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Elaborative and Nonelaborative Processing of a Behavior-Related Communication

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Three experiments examined the sequence of cognitive processes that mediate the impact of a persuasive message on behavioral decisions. When participants could concentrate on the message content, they first estimated the likelihood of each behavioral outcome described in the message and then evaluated its desirability. They later used these outcome-specific beliefs and evaluations to compute an overall attitude toward the behavior, which influenced their behavioral intentions and their actual behavioral decisions. When participants were distracted from thinking carefully about the message content, they were more likely to use the message-relevant affect they were experiencing as a basis for their attitudes toward the behavior; these attitudes influenced their estimates of the likelihood and desirability of the behavior's outcomes. Giving participants more time to think about the implications of the message eliminated the effects of distraction on the impact of argument strength and decreased the influence of the affect they were experiencing.

The influence of a persuasive communication can be governed by either the quality and implications of the arguments contained in the message or by peripheral cues, such as the source of the communication (Chaiken, 1980; Petty & Cacioppo, 1986) or the affect that recipients are experiencing and attribute to their feelings about the behavior advocated in the message (Petty, Gleicher, & Baker, 1991; Petty, Schuman, Richman, & Strathman, 1993; Wegener, Petty, & Klein, 1994). Several contemporary models of persuasion (cf. Chaiken, 1980; Petty & Cacioppo, 1986) contend that qualitatively different processes occur when people pay attention to the arguments contained in the message than when they attend to a peripheral cue such as affect.

More recently, however, Kruglanski, Thompson, and Spiegel (1999) pointed out that both elaborative and nonelaborative processes might obey the same general principles. For example, recipients might identify a piece of information that is relevant to the judgment and apply syllogistic ("if-then") rules to infer the judgment. This procedure could take place regardless of whether the information consists of arguments contained in the persuasive message or pertains to the communication's source. The syllogistic processes suggested by Kruglanski and colleagues may be more likely to underlie the impact of persuasive messages on beliefs rather than their impact on attitudes (cf. Wyer, Clore, & Isbell, 1999). Nevertheless, their analysis calls attention to the fact that differences in the amount of processing or in the capacity to engage in this processing are not sufficient to conclude that elaborative and nonelaborative processes are fundamentally different.

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The present research was designed to investigate in detail the cognitive mechanisms that underlie the impact of persuasive communications under the conditions that presumably elicit elaborative and nonelaborative processing. To this end, in the current research we asked participants who had been induced to feel either happy or unhappy by writing about a past experience to read a persuasive communication urging support for the institution of comprehensive examinations. They then reported their attitudes toward voting in favor of the exams and their intentions to do so as well as the likelihood and desirability of consequences of this behavior. Some participants were distracted while listening to the message, whereas others were not. By investigating the effect of distraction on judgments, examining the time participants took to make these judgments, and using both path analyses to infer the relations among the cognitions that participants reported, we were able to gain insight into the cognitive activities that mediated attitudes and intentions in different conditions.

A behavior-related persuasive message usually consists of assertions that the behavior being advocated has personally or socially beneficial consequences and can be expected to give rise to cognitions of the type investigated by Fishbein and Ajzen (1975). When recipients are able and motivated to engage in elaborative processing, they may estimate the likelihood and desirability of the consequences the message describes. In addition, they might recall and assess the implications of other possible outcomes of the behavior that are not mentioned in the message. They may then integrate the implications of these beliefs and evaluations into an overall attitude toward the behavior being advocated. This integration process may be captured by the formulation proposed by Fishbein and Ajzen, that is,

$$A_B = \Sigma b_i e_i \quad (1)$$

where A_B is the attitude toward the behavior B, b_i is a subjective estimate of the likelihood that the ith consequence of the behavior will occur (outcome-specific belief), and e_i is an estimate of the desirability of this consequence (outcome-specific evaluation). Once this attitude is formed, recipients may use it as a basis for their intentions to perform the behavior and their actual decision to do so (Fazio, 1990; Fishbein & Ajzen, 1975). The nature of elaborative processing we predict appears in the first panel of Figure 1.

Figure 1 suggests that beliefs and evaluations of outcomes (i.e., both message based and knowledge based) are the primary basis for attitudes and ultimate behavioral decisions. In addition, it calls attention to more specific questions concerning the sequence in which these cognitions are formed, which are represented in the second panel of Figure 1. One question is whether outcome-specific beliefs are formed before the outcomes are evaluated or not until afterward. On one hand, message recipients might first assess the plausibility of an outcome and might only assess its desirability if they believe that the outcome is likely to occur. In these situations, the salient perceived likelihood of the outcome could bias estimates of its desirability. On the other hand, outcome-specific evaluations could precede outcome beliefs in the sequence (see e.g., Bargh, Chaiken, Govender, & Pratto, 1992). Then, participants' attitudes and ultimate behavioral decisions might be based on perceptions that the outcomes are desirable independently of their likelihood of occurrence (for related issues, see Killeya & Johnson, 1998).

What happens when persons are distracted from thinking carefully about the content of the message they receive? Under these circumstances, recipients presumably resort to nonelaborative processing. This processing is depicted in the third panel of Figure 1. Although distracted recipients are unlikely to ignore the communication content entirely, they base their attitudes on alternative, heuristic criteria (e.g., the affect they are experiencing; see Schwarz & Clore, 1988), and the content of the message has less effect (Petty & Cacioppo, 1986). Yet, the factors that underlie the decreased effectiveness of the communication's argument have rarely been articulated (for a notable exception, see Festinger & Maccoby, 1964). Research using cognitive response techniques suggests that distraction prevents an elaboration of the message content. For example, it could decrease the ability to form an attitude on the basis of the outcomes described in the message or suggested by prior knowledge. Alternatively, it could decrease the ability to estimate the likelihood and desirability of the specific arguments contained in the message. In any event, a specification of the nature of nonelaborative cognitive processes requires a determination of the sequence in which these operations occur.

Most theories of communication and persuasion agree that when people are unmotivated or unable to think extensively about the arguments contained in a communication, they are likely to use alternative criteria to evaluate the position being advocated. For example, they consider the affect they happen to experience at the time and attribute to their feelings about the position (Petty et al., 1993; for a more general conceptualization of the use of affect as an informational basis for judgment, see Schwarz & Clore, 1983). If recipients base their attitudes on affect, however, these attitudes could have reciprocal effects on cognitions about the behavior's specific outcomes (Rosenberg, 1960). McGuire and McGuire (1991), for example, identified tendencies to engage in both rationalization (e.g., to increase one's perception that the consequences of a liked behavior are desirable or the consequence of a disliked behavior are

