

THE ELABORATION LIKELIHOOD MODEL OF PERSUASION

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I. Introduction

The study of attitudes and persuasion began as the central focus of social psychology (Allport, 1935; Ross, 1908). However, after a considerable flourishing of research and theory from the 1930s through the 1960s, interest in the topic began to wane. Two factors were largely responsible for this. First, the utility of the attitude construct itself was called into question as researchers wondered if attitudes were capable of predicting behavior. Because of this concern, some even concluded that it might be time to abandon the attitude concept (Abelson, 1972; Wicker, 1971). Second, so much conflicting research and theory had developed that it had become clear that "after several decades of research, there (were) few simple and direct empirical generalizations that (could) be made concerning how to change attitudes" (Himmelfarb & Eagly, 1974, p. 594). Reviewers of the attitudes literature during the early 1970s lamented this sorry state of affairs (e.g., Fishbein & Ajzen, 1972). For example, Kiesler and Munson (1975) concluded that "attitude change is not the thriving field it once was and will be again" (p. 443).

By the late 1970s considerable progress had been made in addressing important methodological and theoretical issues regarding the first substantive problem plaguing the field—the consistency between attitudes and behaviors. Conditions under which attitudes would and would not predict behavior were specified (e.g., Ajzen & Fishbein, 1977, 1980; Fazio & Zanna, 1981) and researchers began to explore the processes underlying attitude-behavior correspondence (Sherman & Fazio, 1983; Fazio, 1985). The attitude change problem was slower to be addressed, however. In 1977, Muzifer Sherif asked "What is the yield in the way of established principles in regard to attitude change?" He answered that there was a "reigning confusion in the area" and a "scanty yield in spite of (a) tremendously thriving output" (p. 370). In a review that generally heralded the arrival of a new optimism in the attitudes field, Eagly and Himmelfarb (1978) noted that "ambiguities and unknowns still abound" (p. 544; see Cialdini, Petty, & Cacioppo, 1981; Cooper & Croyle, 1984, for more recent reviews).

As we noted above, the major problem facing persuasion researchers was that after accumulating a vast quantity of data and an impressive number of

theories—perhaps more data and theory than on any other single topic in the social sciences (see McGuire, 1985)—there was surprisingly little agreement concerning if, when, and how the traditional source, message, recipient, and channel variables (cf. Hovland, Janis, & Kelley, 1953; McGuire, 1969; Smith, Lasswell, & Casey, 1946) affected attitude change. Existing literature supported the view that nearly every independent variable studied increased persuasion in some situations, had no effect in others, and decreased persuasion in still other contexts. This diversity of results was apparent even for variables that on the surface, at least, would appear to be quite simple. For example, although it might seem reasonable to propose that by associating a message with an expert source agreement could be increased (e.g., see Aristotle's *Rhetoric*), the accumulated contemporary research literature suggested that expertise effects were considerably more complicated than this (Eagly & Himmelfarb, 1974; Hass, 1981). Sometimes expert sources had the expected effects (e.g., Kelman & Hovland, 1953), sometimes no effects were obtained (e.g., Rhine & Severance, 1970), and sometimes reverse effects were noted (e.g., Sternthal, Dholakia, & Leavitt, 1978). Unfortunately, the conditions under which each of these effects could be obtained and the processes involved in producing these effects were not at all apparent.

Our primary goal in this article is to outline a general theory of attitude change, called the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1981a), which we believe provides a fairly general framework for organizing, categorizing, and understanding the basic processes underlying the effectiveness of persuasive communications. Importantly, the ELM attempts to integrate the many seemingly conflicting research findings and theoretical orientations under one conceptual umbrella. The ELM began with our attempts to account for the differential persistence of communication-induced attitude change. After reviewing the literature on attitude persistence, we concluded that the many different empirical findings and theories in the field might profitably be viewed as emphasizing one of just two relatively distinct routes to persuasion (Petty, 1977; Petty & Cacioppo, 1978). The first type of persuasion was that which likely resulted from a person's careful and thoughtful consideration of the true merits of the information presented in support of an advocacy (central route). The other type of persuasion, however, was that which more likely occurred as a result of some simple cue in the persuasion context (e.g., an attractive source) that induced change without necessitating scrutiny of the true merits of the information presented (peripheral route). In the accumulated literature, the first kind of persuasion appeared to be more enduring than the latter (see Fig. 1; see Cook & Flay, 1978, and Petty, 1977, for reviews).

Following our initial speculation about the two routes to persuasion and the implications for attitudinal persistence (Petty, 1977; Petty & Cacioppo, 1978), we have developed, researched, and refined a more general theory of persuasion,

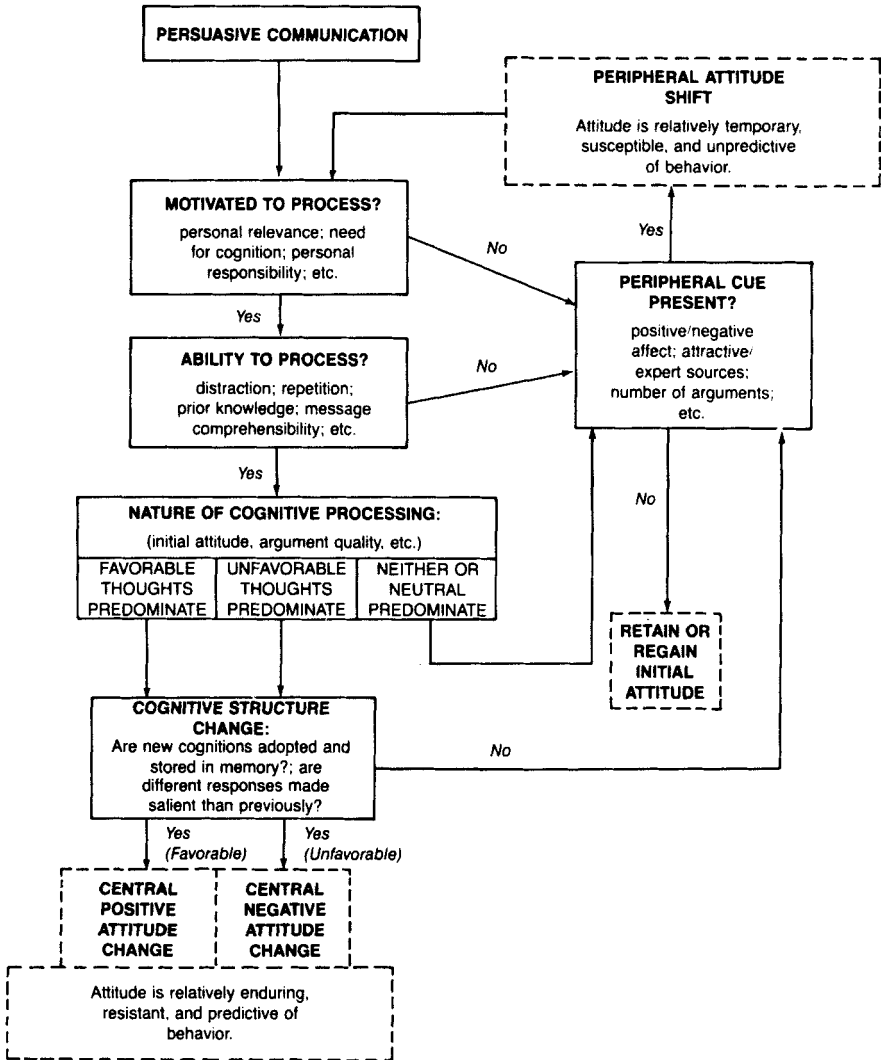


Fig. 1. Central and peripheral routes to persuasion. This figure depicts the two anchoring endpoints on the elaboration likelihood continuum (adapted from Petty, 1977; Petty & Cacioppo, 1978, 1981a).

the ELM, which is based on these two routes (Petty & Cacioppo, 1981a). In addition, we have addressed the various applications of this model to fields such as psychotherapy and counseling (Cacioppo, Petty, & Stoltenberg, 1985; Petty, Cacioppo, & Heesacker, 1984) and mass media advertising and selling (Caciop-

po & Petty, 1985; Petty & Cacioppo, 1983a, 1984b; Petty, Cacioppo, & Schumann, 1984). In the remainder of this article we will outline the ELM as a series of postulates that make explicit the guiding assumptions and principles of the model. We will also provide a methodology for testing the major processes outlined by the ELM and we will review research which provides evidence relevant to the framework.

Before outlining our model of attitude change, however, it is important to define our use of the term *attitude*. Consistent with the positions of other attitude theorists (e.g., Thurstone, 1928), we regard attitudes as general evaluations people hold in regard to themselves, other people, objects, and issues. These general evaluations can be based on a variety of behavioral, affective, and cognitive experiences, and are capable of influencing or guiding behavioral, affective, and cognitive processes. Thus, a person may come to like a new political candidate because she just donated \$100 to the campaign (behavior-initiated change), because the theme music in a recently heard commercial induced a general pleasantness (affect-initiated change), or because the person was impressed with the candidate's issue positions (cognitive initiated change). Similarly, if a person already likes a political candidate he may agree to donate money to the campaign (behavioral influence), may feel happiness upon meeting the candidate (affective influence), and may selectively encode the candidate's issue positions (cognitive influence).

II. Postulate 1: Seeking Correctness

Our first postulate and an important guiding principle in the ELM agrees with Festinger's (1950) statement that:

People are motivated to hold correct attitudes.

Incorrect attitudes are generally maladaptive and can have deleterious behavioral, affective, and cognitive consequences. If a person believes that certain objects, people, or issues are "good" when they are in fact "bad," a number of incorrect behavioral decisions and subsequent disappointments may follow. As Festinger (1954) noted, the implication of such a drive is that "we would expect to observe behavior on the part of persons which enables them to ascertain whether or not their opinions are correct" (p. 118). In his influential theory of social comparison processes, Festinger (1954) focused on how people evaluated the correctness of their opinions by comparing them to the opinions of others. In Section IX,B we address how the ELM accounts for attitude changes induced by exposure to the opinions of varying numbers of other people. But first we need to outline our other postulates.

III. Postulate 2: Variations in Elaboration

Postulate 2 states that:

Although people want to hold correct attitudes, the amount and nature of issue-relevant elaboration in which people are willing or able to engage to evaluate a message vary with individual and situational factors.

By *elaboration* in a persuasion context, we mean the extent to which a person thinks about the issue-relevant arguments contained in a message. When conditions foster people's motivation and ability to engage in issue-relevant thinking, the "elaboration likelihood" is said to be high. This means that people are likely to attend to the appeal; attempt to access relevant associations, images, and experiences from memory; scrutinize and elaborate upon the externally provided message arguments in light of the associations available from memory; draw inferences about the merits of the arguments for a recommendation based upon their analyses; and consequently derive an overall evaluation of, or attitude toward, the recommendation. This conceptualization suggests that when the elaboration likelihood is high, there should be evidence for the allocation of considerable cognitive resources to the advocacy. Issue-relevant elaboration will typically result in the new arguments, or one's personal translations of them, being integrated into the underlying belief structure (schema) for the attitude object (Cacioppo & Petty, 1984a). As we will note shortly, sometimes this issue-relevant elaboration proceeds in a relatively objective manner and is governed mostly by the strength of the issue-relevant arguments presented, but at other times this elaboration is more biased and may be guided mostly by the person's initial attitude.

Of course, people are not motivated nor are they able to scrutinize carefully every message that they receive (cf. McGuire's, 1969, "lazy organism"), and it would not be adaptive for them to do so. As Miller, Maruyama, Beaber, and Valone (1976) noted, "It may be irrational to scrutinize the plethora of counterattitudinal messages received daily. To the extent that one possesses only a limited amount of information processing time and capacity, such scrutiny would disengage the thought processes from the exigencies of daily life" (p. 623). Current research in cognitive and social psychology provides strong support for the view that at times people engage in "controlled," "deep," "systematic," and/or "effortful" analyses of stimuli, and at other times the analyses are better characterized as "automatic," "shallow," "heuristic," and/or "mindless" (for further discussion, see Craik, 1979; Eagly & Chaiken, 1984; Kahneman, Slovic, & Tversky, 1982; Langer, 1978; and Schneider & Shiffrin, 1977).¹

¹See Petty and Cacioppo (1986) for discussion of the relationship between these distinctions and the central/peripheral distinction of the ELM.

A. THE ELABORATION CONTINUUM

One can view the extent of elaboration received by a message as a continuum going from no thought about the issue-relevant information presented to complete elaboration of every argument, and complete integration of these elaborations into the person's attitude schema. The likelihood of elaboration will be determined by a person's motivation and ability to evaluate the communication presented (see Fig. 1). In an earlier review of the attitude change literature (Petty & Cacioppo, 1981a), we suggested that the many theories of attitude change could be roughly placed along this elaboration continuum. At the high end of this continuum are theoretical orientations such as inoculation theory (McGuire, 1964), cognitive response theory (Greenwald, 1968; Petty, Ostrom, & Brock, 1981), information integration theory (Anderson, 1981), and the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein, 1980), which all assume that people typically attempt to carefully evaluate (though not always successfully) the information presented in a message, and integrate this information into a coherent position. Researchers within this tradition have emphasized the need to examine what kinds of arguments are persuasive and how variables affect the comprehension, elaboration, learning, integration, and retention of issue-relevant information (McGuire, 1985).

Other persuasion theories do not place much credence on the arguments in a message or issue-relevant thinking. Instead, they focus on how simple affective processes influence attitudes or on how people can employ various rules or inferences to judge their own attitudes or the acceptability of an attitudinal position. Although in most laboratory studies of attitude change subjects will have some motivation and/or ability to form at least a reasonable opinion either by scrutinizing arguments or making an inference about the acceptability of the recommendation based on cues in the context, there are circumstances in which neither arguments nor acceptance cues are present. For example, when subjects are exposed to nonsense syllables (Staats & Staats, 1957) or polygons (Kunst-Wilson & Zajonc, 1980), no elaboration of arguments is possible because no arguments are presented, and validity cues may be irrelevant because there is no explicit "advocacy" to judge. Theories such as classical conditioning (Staats & Staats, 1958) and mere exposure (Zajonc, 1968, 1980), which describe evaluations of objects changing as a result of rather primitive affective and associational processes, are especially relevant under these circumstances. Although these theories have been tested and applied primarily in situations where no explicit "advocacy" is presented, they also should be applicable to situations in which an issue position is advocated, but people have virtually no ability and/or motivation to consider it. In these situations, attitudes may still be changed if the attitude object is associated with a relatively strong positive or negative affective cue, or a weaker cue is continually paired with the attitude object.

If no strong affective cues are presented, it is still possible for people to form a "reasonable" attitude without relying on scrutiny of the issue-relevant arguments presented by relying on various persuasion rules or inferences that may be either rather simple or relatively complex. For example, according to self-perception theory (Bern, 1972), people may come to like or dislike an object as a result of a simple inference based on their own behavior (e.g., if I bought it, I must like it). According to the heuristic model of persuasion (Chaiken, 1980; Eagly & Chaiken, 1984), people may evaluate messages by employing various rules that they have learned on the basis of past experience (e.g., people agree with people they like). Social judgment theory (Sherif & Sherif, 1967) proposes that people evaluate messages mostly on the basis of their perceived position—messages are contrasted and rejected if they appear too discrepant (fall in the latitude of rejection), but are assimilated and accepted if they appear closer to one's initial position (fall in the latitude of acceptance; Pallak, Mueller, Dollar, & Pallak, 1972).

