiments.

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-perception 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.

Self-perception of knowledge. Subjects rated on 15-point scales (a) how well-informed they were concerning preservation and (b) how frequently in the past few years they had engaged in specific information gathering behaviors, such as talking with others about the topic, reading articles and books on it, taking relevant courses, and watching TV programs on it. Ratings of the specific 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 averaged into an index representing subjects' knowledge about the topic.

Self-perception of involvement. Subjects rated on two 15-point scales how important preservation was to them and how involved they were in the topic. Responses to these two items were highly correlated ($r = .62$) and were averaged into an index representing degree of involvement.

Belief retrieval. To determine the ease with which subjects could retrieve attitude-relevant beliefs, they were asked to list on a questionnaire the characteristics and facts they believed to be true about several issues, including preservation of the environment.² One opinion topic was listed at the top of each page, and six boxes were provided underneath. Subjects were told to write only one belief in each box and to leave blank boxes if they had less than six beliefs to list. Several examples of beliefs about noncritical topics were provided. Subjects were then given 2 min. to list their beliefs about each topic. The number of discrete beliefs each subject listed about preservation of the environment was judged by two independent raters ($r = .91$); disagreements were resolved by discussion. In addition, to allow an analysis of the relation between access to beliefs concerning preservation and access to beliefs on other topics, the number of discrete beliefs that subjects listed concerning two additional issues, psychological research and right to abortion, were judged by two raters ($r_s = .94$ and $.88$, respectively).

Behavior retrieval. Subjects' retrieval of attitude-relevant experiences 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 each topic. The number of discrete behaviors that each subject listed about preservation of the environment, psychological research, and right to

abortion were judged by two raters ($r_s = .89$, $.90$, and $.91$, respectively).

Group membership. Subjects indicated whether they currently belonged to a number of organizations, including environmental groups such as the Sierra Club or the Audubon Society.

First Experiment: Susceptibility to Persuasion

Subjects

Sixty-five subjects returned in groups of about 12 to participate in this experiment.

Procedure

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 distributed a handout explaining 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 to 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. In addition, participants were told that since the interviews represented a wide sampling of opinions, they might read an interview in which the opinion expressed was different from their own.

The experimenter then gave each subject the 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 interested in the issue of environmental preservation. In response to the interviewer's question,

² It is important to consider the effect that completing the retrieval tasks may have had on subjects' opinions. For example, subjects could have changed their opinions (after the preliminary assessment) to be consistent with the numbers of beliefs and behaviors they listed in the retrieval tasks. Subjects were unlikely, however, to have conducted this kind of detailed analysis of their responses to preservation of the environment. Items concerning preservation were embedded in questionnaires measuring responses to six other social issues (some of which were sensitive in nature, such as abortion), and the 1- to 2-week delay between sessions further minimized any impact of the retrieval tasks on subjects' opinions in the second session.

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 the following 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) preserved land is needed for housing and farming; (d) preservation is unnecessary because it is possible to reclaim polluted areas.

After allowing about 6 min. 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, including preservation of the environment, were identical to the ones subjects rated in the preliminary session. The experimenter then explained that she was also interested in subjects' reactions to the interviews. Subjects completed a questionnaire that elicited their thoughts about the interview transcript along with other responses (see below). Finally, subjects were debriefed and excused.

Measuring Instruments

Opinions. Subjects' final opinions concerning preservation were assessed on the same scale used to assess their original opinions.

Cognitive response measures. Subjects were given 2.5 min. 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 ($r = .93$), negative ($r = .80$), and neutral ($r = .53$) thoughts each subject produced.

Perceptions of the communicator. Subjects rated the communicator on 10 15-point bipolar scales. Positive poles were consistent, honest, sincere, nonopportunistic, nonmanipulative, noncompliant, open-minded, unbiased, objective, and likeable.

Other measures. Subjects were asked to summarize each argument that the communicator used to support his position, and two independent judges determined the number correctly recalled ($r = .88$). No significant effects were obtained on this variable, so it will not be discussed further. Subjects were also asked to write down the overall position the communicator took in the interview, and all but two subjects were able to recall correctly this position. At the end of the experiment, subjects wrote down their interpretations of the study. Based on these interpretations, seven subjects (retained in the analysis) were assessed as being suspicious of an influence attempt.