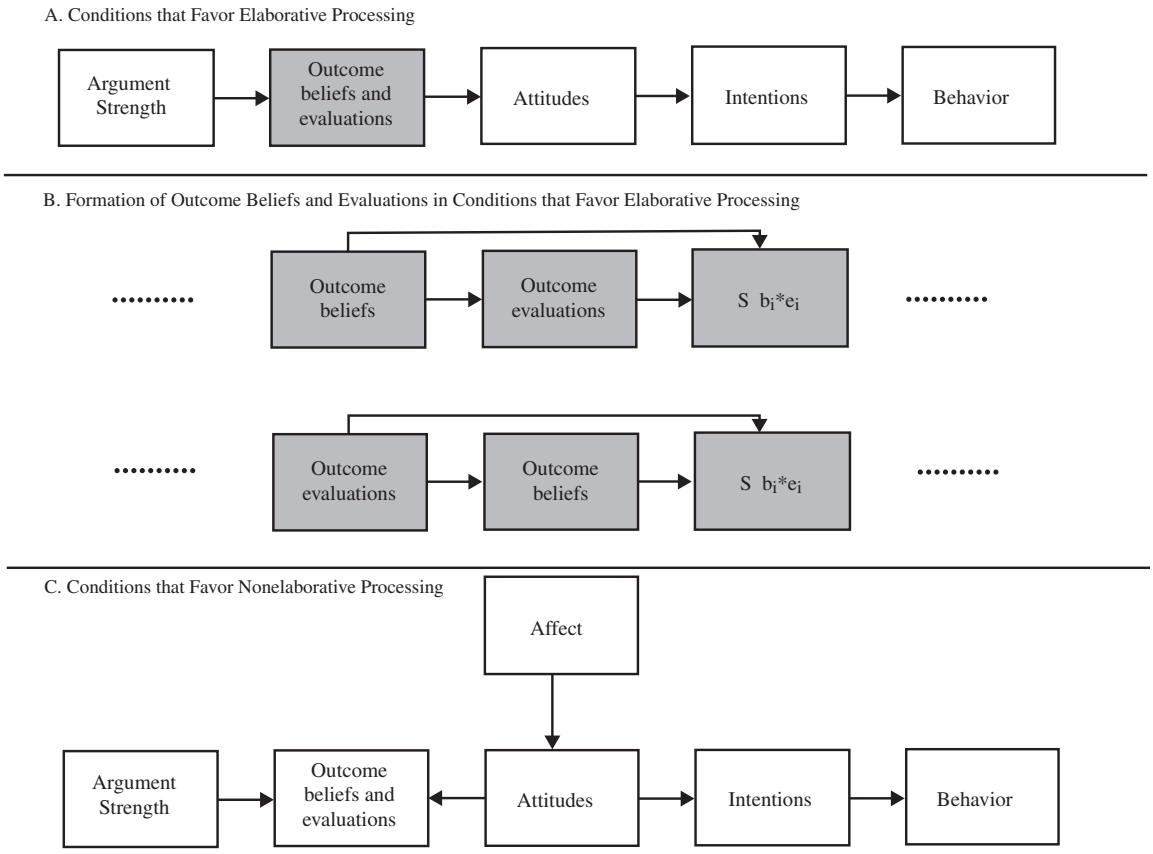

Figure 1 Hypothetical persuasion processes when distraction is high and low.
NOTE: Panel A of this figure presents the general sequence of elaborative processes expected to occur when distraction is low. Panel B elaborates on the sequences in which outcome beliefs and evaluations are presumably formed in conditions of low distraction (shaded box in panel A) and suggests that outcome beliefs could either precede or follow outcome evaluations. As can be inferred from these sequences, the cognitions that are formed and made salient first could have a casual influence on the cognitions that follow. Finally, the predicted nonelaborative processes that are likely to take place when distraction is high appear in Panel C.

undesirable) and wishful thinking (e.g., to increase beliefs that a liked behavior will have desirable consequences and to decrease beliefs that it will have undesirable effects).[1] These findings suggest that although outcome beliefs and evaluations may be determinants of attitudes under conditions in which elaborative processing occurs, outcome cognitions could also be the result of previously formed attitudes under conditions in which nonelaborative processing prevails.

Three experiments investigated different aspects of the cognitive sequences that we propose. In this work, we reasoned that more effortful cognitive activity should be influenced to a greater extent by distraction than less effortful activity. In addition, if one activity cannot be performed until a previous one has been completed, distraction is more likely to influence cognitions formed at the second stage of processing than cognitions formed at the first stage (for a review of similar interactions between order and distraction, see Kruglanski et al., 1999). Therefore, the effects of distraction on the impact of argument strength may be greater on the attitudes that persons report than on the cognitions that theoretically underlie those attitudes, and comparing such effects across different psychological variables could allow us to gain insight into the sequence of processes that mediate the formation of attitudes in the absence of distraction (for similar criteria in other domains, see Festinger & Maccoby, 1964; Gilbert, 1991; Wyer & Martin, 1986).[2] In addition, we examined the effects of affect and message variables on attitudes and other cognitions using path analyses, and we investigated aspects of the sequence of elaborative processing using response time methodologies as well.

EXPERIMENT 1

Method

OVERVIEW AND DESIGN

Participants were told that the experiment concerned the way people give and receive information in natural

settings, such as a coffee shop. On this pretense, they wrote a letter to a friend describing either a happy or a frustrating personal experience and were served either a pleasant- or an unpleasant-tasting drink. Then, participants read a newsletter containing either strong or weak arguments in favor of instituting comprehensive exams at the university. Their ability to think carefully about the arguments was manipulated by varying the situational distraction that existed while reading it. After reading the newsletter, participants indicated their intentions to vote in favor of advocating comprehensive exams in a forthcoming referendum, their attitudes toward the behavior, and their beliefs and evaluations associated with its specific consequences. Finally, at the end of the experiment, participants took part in a straw vote to decide whether the examinations should be instituted.

Participants in the experiment were 38 male and 45 female introductory psychology students who participated for course credit. Between 8 and 13 persons were randomly assigned to each combination of induced 2 (affect: positive vs. negative) × 2 (argument strength: strong vs. weak) × 2 (distraction: high vs. low).

ELICITATION OF KNOWLEDGE-BASED OUTCOMES IN REACTION TO THE MESSAGE

To determine the consequences of instituting comprehensive examinations that might come to mind spontaneously when evaluating the implications of the communication, 67 participants were exposed to the low-distraction conditions of Experiment 1 and were asked after reading the persuasive message to list their thoughts about the topic at hand.[3] Instead of assessing cognitive responses (e.g., see Petty & Cacioppo, 1986), we used procedures similar to those suggested by Ajzen and Fishbein (1980). These procedures, which are widely used in the attitude-behavior domain, allowed us to measure outcome beliefs and evaluations very precisely. The seven thoughts that participants reported most frequently all pertained to negative consequences of instituting comprehensive examinations (e.g., "It would imply a lot more work for students," "it would make or destroy a student's career," "a lot of capable students would not do well on this exam"). Statements about these consequences were employed in Experiment 1 along with statements about the outcomes described in the message.

PROCEDURE

Participants were assigned to separate cubicles to prevent communication. They were introduced to the study with instructions that it concerned the way people process information in natural settings (e.g., a restaurant or coffee shop); that although people often feel more at ease in these situations than in laboratory situations, the situations can sometimes be noisy; and that we would like to determine how these factors influence the way information is both transmitted and received. We further indicated that to simulate these natural conditions, we would play a tape of background noise recorded at a real coffee shop and would ask them both to write a letter to a friend and to read some materials while the tape was being played.

At this point, the tape started and continued playing throughout the entire experiment. In low-distraction conditions, this noise consisted of low-volume, content-free sounds that were recorded at a local coffee shop. This tape was played in high-distraction conditions as well. In the latter case, however, the background noise at the time participants read the message was accompanied by a high-volume conversation in which a male student approached a female student for the purpose of getting acquainted. The conversation touched on school issues, the personal history of the characters, and life in a small town. (The high-distraction material was played during the time allocated for participants to read the message. In all other parts of the experiment, the background noise was the same as in low-distraction conditions.)

Induction of affect. Participants' affective state was manipulated by means of two procedures that had the same objectives. Following Schwarz and Clore (1983), participants were told to write a letter to a friend recalling a personal experience that had made them either extremely happy or extremely angry. (Anger was used instead of happiness because anger has been reported to produce similar processing effects; see Bodenhausen, 1993.) After writing the letter, participants were offered 3 ounces of a soda with instructions to drink it all at once. In the positive affect condition, Coke was served. In the negative affect condition, tonic was served, which is bitter and had been rated as unpleasant during pretesting.