In addition to the relatively simple acceptance/rejection rules proposed by the preceding models, attitude change may be affected by more complex reasoning processes, such as those based on balance theory (Heider, 1946; Insko, 1984) or certain attributional principles (e.g., Kelley, 1967; Eagly, Wood, & Chaiken, 1978). Importantly, even reliance on more complex inferences obviates the need for careful scrutiny of the issue-relevant arguments in a message. In other words, each of these processes (e.g., self-perception, assimilation, balance) is postulated to be sufficient to account for attitude change without requiring a personal evaluation of the issue-relevant arguments.² In sum, we have proposed that when either motivation or ability to process issue-relevant arguments is low, attitudes may be changed by associating an issue position with various affective cues, or people may attempt to form a reasonable opinion position by making an inference about the likely correctness or desirability of a particular attitude position based on cues such as message discrepancy, one's own behavior, and the characteristics of the message source.

B. DEVELOPMENTAL TRENDS IN ELABORATION

Interestingly, the attitude change processes that we have just described form an elaboration continuum which likely coincides with the manner in which attitude change processes develop through adulthood. Specifically, the very young child probably has relatively little motivation to think about the true merits of people, objects, and issues, and even less ability to do so. Thus, attitudes may

²Insko (1981) extended balance theory to include a person's consideration of issue-relevant arguments. This more general balance formulation therefore broadens the theory beyond peripheral processing.

be affected primarily by what feels good or bad. As children mature, they become more motivated to express correct opinions on certain issues, but their ability to scrutinize issue-relevant arguments may still be poor due to lack of knowledge. Therefore, they may be particularly reliant on certain cognitive rules based on personal experience such as, "My mother knows what's right," or "If I play with it, I must like it." Consistent with this reasoning, children have been shown to be more susceptible to appeals based on behavioral cues and self-perceptions than issue-relevant argumentation (e.g., Miller, Brickman, & Bolen, 1975).

Finally, as people move into adulthood, interests become more focused and the consequences of holding correct opinions on certain issues increase. In addition, as people's acquired knowledge and cognitive skills grow, this renders them more able to critically analyze issue-relevant information on certain topics and makes them less reliant than children on certain primitive heuristics (cf. Ross, 1981). As we noted earlier, of course, although people may have the requisite ability and motivation to scrutinize certain attitude issues, they will lack motivation and ability on others. Thus, simple inferences and affective cues may still produce attitude change in adults.

In sum, one's initial evaluations are likely to be largely hedonistic since, lacking the motivation and/or ability to consider issue-relevant arguments, attitudes will be based primarily on positive and negative affective cues associated with the attitude object. As development proceeds, some attitudes may be formed on the basis of simple inferences, decision rules, and social attachments. Finally, the formation and change of some attitudes become very thoughtful processes in which issue-relevant information is carefully scrutinized and evaluated in terms of existing knowledge. Importantly, our sequence of the developmental stages of influence is consistent with other developmental models of judgment. For example, in discussing the development of moral standards, Kohlberg (1963) identifies three developmental levels. At the first level (preconventional), moral evaluations are based primarily on the affective consequences of an act. At level 2 (conventional), evaluations of acts are based primarily on socially accepted rules and laws. Finally, at level 3 (postconventional), an evaluation of an act is based on a person's idiosyncratic but well-articulated moral code. The parallels to our stages of influence are obvious.

Although we have argued that there is a continuum of message elaboration ranging from none to complete, and that different attitude change processes may operate along the continuum, it is also important to note that these different theoretical processes can be viewed as specifying just two qualitatively distinct routes to persuasion. The first route, which we have called the "central route," occurs when motivation and ability to scrutinize issue-relevant arguments are relatively high. The second, or "peripheral route," occurs when motivation and/or ability are relatively low and attitudes are determined by positive or negative cues in the persuasion context which either become directly associated

with the message position or permit a simple inference as to the validity of the message. In short, even though one can view message elaboration as a continuum, we can distinguish persuasion that is primarily a result of issue-relevant argumentation from persuasion that is primarily a result of some cue in the persuasion context that permits attitude change without argument scrutiny. In fact, we will find it useful elsewhere in this article to talk about the elaboration likelihood continuum by referring to the prototypical processes operative at each extreme.

IV. Postulate 3: Arguments, Cues, and Elaboration

Much of our discussion so far is summarized in the next postulate.

Variables can affect the amount and direction of attitude change by: (A) serving as persuasive arguments, (B) serving as peripheral cues, and/or (C) affecting the extent or direction of issue and argument elaboration.

In subsequent sections we discuss how many of the typical source, message, recipient, channel, and context variables manipulated in the accumulated persuasion research can be understood in terms of the three-part categorization above, but first we need to define and operationalize the constructs.

A. ARGUMENT/MESSAGE QUALITY

One of the least researched and understood questions in the psychology of persuasion is "What makes an argument persuasive?" As we noted earlier, literally thousands of studies and scores of theories have addressed the question of how some extramessage factor (e.g., source credibility, repetition) affects the acceptance of a particular argument, but little is known about what makes a particular argument (or message) persuasive in isolation. In fact, the typical persuasion experiment employs only one message and examines how some extramessage factor affects acceptance of the message conclusion. Furthermore, studies that do include more than one message often do so for purposes of generalizability across topics, not because the messages are proposed to differ in some theoretically meaningful way (e.g., Hovland & Weiss, 1951). There are, of course, notable exceptions to our generalization. For example, a few studies have manipulated the comprehensibility or complexity of a message (e.g., Eagly, 1974; Eagly & Warren, 1976; Regan & Cheng, 1973), mostly to test McGuire's (1968) information processing model, but even these studies were not aimed at uncovering the underlying characteristics of persuasive arguments. Perhaps the most relevant research to date is that in which subjects are asked to rate arguments along various dimensions (e.g., validity, novelty) in order to determine what qualities make an argument persuasive (see Vinokur & Burn-

stein, 1974), but this kind of research is rare and in its infancy. After over 40 years of work on persuasion in experimental social psychology, Fishbein and Ajzen (1981) could accurately state that "the general neglect of the information contained in a message...is probably the most serious problem in communication and persuasion research" (p. 359).³

In the ELM, arguments are viewed as bits of information contained in a communication that are relevant to a person's subjective determination of the true merits of an advocated position. Because people hold attitudes for many different reasons (Katz, 1960), people will invariably differ in the kinds of information they feel are central to the merits of any position (Snyder & DeBono, 1985). Nevertheless, for purposes of testing the ELM, it is necessary to specify arguments that the vast majority of a specifiable population finds compelling rather than specious. In our research on the ELM, we have postponed the question of what specific qualities make arguments persuasive by defining argument quality in an empirical manner. In developing arguments for a topic, we begin by generating a large number of arguments, both intuitively compelling and specious ones, in favor of some issue (e.g., raising tuition). Then, members of the appropriate subject population are given these arguments to rate for persuasiveness. Based on these scores we select arguments with high and low ratings to comprise at least one "strong" and one "weak" message. Subsequently, other subjects are given one of these messages and are told to think about and evaluate it carefully. Following examination of the message, subjects complete a "thought-listing measure" (Brock, 1967; Greenwald, 1968), in which they are instructed to record the thoughts elicited by the message. These thoughts are then coded as to whether they are favorable, unfavorable, or neutral toward the position advocated (see Cacioppo & Petty, 1981c; Cacioppo, Harkins, & Petty, 1981, for further discussion of the thought-listing procedure). We define a "strong message" as one containing arguments (e.g., we should raise tuition so that more books can be purchased for the library) such that when subjects are *instructed* to think about the message, the thoughts that they generate are predominantly favorable. Importantly, for positive attitude change to occur, the thoughts should be more favorable than those available prior to message exposure. On the other hand, we define a "weak message" as one containing arguments (e.g., we should raise tuition so that more trees and shrubs can be planted on campus) such that when subjects are instructed to think about them, the thoughts that they generate are predominantly unfavorable. For negative change (boomerang) to occur, the thoughts should be more unfavorable than those available prior to message exposure.

³Notably, Fishbein and Ajzen (1975) and other expectancy value theorists (e.g., Rosenberg, 1956) have examined argument or attribute persuasiveness from a phenomenological perspective. However, the question of *why* a particular argument or attribute is seen as more positive or negative than others is still not addressed.

Once the messages meet the criterion of eliciting the appropriate profile of thoughts, they are checked for other characteristics. First, a panel of subjects rates the messages for overall believability. Our goal is to develop arguments that are strong and weak, but that do not strain credulity. (This is not to say that our arguments are necessarily veridical—just reasonably plausible to our subjects.) Next, people from the relevant subject pool rate the messages for comprehensibility, complexity, and familiarity. Again, our goal is to develop strong and weak messages that are roughly equivalent in their novelty and in our subjects' ability to understand them. The top panel of Fig. 2 depicts the results of a hypothetical study in which some extramessage "treatment" has no effect on persuasion. In this study, only the quality of the message arguments determined the extent of attitude change. We will compare this simple result with the other possibilities depicted in Fig. 2 in the remainder of this article.

B. PERIPHERAL CUES

According to the Elaboration Likelihood Model, one way to influence attitudes is by varying the quality of the arguments in a persuasive message. Another possibility, however, is that a simple cue in the persuasion context affects attitudes in the absence of argument processing. As we noted earlier, some cues will do this because they trigger relatively primitive affective states that become associated with the attitude object. Various reinforcing (e.g., food; Janis, Kaye, & Kirschner, 1965) and punishing (e.g., electric shock; Zanna, Kiesler, & Pilkonis, 1970) stimuli have proved effective in this regard. Other cues work, however, because they invoke guiding rules (e.g., balance; Heider, 1946) or inferences (e.g., self-perception; Bem, 1972).

Since cues are postulated to affect attitude change without affecting argument processing, it is possible to test manipulations as potential cues by presenting them to subjects with the advocated position only (i.e., without accompanying persuasive arguments), as in prestige suggestion (see Asch, 1948). If the manipulation is a potential cue, it should have the ability to affect attitudes in the absence of any arguments. Alternatively, one could present an incomprehensible message (e.g., in a foreign language) on some topic along with the potential cue (e.g., speed of speech; Miller *et al.*, 1976). Subjects could be asked to rate, for example, how likely it is that the speaker is convincing. Again, if the cue is operative, it should be capable of affecting judgments even if there are no arguments to process. Finally, a simple procedure might involve merely describing various potential cues to subjects (e.g., a message with 1 vs. 10 arguments; a message from an attractive vs. an unattractive source) and asking them which would more likely be acceptable and/or persuasive. These procedures would not, of course, indicate *why* a cue was effective (e.g., were the judgments due to affective association or the invocation of a simple decision rule?), nor would they

eliminate the possibility that more thoughtful processes were involved (e.g., subjects might attempt to generate arguments consistent with the position; cf., Burnstein, Vinokur, & Trope, 1973). However, these procedures would indicate whether or not a manipulation has the *potential* to serve as a peripheral cue.

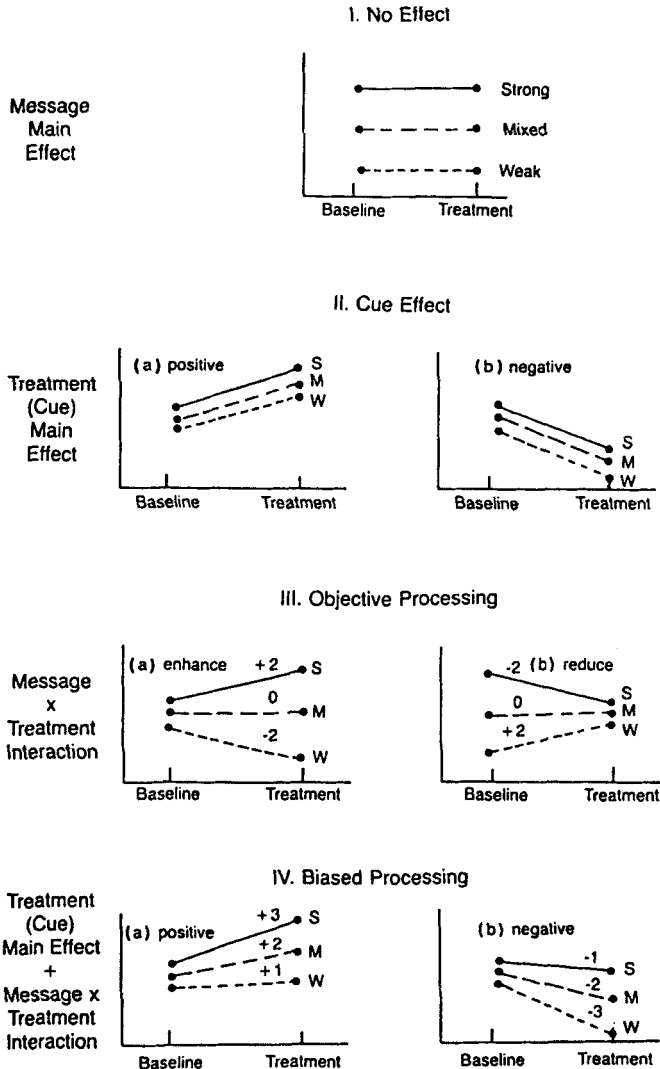


Fig. 2. Impact of variables on attitude change according to the ELM. Under conditions of high elaboration likelihood, attitudes are affected mostly by argument quality (I). Under conditions of low elaboration likelihood, attitudes are affected mostly by peripheral cues (II). Under conditions of moderate elaboration likelihood, variables may enhance or reduce message processing in either a relatively objective (III) or relatively biased (IV) manner (adapted from Petty & Cacioppo, 1984c).

Panel II in Fig. 2 presents the results of a hypothetical study in which strong, weak, and mixed argument messages were presented along with a treatment that served as a peripheral cue. Note that in the pure case of cue processing, the cue affects all three kinds of messages equally. Since cues are most likely to operate when subjects are either unmotivated or unable to process issue-relevant arguments (as depicted in Fig. 1), the data show a strong effect for the cue treatment, but little effect for argument quality. In the left half of Panel 2 the cue is positive, and in the right half the cue is negative.

C. AFFECTING ELABORATION

We have now defined two of the key constructs in the Elaboration Likelihood Model: argument quality and peripheral cues. The third way in which a variable can affect persuasion is by determining the extent or direction of message processing. Variables can affect argument processing in a relatively objective or a relatively biased manner (Petty & Cacioppo, 1981a). In relatively *objective* processing, some treatment variable either motivates or enables subjects to see the strengths of cogent arguments and the flaws in specious ones, or inhibits them from doing so. In relatively *biased* processing some treatment variable either motivates or enables subjects to generate a particular kind of thought in response to a message, or inhibits a particular kind of thought. Relatively objective elaboration has much in common with "bottom-up" processing since the elaboration is relatively impartial and data driven. Relatively biased elaboration has more in common with "top-down" processing since the elaboration, for example, may be governed by a relevant attitude schema which guides processing in a manner leading to the maintenance or strengthening of the schema (cf. Bobrow & Norman, 1975; Landman & Manis, 1983). Postulate 4 deals further with the nature of relatively objective processing, and Postulate 6 deals further with the nature of relatively biased processing.

Of course, in order to test the ELM, it is important to assess how much message processing subjects are engaged in (i.e., how much cognitive activity or effort is devoted to issue-relevant thinking), and what variables affect elaboration. We have used four different procedures to assess the extent of thinking. The first procedure is the simplest and involves directly asking people how much effort they expended in processing the message, or how much thinking they were doing about the advocacy. Although we have found this method to prove sensitive in some studies (e.g., Cacioppo, Petty, & Morris, 1983; Petty, Harkins, & Williams, 1980), in others it has not produced differences even though there were other indications of differential processing (e.g., Harkins & Petty, 1981a, 1982). The problem, of course, is that although people may sometimes be aware of how much cognitive effort they are expending, people do not always have

access to their cognitive processes (Nisbett & Wilson, 1977).