Second Experiment: Intrinsic Motivation

Subjects

Ninety-four subjects returned individually to participate in this experiment. One of these was eliminated because she declined to deliver the persuasive message. Three more were eliminated because they did not believe they would actually deliver the persuasive arguments.

Procedure

This session was supposedly concerned with attitude change. Its apparent purpose was to determine the optimal number of arguments to use in a persuasive message.

The procedure was adapted from an experiment by Kiesler et al. (1969). Subjects were asked to deliver to two people on campus a number of arguments previously prepared by the experimenter. 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 advocated 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 to subjects one of the topics they had rated in the first session. In reality everyone was 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 for agreeing to participate in this phase of the experiment. The money was placed in front of these subjects and remained visible throughout the rest of the session. The other half of the subjects were not offered a monetary reward for their participation (no reward condition). Subjects were then asked if they would present the persuasive message.

After the subject had agreed to the task, the experimenter remarked that it would probably be a good idea to get a measure of how the subject felt right then about the message topic. Subjects responded to a questionnaire on which they gave their opinions concerning preservation and other responses (see below).

After completing the questionnaire, subjects were questioned for suspicion, then debriefed and excused. Those in the reward condition received \$5.

Measuring Instruments

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

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 he or she cared to mention.

Results and Discussion

The number of beliefs subjects indicated concerning preservation of the environment ranged from 2 to 7, with a mean of 3.75, and the number of behaviors ranged from 0 to 6, with a mean 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) \times Number of Behaviors Retrieved (few vs. many) analyses of variance were calculated, along with appropriate contrasts.³

Self-Perception of Past Experiences, Knowledge, and Involvement

Subjects' perceptions of their past experiences, knowledge, and involvement concerning preservation of the environment corresponded to 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 to 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 no significant effects on these variables were obtained for belief retrieval, differences between subjects who listed few beliefs and those who listed many were consistently in the predicted direction.

The obtained relations between retrieval and the self-perceptions are informative concerning the validity of the retrieval tasks. Self-perceptions were related to behavior retrieval (and to a lesser extent to belief retrieval) presumably because all of these measures reflect, at least partially, the extent to which attitude-relevant information is organized in memory in an easily accessible form. The relation between retrieval and involvement will be elaborated further in the general discussion.

Group Membership

Further evidence for the validity of behavior retrieval was provided by the finding that participants who were members of environmental groups such as the Sierra Club and the Audubon Society listed more behaviors (19 listed many behaviors vs. 6 listed

Table 1
Preliminary Session: Mean Self-Perception of Thoughts, Behaviors, Feelings, Knowledge, and Involvement as a Function of Behavior Retrieval

Measure	Few behaviors retrieved from memory	Many behaviors retrieved from memory
Frequency of previous thought	10.16	11.93
Frequency of previous action	7.69	9.88
Frequency of previous feelings	10.46	12.04
Degree of knowledge	8.25	10.11
Extent of involvement	9.58	11.43

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

few) than nonmembers (70 listed many behaviors vs. 62 listed few), $\chi^2(1) = 4.52$, $p < .05$. Parallel results were obtained for belief retrieval, although they were not significant.

First Experiment: Susceptibility to Persuasion

The hypotheses were explored by a 2 (few vs. many beliefs) \times 2 (few vs. many behaviors) design.⁴

Opinions

Analysis of covariance was conducted on the postopinions, with preopinions as the covariate. A test for homogeneity of the covariate regression coefficients indicated that the coefficients did not differ across experimental conditions. Analysis of variance indicated that preopinions were more proenvironment in the many ($M = 14.15$) than few behaviors conditions ($M = 13.22$, $p <$

³ Due to the relatively moderate correspondence between belief and behavior retrieval ($r = .30$), these variables were employed separately in the reported analyses.

⁴ Analyses including subject sex as an additional variable in both studies yielded no differences between males' and females' persuasibility and no systematic differences on other measures. This variable was, therefore, not included in the reported analyses.