Presentation of message. The persuasive message was constructed in the form of a newsletter that had ostensibly been written in anticipation of a referendum to decide whether comprehensive exams should be instituted for university undergraduates. In fact, however, the message was based on materials developed by Petty and Cacioppo (1986). It consisted of an introduction to the problem followed by either four strong arguments or four weak arguments in favor of such exams. Two versions of each type of message were constructed, each containing a different set of arguments (*M* length = 657 words). Thus, for example, one strong-argument newsletter asserted that if comprehensive exams were

instituted, the starting salary of the graduates would increase and the reputation of the university and its alumni would be elevated. It further argued that senior final exams would be eliminated as a result of comprehensive exams and that faculty would teach more effectively. In contrast, one of the weak-argument newsletters stated that exams would lead to better student performance as a result of an increase in anxiety and would discriminate less against undergraduates given that graduate students were already able to take comprehensive exams.

Participants were then given the newsletter with instructions to read it as they would if they wanted to describe its contents to a friend and discuss its implications. Furthermore, we indicated that if the background material seemed interesting, they could pay attention to it as well. To ensure that participants in high-distraction conditions would not compensate by taking extra time, however, all participants were requested to read through the message only once. All participants were given 5 minutes to read the newsletter and were supervised to make sure that they complied with the instructions.

DEPENDENT MEASURES

After reading the newsletter, participants completed a questionnaire that included measures for attitudes, beliefs, evaluations, and intentions.

Outcome-specific beliefs and evaluations. Sixteen outcome statements were constructed pertaining to message-related outcomes. Each statement referred to a different outcome specified in arguments from which persuasive messages were constructed. Eight items pertained to weak arguments (e.g., "Instituting comprehensive examinations will lead students' parents to feel good because they are the ones who pay for the education") and 8 pertained to strong arguments (e.g., "Instituting comprehensive exams will result in a salary increase for Illinois graduates"). Of these, 4 pertained to the specific arguments contained in the newsletter that participants had read, whereas the remaining items concerned arguments contained in the newsletters they did not read. (Thus, by pooling over the two newsletters administered at each level of argument strength, we could compare cognitions concerning outcomes when they were mentioned in a message with cognitions concerning the same outcomes when they were not mentioned.)

In addition to statements about these message-related outcomes, statements pertaining to each of the seven knowledge-based outcomes identified on the basis of pretesting were constructed. These 23 statements were distributed in the questionnaire in a manner to be described.

Participants reported their beliefs in each of the 23 outcomes along a scale from 0 (*not at all likely*) to 10 (*extremely likely*). In addition, they evaluated each outcome along a scale from –5 (*dislike*) to +5 (*like*). The reliability of scales for message-based and knowledge-based beliefs ranged from $r = .59$ to .83 (M Cronbach's $\alpha = .74$; M item-total correlations > .30 in all cases). The reliability of evaluation scales ranged from .60 to .78 ($M\ \alpha = .67$; M item-total correlation > .30 in all cases).

Attitudes. Attitudes toward the behavior "voting in favor of comprehensive exams on the referendum" were assessed by the M of six highly intercorrelated ($\alpha = .76$) judgments made on 11-point bipolar dimensions from –5 to +5, with the following endpoints: *something I like* versus *don't like, pleasant* versus *unpleasant, something that makes me feel bad* versus *something that makes me feel good; something that makes me angry* versus *something that doesn't make me angry, something that makes me feel happy* versus *something that makes me feel unhappy,* and *something that ruins my mood* versus *something that improves my mood.*

Intentions. The measure of intentions averaged two highly correlated ($r = .83$) items (i.e., "I will vote yes in the referendum" and "I intend to vote yes in the referendum"), which were reported along scales from 0 (*not at all likely*) to 10 (*extremely likely*).

Order of presentation. To control for the order in which behavior-relevant cognitions were reported, four versions of the questionnaire were constructed. In each case, intentions were assessed first to minimize the possibility that they would be artifactually influenced by requiring participants to report the cognitions that theoretically mediate them. However, the questionnaires differed in the order in which attitudes, outcome-specific beliefs, and outcome-specific evaluations were reported (specifically, $\text{attitude}_1\text{-evaluations}_2\text{-beliefs}_3$, $\text{attitudes}_1\text{-beliefs}_2\text{-evaluations}_3$, $\text{beliefs}_1\text{-evaluations}_2\text{-attitudes}_3$, and $\text{evaluations}_1\text{-beliefs}_2\text{-attitudes}_3$, in which subscripts refer to the order in which the three types of judgments were made). Questionnaire versions were administered a similar proportion of times in each experimental condition. Finally, outcome-specific belief and evaluation items were interspersed in each questionnaire so that the M serial position of items that concerned (a) the 4 outcomes mentioned in the message participants received, (b) the 12 outcomes mentioned in the messages that participants did not read, and (c) the 7 negative message-unrelated outcomes that participants were likely to think about spontaneously was about the same.

MANIPULATION CHECKS

After reporting their beliefs and attitudes, participants were administered a postexperiment questionnaire concerning their reactions to various aspects of the experimental procedure. These reactions included (a)

the extent to which they thought about the arguments in the message while reading them and (b) the extent to which they were distracted at the time they read the newsletter. They also estimated the extent to which they felt happy at the time they (a) drank the soda and (b) wrote the letter to a friend and the extent to which they felt angry at those times. Responses to all items were made along a scale from 0 (*not at all*) to 10 (*extremely*). Finally, to assess argument quality, participants indicated whether they considered the arguments contained in the message to be (a) convincing, (b) valid, and (c) strong. All ratings were reported along scales from 0 (*not at all*) to 10 (*extremely*).

BEHAVIOR

To obtain an indication of whether participants would actually perform the behavior advocated in the message they had read, we added a final page to the questionnaire. On this page, we indicated that the fact that participants had read a newsletter about comprehensive exams gave us the opportunity to see how informed students might vote on the referendum. The instructions went on to indicate that to ensure fair voting, the ballots had been signed by the experimenter and stapled to the last page of the questionnaire. Participants were asked to select the slip that represented their choice and to place it in a ballot box that was in the room. Thus, their votes were ostensibly anonymous. Nevertheless, we were able to infer each participant's vote on the basis of the slip that was left in the questionnaire. A favorable vote was scored as 1 and an unfavorable vote as 0.

Results and Discussion

MANIPULATION CHECKS

Our manipulations of affect, distraction, and argument strength were successful. Participants reported feeling happier while writing a letter about a happy experience than while writing about a frustrating one (Ms = 6.67 vs. 3.32), $F(1, 80) = 40.32$, $p < .001$, and reported feeling angrier in the latter condition than in the former (Ms = 4.30 vs. 1.46), $F(1, 80) = 27.89$, $p < .001$. Participants under high-distraction conditions, relative to participants under low-distraction conditions, reported being more distracted while reading the passage (Ms = 7.10 vs. 3.38), $F(1, 80) = 40.81$, $p < .01$; less able to think about the message (Ms = 5.02 vs. 7.77), $F(1, 80) = 40.96$, $p < .01$; and less able to concentrate on it (Ms = 4.33 vs. 7.77), $F(1, 80) = 60.67$, $p < .01$. Communications were rated as more convincing if they contained strong arguments ($M = 6.32$) than if they contained weak ones ($M = 3.79$), $F(1, 80) = 24.26$, $p < .01$. In addition, the former communications were rated as more valid (Ms = 6.46 vs. 4.69), $F(1, 80) = 11.07$, $p < .01$, and as containing stronger arguments (Ms = 6.46 vs. 3.92), $F(1, 80) = 24.82$, $p < 01$.