A second procedure involves using the thought-listing technique developed by Brock (1967) and Greenwald (1968). In this procedure, subjects list their thoughts either in anticipation of, during, or after message exposure, and the thoughts are subsequently categorized into theoretically meaningful units (e.g., counterarguments; source-related thoughts) by the subjects or independent judges. The thought-listing technique has proved to be an important supplemental tool in tracking the amount and type of cognitive activity involved in persuasion and resistance (see Cacioppo *et al.*, 1981; Cacioppo & Petty, 1981c; for reviews of thought-listing methodology and results). Although statistical procedures have been used to show that cognitive activity mediates attitude effects in some instances (e.g., Cacioppo & Petty, 1979b; Insko, Turnbull, & Yandell, 1974; Petty & Cacioppo, 1977), thought listings do not provide definitive evidence for cognitive mediation because the evidence is basically correlational (cf. Miller & Colman, 1981).

A third procedure that we have used to assess the extent and affectivity of information processing activity involves the use of psychophysiological measures. For example, we have shown that facial electromyographic (EMG) activity is capable of distinguishing positive from negative reactions to stimuli (e.g., Cacioppo & Petty, 1979a) and that perioral (e.g., lip) EMG activity is capable of distinguishing cognitively effortful from less taxing mental work (e.g., Cacioppo & Petty, 1981b). The physiological procedures have several potential advantages over self-reports of cognitive activity and thought listings. For example, these measures can track psychological processes over time, and may be less susceptible to artifacts (e.g., demand characteristics) and subjects' inability to recall the process or content of their thoughts. Although work on psychophysiological assessments of attitudinal processes is in its early stages, these measures hold considerable promise for tracking and marking the underlying mediation of persuasion and resistance (see Cacioppo & Petty, 1981a, 1986; Petty & Cacioppo, 1983; for reviews).

The fourth procedure for assessing the extent of cognitive processing, and the one highlighted in this article, is based on our manipulation of message argument quality. This procedure is discussed in the next section.

V. Postulate 4: Objective Elaboration

Postulate 3 noted that variables could serve as arguments, cues, or affect processing. We further noted that processing could proceed in a relatively objective or biased manner. Postulate 4 deals with objective processing. Specifically:

Affecting motivation and/or ability to process a message in a relatively objective manner can do so by either enhancing or reducing argument scrutiny.

As we hinted above, our empirical method of defining argument quality allows us to assess the extent to which a variable affects argument processing and the extent to which this processing is relatively objective or biased. We shall consider first the expected consequences of variables affecting relatively objective processing.

Assume for the moment that we have created a control condition in which motivation or ability to process issue-relevant arguments is rather low. Subjects should show relatively little differentiation of strong from weak arguments in this condition. However, if a manipulation enhances argument processing in a relatively objective manner, then subjects should show greater differentiation of strong from weak arguments. More specifically, a message with strong arguments should produce more agreement when it is scrutinized carefully than when scrutiny is low, but a message with weak arguments should produce less overall agreement when scrutiny is high rather than low. This pattern of results is depicted in the left half of Panel III in Fig. 2. In a similar fashion, we can assess the extent to which a variable disrupts processing in a relatively objective manner. Consider a situation in which subjects are processing the message arguments quite diligently. These subjects should show considerable differentiation of strong from weak arguments. However, if argument processing is disrupted, due either to reduced motivation or ability, argument quality should be a less important determinant of persuasion. More specifically, a strong message should induce less agreement when processing is disrupted than when it is not, but a weak message should produce more agreement when processing is disrupted than when it is not. The right half of Panel III in Fig. 2 depicts this pattern. In addition to subjects' attitudes being more differentiated to weak and strong messages when argument processing is high rather than low, the profile of subjects' thoughts also should show greater differentiation of arguments when processing is high rather than low.

In sum, by manipulating argument quality along with some other variable, it is possible to tell whether that variable enhances or reduces argument processing in a relatively objective manner. If the variable enhances argument processing, subjects' thoughts and attitudes should be more polarized when the variable is present rather than absent, but if the variable reduces argument processing, subjects' thoughts and attitudes should be less polarized when the variable is present rather than absent. Before moving on to our postulates concerning peripheral cues and biased processing, we review some evidence that variables can affect persuasion by affecting the extent of argument processing in a relatively objective manner.

A. DISTRACTION

Research on distraction's effect on persuasion can be traced to an intriguing study by Allyn and Festinger (1961), in which high school students were presented with a speech which argued that teenage drivers are dangerous. The students were either forewarned of the opinion topic and told that their opinions would be assessed (opinion orientation) or were told simply that they were to assess the personality of the speaker (personality orientation). Although these two conditions did not differ in the average opinion change they induced, when analyses were conducted on the most involved subjects (those with extreme opinions or those who said the issue was important), a significant difference was found such that there was more persuasion in the personality than in the opinion orientation condition. Two possible explanations for this effect were offered. The initial explanation favored by Allyn and Festinger was that the "forewarning" in the opinion orientation condition stimulated the involved students to counterargue and/or derogate the source (see also Freedman & Sears, 1965). A second explanation, proposed initially by Festinger and Maccoby (1964), was that the involved subjects in the personality orientation condition were distracted from the counterarguing and/or source derogating in which they normally would have engaged.

In the years since the Allyn and Festinger experiment, a considerable number of studies have accumulated on both "forewarning" and "distraction," and it is now clear that both effects are viable. In this section we apply the ELM framework to "distraction" and discuss how this variable works by affecting information processing in a relatively *objective* manner. In section VII,B we apply the ELM to "forewarning" and address how this variable also works by affecting information processing, but in a relatively *biased* manner.

In 1973, Baron, Baron, & Miller reviewed the accumulated research on "distraction" and concluded that although many individual studies were susceptible to a wide variety of mediational interpretations, there were just two theoretical explanations that could account for the existing data parsimoniously. One explanation was the disruption of counterarguing interpretation favored by Festinger and Maccoby. Another interpretation offered by Baron *et al.*, however, was based, ironically, on Festinger's (1957) theory of cognitive dissonance. Baron *et al.* argued that distraction manipulations require subjects to exert more effort than usual in order to understand the message. Furthermore, "since choosing to hear a counterattitudinal message can be viewed as attitude-discrepant behavior, the effort required to comprehend a counterattitudinal message will directly determine the amount of dissonance created by the choice" (p. 317). One way for subjects to reduce this dissonance, of course, is for them to justify their effort by overvaluing the communication.

At the time of the review by Baron *et al.*, the available experiments did not allow a distinction between the two alternative theories because evidence that appeared to support either the counterargument or the dissonance position also could be seen as consistent with the other account. Importantly, even research using the thought-listing technique, which showed that with increasing distraction the number of counterarguments listed decreased (Keating & Brock, 1974; Osterhouse & Brock, 1970), was open to multiple interpretations. Was a reduction in negative thoughts obtained with distraction because distraction disrupted counterarguing, or was it because distraction induced attitude change via dissonance (or some other process) which was subsequently justified in the thought listings (Miller & Baron, 1973)?

Our initial use of the manipulation of strong and weak arguments (see section IV,A) came in an experiment that attempted to distinguish the dissonance from the counterargument disruption interpretations of distraction (Petty, Wells, & Brock, 1976, Experiment 1). A second aim of our experiment was to test a more general distraction formulation than "counterargument disruption." Specifically, we reasoned that if the predominant thoughts to a message without distraction were unfavorable, then distraction should disrupt these unfavorable thoughts and lead to increased agreement. However, if the predominant thoughts to a message without distraction were favorable, then distraction should disrupt these favorable thoughts resulting in decreased agreement. Our manipulation of argument quality provides a means of assessing this general "thought disruption" hypothesis as well as testing it against the predicted results from dissonance theory.

The thought disruption interpretation holds that distraction should enhance persuasion for a message containing weak arguments (since unfavorable thoughts should dominate under no distraction and would therefore be disrupted), but that distraction should *reduce* persuasion for a message containing strong arguments (since favorable thoughts should dominate under no distraction and would therefore be disrupted). The predictions from dissonance theory are quite different, however. Research on selective exposure and attention indicates that people prefer to hear weak rather than strong arguments against their own position (Kleinhesselink & Edwards, 1975; Lowin, 1967), suggesting that exerting effort to hear strong counterattitudinal arguments would induce more dissonance than exerting effort to hear weak ones. Because of this, dissonance theory predicts that for counterattitudinal messages, distraction should enhance persuasion more for strong arguments than for weak ones.

Two discrepant messages were prepared for our study. Both messages argued that tuition at the students' university should be increased by 20%, but the messages differed in the presentation of five key arguments. As explained previously, the strong arguments were selected so that they elicited primarily favorable thoughts when subjects were instructed to think about them, and the weak

arguments were selected so that they elicited primarily negative thoughts. The distraction task required subjects to record on a monitoring sheet the quadrant in which Xs flashed on a screen in front of them. Subjects were either told that "no Xs would flash for now" (no distraction), or the Xs appeared on the screen at 15- (low distraction), 5- (medium distraction), or 3- (high distraction) sec intervals during the message. After hearing one of the messages over headphones, subjects completed attitude measures, were given 2.5 min to list their thoughts, and responded to ancillary questions. The attitude results are presented in Fig. 3, Box 1. Consistent with the general thought disruption hypothesis, a significant message quality $\times$ distraction interaction was obtained: increasing distraction was associated with more favorable attitudes when the message was weak, but increasing distraction was associated with less favorable attitudes when the message was strong. Analyses of the postmessage thoughts listed indicated that overall the messages differed in the number of counterarguments they elicited. In addition, high distraction reduced counterargument production for the weak, but not the strong message. Finally, high distraction tended to reduce the number of favorable thoughts elicited by the strong, but not the weak message.⁴

Several conceptual replications of our results have been reported. In one study, we exposed subjects to a strong or weak proattitudinal message under conditions of either low or medium distraction (Petty *et al.*, 1976, Experiment 2). As in our initial study, a significant message quality $\times$ distraction interaction was obtained: distraction was associated with increased agreement when the message was weak, but with decreased agreement when the message was strong (see Box 2, Fig. 3). In another study, Tsal (1984) prepared print ads containing strong or weak arguments for a variety of consumer products. As subjects were exposed to the ads via slides, they were either not distracted or were required to count the number of random "clicks" presented on tape. Again, distraction was associated with more favorable attitudes toward the products when the arguments were weak, but with less favorable attitudes when the arguments were strong (see also, Lammers & Becker, 1980).

In sum, the accumulated literature is very consistent with the view that distraction is one variable that affects a person's ability to process a message in a relatively objective manner. Specifically, distraction disrupts the thoughts that would normally be elicited by a message. Distraction should be especially important as a thought disrupter when people are highly motivated and able to process the message. If motivation and/or ability to process the message are low, distraction should have little effect (see Petty & Brock, 1981, for further discussion).

⁴Since the thought-listing data parallel the attitude data in nearly all of the studies that we report here, detailed results on this measure will not be described for the remaining studies that we review. Readers are referred to the original reports.

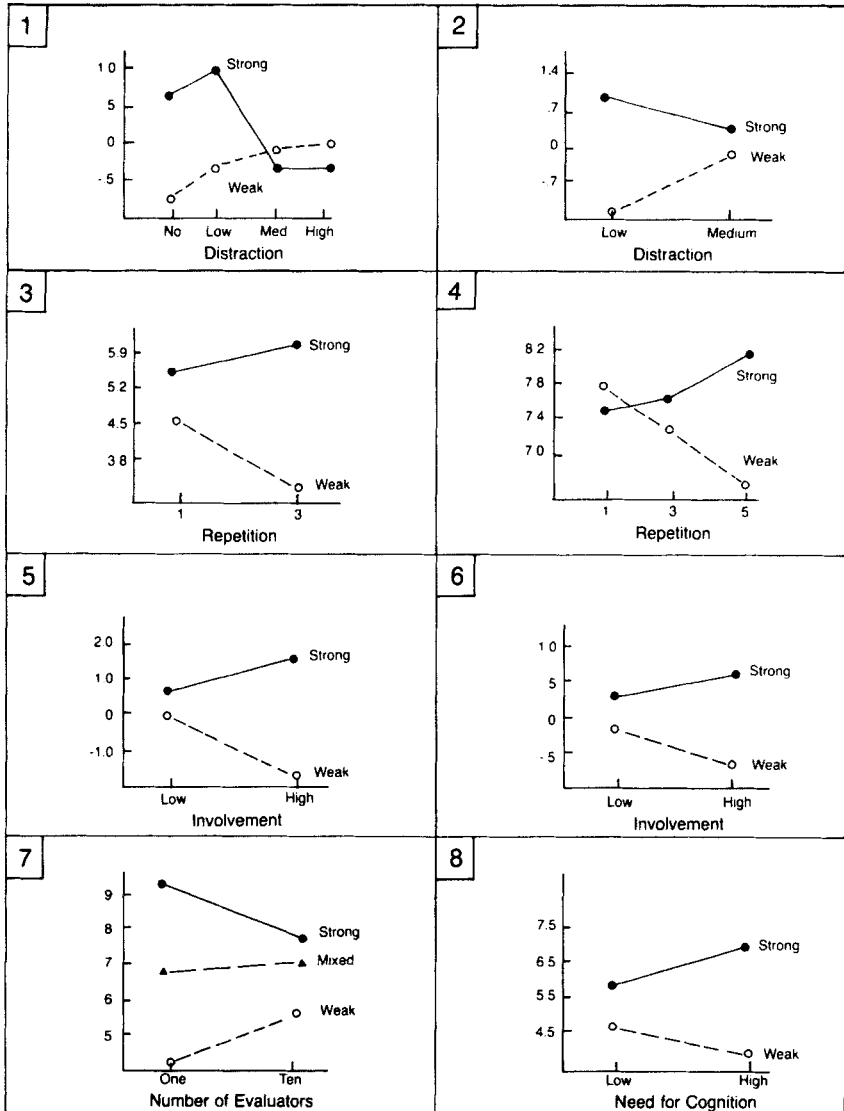


Fig. 3. Variables that may enhance or reduce elaboration in a relatively objective manner. (1) Effects of distraction on attitudes following strong and weak counterattitudinal messages (data from Petty, Wells, & Brock, 1976; Experiment 1). (2) Effects of distraction on attitudes following strong and weak proattitudinal messages (data from Petty, Wells, & Brock, 1976; Experiment 2). (3) Effects of message repetition on initial attitudes following strong and weak messages (data from Cacioppo & Petty, 1985). (4) Effects of message repetition on delayed attitudes following strong and weak messages (data from Cacioppo & Petty, 1980a, Experiment 2). (5) Effects of personal relevance on

B. REPETITION

Repetition of stimuli has been shown to increase liking (e.g., Zajonc, 1968), decrease liking (e.g., Cantor, 1968) and have no effect on attitudes (e.g., Belch, 1982). The most common finding in the persuasion literature, however, is that repeating a persuasive communication tends to first increase and then decrease agreement (e.g., Cacioppo & Petty, 1979b; Calder & Sternthal, 1980; Gorn & Goldberg, 1980). A variety of theoretical accounts has been proposed for the effects of repeated exposure, including message learning, response competition, and others (see reviews by Harrison, 1977; Sawyer, 1981).

Based on the accumulated research, we proposed that message repetition guides a sequence of psychological reactions to a persuasive communication best conceptualized as a two-stage attitude-modification process (Cacioppo & Petty, 1979b). In the first stage, repeated presentations of a message provide recipients with a greater opportunity to consider the implications of the content of the message in a relatively objective manner. Thus, just as distraction can disrupt information processing, repetition can enhance a person's ability to process the message arguments. The benefit of repetition should be most apparent when additional opportunities are needed to process a message, such as when ability to process the full implications of the message with only one exposure is low (e.g., the message is complex), or when motivation to process with one exposure is low. Once a person has considered the implications of the message, however, the second stage of information processing commences. In this second stage, the relatively objective processing of the first stage ceases as tedium and/or reactance are elicited by the excessive exposures. Both tedium and reactance will tend to result in decreased message acceptance either by serving as simple negative affective cues or by biasing the nature of information processing in a negative direction (see Section VII,C). In this section we explore the consequences of the first (objective) stage of information processing.