Table 2
Persuasion Experiment: Mean Postopinions as a Function of Belief and Behavior Retrieval

Number of beliefs retrieved from memory	Number of behaviors retrieved from memory	
	Few behaviors	Many behaviors
Few beliefs	5.68	3.92
Many beliefs	4.33	3.26

Note. Means are adjusted postopinion scores on a 15-point scale on which higher numbers indicate greater opinion change.

.05),⁵ and that preopinions ($M = 13.71$) differed significantly from postopinions ($M = 11.85$, $p < .01$).

Opinion means, which are the postopinion scores adjusted on the basis of the analysis of covariance, appear in Table 2. Analyses 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, $F(1, 61) = 7.91$, $p < .01$. Those who listed a large number of beliefs changed their opinions less than those who indicated few beliefs, $F(1, 61) = 4.43$, $p < .05$.

Cognitive Responses

Consistent with a cognitive response analysis of persuasion (Petty & Cacioppo, 1979), subjects' cognitive responses appeared to mediate the effects of belief and behavior retrieval on opinion change. In the first step of this mediation, the cognitive responses that subjects produced were a function of the extent to which they could retrieve relevant experiences from memory. Fewer favorable thoughts were generated by subjects who listed many behaviors ($M = .81$), compared to those who listed few ($M = 1.54$), $F(1, 61) = 5.86$, $p < .05$. In addition, a greater number of counterarguments were produced by subjects who listed many behaviors ($M = 2.62$) than by those who listed few ($M = 1.43$), $F(1, 61) = 8.10$, $p < .01$. Behavior retrieval was not related to the number of neutral thoughts subjects produced, and belief retrieval was not a predictor of any cognitive responses. Evidence for the second step in the mediational link was

provided by the average within-cell correlations between favorable thoughts and adjusted postopinions ($r = -.23$, $p < .10$) and between counterarguments and postopinions ($r = .41$, $p < .01$).

Further evidence that the cognitive responses mediated acceptance of the persuasive message was suggested by a hierarchical regression analysis predicting opinion change. When the counterarguments variable was entered into the analysis before belief and behavior retrieval, belief retrieval became only a marginally significant predictor of opinion change, $F(1, 59) = 3.04$, $p < .10$, and behavior retrieval 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. It thus appears that attitudes derived from beliefs and behaviors retrieved from memory were little affected by the persuasive message, largely because information was available for the effective production of counterarguments to the material presented. In contrast, attitudes with little underlying cognitive support may have been influenced more by the message because few counterarguments were generated.

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 *open-minded* (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 more open-minded by subjects who listed few, compared with many, beliefs ($p < .01$) and as more sincere by subjects who listed few, compared with

⁵ To eliminate the relation in the persuasion study between extremity of initial opinions and behavior retrieval, a median split was conducted on the number of behaviors listed at each point on the attitude scale. In comparison to the median split procedure reported in the text, this alternate analysis resulted in the reclassification of only four subjects. The alternate procedure, then, was not used in the analyses because it did not reduce the relation between extremity and retrieval.

many, behaviors ($p < .01$). No effects were obtained in the analysis on the objective factor.

The source ratings that failed to load highly on any of these factors (i.e., consistent, nonopportunistic, nonmanipulative, and noncompliant) were analyzed separately, and only the analysis of the nonmanipulative scale yielded significant effects. Subjects who listed few, compared with many, beliefs perceived the source to be less manipulative ($p < .05$).

Subjects tended to change their opinions to the extent that they perceived the source as open-minded and nonmanipulative ($r_s = .24$ and $.26$, respectively, $p_s < .10$). However, because these perceptions were not significant predictors of opinion change when entered into a hierarchical regression analysis before belief and behavior retrieval, perceptions did not mediate the effects of retrieval on opinion change.

Second Experiment: Intrinsic Motivation

The hypotheses were explored by a 2 (few vs. many beliefs) \times 2 (few vs. many behaviors) \times 2 (reward vs. no reward) design.