RELATION OF ATTITUDES TO MESSAGE-BASED AND KNOWLEDGE-BASED COGNITIONS

According to Fishbein and Ajzen (1975), participants' attitudes toward the behavior being advocated should be predictable from Equation 1. It was unclear, however, whether participants in computing their attitudes would take into account the outcomes specified in the message they received, unmentioned consequences that they spontaneously recalled and thought about, or both. Predicted attitudes based on Equation 1 were computed under low-distraction conditions on the basis of (a) participants' estimates of the likelihood and desirability of the four outcomes specified in the message they read (i.e., message-based outcomes) and (b) their judgments of the seven outcomes that pretest participants had generated spontaneously on the basis of their prior knowledge (i.e., knowledge-based outcomes). The attitudes they actually reported were correlated $r = .57$ ($n = 40$, $p < .01$) with predicted values based on cognitions about message-based outcomes but only $r = .25$ (*ns*) with predicted values based on cognitions about knowledge-generated outcomes.

These differences must be evaluated in relation to analogous data from an independent group of participants who have not read the persuasive message. To permit these comparisons, we asked 21 participants who had not been exposed to the message or to any other experimental manipulations to complete the same dependent variable questionnaire that experimental participants were administered. Attitudes reported by these participants were correlated only $r = .18$ (*ns*) with predicted values based on beliefs and evaluations of the consequences discussed in the messages we presented but .47 ($p < .05$) with predicted values based on cognitions about consequences that were likely to come to mind spontaneously. Thus, relative to message-recipients, participants who had not read a persuasive message based their attitudes primarily on beliefs and evaluations concerning outcomes that came to mind spontaneously when they thought about comprehensive examinations.

TEST OF HYPOTHESES

We analyzed each set of behavior-related cognitions we considered in this study (message-based outcome beliefs and evaluations, knowledge-based outcome beliefs and evaluations, attitudes, and behavior intentions) as well as the behavioral decisions that were presumably mediated by these cognitions as a function of argument strength, induced affect, distraction, and order employing unweighted M analyses of variance. No effects involving the order of the items in the questionnaire were reliable ($p > .10$). Nor was the three-way interaction of argument strength, induced affect, and distrac-

TABLE 1: Effects of Argument Strength and Message-Irrelevant Affect on Behavior-Related Cognitions: Experiments 1 and 3

	Experiment 1				*Experiment 3*			
	Distraction		F(*1, 73*)		*Distraction*		F(*1, 153*)	
	High	*Low*	*Main Effect*	*Interaction*	*High*	*Low*	*Main Effect*	*Interaction*
Effects of argument strength[a]								
Message based								
Beliefs	2.10	2.08	25.89***	0.02	1.48	2.34	52.80***	2.71
Evaluations	3.22	4.33	88.45***	2.23	3.48	3.75	191.07***	0.25
Predicted attitudes	104.06	70.95	71.97***	0.29	76.28	43.75	133.23***	1.35
Knowledge based								
Beliefs	–0.84	–1.63	11.03***	2.97	–0.33	2.29	0.01	1.20
Evaluations	–0.50	1.02	9.67***	5.30*	–0.29	–0.67	2.90	0.38
Predicted attitudes	–24.06	20.35	0.12	0.04	—40.33	–5.6	2.99	0.03
Attitudes	0.62	2.61	15.39***	5.82*	1.10	1.05	10.72***	0.01
Intentions	1.77	3.91	25.93***	3.69*	2.05	3.16	29.17***	1.34
Behavior[c]	0.38	0.51	21.42***	0.47	.26	.46	23.79***	1.67
Effects of affect[b]								
Message based								
Beliefs	0.75	–0.92	0.40	4.87*	1.48	2.34	0.04	5.08*
Evaluations	1.48	–0.52	1.67	6.80*	3.49	3.75	0.17	0.01
Predicted attitudes	–0.19	144.45	0.30	9.64**	2.09	41.31	0.20	3.99*
Knowledge based								
Beliefs	–0.56	0.38	0.59	3.71*	0.41	–0.68	0.24	3.73*
Evaluations	0.87	–0.16	1.18	2.43	0.94	–0.38	1.38	5.69*
Predicted attitudes	–4.18	89.95	0.24	1.58	–49.43	–85.04	0.81	9.19***
Attitudes	1.79	–0.73	1.68	9.39*	1.16	–0.28	1.82	4.76*
Intentions	2.09	–0.60	1.78	5.79*	0.99	–0.58	0.18	2.62
Behavior[c]	.33	–0.01	2.72	3.13	0.17	–.09	0.35	2.88

NOTE: Mean differences are based on cases with complete data. $F_{\text{Main effect}}$ indicates the influence of argument strength or affect, whereas $F_{\text{Interaction}}$ indicates the combined influence of argument strength or affect with distraction.

a. The effect of argument strength is inferred from the difference between judgments when the presented arguments were strong and judgments when the presented arguments were weak.

b. The effect of affect is inferred from the difference between judgments when affect was positive and judgments when it was negative.

c. Behavior is expressed as proportion of participants who voted in favor of the institution of comprehensive examinations.

*$p < .05$. **$p < .01$ ***$p < .001$.

tion significant in any analysis ($p > 10$).[4] In other words, the effect of distraction on elaborative processing (inferred from the impact of argument strength) and its influence on nonelaborative processing (reflected in the impact of induced affect) were independent.

Effects of elaborative processing. The effects of elaborative processing were inferred from the impact of argument strength. As one possible way of looking at these effects, we computed differences between cognitions reported when the presented arguments were strong and the cognitions reported when the arguments were weak. These differences appear in the top-left section of Table 1. As suggested by the *F* ratios for the interaction between argument strength and distraction in Table 1, distraction decreased the impact of argument strength on the attitudes and intentions that participants reported. The pattern was the same for behavior, although it was not significant.

As the effects of argument strength on message-related outcome-specific cognitions indicate (see Table 1), argument strength had an effect on both beliefs and evaluations. However, the effect of argument strength on outcome beliefs was not at all influenced by distraction. Moreover, although the effects of argument strength on outcome-specific evaluations were somewhat less when distraction was high than when it was low, this difference was also not significant ($p < .10$).[5]

The knowledge-based outcomes of introducing comprehensive examinations that participants were likely to generate spontaneously were all undesirable. Participants believed these outcomes to be less likely when the arguments contained in the message were strong than when they were weak and also evaluated these outcomes less unfavorably in the former conditions. However, distraction decreased the impact of argument strength on both the evaluations of these unmentioned outcomes and, to a lesser extent ($p < .10$), beliefs that they would occur. In the context of evidence that distraction had little effect on the impact of argument strength on message-based cognitions, these data suggest that knowledge-based out-

comes were not evaluated at the time the message was read but rather were only taken into account afterward. We discuss this matter in more detail presently.

To compare the impact of distraction on attitudes to its impact on the outcome-related cognitions with which the attitudes were presumably associated, each set of judgments was converted to standard scores. Analyses of variance of these data as a function of argument strength and distraction as well as type of cognition as a within-subject variable indicated that the influence of argument strength on attitudes was adversely affected by distraction to a significantly greater extent (*M* standardized effect = 1.26 vs. 0.32 under low- and high-distraction conditions, respectively) than was the effect of argument strength on either outcome beliefs (*M*s = 1.15 vs. 1.05), outcome evaluations (*M*s = 1.75 vs. 1.20) or predicted attitudes (*M*s = 1.58 vs. 1.30); in each case, $F(1, 77) > 3.80$, $p < .05$. However, the interactive effects of distraction and argument strength on the latter three variables did not differ from one another, $F < 1$.