In order to provide a test of our view that moderate repetition can affect persuasion by increasing the opportunity to scrutinize arguments in a relatively objective manner, we conducted a study in which students were exposed to a message advocating that seniors at their university be required to take a comprehensive exam in their major area as a requirement for graduation (see Cacioppo

attitudes following pro- (strong) and counterattitudinal (weak) messages (data from Petty & Cacioppo, 1979b; Experiment 1). (6) Effects of personal relevance on attitudes following strong and weak counterattitudinal messages (data from Petty & Cacioppo, 1979b; Experiment 2). (7) Effects of personal responsibility on attitudes following strong, weak, and mixed messages (data from Petty, Harkins, & Williams, 1980; Experiment 2). (8) Effects of need for cognition on attitudes following strong and weak messages (data from Cacioppo, Petty, & Morris, 1983; Experiment 2).

& Petty, 1985, for details). As in our work on distraction, half of the subjects heard a message containing strong arguments and half heard a message containing weak arguments. In addition, half of the subjects heard the message once, and half heard the message three times in succession. An analysis of subjects' postmessage attitudes toward the senior comprehensive exam issue revealed a message quality $\times$ repetition interaction (see Box 3, Fig. 3). Subjects showed greater attitudinal differentiation of strong from weak arguments when the message was presented three times rather than just once.

In another study (Cacioppo & Petty, 1980a, Experiment 2), we provided a conceptual replication and in addition examined the delayed impact of message repetition. In this study, students were exposed to a strong or weak message in favor of raising the price of their local newspaper. The message was presented to subjects as an audiotape of a telephone interview with a local resident. The strong message emphasized the benefits subscribers would receive from the price increase, whereas the weak message emphasized the benefits to management. Subjects were instructed to evaluate the sound quality of the tapes, and the message was played either one, three, or five times in succession. Immediately following exposure, subjects listed their thoughts about the tapes and rated the sound quality. From 8 to 14 days later, individuals were contacted by an interviewer who appeared unrelated to the initial experimenter. The second experimenter, who was blind to the respondents' initial experimental conditions, inquired about a number of community issues including attitudes toward increasing the price of the local paper. Consistent with the previous study, a message quality $\times$ repetition interaction was obtained (see Box 4, Fig. 3). Again, subjects showed greater attitudinal differentiation of strong from weak arguments as repetition increased.⁵

C. PERSONAL RELEVANCE/INVOLVEMENT

We have now discussed two of the major variables that can affect a person's *ability* to scrutinize issue-relevant arguments in a relatively objective manner. Motivational variables are also important in affecting the likelihood of message elaboration. Perhaps the most important variable in this regard is the personal relevance of the message. Previous social psychological analyses of personal

⁵For exploratory purposes, a third group of subjects received a message containing novel arguments that were weak but "subtly contradictory." Subjects exposed to this message showed an inverted-U attitude pattern with repetition. It is also important to note in considering the effects of repetition that the number of repetitions required to enhance argument processing but not induce tedium or reactance will depend on a number of factors. For example, the more complex, the more lengthy, or the more rapidly presented is the message, the more repetitions that may be necessary for the full implications of the arguments to be realized. Thus, what is "moderate" and what is "excessive" repetition will depend on a number of factors (see Cacioppo & Petty, 1985).

relevance have labeled this construct (or variations of it) "ego-involvement" (Rhine & Severance, 1970; Sherif, Sherif, & Nebergall, 1965), "issue involvement" (Kiesler, Collins, & Miller, 1969), "personal involvement" (e.g., Apsler & Sears, 1968; Sherif, Kelly, Rodgers, Sarup, & Tittler, 1973), "vested interest" (Sivacek & Crano, 1982), and others. In brief, consistent with prevailing definitions, we regard personal relevance as the extent to which an advocacy has "intrinsic importance" (Sherif & Hovland, 1961) or "personal meaning" (Sherif *et al.*, 1973). Personal relevance occurs when people expect the issue "to have significant consequences for their own lives" (Apsler & Sears, 1968). Of course, relevance can be judged in terms of a variety of dimensions, such as the number of personal consequences of an issue, the magnitude of the consequences, and the duration of the consequences. For example, some advocacies may remain high in personal relevance for many people over a long period of time (e.g., changing the United States income tax structure), other advocacies may have personal relevance for a more circumscribed period and/or audience (e.g., raising college tuition), and still other advocacies may have personal relevance only under certain very transient conditions (e.g., refrigerator ads have higher relevance when a person is in the market for this appliance).⁶

Most of the early research on the personal relevance of an issue indicated that increasing personal involvement was associated with resistance to persuasion (Miller, 1965; Sherif & Hovland, 1961), and the most prominently mentioned explanation for this finding was derived from social judgment theory (Sherif *et al.*, 1965). Involvement was believed to be associated with a greater probability of message rejection because people were postulated to hold expanded "latitudes of rejection" as personal involvement increased, and incoming messages would therefore be more likely to fall within the unacceptable range of a person's implicit attitude continuum (Eagly & Manis, 1966). To account for the fact that increasing relevance was associated with increased resistance mostly for counterattitudinal and not proattitudinal issues (e.g., Eagly, 1967), Pallak *et al.* (1972) proposed that increasing involvement (or commitment) increased the probability of rejecting counterattitudinal messages because these messages were *contrasted* (seen as further away from one's own position

⁶This kind of "issue relevance" can be contrasted with another kind of self-relevance referred to as "response involvement" (Zimbardo, 1960) or "task involvement" (Sherif & Hovland, 1961). In this second kind of involvement, the attitudinal issue per se is not particularly important or relevant to the person, but adopting a position that will maximize the immediate situational rewards is (cf. Zanna & Pack, 1975). For example, the issue of raising taxes in the United States has personal implications for most United States taxpayers (high issue involvement) whereas the issue of raising taxes in England does not. However, one's expressed attitude on the latter topic may become important while entertaining one's British boss for dinner (high response involvement). In some cases, response involvement should lead to increased influence (Zimbardo, 1960) and in other cases to decreased influence (e.g., Freedman, 1964), depending upon which enhances self-presentation.

than they really were and therefore more objectionable), but proattitudinal messages were *assimilated* (seen as closer to one's own position and therefore more acceptable).

Importantly, explanations of involvement based on social judgment theory did not consider the nature of the issue-relevant arguments presented in the communication. Instead, as involvement increased, a message was thought to induce increased assimilation (and acceptance) or increased contrast (and rejection) based on the particular position that it was judged to espouse. The ELM suggests an alternative analysis of the effects of personal involvement or relevance (Petty & Cacioppo, 1979b). Specifically, we suggested that as personal relevance increases, people become more motivated to process the issue-relevant arguments presented. As the personal consequences of an advocacy increase, it becomes more important for people to form a veridical opinion because the consequences of being incorrect are greater. Because of the greater personal implications people should be more motivated to engage in the cognitive work necessary to evaluate the true merits of the proposal.

Much of the early work on issue involvement was conducted by finding existing groups that differed in the extent to which an issue was important (as assessed by membership in issue-relevant groups), and thus was correlational in nature (e.g., Hovland, Harvey, & Sherif, 1957). More recent investigators have chosen to study issue relevance by varying the issue and message between subjects (e.g., Lastovicka & Gardner, 1979). For example, some undergraduate students would receive a message on a highly involving issue (e.g., increasing tuition), whereas others would receive a message on an issue of low relevance (e.g., increasing park acreage in a distant city; Rhine & Severance, 1970). Although this research is interesting in that these involvement classifications probably capture the personal relevance concept as it often occurs in the "real world," several interpretive problems are introduced. Specifically, distinctions based on different kinds of people or different issues may confound personal relevance with other factors (see discussion by Kiesler *et al.*, 1969). One particularly likely confound is that people in the high relevance groups or who receive the high relevance issues may be more familiar with the issue and may have more topic-relevant knowledge. Thus, in addition to possessing greater motivation to process the messages, it is likely that these subjects also have greater ability to do so. Thus, when a message contains information that is inconsistent with subjects' initial opinions, high relevance subjects should be more motivated and generally more able to generate counterarguments to the arguments presented. However, when a message contains information that is consistent with the subjects' initial attitudes, high relevance subjects should be more motivated and generally more able to elaborate the strengths of the arguments. In sum, it is possible that differences in message-relevant elaboration between high and low relevance subjects (rather than assimilation/contrast effects) may account for the different

effects obtained for pro- and counterattitudinal issues in previous research on personal involvement.

In order to test our formulation, we first sought to replicate previous research using a manipulation of personal relevance that did not include differences in familiarity with the issue and arguments as a component. Employing a procedure introduced by Apsler and Sears (1968), we had subjects in both high and low relevance groups receive the same message on the same topic, but high involvement subjects were led to believe that the advocacy would affect them personally, whereas low involvement subjects were led to believe that the advocacy would have no personally relevant implications.

In our initial experiment (Petty & Cacioppo, 1979b, Experiment 1), undergraduate students received either a proattitudinal message extolling the virtues of more lenient coed visitation hours on college campuses, or a counterattitudinal message contending that colleges should be more strict in their coed visitation policies. The message arguments were pretested so that the counterattitudinal message arguments were weak and elicited predominantly unfavorable thoughts, and the proattitudinal message arguments were strong and elicited predominantly favorable thoughts when subjects were instructed to think about them. To manipulate personal relevance, half of the subjects was told that the speaker was advocating that the change in visitation hours be implemented at their own university (Notre Dame), whereas the other half was told that the speaker advocated the change for a distant college (Juanita Junior College). As depicted in Box 5 of Fig. 3, a message direction/quality $\times$ relevance interaction was obtained on the measure of subjects' attitudes toward the change in visitation policy. When the message was counterattitudinal (and weak), increased relevance was associated with decreased acceptance, but when the message was proattitudinal (and strong), increased relevance was associated with greater acceptance.

Although this study provides evidence consistent with our view that increasing personal relevance enhances motivation to scrutinize message content, it is still possible that attitude change was mediated by assimilation/contrast effects since the strong arguments advocated a proattitudinal position and the weak arguments advocated a counterattitudinal one. To provide a stricter test of the Elaboration Likelihood Model, we conducted a second experiment (Petty & Cacioppo, 1979b, Experiment 2) in which all subjects were exposed to a counterattitudinal message advocating that college seniors should be required to pass a comprehensive exam in their major area as a requirement for graduation. For half of the subjects, the arguments in the message were strong and compelling, and for the other half, the arguments were weak and specious. Finally, for half of the subjects the speaker advocated that the exam policy be instituted at their own university (University of Missouri), and for half the speaker advocated implementation at a distant school (North Carolina State). The results were identical to

those in the preceding study (see Box 6, Fig. 3). A message quality $\times$ relevance interaction indicated that as relevance increased, subjects' attitudes and thoughts showed greater discrimination of strong from weak arguments. More specifically, when the message was strong, increasing relevance produced a significant increase in attitudes, but when the message was weak, increasing relevance produced a significant decrease in attitudes.

In the context of examining the effects of other variables, we have replicated the interaction of personal relevance and argument quality several times (e.g., Petty, Cacioppo, & Heesacker, 1981; Petty & Cacioppo, 1984a). Subsequent studies have also supported the view that as personal relevance increases, information processing increases in intensity and/or complexity (e.g., Harkness, DeBono, & Borgida, 1985; see Burnkrant & Sawyer, 1983). Although this research is consistent with the idea that people become more likely to undertake the cognitive work of evaluating issue-relevant arguments as personal relevance increases, several caveats are in order concerning possible limitations on this effect. First, we suspect that there are some circumstances where personal interests are so intense, as when an issue is intimately associated with central values (e.g., Ostrom & Brock, 1968), that processing will either terminate in the interest of self-protection or will become biased in the service of one's own ego (e.g., Greenwald, 1980, 1981).

A second factor to consider, however, is that, as we noted above, in the "real world" there is likely to be a natural confounding between the personal relevance of an issue and the amount of prior thinking a person has done about the pool of issue-relevant arguments. There are at least two potentially important consequences of this prior thinking. First, because of the prior consideration, people may have a greater ability or may be more practiced in defending their beliefs. This would reduce susceptibility to counterattitudinal appeals. Second, if a person has considered an issue many times in the past, it may be more difficult to motivate the person to think about another message on the same topic because the person may feel that all arguments have been evaluated (and rejected) already. This would make it less likely that new compelling arguments would be processed.

A final factor to consider is the empirically derived nature of the strong and weak arguments used in our research. This empirical derivation is an important methodological tool in that it allows us to test the extent of argument processing induced by different variables. However, in the "real world," where persuaders are often confined to posing arguments that are veridical (rather than plausible), it may generally be difficult to generate arguments on some issues that elicit primarily favorable thoughts when people scrutinize them. Importantly, even if all of these factors combine to make it generally more difficult to obtain increased persuasion with increased personal relevance in the real world, the ELM accounts for this resistance by tracking the extent to which enhancing relevance affects the elaboration of the issue-relevant arguments presented.

D. PERSONAL RESPONSIBILITY

We have argued and provided evidence for the view that personal relevance enhances motivation to process issue-relevant arguments. There is also reason to believe that personal responsibility produces similar effects. Ever since Ringelmann, a German researcher, found that group productivity on a rope-pulling task failed to reach the levels predicted based on individual performance (see Steiner, 1972), several contemporary social psychologists have replicated this effect and pursued its underlying cause. Recent research has documented that at least part of the reduced performance in groups (called "social loafing" by Latané, Williams, & Harkins, 1979) results from loss of motivation rather than ability (Ingham, Levinger, Graves, & Peckham, 1974; Latané *et al.*, 1979).

Although most of the research following Ringelmann has focused on tasks requiring physical exertion (e.g., Harkins, Latané, & Williams, 1980; Kerr & Bruun, 1981), in an exploratory study we examined the possibility that people who shared responsibility for a *cognitive* task would exert less *mental* effort than people who were individually responsible. In this study (Petty, Harkins, Williams, & Latané, 1977) we asked undergraduates to judge a poem and an editorial ostensibly written by fellow students. Our subjects were led to believe that they were the only one, 1 of 4, or 1 of 16 evaluators. All of them actually read the same two communications, and after exposure to each stimulus they were asked three questions designed to measure their perceived cognitive involvement in the task (e.g., to what extent were you trying hard to evaluate the communication?). Students who were solely responsible for the evaluation reported putting more effort into their evaluations than those who shared responsibility. Although no measures of actual cognitive effort or work were obtained in our initial study, subsequent research has obtained relevant evidence. For example, Harkins and Petty (1982) employed a brainstorming task in which students were asked to generate uses for objects. The students were either told that "you alone are responsible for listing uses" or that "you share the responsibility for listing uses for this object with nine other persons whose uses will be combined with yours." When confronted with objects for which it was relatively easy to generate uses (i.e., knife, box), solely responsible subjects generated significantly more uses than subjects who shared the responsibility (when the task was more difficult and challenging, no loafing was obtained).

In three studies, Brickner, Harkins, and Ostrom (1985) asked subjects to list their thoughts about the implementation of senior comprehensive exams (no messages were presented). Subjects were either told that they were the only person listing thoughts or that they shared the responsibility with a partner. In addition, the personal relevance of the exam proposal was varied by telling subjects either that the exam proposal was being considered for next year at their own university or that it was being considered either for a future date or for another university. When the issue was low in personal relevance, subjects who

shared responsibility generated significantly fewer thoughts than those who were individually responsible. As might be expected if personal relevance motivates issue-relevant thinking (Petty & Cacioppo, 1979b), less loafing occurred in groups when the issue had high personal relevance.