Opinions

Similar to the persuasion experiment, analysis of covariance was conducted on the postopinions with preopinions as the covariate. A test for homogeneity of the covariate regression coefficients indicated that the coefficients did not differ across experimental conditions. Analysis of variance revealed that preopinions did not vary across experimental conditions and that they ($M = 14.03$)

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 3. 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, $F(1, 79) = 7.66$, $p < .01$. Further, the findings supported the present hypotheses. Subjects who indicated few behaviors changed their opinions more than those who indicated many, $F(1, 79) = 17.22$, $p < .001$. More importantly, a Reward \times Number of Behaviors interaction, $F(1, 79) = 6.87$, $p < .05$, 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 ($F < 1$).

Attributions

Rewarded subjects attributed their decision to deliver the persuasive arguments marginally more to experimental credit or payment ($M = 11.26$) than unrewarded subjects ($M = 10.48$), $F(1, 79) = 3.08$, $p < .10$.

Consistent with an attribution analysis of self-perception (Nisbett & Valins, 1972), subjects' attributions to belief appeared to mediate the effects of the reward manipulation and retrieval on opinion change. In the first step of this mediation, subjects' attributions to belief were a function of the reward manipulation and the extent of their retrieval (see Table 3). Subjects who listed many, rather than few, beliefs attributed the

Table 3

Intrinsic Motivation Experiment: Mean Postopinions and Attributions to Belief as a Function of Behavior Retrieval and Reward

Measure	Few behaviors retrieved from memory		Many behaviors retrieved from memory	
	Reward	No reward	Reward	No reward
Adjusted postopinions	4.54	3.05	2.76	2.77
Attribution of decision to belief	9.67	11.05	11.84	10.60

Note. Higher numbers indicate greater opinion change and greater attribution to belief.

decision to deliver the arguments marginally more to belief in preservation ($p < .10$). More importantly, a Reward \times Number of Behaviors interaction, $F(1, 79) = 8.20$, $p < .01$, revealed that consistent with the opinion change findings, 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, $F(1, 79) = 3.81$, $p < .05$. In the many-behaviors groups, however, rewarded subjects unexpectedly made a marginally stronger attribution to their belief than unrewarded subjects, $F(1, 79) = 3.62$, $p < .10$. This result is not reflected in the opinion change findings. Evidence for the second step in the mediational link was provided by a small but significant average within-cell correlation between attribution to belief and adjusted postopinions ($r = .23$, $p < .05$).

Further evidence of the mediational nature of subjects' attributions to belief was suggested by a hierarchical regression analysis predicting opinion change. When attribution was entered into the equation before behavior retrieval, the reward manipulation, and the Reward \times Behaviors interaction, the results indicated that the interaction was no longer a significant predictor of opinion change, $F(1, 82) = 2.63$, $p < .15$, and the reward manipulation and behavior retrieval became less effective predictors, $F(1, 82) = 3.51$, $p < .10$, and $F(1, 82) = 6.62$, $p < .05$, respectively.

In sum, the reward and the retrieval of prior experiences appear to have affected opinion change largely through the mediation of subjects' explanations for their decisions. Subjects who had access to prior experiences with preservation of the environment were able to draw on this information when constructing their explanations and thus, regardless of the presence or absence of the reward, explained their decision in terms of a belief in the advocated position. Attribution to belief, then, tended to lead to the maintenance of a favorable opinion. In contrast, the mediation of opinion change for subjects without access to relevant experiences was consistent with the attribution analysis of attitude inference from behavior and contextual cues (Nisbett & Valins, 1972). Those who were not rewarded had

only one plausible explanation for their decision, belief in preservation, and they maintained a relatively favorable opinion. For rewarded subjects, however, the presence of the additional cause, the reward, moderated explanations in terms of belief in preservation. These subjects, then, changed their opinions to be relatively less favorable.

General Discussion

The two experiments support the hypotheses. Individuals who had access to attitude-relevant information in memory apparently used this data to assess how favorable they were toward the attitude issue. In contrast, individuals who did not have easy access to such information in memory relied relatively more on the currently available cues provided by the persuasive message and the decision to proselytize.