Effects of distraction on nonelaborative processing. Participants who were distracted from engaging in elaborative processing of a message were expected to base their attitudes toward the behavior being advocated on the message-irrelevant affect that they were experiencing at the time they thought about the behavior rather than on the message content. Data bearing on these possibilities are presented in the bottom left section of Table 1. Under high-distraction conditions, induced affect had a positive influence on not only the attitudes that participants reported but also their behavioral intentions and their actual behavior. This effect was also evident on outcome beliefs and evaluations. In contrast, the impact of affect on cognitions and behavior in low-distraction conditions was, if anything, negative in direction, as evidenced by consistently significant interactions of induced affect and distraction.

Path analyses. The causal relations implied by these sequences of processes in Figure 1 were evaluated on the basis of path analyses (see Pearson *r* matrices in the appendix). The specific path models were consistent with Figure 1 but more detailed. For example, affect had an influence on attitudes in conditions of high distraction, whereas argument strength influenced message-based cognitions in all conditions. These message-based cognitions represent the encoding and validation of the arguments in the message. Once formed, these cognitions may stimulate the message recipient to generate other cognitions based on prior knowledge (e.g., counteraguments). Both message-based and knowledge-based cognitions may be the basis for attitudes when distraction is low but are expected to be the result of these attitudes when distraction is high.[6] Maximum likelihood techniques indicated that the model summarized in the first panel of Figure 1 was not adequate under low-distraction conditions. However, with the addition of a direct path from message-based evaluations to intentions, the fit became satisfactory (Comparative Fit Index [CFI] = 1.00, Bollen's [1989] fit index [IFI] = 1.02, Standardized Root Mean Residual [SRMR] = .00), $\chi^2(21) = 20.07$, *ns*).[7] In contrast, the fit of the low-distraction model to the data obtained under high-distraction conditions was significantly less satisfactory (CFI = .84, IFI = .86, SRMR = .17), $\chi^2(21) = 49.66$, $p < .001$). The coefficients corresponding to this latter model appear in the top-left panel of Figure 2.

A path model based on the set of relations described in Figure 1c provided an adequate fit to the data obtained under high distraction (CFI = .95, IFI = .96, SRMR = .14), $X^2(21) = 28.82$, *ns*. The corresponding path diagram is presented in the top-right panel of Figure 2, with solid lines representing statistically significant paths. In contrast, the application of this model under low-distraction conditions was significantly less adequate (CFI = .86, IFI = .87, SRMR = .23), $\chi^2(21) = 46.81$, $p < .001$).

A major difference between the elaborative and nonelaborative processes we postulate surrounds the relation of outcome beliefs and outcome evaluations to attitudes. This relation was therefore evaluated more carefully. First, we assumed that message-related outcome beliefs and evaluations determine the attitudes formed as a result of elaborative processing but are determined by attitudes that are formed as a result of nonelaborative processing. To evaluate this assumption more directly, supplementary path analyses were performed. Specifically, the elaborative-processing model we tested was reapplied under low-distraction conditions reversing the direction of the paths linking attitudes to outcome beliefs and evaluations (for procedures to test for directionality, see McCallum, Wegener, Uchino, & Fabrigar, 1993). As confirmed by chi-square differences, this model had a worse fit (CFI = .94, IFI = .94, SRMR = .20), $\chi^2(21) = 34.39$, $p < .06$. Correspondingly, the nonelaborative processing model reapplied under high-distraction conditions after reversing the paths linking attitudes and outcome cognitions also provided a poorer fit than the assumed model (CFI = .86, IFI = .87, SRMR = .16), $\chi^2(21) = 45.12$, $p < .02$, which was confirmed by differences in the chi-squares. Thus, our assumptions concerning the direction of these paths in each level of ability were supported.

Three more specific tests were conducted to confirm differences in the processes that occurred in distraction and no-distraction conditions. First, in low-distraction conditions, a direct path from argument strength to atti-

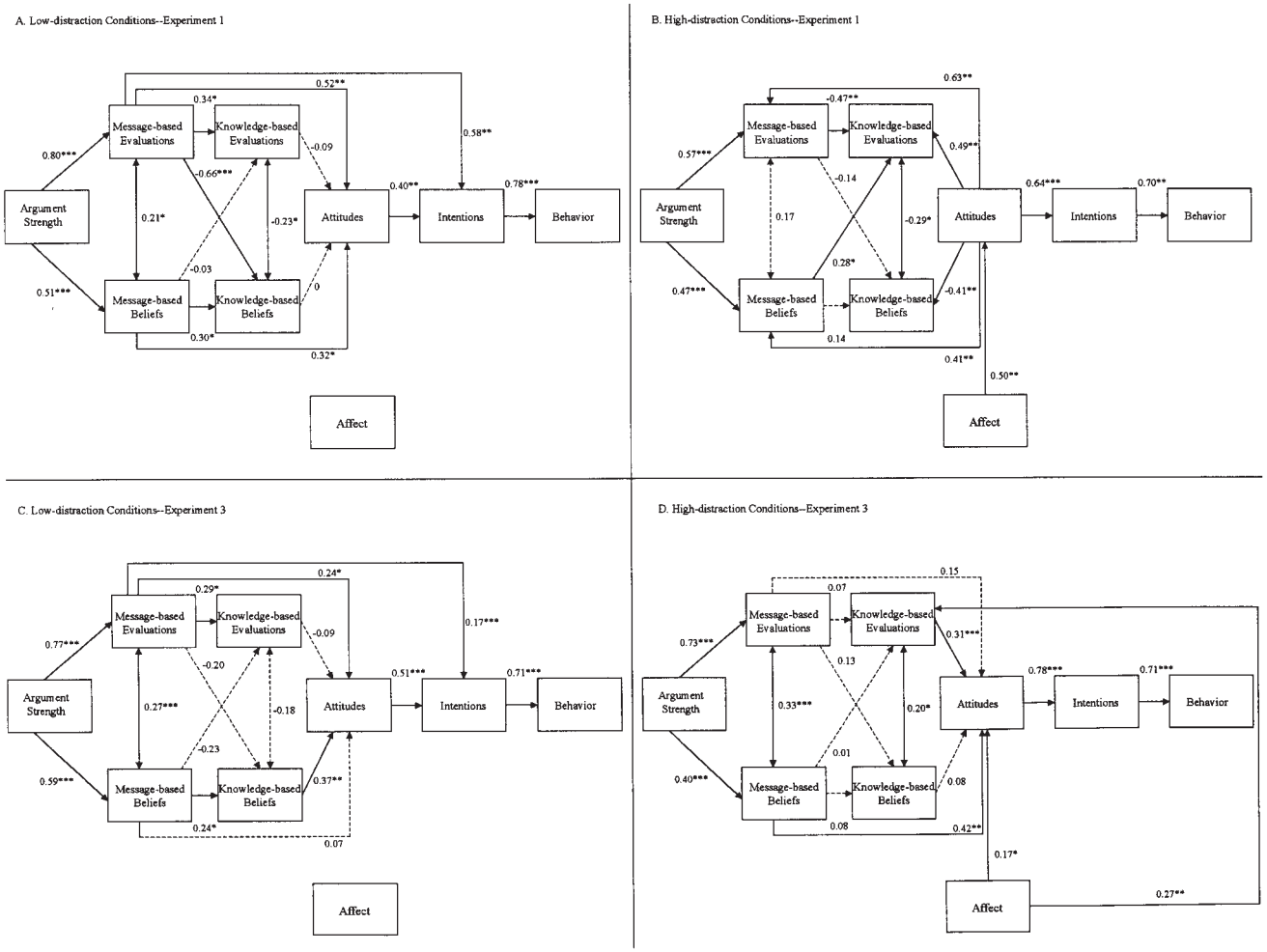

Figure 2 **Path diagrams for (a) low- and (b) high-distraction conditions in Experiment 1 and (c) low- and (d) high-distraction conditions in Experiment 3.**

tudes was not significant (β = 0.02, *ns*), thus confirming that the influence of argument strength on this judgment was mediated by outcome-specific cognitions. Moreover, the path from affect to attitudes was nonsignificant in low-distraction conditions (β = 0.23, *ns*) and was significantly different ($p < .05$) from the same path in high-distraction situations (β = 0.48, $p < .01$). In contrast, affect had a direct influence on attitudes in high-distraction conditions. (This effect was not mediated by beliefs and evaluations; the regression weights linking affect and the four sets of outcome-related cognitions ranged from .01 and .02, *ns*, whereas the coefficient representing the direct effect on attitudes was 0.50, $p < .001$.)