The implications of this research for persuasion are straightforward: the greater the personal responsibility for evaluating an issue, the more people should be willing to exert the cognitive effort necessary to evaluate the issue-relevant arguments presented. To test this hypothesis, we asked undergraduates to provide peer feedback on editorial messages ostensibly written by journalism students (Petty, Harkins, & Williams, 1980, Experiment 2). Subjects were led to believe that they were either the only person responsible for evaluating an editorial or 1 of 10 people who shared the responsibility. Subjects received one of three versions of a message arguing that seniors should be required to pass a comprehensive exam in their major as a requirement for graduation. One message contained strong arguments, another contained weak arguments, and a third contained a mixture of arguments (and elicited a mixture of favorable and unfavorable thoughts). After reading the appropriate message, subjects provided an evaluation and listed their thoughts. The attitude results, graphed in Box 7 of Fig. 3, revealed a message quality $\times$ responsibility interaction. As personal responsibility for evaluation decreased, the quality of the arguments in the message became a less important determinant of the evaluations. More specifically, group evaluators were significantly more favorable toward the weak message, but were significantly less favorable toward the strong message than individual evaluators. As expected, evaluations of the mixed message were unaffected by the extent of responsibility.

E. NEED FOR COGNITION

Just as there are situational factors that influence the likelihood that individuals will think about and elaborate upon the arguments provided in a message, so too must there be individual factors governing message processing, and, indirectly, persuasion. Cohen, Stotland, and Wolfe (1955) introduced an individual difference called the "need for cognition," which they described as "a need to structure relevant situations in meaningful, integrated ways. It is a need to understand and make reasonable the experiential world" (p. 291). Early research on this construct suggested that people high in need for cognition made more discriminating judgments and were more motivated to think about persuasive communications (e.g., Cohen, 1957). Unfortunately, the objective tests used to gauge individual differences in need for cognition were never described in detail or published, and are apparently no longer available. Because of the great relevance of individual differences in motivation to think to the ELM and to

cognitive social psychology more generally, we developed and validated a new assessment instrument (Cacioppo & Petty, 1982; Cacioppo, Petty, & Kao, 1984). Specifically, in an initial study, we generated a pool of statements concerning a person's reactions to engaging in effortful thinking in a variety of situations (e.g., "I really enjoy a task that involves coming up with new solutions to problems") and tested them on two groups of people presumed to differ substantially in their tendencies to engage in and enjoy effortful cognitive endeavors (i.e., university faculty vs. assembly line workers). Thus, the need for cognition scale (NCS) was designed to distinguish individuals who dispositionally tend to engage in and enjoy effortful analytic activity from those who do not (see Cacioppo & Petty, 1982, 1984b, for further information about scale construction and validation).

The results of several studies indicate that individuals high in need for cognition do indeed enjoy relatively effortful cognitive tasks, even in the absence of feedback about performance. For example, in one study (Cacioppo & Petty, 1982; Experiment 4), subjects were given either simple or complex rules to use in performing a boring number circling task. Afterward, subjects were asked to express their attitudes about the task. Results revealed that subjects generally disliked the task, but a significant interaction revealed that individuals high in need for cognition tended to prefer the complex to the simple task whereas individuals low in need for cognition tended to prefer the simple to the complex task. In another study, subjects who were low in need for cognition "loafed" on a brainstorming task when they were part of a group that was responsible for generating uses for an object, but subjects who were high in need for cognition did not loaf on this cognitive task (i.e., they generated the same high number of uses whether they were solely or jointly responsible; Petty, Cacioppo, & Kasmer, 1985).

Again, the implications for responses to persuasive communications are straightforward. If people high in need for cognition tend to engage in and enjoy effortful cognitive activity, they should be particularly likely to evaluate a message by scrutinizing and elaborating the issue-relevant arguments presented. In order to test this hypothesis, we exposed high and low need for cognition subjects to a set of strong or weak arguments for a counterattitudinal position (raising tuition at their university; Cacioppo *et al.*, 1983, Experiment 2). After message exposure, subjects were asked to provide an overall evaluation of the message arguments and their personal opinion about the issue. Both measures indicated that subjects high in need for cognition scrutinized the message more carefully than subjects low in need for cognition. Specifically, the strong and weak messages induced more polarized evaluations and attitudes for high than low need for cognition subjects (attitude results are graphed in Box 8, Fig. 3). In addition, we reasoned that if subjects high in need for cognition were more likely to derive their attitudes through a considered evaluation of the arguments central

to the recommendation, then there should be a stronger association between message evaluations and attitudes for subjects high than low in need for cognition. Separate correlations within each group provided support for this hypothesis. As expected, the correlation between argument evaluation and personal opinion was significantly larger in the high ($r = .70$) than the low ($r = .22$) need for cognition group.

VI. Postulate 5: Elaboration versus Cues

It is now clear that a wide variety of variables can affect a person's motivation and/or ability to consider issue-relevant arguments in a relatively objective manner. The implications of this are that when the arguments in a message are "strong," persuasion can be increased by enhancing message scrutiny but reduced by inhibiting scrutiny. However, when the arguments are weak, persuasion can be increased by reducing scrutiny, but can be decreased by enhancing scrutiny. In detailing these processes (depicted in Panel III, Fig. 2), Postulate 4 brings under one conceptual umbrella the operation of a seemingly diverse list of variables such as distraction, repetition, personal relevance, and others, whose effects had been explained previously with a variety of different theories (e.g., dissonance, social judgment). In Section IX we discuss additional variables that affect objective processing.

Although it is now apparent that argument quality will be an important determinant of persuasion when motivation and ability to process message arguments are high, what happens when motivation and/or ability are low? Postulate 5 addresses this issue:

As motivation and/or ability to process arguments is decreased, peripheral cues become relatively more important determinants of persuasion. Conversely, as argument scrutiny is increased, peripheral cues become relatively less important determinants of persuasion.

In the remainder of this section we examine this postulate in regard to variables affecting processing in a relatively objective manner (e.g., personal relevance). In Section VII, we apply this same postulate to variables affecting processing in a relatively biased manner.

A. PERSONAL RELEVANCE/INVOLVEMENT AND THE OPERATION OF CUES

Testing Postulate 5 requires establishing two kinds of persuasion contexts: one in which the likelihood of message-relevant elaboration is high, and one in

which the elaboration likelihood is low. In discussing Postulate 4 we noted several candidates for varying the elaboration likelihood (e.g., distraction, repetition), but most research pertaining to this postulate has varied the personal relevance of the communication. In this section we discuss our own work and other studies in which peripheral cues were tested under different personal relevance conditions. We focus first on source cues, and then on message cues.

1. Source Cue Studies

In our initial investigation of source cues, we asked college students to listen to a message over headphones that advocated that seniors be required to pass a comprehensive exam in their major as a requirement for graduation (Petty, Cacioppo, & Goldman, 1981). Three variables were manipulated in the study: personal relevance, argument quality, and source expertise. In the high relevance conditions, the speaker advocated that the exam policy be instituted at the students' own university next year, thereby affecting all current students. In the low relevance conditions, the speaker advocated that the policy begin in 10 years, thereby affecting no current students. Half of the students heard eight cogent arguments in favor of the recommendation and half heard eight weak arguments. Finally, half of the students were told that the tape they would hear was based on a report prepared by a local high school class, and half were told that the tape was based on a report prepared by the Carnegie Commission on Higher Education, which was chaired by a Princeton University Professor. The expertise of the message source, of course, provides a peripheral cue that permits an assessment of the advocacy without any need to think about the issue-relevant arguments.

Following message exposure, subjects rated their attitudes concerning comprehensive exams. In addition to significant main effects for source and arguments (more favorable evaluations with strong than weak arguments, and expert than inexperienced source), two significant interactions provided support for Postulate 5. First, a relevance $\times$ message quality interaction replicated our previous finding that argument quality was a more important determinant of persuasion for high than low relevance subjects (Petty & Cacioppo, 1979b). In addition, however, a relevance $\times$ source expertise interaction indicated that the source cue was a more important determinant of attitudes for low than high relevance subjects. The results for all cells of this study are graphed in the left half of Fig. 4. In the top panel it can be seen that under low relevance conditions, increasing source expertise enhanced attitudes regardless of message quality (a cue effect as depicted in the left side of Panel II in Fig. 2). However, in the bottom left panel of Fig. 4, it can be seen that under high relevance conditions, source expertise had no impact on attitudes; only argument quality was important.

In a conceptual replication of this study we employed a different manipulation of relevance, a different issue and arguments, a different cue, and a different

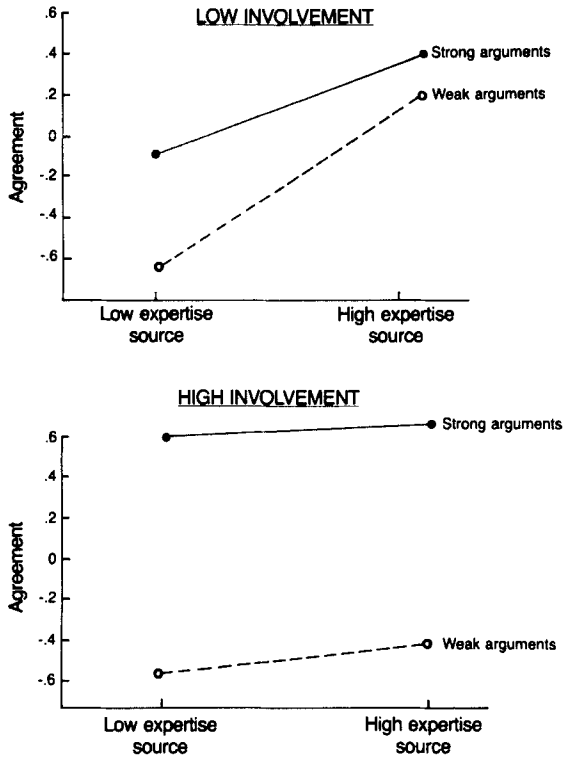


Fig. 4. Source factors under high and low relevance. (Left) Source expertise serves as a peripheral cue under low relevance conditions (top), but only argument quality affects attitudes under high relevance (bottom) (data from Petty, Cacioppo, & Goldman, 1981). (Right) Famous product endorsers serve as a peripheral cue under low relevance conditions (top), but only product quality information affects attitudes under high relevance (bottom) (data from Petty, Cacioppo, & Schumann, 1983).

method of message presentation. In this study (Petty, Cacioppo, & Schumann, 1983), undergraduates were asked to examine a booklet containing 12 magazine advertisements. Each of the ads was preceded by a brief description of the purpose of the ad. A variety of both familiar and unfamiliar ads appeared in the booklet, but the crucial ad was for a fictitious new product, "Edge disposable razors." Two things were done to either enhance or reduce the personal relevance of the ad for this product. In the high relevance groups, the ad was preceded by a description indicating that the product would be test marketed soon in the subjects' community. In the low relevance groups, the crucial ad was preceded by a description indicating that the product would be test marketed soon in several distant cities. In addition, all subjects were told before examining any

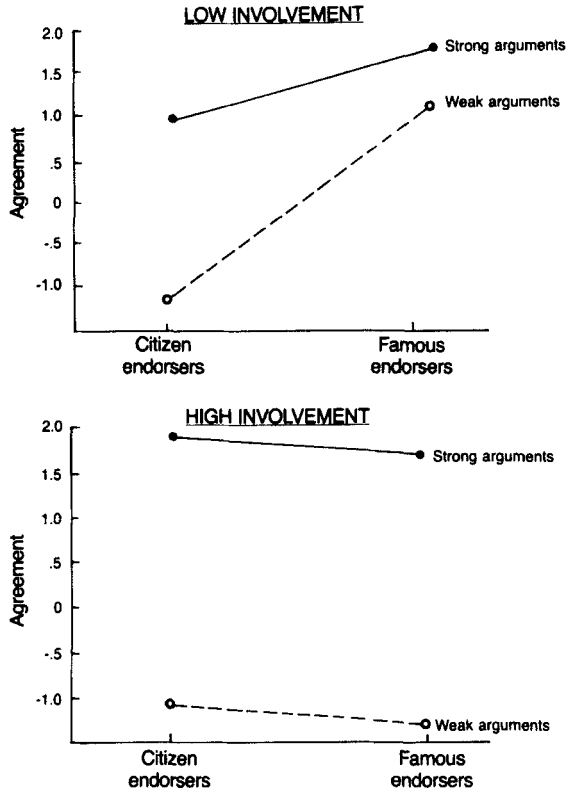


Fig. 4. (continued).

ads that at the end of the experiment they would be given a free gift for their participation. In the high relevance groups, they were told that they would be allowed to choose among several brands of disposable razors. In the low relevance groups, they were told that they would be selecting among brands of toothpaste (an ad for toothpaste appeared in the ad booklet). In sum, the high relevance subjects were not only led to believe that the crucial product would be available in their local area soon, but they also believed that they would make a decision about the product class. In contrast, the low relevance subjects believed that the product would not be available in their local area in the foreseeable future and did not expect to make a decision about that product class.

Four different versions of the razor ad were constructed. Two featured photographs of two well-known and -liked sports celebrities, and two featured middle-aged citizens described as Californians. The product endorsers served as the manipulation of the peripheral cue. Finally, two of the ads contained six

persuasive statements about the product (e.g., handle is tapered and ribbed to prevent slipping) and two ads contained six specious or vague statements (e.g., designed with the bathroom in mind).

Following examination of the ad booklet, subjects indicated their attitudes about the products depicted, including of course, Edge razors. In addition to main effects for argument quality and relevance (more favorable attitudes with strong than weak arguments and low than high relevance), two significant interactions paralleled the results of our previous study (Petty, Cacioppo, & Goldman, 1981). A relevance $\times$ message quality interaction revealed that the arguments in the ad were a more important determinant of product attitudes for high than low relevance subjects, but a relevance $\times$ endorser interaction revealed that the status of the product endorsers was a more important determinant of attitudes for low than high relevance subjects. The results of this study are graphed in the right half of Fig. 4. In the top panel it can be seen that the endorsers served as a simple cue under low relevance conditions (enhancing the effectiveness of both messages). The bottom panel indicates that only argument quality affected attitudes in the high relevance conditions.

Other studies have also provided support for Postulate 5 by showing that simple source cues are more important determinants of persuasion when personal relevance is low rather than high. For example, in one of the earliest experimental studies on source expertise, Hovland and Weiss (1951) had subjects read a message and then told them about the source. The source was either highly credible or lacked credibility. Four different topics (with appropriate sources) were used in the experiment. Although Hovland and Weiss in collapsing their data across the four topics concluded that the high credibility sources produced more change than the sources of low credibility, an analysis of the credibility effect for individual topics indicates that the credibility effect was reasonably strong for the two topics with the lowest direct relevance and prior knowledge (e.g., "Can a practical atomic powered submarine be built in the present time?"), but was weak and insignificant for the two most relevant topics (e.g., "As a result of TV, will there be a decrease in the number of movie theaters in operation by 1955?").

In a more recent study, Chaiken (1980; Experiment 2) manipulated the personal relevance of an issue by telling students that their university was considering switching from a semester to a trimester system either next year or after they graduated. Subjects either read a message from a likable source who presented one strong argument or from a dislikable source who presented five strong arguments. When the issue was of little relevance, the likable source was significantly more persuasive than the dislikable source (i.e., the source cue was effective). When the issue was of high relevance, however, subjects tended to be more persuaded by the message with five strong arguments than one even though the source was dislikable (see also Rhine & Severance, 1970).