Subjects' degree of access to relevant information in memory proved not to have a direct impact on attitude change, but rather to have been, at least in part, mediated by other processes. In the persuasion study, access to relevant information enabled subjects to produce counterarguments to the persuasive message, and the production of counterarguments then tended to lead to less opinion change. In the intrinsic motivation study, retrieval of prior experiences enabled subjects to explain a recent behavior in terms of their orientation toward the attitude object, rather than other factors. Explanation in terms of belief in the issue, then, tended to lead to the maintenance of a favorable opinion.

In general, retrieval of beliefs and prior experiences seemed to provide subjects with data to evaluate new information concerning the attitude issue, and it was the result of this analysis that determined whether subjects changed their opinions to be consistent with the new information. The specific nature of subjects' evaluations differed in the two experimental settings, in one study involving the generation of cognitive responses and in the other attributions for behavior. The manner in which subjects combine data from internal and external sources to arrive at an attitude judgment is likely to take many forms, including potentially more for-

mal cognitive integration processes (e.g., Wyer & Hartwick, 1980) in addition to those identified in the present research. Yet it seems likely that the information utilized in a variety of attitude judgment processes will be a function of one's access to relevant information in memory.

Adequacy of Belief and Behavior Retrieval Measures

Access to attitude-relevant information was operationalized in terms of the number of beliefs and behaviors subjects indicated in the listing tasks. The analysis consistently yielded the expected relations among behavior retrieval, opinion change, and the mediators of opinion change, but only in a few instances did belief retrieval yield the predicted effects. There are several possible explanations for these results.

First, it may be that behavior retrieval is in general a more important contributor to opinions than belief retrieval. Indeed, it has been argued that attitudes based on the information obtained through direct experiences with the attitude object are relatively well defined and held confidently (Fazio & Zanna, 1981; Zanna, Olson, & Fazio, 1980). Attitudes based primarily on information obtained through less direct encounters (i.e., information acquired second hand), however, are thought to be less clear and less confidently held. The greater importance of behavior retrieval can also be understood in terms of a general distinction between two types of memory stores. Long-term storage is sometimes thought to be composed of a semantic memory, which contains generalized knowledge about objects and concepts, and an episodic memory, which consists of a more concrete record of personal experiences (Tulving, 1972). It has been suggested that attitudes may commonly be derived from episodic-type information, such as one's prior experiences, rather than abstract cognitions, such as one's beliefs (Abelson, 1976).

The disappointing performance of belief retrieval could also be explained in terms of its being a less effective indicator of access than behavior retrieval. That subjects listed, on the average, a greater number of beliefs than behaviors might suggest that the act of

retrieving beliefs spontaneously resulted in newly perceived relations between the attitude issue and other constructs stored in memory. The retrieval of behaviors, however, may be less likely to generate spontaneously newly perceived instances because recall of specific examples of prior experiences is required. The measure of belief retrieval may, thus, have contained a greater degree of error than behavior retrieval.

Finally, the relative effectiveness of belief and behavior retrieval in predicting opinions could depend on the attitude issue involved. Day-to-day life offers many opportunities to engage in actions toward the environment, such as decisions about whether to litter and whether to recycle. Attitudes toward such issues may, thus, be relatively dependent on behavior retrieval. Other issues, however, such as tax reform, may offer little opportunity for action, and attitudes toward these topics may depend relatively more on access to beliefs.

Retrieval of Topic-Specific Information

The belief and behavior retrieval measures were assumed to tap subjects' access to topic-specific information, not to assess a general cognitive style involving easy or difficult access to information in memory. This assumption was explored by examining the relation between subjects' opinion change on preservation of the environment and the extent of their retrieval of information on two additional issues, psychological research and right to abortion.⁶ Opinion change on preservation was not predicted from subjects' access to abortion-related information, and only in the persuasion study was access to research-related information a predictor of preservation opinions: Although subjects who indicated few research behaviors changed their opinions more than those who indicated many ($p < .05$), this effect was weaker than the prediction of opinion change from be-

⁶ To determine the relation between opinion change on preservation and retrieval on other issues, median splits were conducted on the number of beliefs and the number of behaviors subjects listed about psychological research and right to abortion. For each issue, then, analyses were calculated with low versus high belief retrieval and low versus high behavior retrieval.

haviors relevant to preservation. In general, then, these results suggest that attitude change was a function of the retrieval of attitude-relevant data, rather than general access to information in memory.