Interrelations of attitudes and outcome-related cognitions. We further assumed that a disruption in the formation of attitudes on the basis of outcome-related cognitions could be reflected in decreased correlations between attitudes and Equation 1. To investigate this possibility, we determined the proportion of variance in attitudes accounted for by (a) Σb_i and Σe_i, (b) $\Sigma b_i e_i$, and (c) all three variables in combination. Under low-distraction conditions, $\Sigma b_i e_i$ accounted for 6% of the variance in attitudes over and above the contributions of Σb_i and Σe_i, $F(1, 36) = 4.97$, $p < .03$. Under high-distraction conditions, however, $\Sigma b_i e_i$ contributed only a nonsignificant .01% of the variance in attitudes over and above b_i and Σe_i ($F < 1$). In combination, these data support the hypothesis that the use of outcome-related cognitions as a basis for attitudes was disrupted by distraction

EXPERIMENT 2

Experiment 1 shed some light on the processes that result from decreases in ability to think about the message content. The effects of distraction on message-based beliefs and evaluations suggest that when

environmental distraction is high, recipients of a persuasive communication are still able to form beliefs in and evaluations of the outcomes described in the message. However, they are apparently unable to use these outcomes as a basis for attitudes toward the behavior advocated in the message. We also used distraction to make inferences about the order in which different types of outcome-related cognitions are formed. For example, we observed that knowledge-based evaluations were significantly disrupted by distraction, whereas the other sets of cognitions were not. This pattern led us to the preliminary conclusion that people who are exposed to a persuasive message may first assess the outcomes that the message describes, and only then may they consider alternate outcomes that the message failed to mention. However, a third question about the sequence of processing in low-distraction conditions could not be answered in Experiment 1. Although there was a suggestion that distraction disrupted the influence of argument strength on message-based outcome evaluations to a greater extent than on message-based outcome beliefs, this pattern received no statistical support whatsoever. Therefore, we conducted Experiment 2 to see if having participants provide these judgments online (as opposed to after the message content has been processed) would clarify the order in which these two cognitions are formed.

In Experiment 1, the likelihood and desirability of the outcomes specified in the message may already have been formed by the time participants reported them in the questionnaire. In Experiment 2, we used response time techniques to observe how the online computation of one type of outcome-specific cognition (e.g., beliefs) facilitates the report of the others (e.g., evaluations) under conditions in which the outcomes involved were unlikely to have been considered previously.

Specifically, the outcomes specified in the message we presented in Experiment 1 were fairly novel. Thus, persons who had not read a message pertaining to them are unlikely to have estimated the likelihood and desirability of these outcomes before being asked to do so. However, suppose that participants who consider these outcomes estimate their likelihood of occurrence before assessing its desirability. Then, they should report their evaluations of an outcome more quickly if they have already reported their belief in its occurrence than if they have not. In contrast, suppose participants spontaneously evaluate outcomes before estimating their likelihood. Then, reporting evaluations first should decrease the time to report beliefs.

Method

Specifically, in Experiment 2, 60 male and 65 female introductory psychology students completed a computer-based version of the questionnaire administered in Experiment 1. These participants were not exposed to a message to ensure that their responses to the questionnaire would be online. We specifically restricted our attention to the 16 outcomes mentioned in the messages used in Experiment 1, which persons who had not been exposed to these messages were unlikely to have considered. In one condition, participants reported their belief in each outcome before evaluating the desirability of the outcome ($n = 50$). In the other condition, they evaluated each outcome before reporting their belief that it would occur ($n = 65$).

The questions were presented sequentially on a computer screen, and participants responded to each by touching a number from 0 to 9 on the keyboard. (In reporting beliefs, the scales ranged from *not at all likely* to *extremely likely*. In reporting evaluations, the scales ranged from *dislike* to *like*.) The time required to report each judgment was recorded. Response times pertaining to each type of cognition were averaged for each participant and used as a single index of the time to report the type of cognition involved.

Results and Discussion

A test of the facilitating effect of reporting one type of outcome-related cognition on the time to report the other is complicated by the fact that the same outcome descriptions were presented when participants reported beliefs as when they reported evaluations. Exposure to a description in the course of making the first judgment is likely to increase the ease of reading and comprehending it when it is considered again. Consequently, the second judgment should generally take less time than the first one regardless of which specific judgment is made first. However, the facilitating influence of reporting beliefs on the time to report evaluations should occur over and above this more general order effect. That is, reporting outcome beliefs should decrease the time to report outcome evaluations to a greater extent than reporting outcome evaluations decreases the time to report beliefs.

This was in fact the case. The time taken to report outcome-specific beliefs and evaluations was analyzed as a function of presentation order and type of cognition (beliefs vs. evaluations). Averaged over the two order conditions, outcome beliefs and outcome evaluations were reported equally quickly ($M = 0.94$ s in each case). Thus, neither type of cognition was inherently easier to compute than the other. However, evaluations were made more quickly when beliefs had been reported beforehand ($M = 0.73$ s) than when they had not ($M = 1.15$ s). This difference ($M_d = 0.42$ s) was significantly greater than the difference in time required to report beliefs when evaluations had and had not been reported

earlier (*Ms = 0.89 s vs. 0.99 s, respectively;* $M_d = 0.11$ s), $F(1, 123) = 4.52$, $p < .01$. Thus, Experiment 2 provided support for the hypothesis that outcome beliefs are formed prior to outcome evaluations.

EXPERIMENT 3

Although Experiment 1 had provided evidence that distraction disrupts the formation of attitudes on the basis of outcome-related cognitions, it was important to provide an independent validation that the effects of distraction reflected disruption of a process that unfolds over time. We reasoned that if, as we concluded, distraction disrupted attitude formation in Experiment 1, allowing participants more time to think about the message would permit them to perform cognitive activities that would otherwise be prevented (for similar procedures, see Mackie & Cooper, 1989). That is, message recipients who are distracted but are given sufficient time to assess the desirability of the behavior on the basis of the information they have encoded should be able to form attitudes as well as nondistracted participants. Such a pattern would be reflected in a nonsignificant interaction between argument strength and distraction.

In addition, Experiment 1 raised some questions about the role of knowledge-based cognitions, which according to some authors, are a more important basis for attitudes than the cognitions mentioned in the message (for a review, see Eagly & Chaiken, 1993). The lack of correlation between attitudes and knowledge-based cognitions in Experiment 1 suggested that people do not form outcome-specific cognitions online. It is nevertheless possible that giving recipients more time to think about it would increase the likelihood that other outcomes not mentioned in the message would come into play, possibly overriding the influence of message-based cognitions. Experiment 3 examined this possibility.

METHOD

Experiment 3 replicated the first experiment with one exception. That is, whereas participants in Experiment 1 were given only 5 minutes to read the persuasive communication they received, participants in this experiment were given 10 minutes to do so. In all other respects, the procedures and measures used in the two experiments were identical and equally successful according to manipulation checks. Participants were 119 female and 45 male undergraduates who took part to fulfill a course requirement.