2. *Message Cue Studies*

Distinctions between attitude changes based on source factors versus changes based on message factors have a long history in social psychology (e.g., Kelman & Hovland, 1953). In fact, the studies of source cues just described may appear to provide evidence consistent with the distinctions others have made between source and message orientations (e.g., Kelman & Eagly, 1965; McDavid, 1959; Harvey, Hunt, & Schroder, 1961). However, the central/peripheral distinction of the ELM is not equivalent to a source/message dichotomy. Importantly, the ELM holds that both source and message factors may serve as peripheral cues (and both source and message factors may affect information processing; see Section IX,B). Consider a person who is not motivated or able to think about the actual merits of the arguments in a message. For this person, it might be reasonable to assume that the more arguments contained in the message, the more meritorious it is. Although the literature on persuasion clearly indicates that increasing the number of arguments in a message is often an effective way to increase persuasion (e.g., Eagly & Warren, 1976; Insko, Lind, & LaTour, 1976; Maddux & Rogers, 1980), most have argued that this is because with more arguments, people generate and/or integrate more favorable issue-relevant beliefs (e.g., Calder, Insko, & Yandell, 1974; Chaiken, 1980). According to the ELM, it would be possible for the number of arguments in a message to affect issue-relevant thinking in some circumstances, but to affect persuasion by serving as a simple cue in other situations.

To test this hypothesis we conducted two studies (Petty & Cacioppo, 1984a). In one experiment, undergraduates received a written message on the topic of instituting senior comprehensive exams. For some subjects, the message had high personal relevance (it advocated that the exam policy begin at their university next year), and for others the relevance was very low (it advocated that the exam policy be instituted in 10 years). Subjects received one of four messages in favor of the exam proposal. One message contained nine strong arguments, one contained three strong arguments (randomly selected from the nine), one contained nine weak arguments, and one contained three weak ones (randomly selected from the nine). Following exposure, subjects gave their attitudes on the exam proposal. A main effect for message quality was obtained as were two significant interactions. A relevance $\times$ message length interaction revealed that the number of arguments in the message was a more important determinant of persuasion under low than high relevance. However, a relevance $\times$ message quality interaction revealed that the cogency of the arguments presented was a more important determinant of persuasion under high than low relevance conditions. The top half of Fig. 5 graphs the results. In the left panel it can be seen that under low relevance, the number of arguments serves as a simple cue, increasing agreement regardless of argument quality. In the right panel, it can be seen that under high relevance, the number of arguments acts to enhance argument pro-

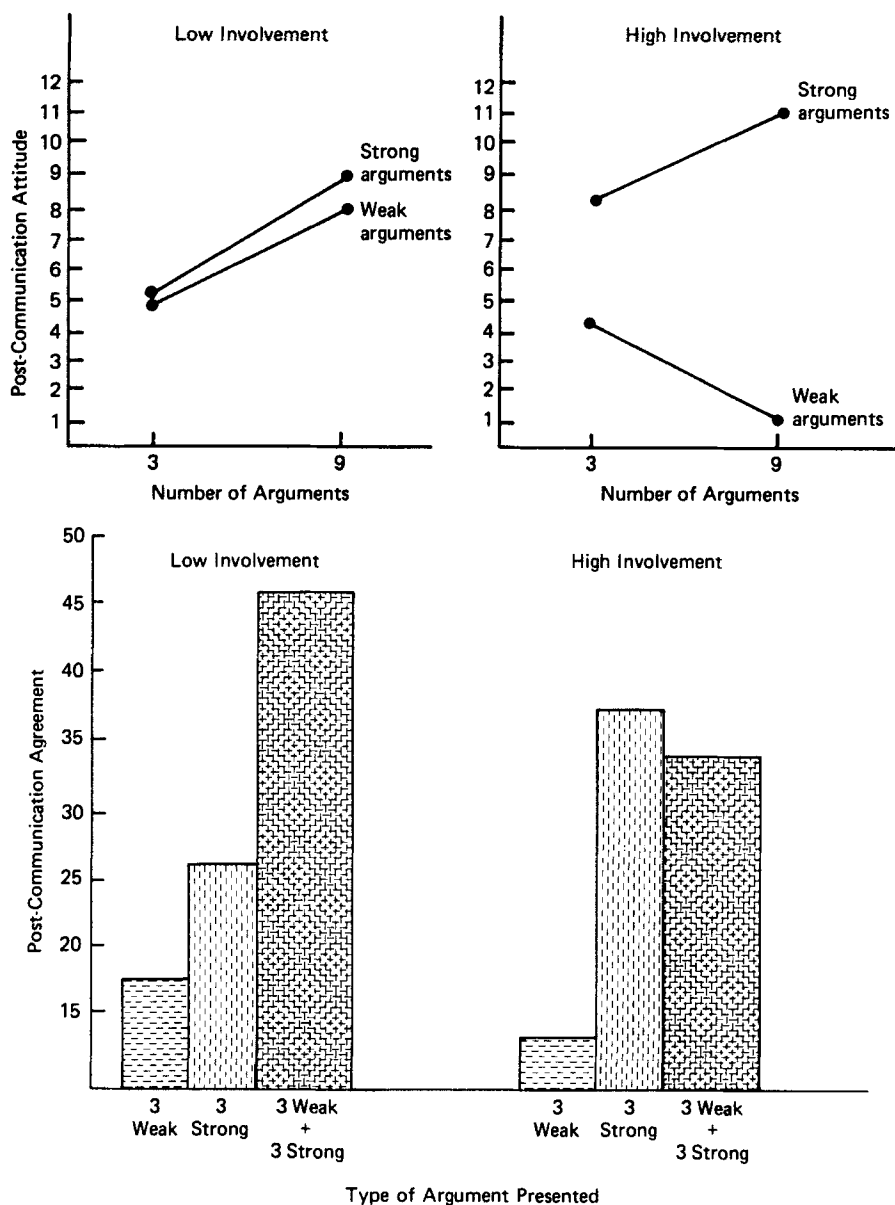


Fig. 5. Message factors under high and low relevance. (Top) Number of message arguments serves as a peripheral cue under low relevance conditions (left) but affects information processing under high relevance (right) (data from Petty & Cacioppo, 1984a; Experiment 2). (Bottom) Number of message arguments serves as a peripheral cue under low relevance (left) but affects information processing under high relevance (right) (data from Petty & Cacioppo, 1984a; Experiment 1).

cessing: when the arguments are strong increasing their number enhances persuasion, but when their quality is weak, increasing their number reduces persuasion.

In our second study, undergraduates were asked to read one of three messages. All of the messages concerned a faculty proposal to increase tuition, but in the high relevance conditions the proposal was for the students' own university, whereas in the low relevance conditions the proposal was for a distant but comparable university. The message that subjects read contained either three cogent arguments, three weak arguments or six arguments (three strong and three weak). After reading the assigned message, subjects indicated their attitudes toward the idea of raising tuition. Statistical comparison of the messages processed under high and low relevance conditions revealed the following (see bottom half of Fig. 5). When the issue was of low relevance, three strong arguments did not elicit more agreement than three weak arguments, but the message with six arguments (three strong and weak) elicited more agreement than either of the three-argument messages. When the message was highly relevant, however, three strong arguments did elicit more agreement than three weak arguments, but the six-argument message did not enhance persuasion over presenting three strong arguments. Again, argument quantity served as a cue under low relevance, but argument quality was more important under high relevance.

Langer, Blank, and Chanowitz (1978) explored the importance of the perception of arguments in a field study of compliance. All subjects in this study were standing in line to make copies when a confederate approached them with a request to make either 5 (low personal consequences) or 20 (high consequences) copies. The request was accompanied by either a valid reason ("I'm in a rush"), a "placebic" reason ("I have to make copies"), or no reason. Both kinds of reasons were more successful than no reason when the personal consequences were low (i.e., argument quality was unimportant), but the valid reason was significantly more potent than the placebic reason when the personal consequences were high. Folkes (1985) provided a partial replication of this effect. In two field studies using the inconsequential request (making five copies), respondents were equally willing to comply whether the request contained the valid or the placebic reason. In a third study, however, subjects were asked to guess how they would respond to the requests and to "think carefully before answering." When instructed to think before responding, the valid reason produced significantly more anticipation of compliance than the placebic reason.⁷ In sum,

⁷Although providing a partial replication of Langer *et al.* (1978), Folkes takes issue with Langer's assertion that the placebic information is processed "mindlessly." Folkes argues that if the reasons are processed automatically under low consequences conditions, then a poor reason should be as effective as a valid one. However, she found that a poor reason (e.g., "because I don't want to wait") was significantly less effective than a valid or placebic one under low consequences conditions. The ELM would predict that the validity of a reason would become even *more* important when the personal consequences are high. This was untested in Folkes' study.

as personal relevance or thoughtfulness increases, the quality of issue-relevant arguments becomes more important than the quantity of arguments provided.

3. *Additional Cue Studies*

In addition to the research on source and message cues noted above, other studies have provided support for Postulate 5 by showing that simple cues are more important determinants of evaluations when personal relevance is low rather than high. For example, in one study, Gorn (1982) manipulated the personal relevance of a product (pen) and exposed subjects to ads for two different brands. One ad was attribute oriented and provided product-relevant information (e.g., "never smudges"), whereas the other ad featured pleasant music rather than information. Of the subjects in the high relevance condition, 71% chose the pen advertised with information, but in the low relevance condition, 63% chose the pen advertised with the pleasant music ($p < .001$; see Batra & Ray, 1984, 1985, for further discussion on how affectively oriented ads have greater impact under conditions of low than high involvement).

In two pertinent studies, Borgida and Howard-Pitney (1983) varied the visual prominence of discussants in a videotaped two-person conversation along with the personal relevance of the discussion topic. Previous research had shown that observers' evaluative judgments and attributions of causality tended to be more extreme for visually salient than nonsalient actors, a phenomenon called "top of the head" processing by Taylor and Fiske (1978). Based on the research we reviewed previously showing that personal relevance enhances message processing and reduces cue potency, Borgida and Howard-Pitney reasoned that perceivers' judgments of the discussion should become less influenced by the seemingly trivial visual salience cue (and presumably more by the content of the discussion) as the topic increased in personal importance. Their results supported this reasoning.

In sum, the accumulated research on personal relevance has provided strong support for Postulate 5 (see also, Taylor, 1975). Some studies have shown that various simple cues in the situation (i.e., source credibility/likability, mere number of arguments, pleasant music, visual salience) exert a more powerful effect on judgments when personal relevance is low rather than high. Other studies have shown that the quality of issue-relevant arguments exerts a more powerful effect on judgments when personal relevance is high rather than low. Still other studies have demonstrated both of these effects within the same experiment (e.g., Petty, Cacioppo, & Goldman, 1981).⁸

⁸Chaiken (1980) argued that just as issue relevance can determine the route to persuasion (Petty & Cacioppo, 1979b), so too can manipulations of response involvement, such as varying whether or not a person expects to be interviewed on an issue (see footnote 5). We suspect that this is true mostly when issue relevance is also reasonably high (as it was in Chaiken's study; Experiment 1). If issue

B. OTHER MODERATORS OF CUE EFFECTIVENESS

The research that we have just reviewed clearly indicates that the personal relevance of a message is an important determinant of the route to persuasion. According to the Elaboration Likelihood Model, however, other variables should also determine the route to persuasion by affecting a person's motivation and/or ability to process the arguments in a message. In discussing Postulate 4, we identified five variables that affect motivation and/or ability to process a message in a relatively objective manner. Each of these variables should be capable of moderating the route to persuasion.

For example, in an early study we showed how distraction disrupted argument processing resulting in more agreement when the arguments were weak but less agreement when the arguments were strong (Petty *et al.*, 1976). Just as arguments become less important determinants of persuasion as distraction is increased, simple cues should become *more* important determinants of persuasion as distraction is increased. Although this hypothesis has not been tested directly, available research is consistent with this idea. In one study, Kiesler and Mathog (1968) exposed undergraduates to a variety of relatively involving messages (e.g., requiring dormitory bed checks) under conditions of either distraction (copying lists of two-digit numbers) or no distraction. In addition, the credibility of the message advocacy was manipulated. The study resulted in a distraction $\times$ credibility interaction showing that distraction enhanced persuasion only when the source was highly credible. Consistent with previous theories of distraction (see Section V,A), this interaction has been accounted for by arguing that distraction enhances persuasion only when the source is credible because more credible sources induce more dissonance, or because more credible sources induce more counterarguing (Baron *et al.*, 1973; Kiesler & Mathog, 1968; Petty & Brock, 1981). The ELM provides a different yet equally plausible account for this effect. Rather than emphasizing the finding that distraction enhances persuasion when source credibility is high, the ELM views the interaction as showing that credibility enhances persuasion when distraction is high (Petty & Cacioppo, 1984c). In other words, when people are disrupted from processing the issue-relevant arguments by distraction, simple cues in the persuasion context become more powerful determinants of influence.

relevance is low, but response involvement is high, impression management motives (rather than concerns about adopting a veridical position based on examination of issue-relevant arguments) may determine the attitude expressed (see Cialdini, Levy, Herman, Kozlowski, & Petty, 1976). Although it is possible for impression management concerns to lead to extensive issue-relevant cognitive activity in some situations (e.g., a student assigned to argue in a public debate may carefully research the position in order to make a favorable impression), more typically, impression management concerns may not necessitate a careful evaluation of issue-relevant arguments (Cialdini & Petty, 1981; Moscovici, 1980).

In addition to personal relevance and distraction, the other variables discussed under Postulate 4 should also be moderators of the route to persuasion. For example, we have already noted that argument quality becomes a more important determinant of persuasion as people feel more personal responsibility for message evaluation (Petty *et al.*, 1980), and for individuals high rather than low in need for cognition (Cacioppo *et al.*, 1983). Although it has not yet been tested, the ELM expects that peripheral cues in the persuasion context should generally be more important for group than individually responsible message evaluators, and for individuals low rather than high in need for cognition. Before concluding this section, we note two additional variables that appear to moderate the route to persuasion.

One previously unmentioned variable that appears to affect the extent of issue-relevant thinking is the modality of message presentation. In general, audio and video presentations compared to print give people less opportunity to process issue-relevant arguments because exposure is forced rather than self-paced. Thus, presenting messages in written form should be especially important when the arguments are complex and difficult to process rapidly (Chaiken & Eagly, 1976). On the other hand, if it is generally more difficult to process issue-relevant arguments when exposure is forced rather than self-paced, simple cues in the persuasion context should be more powerful determinants of persuasion in the former than in the latter modality. Studies which have manipulated medium of presentation and source cues have supported this proposition. Thus, both source credibility (Andreoli & Worchel, 1978) and likability (Chaiken & Eagly, 1983) have had a greater impact on attitudes when a message was presented on video or audio tape rather than in written form.

Interestingly, the nature of the message itself has also been implicated as a determinant of whether a person processes mostly issue-relevant arguments, or searches for simple cues to determine message acceptability. For example, research suggests that messages that are either overly vague (Pallak *et al.*, 1983), or overly quantified (Yalch & Elmore-Yalch, 1984), may induce reliance on peripheral cues. The ELM would expect this to occur to the extent that these messages reduce either subjects' ability (vague message) or motivation (overly quantified message) to process issue-relevant arguments (Witt, 1976).

VII. Postulate 6: Biased Elaboration

We have now seen that a wide variety of variables can moderate the route to persuasion by increasing or decreasing the extent to which a person is motivated or able to process the issue-relevant arguments in a relatively objective manner. As we noted in discussing Postulate 3, however, variables can also affect persua-

sion by affecting motivation and/or ability to process message arguments in a more biased fashion. Specifically, Postulate 6 states:

Variables affecting message processing in a relatively biased manner can produce either a positive (favorable) or negative (unfavorable) motivational and/or ability bias to the issue-relevant thoughts attempted.