Retrieval and Involvement

The present research takes an information processing approach to the often investigated problem of how attitude change varies with the depth or intensity of the attitude. Earlier research indicated that resistance to counterattitudinal information is conferred by prior behavioral commitment to the attitude position (Kiesler, 1971), a high level of connectedness or centrality of the target belief in relation to subjects' other beliefs (Rokeach, 1968), and high ego-involvement in the message topic (Sherif & Hovland, 1961). Although these analyses have been concerned primarily with factors that induce resistance to counterattitudinal persuasive messages, it has been suggested that involvement also increases the probability of accepting or assimilating proattitudinal messages (Pallak, Mueller, Dollar, & Pallak, 1972).

Given that in the data from the preliminary session of the present research, subjects' ratings of their own involvement were correlated with extent of retrieval, it could be argued that the observed effects of retrieval on opinion change were actually due to involvement. The attenuated opinion change obtained in the persuasion experiment when subjects had access to relevant data in memory is consistent with such an interpretation. Yet subjects' responses to proattitudinal information in the intrinsic motivation study are less clearly interpretable in terms of involvement. Since subjects with access to prior experiences tended to change their opinions least, the results of this second study certainly cannot be interpreted in terms of any tendency for involvement to enhance the acceptance of proattitudinal data. Traditional perspectives focusing on global concepts such as involvement are thus unable to account adequately for the present results.

More recent work has suggested that to

understand the relation between involvement and opinion change, it is fruitful to consider the information processing consequences of involvement (Chaiken, 1980). For example, an analysis that considers subjects' thinking about the content of the persuasive communication can account for involvement's enhancing or inhibiting persuasion. Since involvement increases thinking (as indicated by cognitive responses), involvement can increase persuasion when a message contains high quality argumentation (Petty & Cacioppo, 1979). Hence involvement has no necessary relation to opinion change, rather its effects seem to depend on such mediating processes as subjects' extent of thought and, potentially, degree of access to relevant information.

An information processing perspective, then, suggests that any relation between involvement and opinion change in the present research is understandable only in terms of involvement's effects on cognitive mediators such as retrieval. Since involvement proved to be related to opinions in a manner similar to retrieval,⁷ it most likely enhanced access to relevant data in memory and lessened reliance on external cues. Indeed, high levels of involvement have been found to facilitate processing of self-related data (Markus, 1977). In general, then, the crucial information processing determinant of opinion change, access to relevant information, was measured directly in the present research. Global factors such as involvement are more causally remote predictors of opinions and

⁷ To determine the relation between involvement and opinions, median splits were conducted on self-perceptions of involvement to classify subjects according to high or low involvement. In the persuasion experiment, subjects who perceived themselves as involved changed their opinions less than those who perceived themselves as uninvolved ($p < .001$). In the intrinsic motivation experiment, involved subjects again changed their opinions less than those uninvolved ($p < .001$), and unrewarded subjects changed their opinions less than those rewarded ($p < .05$). A Reward \times Involvement interaction ($p < .01$) further indicated that for uninvolved subjects, presence (vs. absence) of the reward increased opinion change away from the advocated position ($p < .001$), but the reward manipulation had little effect on the opinions of involved subjects.

taken alone cannot account for the specific configuration of opinion change findings.

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 stored in memory and (b) those derived from currently available external cues such as persuasive arguments or a recent behavioral incident. In both the persuasion and intrinsic motivation experiments, subjects' opinion change proved to be a function of the degree to which they had access to relevant information in memory. This focus on information retrieval considers only the most immediate antecedents of opinion change. The organization and storage of information for future use, however, can be considered a multistage process, of which information retrieval is only one aspect. A comprehensive analysis of the process of attitude judgments would consider information processing from the initial stage of attention to information, to subsequent stages of comprehension and storage, and ultimately to retrieval. Future research may profitably consider the implications for attitude judgments of the information processed at each of these stages.

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