Results and Discussion

ANALYSES OF MEANS ACROSS CONDITIONS

As in Experiment 1, an unweighted analysis of variance yielded no significant 3-way interactions involving affect, argument strength, and distraction (ps > .10), justifying a consideration of the effects of each factor independently. As the right portion of Table 1 indicates, the effect of argument strength on message-based cognitions, attitudes, intentions, and behavior were significant. Unlike Experiment 1 (see left section of Table 1), however, no argument strength effect depended on distraction. As indicated by the difference between responses when affect was positive and responses when it was negative, affect had a significantly greater effect on both participants' attitudes when distraction was high than when it was low, and these effects were similar to those observed in Experiment 1 (see Table 1). The impact of distraction on the influence of affect was also evident in outcome-specific cognitions. It therefore seems reasonable to conclude that when participants had time to think about the implications of the message they received at the time they read it, the effects of distraction on the amount of elaborative processing they performed were eliminated, although the effects of affect were not altered.

PATH ANALYSES

Results from path analyses in each distraction condition were consistent with these conclusions. As in Experiment 1, the elaborative-processing model that we tested had an adequate fit in low-distraction conditions (CFI = .94, IFI = .94, SRMR = .10), $\chi^2(21) = 38.75$, $p < .001$—a fit that was significantly better than the fit of both the nonelaborative-processing model (CFI = .82, CFI = .83; SRMR = .20), $\chi^2(21) = 75.03$, $p < .001$, and the elaborative-processing model after reversing the paths from outcome-specific cognitions to attitudes (CFI = .92, CFI = .92; SRMT = .09), $\chi^2(21) = 45.59$, $p < .001$. The path diagram that corresponds to the elaborative-processing model appears in the bottom-left panel of Figure 2.

In high-distraction situations, the nonelaborative-processing model was adequate (CFI = .94, CFI = .94; SRMR = .11), $^2(21) = 37.95$, $p < .01$. Unlike in Experiment 1, however, the fit of this model did not decrease significantly after reversing the paths from attitudes to message-based outcome-specific cognitions (CFI = .95, IFI = .95, SRMR = .08), $\chi^2(21) = 34.83$, $p < .03$. Based on this latter finding, along with implications of analyses of variance that distraction had not disrupted attitude formation, the final model for high-distraction conditions was fitted with paths from outcome-specific cognitions to attitudes, as shown in the bottom right panel of Figure 2. In addition, because a supplementary analysis testing the influence of affect on the different sets of outcome-specific cognitions suggested that affect had direct influences on not only attitudes but also on knowledge-based evaluations, the model in Figure 2 (CFI = .97, IFI = .97,

SRMR = .07), $\chi^2(20) = 26.07$, $p < .09$, includes this path as well.

The path diagrams confirm our earlier conclusion that providing more time to read the message allowed distracted participants to form attitudes on the basis of outcome-related cognitions, although affect continued to have an influence. Furthermore, a comparison of the top and bottom panels of Figure 2 under low-distraction conditions suggests that relative to nondistracted participants in Experiment 1 (who had 5 minutes to read the message), nondistracted participants in this experiment used knowledge-based beliefs as a basis for attitudes to a greater extent and message-based beliefs to a correspondingly lesser extent ($p < .05$ for contrasts between the coefficients corresponding to the two experiments). Presumably, having more time to counterargue the message allowed participants to retrieve previous knowledge bearing on the implications of the message, and these cognitions, once salient, became more influential than message-based cognitions.

GENERAL DISCUSSION

The evidence that elaborative processing gives way to nonelaborative processing when people have limited capacity to process the information they receive is not surprising. Similar effects of capacity and motivation have been suggested elsewhere (Chaiken, 1980; Fazio, 1990; Fiske & Neuberg, 1990; Judd & Krosnick, 1989; Kruglanski, 1990; Petty & Cacioppo, 1986). However, by providing evidence of the sequence of cognitive activities that mediate these two types of processing, the present research extended on these earlier findings in several ways.

Elaborative Processing

When people receive a behavior-related persuasive message and are both motivated and able to think about its implications, they estimate the likelihood that each behavioral outcome described in the message would actually occur. They then combine the implications of the outcome's likelihood and desirability in a manner implied by Fishbein and Ajzen (1975) and use this information as a basis for their attitude toward the behavior being advocated (see Albarracin & Wyer, in press). This attitude may then influence their intentions to perform the behavior and their ultimate decision to do so.

Nondistracted recipients of a persuasive message appear to form attitudes online predominantly on the basis of the implications conveyed in the message (see Experiment 1). As Experiment 3 shows, however, participants who have more time to think about the communication can still retrieve prior knowledge about the message's topic and use this knowledge as a basis for attitudes (for related evidence, see Edwards & Smith, 1996). Other conditions may also trigger counterarguing. When a message argues against a position that recipients favor strongly, individuals may attempt to bolster their initial position with other, message-unrelated knowledge that supports it. This bolstering may not occur unless participants have considerable time and motivation to think about the issues (as when cognitive responses are requested) or unless their prior knowledge about the topic is very salient. Nevertheless, this conclusion may qualify evidence from other research that message-based cognitions per se have a negligible influence on recipients' attitudes (for a review, see Eagly & Chaiken, 1993).

Our findings also have implications for Fishbein and Ajzen's (1975) assumption that attitudes are based on a subset of beliefs that are salient to participants. That is, the present results suggest that this subset of beliefs may not be stable but rather may be determined largely by the subset of behavior-relevant knowledge that is easily accessible at the time. The effect of construct accessibility on the impact of these constructs on judgments is hardly surprising (for reviews of the influence of construct accessibility on judgments, see Higgins, 1996; Wyer & Srull, 1989). However, construct accessibility is important in considering assumptions that underlie the frequent application of Fishbein and Ajzen (1975)'s model in predicting behavior. That is, the attitudes assessed by these procedures and the cognitions that give rise to them may not be stable but rather may vary with situation-specific features of the situation in which the beliefs and evaluations are reported.

Nonelaborative Processing

The work reported in this article also permitted some important conclusions about the nature and contingencies of nonelaborative processes that take place in the persuasion domain, as follows. Persons who are prevented from thinking carefully about a message at the time they receive it may nevertheless be able to compute the likelihood and desirability of each behavioral outcome described in the message, much as they would if they were not distracted. However, they may be unable to combine the implications of these cognitions to form an attitude. Consequently, they are more inclined to base their attitudes on the affect they are experiencing and attribute to their feelings about the behavior being advocated independently of the message content. Once this affect-based attitude is formed, it may influence participants' intentions and behavioral decisions in much the same way as message-based attitudes do. Moreover, the attitude appears to have a reciprocal influence on out-

come beliefs and evaluations through processes of wishful thinking and rationalization.

The fact that distraction prevents persons from thinking carefully about the content of a communication they receive and therefore increases the likelihood that they use peripheral criteria as a basis for their attitudes toward the position advocated in the communication is not news (Petty & Cacioppo, 1986). However, this study provides several additional insights into the specific cognitive processes that are likely to be influenced by this distraction. Previous research suggested that distracting persons from thinking about the content of a communication prevents them from refuting the validity of the arguments contained in it and, therefore, increases the impact of the communication's content (Festinger & Maccoby, 1964; Osterhouse & Brock, 1970). These effects, which in the present context would be reflected in the impact of distraction on beliefs and evaluations of the outcomes specified in the message, were not evident in this study.

The evidence that the affect participants were experiencing had greater impact on their attitudes when they were distracted from thinking carefully about the message content is consistent with the notion that people use their affective reactions as a heuristic basis for judgments when other criteria are difficult to employ (Forgas, 1995; Schwarz & Clore, 1988). For example, Experiment 1 suggested participants use affect as information when the influence of argument strength decreases. Nevertheless, Experiment 3 indicated that even when participants are at least partially able to combine outcome-related information as a basis for attitudes (see bottom-right panel in Figure 2), they still use affect as information. Thus, people may not use affect as information not because of the absence of message-based criteria but because they are unable to accurately identify the source of the affect they experience and therefore misattribute it to the message.