As we will see, there are a number of ways to induce biased processing, but often the bias results from a person's initial attitude becoming a more important schema in guiding processing (e.g., Tesser, 1978). Panel IV in Fig. 2 graphs the expected results for a variable that biases information processing activity. In the left half of the panel, the effects of a variable that produces a positive cognitive bias (enhancing favorable thoughts and/or reducing negative thoughts) is depicted. It is instructive to compare this pattern with the pattern of data in the two panels above it. First note that *unlike* a variable operating as a simple positive cue (left half of panel II), a variable producing a positive processing bias is not expected to affect all messages equally. Since the pure cue processor is not elaborating message arguments at all, the effectiveness of the cue is not constrained by the arguments presented. The biased processor, however, is attempting to process the arguments and in this regard is similar to the objective processor. Nevertheless, an important difference between objective and biased processing exists. The objective processor is motivated or is able to discover the "true validity" of the message, and thus strong arguments induce more persuasion and weak arguments induce less persuasion with more processing. In stark contrast, the biased processor is either particularly motivated or able to generate a particular kind of thought, often in defense of an initial attitude. However, even though the person is biased in processing a communication, the arguments in the message pose some limitation on this bias. For example, consider a person who is truly motivated to *counterargue* (and not simply discount) an advocacy. This person's task is simpler to the extent that the message provides weak rather than strong arguments in support of its position (see right half of Panel IV, Fig. 2).

Figure 2 summarizes the ways in which a treatment can affect attitude change according to the ELM, and it shows how these different processes can be tested by varying argument quality. First, a treatment can have no effect on persuasion for either strong or weak arguments (such as a peripheral cue under conditions of high elaboration likelihood; Panel I). Second, a treatment may produce only a main effect (Panel II). If so, it suggests that the treatment is operating as a simple positive or negative cue (low elaboration likelihood conditions). However, if a treatment interacts with message quality, it suggests that the treatment is affecting the elaboration likelihood. If the interaction follows the form depicted in Panel III of Fig. 2, it suggests that the processing is relatively objective. If a treatment main effect and an interaction as depicted in Panel IV of Fig. 2 is obtained, it suggests that the treatment is biasing information processing.

As Panel IV indicates, a treatment which biases thinking in a positive direction should generally have a greater impact on a strong than a weak message because it will be more difficult for a person to generate favorable thoughts to weak than strong message arguments. On the other hand, a variable which biases thinking in a negative direction should generally have a greater impact on a weak than a strong message because it will be more difficult for a person to generate counterarguments to strong than weak arguments.

Importantly, these predictions (and the depictions in Panel IV of Fig. 2) assume that in the baseline (control) condition, relatively little issue-relevant thinking is occurring. However, consider a control (comparison) condition in which subjects are maximally processing strong and weak arguments. If the experimental treatment includes a variable that biases thinking in a positive direction, it will be difficult to observe more favorable attitudes to the strong arguments in the experimental than the control condition since the arguments are already being processed maximally in the control condition (i.e., a ceiling effect is operating). However, the positive bias may result in more favorable attitudes toward the weak message than observed in the control condition (since no ceiling effect is operating). Thus, it may appear that the positive bias is working better for the weak than the strong message.

Similarly, if the experimental treatment includes a variable that biases thinking in a negative direction, it will be difficult to observe more negative attitudes toward the weak arguments than in the control condition if control subjects are highly motivated and able to process the message objectively (without bias). Thus, it may appear that the negative bias is working better for the strong than the weak message (because of a floor effect for the weak arguments). The caveat here is to include an appropriate control or baseline condition so that ceiling and floor effects are not problems. In general, when testing variables hypothesized to enhance processing, it is better to include control conditions in which processing is minimal. When testing variables hypothesized to reduce processing, the opposite holds.

In the remainder of this section we review evidence consistent with the view that some variables affect information processing in a relatively biased rather than a relatively objective manner. Importantly, a consideration of Postulates 5 and 6 together indicates that just as there is a tradeoff between a person's motivation and ability to process a message in a relatively objective manner and the effectiveness of peripheral cues, so too is there a tradeoff between biased processing and the operation of cues. As argument scrutiny is reduced, whether objective or biased, peripheral cues become more important determinants of persuasion. As argument scrutiny is increased, whether objective or biased, peripheral cues become less important. We now turn to some of the major variables affecting information processing in a relatively biased manner, and consider both message processing effects and the operation of peripheral cues.

A. PRIOR KNOWLEDGE

One of the most important variables affecting information processing activity is the extent to which a person has an organized structure of knowledge (schema) concerning an issue (Britton & Tesser, 1982; Higgins, Herman, & Zanna, 1981; Wyer & Srull, 1984). Although it is possible for prior knowledge to enable more objective information processing in some instances (Bobrow & Norman, 1975), since stored knowledge tends to be biased in favor of an initial opinion, more often than not this prior knowledge will enable biased scrutiny of externally provided communications (Craik, 1979; Taylor & Fiske, 1984). Specifically, schema-driven processing tends to be biased such that external information is processed in a manner that contributes to the perseverance of the guiding schema (e.g., Ross, Lepper, & Hubbard, 1975). Thus, the more issue-relevant knowledge people have, the more they tend to be able to counterargue communications opposing their initial positions and to cognitively bolster (pro-argue) congruent messages (e.g., Lord, Ross, & Lepper, 1979).

1. Message Processing Effects

The impact of knowledge structures on attitude-relevant processing is shown clearly in Tesser's program of research on the effects of "mere thought" (e.g., Sadler & Tesser, 1973; Tesser & Conlee, 1975; Tesser, 1976). In a series of studies, Tesser has shown that when instructed to think about an issue or object, attitudes tend to become more polarized in the direction of their initial tendency (i.e., they become more schema consistent; see Tesser, 1978, for a review). Importantly, this polarization effect requires that subjects have an organized store of issue-relevant information to guide processing, and that they are motivated to employ this issue-relevant knowledge in defense of their initial opinions. In the absence of these conditions, mere thought may not lead to polarization (Linville, 1982; Millar & Tesser, 1984; Tesser & Leone, 1977).

Although Tesser's research has focused on situations in which no message is provided to subjects, similar schema-driven processing can be observed when people evaluate persuasive messages. For example, in one study we exposed subjects to a proattitudinal message that was either relevant or irrelevant to a self-schema (Cacioppo, Petty, & Sidera, 1982). Our hypothesis was that schema-relevant messages would be more likely to invoke schematic processing than irrelevant messages (e.g., Cantor & Mischel, 1979), and that schema activation would enhance a person's ability to cognitively bolster the congruent message. Employing a procedure adapted from Markus (1977), we identified two groups of students who were attending a major Catholic university. Some of the students were categorized as possessing a "religious" self-schema whereas others were categorized as possessing a "legalistic" schema. Subjects received a generally

weak message that supported their own opinions on an issue (e.g., against government support of abortion), and the message either employed a religious or a legalistic perspective in the arguments presented. An analysis of subjects' ratings of message persuasiveness revealed a schema type $\times$ message type interaction: the legalistic message was seen as more persuasive by the legalistic than the religious subjects, and the religious message was seen as more persuasive by the religious than the legalistic subjects. In addition, recipients generated more topic-relevant thoughts when the message was reflective than when it was unreflective of their self-schema. Further analyses revealed that this effect was accounted for mostly by the increased generation of favorable thoughts to schema-reflective messages.

If a message is inconsistent with a person's initial opinion, however, it would be expected that prior knowledge would enhance the person's ability to counterargue the message. In a test of this hypothesis, Wood (1982; Experiment 1) assessed the prior knowledge and experience people had on the issue of environmental preservation by asking them to list their beliefs and previous behaviors concerning environmental preservation. Subjects were divided into high and low belief and behavior retrieval groups based on a median split on the number of beliefs and behaviors listed. Consistent with the view that this assessment technique taps prior knowledge, subjects who generated more behaviors indicated that they had thought more about preservation, knew more about the topic, and were more involved than subjects who generated fewer behaviors (no effects were found for belief retrieval, however). One to two weeks later, subjects returned and read a counterattitudinal message providing four arguments against environmental preservation. After message exposure, subjects reported their attitudes and gave their thoughts. Subjects who had high prior knowledge changed less in the direction of the message than subjects with low prior knowledge. In addition, subjects with high prior knowledge (as assessed by behavior retrieval) generated more counterarguments and fewer favorable thoughts in response to the message. In sum, the available research is generally consistent with the view that prior knowledge enables counterarguing of incongruent messages (Wood, 1982) and bolstering of proattitudinal ones (Cacioppo *et al.*, 1982).

2. Cue Effects

Research is also generally consistent with the view that simple cues or decision rules are more likely to affect susceptibility to influence when prior knowledge is low rather than high. One cue that has been studied in the context of previous issue-relevant knowledge is gender. Previous studies of sex differences in persuasion have provided some support for the view that females are more susceptible to influence than males in some contexts (see reviews by

Cooper, 1979; Eagly & Carli, 1983), and one explanation for this effect is based on the idea that females may have been socialized to be more agreeable (i.e., concerned with social harmony) than males (e.g., Eagly, 1978). To the extent that females have learned to be more agreeable and less dominant than males, the invocation of this socialized female gender role or category (cf. Deaux, 1984) could lead to a sex difference in influenceability. However, according to the ELM, attitude expression based on the female gender role should be more likely when women have little ability to process the issue-relevant information presented than when ability is high.

In a test of this hypothesis, we exposed male and female undergraduates to photographs relevant to domains for which men and women had rated their knowledge differently (Cacioppo & Petty, 1980b). Half of the photos depicted football tackles (high male knowledge) and half depicted current fashions (high female knowledge). Each photograph was accompanied by a set of comments attributed to another subject. The comments were either completely factual and descriptive (e.g., the dress is blue, the runner's feet are off the ground) or included an evaluation (e.g., that's a great tackle) that was either accurate or inaccurate. Subjects were asked to rate the extent to which they agreed with the comments made by the other subject. The ELM suggests that to the extent that gender roles provide simple rules as to how one should behave (e.g., "As a woman, I should maintain harmony"), such rules should operate mostly when ability (and/or motivation) to evaluate the stimuli are low. In our study, when the comments were completely factual and easily verifiable, both males and females should be equally able to evaluate the comments whether they concerned fashions or football; thus, there should be no sex differences in extent of agreement. When the comments were evaluative rather than descriptive, however, knowledge is required to confidently evaluate the statements. For football tackles, then, the invocation of the female gender role should lead to women showing more agreement than men whether the evaluations were accurate *or* inaccurate. Actual accuracy should make little difference because in both cases women would have little confidence (due to low knowledge) in their judgments. When the judgments concerned fashions, however, women do have the requisite knowledge and confidence to make judgments. Thus, they should be more accepting of the accurate evaluations, but less accepting of the inaccurate evaluations than men. The data from our study generally conformed to this pattern. Other research has also supported the view that prior knowledge is an important determinant of sex differences in influenceability (e.g., Karabenick, 1983; Sistrunk & McDavid, 1971).

Another simple rule that people sometimes use is based on observation of their own behavior and the situational constraints imposed upon it (i.e., the self-perception principle; Bem, 1967, 1972). For example, if an initially agreeable behavior is overjustified, people may reason that their behavior is governed more

by the reward than their attitude and come to evaluate the behavior less positively (e.g., Lepper, Greene, & Nisbett, 1973; see Deci & Ryan, 1980). Wood (1982; Experiment 2) reasoned that this relatively simple inference process based on a behavioral cue should be a more potent determinant of attitudes for people who have relatively little knowledge on a topic. In a test of this hypothesis, she found that low knowledge subjects used a monetary incentive to make an inference about their attitudes (as self-perception theory would expect), but high knowledge subjects were unaffected by this simple external cue (see Chaiken & Baldwin, 1981; and Fiske, Kinder, & Larter, 1983; for additional evidence).

Finally, we note that simple affective cues may be a more important determinant of attitudes when prior knowledge is low rather than high. For example, Srull (1983) had subjects rate their general knowledge about automobiles (cf. Bettman & Park, 1980; Johnson & Russo, 1981). Following a mood-induction procedure in which subjects were placed in a positive, negative, or neutral mood, they were exposed to an attribute-oriented ad for a new car and then asked to evaluate it. The attitudes of low knowledge subjects (as determined by a median split) were significantly affected by the mood manipulation, but attitudes of high knowledge subjects were not influenced by this simple affective cue.

3. *Testing the ELM*

In general, research on prior knowledge has provided support for the ELM view that when prior knowledge is low, simple cues in the persuasion context affect influence, but when prior knowledge is high, message processing is biased because previous knowledge enables the counterarguing of incongruent messages and the bolstering of congruent ones. However, more definitive support for the ELM analysis of prior knowledge requires a study in which knowledge is varied along with argument strength and a peripheral cue.

Fortunately, Wood, Kallgren, and Priesler (1985) reported such a study. In this study, Wood and colleagues asked undergraduates to list their beliefs and behaviors relevant to environmental preservation. Subjects were divided into three groups based on a combination of the total number of beliefs and behaviors listed (creating high, medium, and low knowledge groups). Subjects returned 1 to 2 weeks later and were exposed to one of four persuasive messages. The messages differed in both the strength and length of the arguments presented. Two of the messages contained three strong arguments favoring an antipreservation view and two messages contained three weak arguments. Two versions of each argument were developed, however. One version contained short concise statements of the arguments, and the other contained longer more wordy versions of essentially the same information. The long and short versions were equated in terms of strength and ease of comprehension.

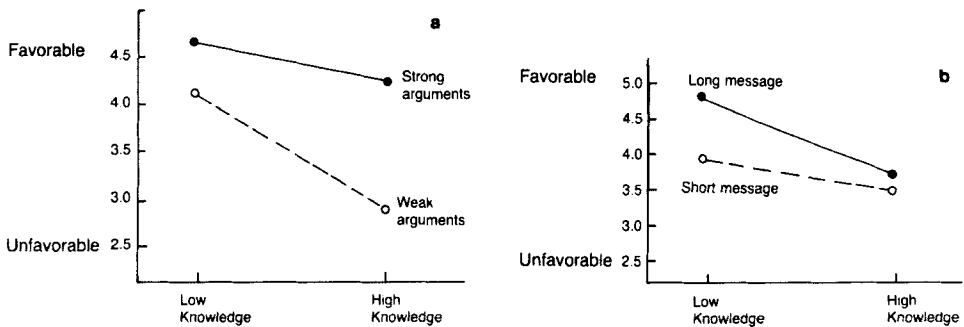


Fig. 6. Prior knowledge biases message processing. (a) Increased knowledge makes it easier to counterargue weak than strong message arguments. (b) Length of arguments serves as a peripheral cue for low but not high knowledge subjects (data adapted from Wood, Kallgren, & Priesler, 1985; see Footnote 9).