Incidentally, the emphasis in this study on the role of affect as an informational basis for judgment (Schwarz & Clore, 1983, l988; see also Wyer et al., 1999) does not in itself preclude other ways in which affect can influence the processing of a persuasive message. For example, happy and sad individuals appear to differ in their disposition to process persuasive messages systematically (Bless, Bohner, Schwarz, & Strack, 1990; Wegener et al., 1994; but see Wyer et al., 1999, for an alternative view). In the present research, this difference was minimized by inducing anger rather than sadness, in view of findings that anger and happiness have similar effects on the tendency to engage in elaborative versus nonelaborative processing (Bodenhausen, 1993). Therefore, it seems reasonable to suppose that the effects were observed over and above any motivational effect that differences in affect might have had.

It is important to note that the finding that both argument strength and affect can coexist as sources of information is inconsistent with Petty and Cacioppo's (1986) assumptions that these two processes are independent. It is, however, in line with predictions from the heuristic systematic model that the two modes of inference can exert parallel, additive influences on judgment (see Chaiken, 1980; see also Kunda, 1999). Moreover, this demonstration is particularly important because it clarifies the nature of direct and biasing influences of affect in greater detail. That is, this work suggests that when both elaborative and nonelaborative processes coexist, affect can not only bias detailed outcome-based cognitions (see Chaiken, 1980) but also have direct influences on attitudes (see bottom-right panel of Figure 2).

A Final Note

Our conceptualization of elaborative information processing is based in part on the theory of reasoned action proposed by Fishbein and Ajzen (1975). Although this theory makes no explicit claims concerning the nature of the cognitive processes that underlie attitude formation (see Fishbein & Middlestadt, 1995), the general conceptualization is useful in conceptualizing the sequence of cognitive steps that underlie the impact of a persuasive communication on behavior when persons have the motivation and ability to evaluate its implications. At the same time, our findings suggest that when persons are unable or unwilling to devote cognitive resources necessary to extensively process the information they receive, they may base their attitudes on criteria that are not taken into account by Fishbein and Ajzen's (1975) theory of reasoned action. The methodology we have employed in this research provides one means of determining the conditions in which this theory is likely to account for behavior intentions and actual behavior and of specifying conditions in which other considerations must be brought into the picture as well.

APPENDIX
Correlation Matrices

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Experiment 1									
Low-distraction conditions									
1. Behavior	1								
2. Intention	.78	1							
3. Attitude	.68	.79	1						
4. Message-based beliefs	.60	.63	.62	1					
5. Message-based evaluations	.66	.80	.69	.62	1				
6. Knowledge-based beliefs	–.34	–.22	–.25	–.11	–.48	1			
7. Knowledge-based evaluations	.23	.12	.14	.18	.32	–.39	1		
8. Affect	–.09	–.18	–.24	–.25	–.24	.21	–.11	1	
9. Argument strength	.55	.64	.55	.51	.80	–.48	.34	–.15	1
High-distraction conditions									
1. Behavior	1								
2. Intention	.70	1							
3. Attitude	.61	.64	1						
4. Message-based beliefs	.47	.52	.47	1					
5. Message-based evaluations	.66	.80	.69	.62	1				
6. Knowledge-based beliefs	–.49	–.30	–.39	–.20	–.33	1			
7. Knowledge-based evaluations	.15	.10	.27	.13	.02	–.36	1		
8. Affect	.32	.37	.49	.16	.26	–.14	.34	1	
9. Argument Strength	.40	.32	.16	.53	.64	–.23	–.17	–.08	1
Experiment 3									
Low-distraction conditions									
1. Behavior	1								
2. Intention	.71	1							
3. Attitude	.60	.66	1						
4. Message-based beliefs	.51	.54	.22	1					
5. Message-based evaluations	.60	.61	.33	.72	1				
6. Knowledge-based beliefs	.12	.23	.38	–.03	.10	1			
7. Knowledge-based evaluations	–.06	–.01	–.03	.13	–.02	.15	1		
8. Affect	–.09	–.13	–.07	–.16	–.03	–.22	–.09	1	
9. Argument strength	.46	.48	.24	.59	.77	.09	–.18	0	1
High-distraction conditions									
1. Behavior	1								
2. Intention	.71	1							
3. Attitude	.61	.78	1						
4. Message-based beliefs	.37	.48	.54	1					
5. Message-based evaluations	.35	.48	.44	.62	1				
6. Knowledge-based beliefs	.41	.26	.36	0	.08	1			
7. Knowledge-based evaluations	.12	.19	.26	.09	.07	.23	1		
8. Affect		.17	.13	.28	.14	–.03	.11	.29	1
9. Argument Strength	.26	.29	.27	.39	.73	–.07	–.08	–.01	1

NOTES

1. McGuire and McGuire (1991) defined rationalization more specifically as a tendency to change perceptions of an event's desirability to be consistent with beliefs that the event will occur. However, to the extent one's intention to perform a behavior is an indication of a belief that the behavior will occur and this intention is determined by attitudes toward the behavior, our use of the term and McGuire and McGuire's use of it are compatible.

2. The elaborative processes we postulate could also be performed in parallel. If this is so, decreases in the ability or motivation to think extensively about the information available might decrease the amount of processing performed at all stages by a similar amount and thus might have a similar effect on cognitions formed at each of these stages.

3. It may be worth noting that 60% of the thoughts elicited by weak arguments were unfavorable, as opposed to only 46% of the thoughts elicited by strong arguments. This suggests that participants were more likely to counterargue weak arguments than strong ones.

4. There was a significant interaction between the strength of the arguments contained in the message and the affect experienced that was evident on knowledge-based beliefs, $F(1, 77) = 16.60$, $p < .01$, and behavior, $F(1, 77) = 3.61$, $p < .06$. However, this interaction did not replicate in Experiment 3. Here and elsewhere, unweighted and weighted mean analyses yielded the same results.

5. Similar conclusions can be drawn from supplementary analyses of the difference between beliefs in outcomes when they were mentioned in the message that participants read and beliefs in the same outcomes when they were not mentioned. Specifically, strong arguments increased beliefs in the outcomes when they were described in the message relative to conditions in which they were not (M difference = 1.30), whereas presenting weak arguments did not have this effect ($M_d = 0.45$). However, the differential effectiveness of strong and weak arguments was similar under both low-distraction conditions ($M_s =$

1.20 vs. 0.60) and high-distraction conditions (M_s = 1.40 vs. 0.30). This conclusion is confirmed by an interaction of argument strength and argument type (mentioned vs. not mentioned), $F(1, 80) = 6.15$, $p < .01$, which was independent of distraction, $F < 1$. The same pattern was true in Experiment 3.

6. The path models did not include the multiplicative component derived from Equation 1 because of multicollinearity. The Comparative Fit Index (CFI) and Bollen's fit index (IFI) are considered adequate when they exceed .90 (Bollen, 1989). The Standardized Root Mean Residual (SRMR) represents reasonable fit at .08 or less. The chi-square index is a measure of poor fit, with higher numbers indicating less adequate models and/or higher sample sizes, and allows for between-model comparisons (Bollen, 1989). Differences in chi-squares are distributed as $\chi^2(1)$, and values greater than 3.84 indicate that the model with the lower index is superior in fit ($p < .05$). In all cases, we used this criterion in deriving conclusions about model differences.

7. This path is consistent with prior suggestions of syllogistic influences of outcome beliefs on intentions (see Jaccard & King, 1977).

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