After exposure to one of the versions of the message, subjects indicated their attitudes on the topic of environmental preservation. Overall, a main effect for knowledge was obtained indicating that as knowledge increased, subjects were more resistant to the counterattitudinal appeal. In addition, individual cell comparisons revealed that the attitudes of high knowledge subjects were affected by argument quality, but the attitudes of low knowledge subjects were not. A closer inspection of this interaction pattern (graphed in Fig. 6a) indicates that although high knowledge subjects were generally more resistant to all messages than low knowledge subjects, this was especially true for the message containing weak arguments. As noted previously, this particular interaction pattern suggests that high knowledge subjects were better able (and perhaps more motivated) to counterargue the incongruent message, but that it was more difficult to counterargue the strong than the weak version of it (cf. Panel IV, Fig. 2). In addition, planned comparisons indicated that the attitudes of low knowledge subjects were affected by argument length, but the attitudes of high knowledge subjects were not (see Fig. 6b). In sum, low knowledge subjects' attitudes were affected by the simple cue of message length, but high knowledge subjects used their prior knowledge in an attempt to defend their attitudes. They were more successful in doing this when the arguments in the message were weak rather than strong.⁹

⁹For ease of exposition we have graphed the data based on a median split on knowledge (W. Wood, personal communication, October 18, 1984) rather than the three-way split reported in the published article. As might be expected, the three-way split only enhances the differences between high and low knowledge groups, though the median split is based on a larger sample size.

B. FOREWARNINGS

Just as some variables generally enhance a person's ability to engage in biased processing of a persuasive message, such as prior knowledge, so too can variables enhance a person's *motivation* to process a message in a biased fashion, even if ability is held constant. For example, McGuire (1964) argued that inoculation treatments enhance resistance to persuasion mostly by increasing peoples' motivation to defend their beliefs. The persuasion literature has identified other variables that increase motivation to defend beliefs, and the most researched category of variables is "forewarning" (see Smith, 1982).

Papageorgis (1968) noted that two conceptually distinct kinds of warnings have been studied by persuasion researchers. One kind of treatment forewarns message recipients of the upcoming topic and/or position of the persuasive message (warning of message content). A second kind of treatment suggests to subjects that they are the targets of an influence attempt (forewarning of persuasive intent). Although some studies have explored the effects of combining the two kinds of forewarnings (e.g., Allyn & Festinger, 1961; Brock, 1967), it is possible to study their effects separately. Also, although many studies have shown that forewarnings can reduce the persuasive impact of a message, other studies have shown that forewarnings can enhance persuasion (e.g., Cooper & Jones, 1970; Mills, 1966). Importantly, which effect is obtained appears to depend largely on a person's motivation and ability to think about the issue. With low motivation and/or ability, forewarnings have tended to either have no effect or to enhance change in the direction of the advocacy. With high motivation and ability, however, resistance to persuasion has generally resulted (e.g., Apsler & Sears, 1968; Freedman, Sears, & O'Conner, 1964; Petty & Cacioppo, 1979a). According to the ELM, when motivation (e.g., personal relevance) and/or ability (e.g., prior knowledge) to think about an issue are low, forewarnings should enhance the salience of various cues (e.g., attractive sources; e.g., Mills & Aronson, 1965) or motives (e.g., impression management; e.g., Cialdini, Levy, Herman, & Evenbeck, 1973) in the situation that are capable of producing attitude change without issue-relevant thinking. When motivation and ability are high, however, forewarnings should modify attitudes by affecting issue-relevant thinking.

1. *Warning of Message Content*

A forewarning of message content gives message recipients advance indication of what the message is about. McGuire and Papageorgis (1962) hypothesized that the advance warning would motivate recipients to begin considering information that would support their beliefs and counterargue opposing arguments (i.e., biased processing). Consistent with this view, a content forewarning

is most effective when there is a sufficient time delay between the warning and message to allow thinking (Freedman & Sears, 1965; Hass & Grady, 1975; Petty & Cacioppo, 1977). In addition, studies employing the thought-listing procedure (e.g., Brock, 1967; Petty & Cacioppo, 1977) and psychophysiological assessments (Cacioppo & Petty, 1979a) have supported the view that when confronted with an impending counterattitudinal message on an involving issue, people use the period between the forewarning and the message to bolster their initial opinions. This "biased scanning" of arguments on the issue (cf. Janis & Gilmore, 1965) enables greater resistance to the subsequent message.

If accessing one's issue-relevant information prior to a persuasive attack assists in resisting the subsequent message, then a forewarning of the impending

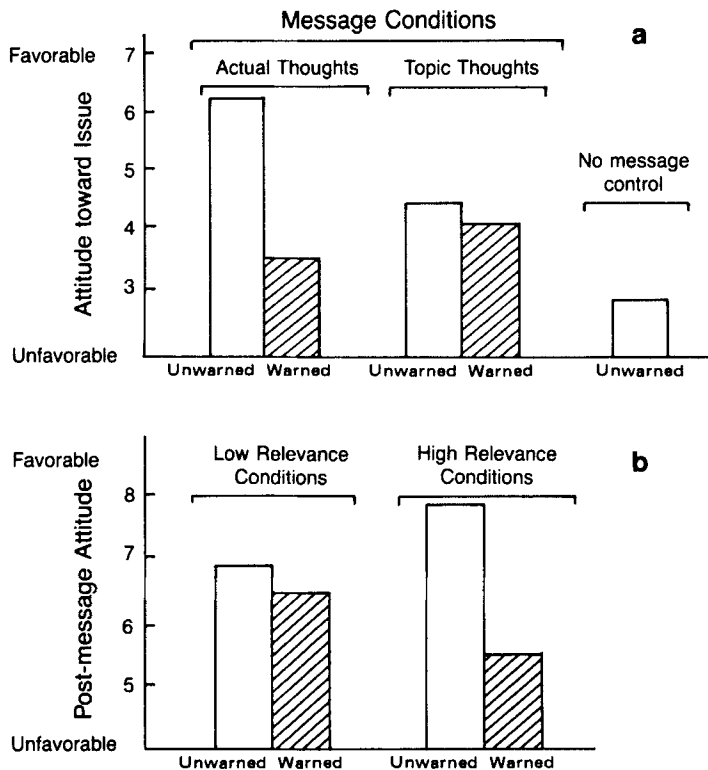


Fig. 7. Forewarnings bias message processing. (a) Forewarning of an involving counterattitudinal message topic and anticipatory topic-relevant thinking produce resistance to a message with strong arguments (data from Petty & Cacioppo, 1977; Experiment 2). (b) Forewarning of persuasive intent produces resistance to a message with strong arguments on a counterattitudinal topic when the issue is of high relevance (data from Petty & Cacioppo, 1979a).

message topic is not really necessary for resistance, but rather it is necessary for people to access their issue-relevant knowledge in preparation for the message. In a study testing this hypothesis (Petty & Cacioppo, 1977, Experiment 2), we told students in an introductory psychology class that they soon would be hearing a guest lecture from a counseling psychologist. Half of the students were warned several minutes in advance of the lecture that the speaker would advocate that all freshmen and sophomores be required to live in campus dorms (an involving counterattitudinal issue). The remaining subjects were unaware of the topic of the speech. After 3 min of sitting quietly, the students were given either three additional minutes to list the thoughts that occurred to them during the preceding minutes (actual thoughts) or they were instructed to list their thoughts on the topic of requiring freshmen and sophomores to live in dorms (topic-relevant thoughts). Following this procedure, the guest speaker presented a five-min advocacy on the topic, and the students' attitudes were measured. A control group of subjects responded to the attitude measure prior to the warning and advocacy.

The results of the study are depicted in Fig. 7a. The data for subjects in the "actual thoughts" groups were in accord with previous research employing involving counterattitudinal issues (e.g., Freedman & Sears, 1965). Specifically, the unwarned subjects were influenced by the message, but the warned subjects did not differ from controls. More interestingly, however, is that when subjects listed their thoughts about the message topic prior to receiving it, the warning had no unique effect. Subjects resisted the message whether they were warned or not. The resistance of the unwarned group that accessed issue-relevant cognitions prior to message exposure indicates that it is not the forewarning per se that induces resistance. Rather, the accessing of attitude-supportive beliefs prior to message exposure (which can be triggered by a warning) biases message processing and thereby facilitates resistance (cf. Miller, 1965).

2. *Warning of Persuasive Intent*

A forewarning of persuasive intent must work differently than a warning of message content because a warning of intent does not indicate the topic of the message. Thus, this kind of warning cannot enable a potential recipient to access the relevant store of issue-relevant cognitions prior to message exposure. As might be expected, then, unlike a warning of message content, a warning of persuasive intent is equally effective in inducing resistance whether it immediately precedes or comes several minutes before message exposure (Hass & Grady, 1975). What then is the psychological process responsible for the resistance conveyed by making the persuasive intent of a message salient? Brehm (1966, 1972) has argued that restricting a person's perceived freedom to think or act in a particular way arouses a psychological state of "reactance" that motivates peo-

ple to restore their freedom. When a speaker announces an intention to persuade a recipient, this may be perceived as a direct threat to the person's freedom to hold a particular attitude (Hass & Grady, 1975). One way to demonstrate or reassert freedom, of course, is to resist the persuasive message.

According to the ELM, a warning of persuasive intent may induce resistance in one of three ways. First, the warning may serve as a simple rejection cue leading the person to discount the message without considering it (cue effect). Second, the warning may lead the person to more carefully scrutinize the message arguments leading to resistance when the arguments are weak but not when they are strong (objective processing). Finally, the warning may motivate the recipient to actively counterargue the message drawing upon previous knowledge in order to attack the message to the best of one's ability (biased processing). The results of several studies suggest that the latter process is responsible for the resistance conveyed by a warning of persuasive intent.

For example, in one study, Kiesler and Kiesler (1964) varied whether the information about persuasive intent preceded or came after the message. Persuasive intent only reduced persuasion when it came before the message. If the statement of intent served as a simple rejection cue, it should have produced resistance regardless of its position. In another study (Watts & Holt, 1979), a warning of persuasive intent given before the message reduced persuasion only when the message was not accompanied by distraction. The fact that distraction during the message eliminated the effect of the forewarning is consistent with the view that a warning works by affecting ongoing message processing. When this processing is disrupted by distraction, the warning is ineffective.

Although these studies are consistent with the idea that a forewarning of intent affects message processing rather than serving as a simple cue, they do not indicate whether the processing is relatively objective or biased. In a study designed to explore this issue (Petty & Cacioppo, 1979a), we told students that they would be evaluating radio editorials. Some were further told that the tape that they would hear "was designed specifically to try to persuade you and other college students of the desirability of changing certain college regulations." Others were simply told that the tape was prepared as part of a journalism class project. In addition to the warning manipulation, the personal relevance of the advocacy was manipulated. Some subjects were led to believe that the advocated change would affect them personally because the change would be implemented next year (high relevance), whereas others were led to believe that it would not affect them either because the change would not take effect for 10 years (low relevance-date) or because it was proposed for next year but for a different university (low relevance-place). All subjects received a message containing five strong arguments in favor of requiring seniors to take a comprehensive exam as a requirement for graduation.

The results of this study revealed a main effect for warning and a warning $\times$

relevance interaction on the postmessage attitude measure (see Fig. 7b). Although the warning decreased agreement overall, the effect was only significant under the high relevance conditions. The fact that the warning worked better under high than low relevance again suggests that the warning is not operating as a simple rejection cue. As we detailed in Section VI,A, cues tend to work better under low than high relevance conditions. Also, since the warning reduced persuasion even though the arguments were strong, this suggests that the warning induced biased rather than objective processing. When subjects were not warned, increasing involvement enhanced persuasion as would be expected if the arguments were strong and relevance increased subjects' motivation to process the arguments in a relatively objective manner (Petty & Cacioppo, 1979b). It appears that when a forewarning of persuasive intent was introduced under high involvement, the nature of the information processing changed as subjects became less objective, and more intent on finding fault with the message arguments in order to reassert their attitudinal freedom. Consistent with this reasoning, under high involvement, subjects who were warned generated significantly more counterarguments and fewer favorable thoughts than unwarned subjects in a postmessage thought listing.

C. OTHER BIASING TREATMENTS

Although we have focused on two highly researched variables that appear to enable or motivate biased information processing (prior knowledge and forewarning), other treatments may also bias the nature of message processing. We have already noted that McGuire's (1964) discussion of inoculation treatments provides a cogent example.

In our own research we have suggested several procedures for biasing the processing of a persuasive message. For example, in one study (Petty & Brock, 1979) we embedded a bogus personality assessment within an overall Barnum personality description (e.g., Forer, 1949). Subjects who in one experiment were led to believe that they had "closed-minded" personalities, subsequently generated a more one-sided profile of thoughts than subjects who were led to believe that they were "open-minded." In another study (Wells & Petty, 1980), we attempted to bias thought production by instructing subjects to make vertical or horizontal head movements while they processed a persuasive message. Whether the message was pro or counterattitudinal, subjects who engaged in vertical (yes) movements agreed with the message more than subjects who engaged in horizontal head movements. In other studies we have found that excessive message repetition (Cacioppo & Petty, 1979b) and the presence of hecklers (Petty & Brock, 1976) led to reduced agreement even though the arguments presented were strong.

The research on each of these independent variables (e.g., heckling, excessive repetition) clearly indicates that they are unlikely to enhance objective information processing. However, although there is some correlational evidence (e.g., from thought listings) to suggest that some of these treatments bias the nature of information processing, the studies may also be interpreted as indicating that the treatments serve as simple acceptance or rejection cues. For example, horizontal head movements, hecklers, or excessive repetition may not facilitate the production of counterarguments, but may instead induce negative affect that becomes associated with the advocacy (see Zajonc & Markus, 1982). Alternatively, the negative affect may bias information processing by increasing access to other information linked to negative states (Bower, 1981; Clark & Isen, 1982). Research that includes these treatments along with message quality and other motivational and ability variables should allow more definitive distinction of these possibilities (see also Section IX,B).

VIII. Postulate 7: Consequences of Elaboration

In the preceding sections of this article we have outlined how the ELM accounts for the initial attitude changes induced by persuasive messages. Postulate 7 deals with the different consequences of attitude changes induced via the central and the peripheral routes. Specifically:

Attitude changes that result mostly from processing issue-relevant arguments (central route) will show greater temporal persistence, greater prediction of behavior, and greater resistance to counterpersuasion than attitude changes that result mostly from peripheral cues.

There are several reasons why these differential consequences would be expected. Recall that under the central route, attitude changes are based on a thoughtful consideration of issue-relevant information and an integration of that information into an overall position. Under the peripheral route, however, an attitude is based on a simple cue that provides some affective association or allows some relatively simple inference as to the acceptability of the message. Thus, attitude changes induced via the central route involve considerably more cognitive work than attitude changes induced under the peripheral route. The process of elaborating issue-relevant arguments involves accessing the schema for the attitude object in order to evaluate each new argument (e.g., by comparing it to information previously stored in memory). Under the peripheral route, however, the schema may be accessed only once to incorporate the affect or inference elicited by a salient cue. Or, a peripheral schema unrelated to the issue

schema may be invoked in order to evaluate the cue (i.e., is the source credible?). Under the central route, then, the issue-relevant attitude schema may be accessed, rehearsed, and manipulated more times strengthening the interconnections among the components and rendering the schema more internally consistent, accessible, enduring, and resistant than under the peripheral route (cf. Crocker, Fiske, & Taylor, 1984; McGuire, 1981).¹⁰

The greater the accessibility of the information supporting an attitude, the greater the likelihood that the same attitude will be reported over time if people consider their prior knowledge before reporting their attitudes. Even if people do not scan their store of attitude-relevant information before reporting their attitudes in some circumstances (Lingle & Ostrom, 1981), the greater accessibility and endurance of the attitude itself would enhance the likelihood that the same attitude would be reported at two points in time. Also, the greater the accessibility of the information supporting an attitude and the more well organized it is, the greater the likelihood that this attitude-relevant knowledge can be used to defend the attitude from subsequent attack. Finally, the greater the accessibility of the attitude itself, the greater the likelihood that it can guide behavior (Fazio, Chen, McDonel, & Sherman, 1982).

In sum, the greater memory trace and accessibility of attitudes and attitude-relevant information for influence occurring via the central versus the peripheral route renders people more *able* to report the same attitude over time, to defend their beliefs, and to act on them. A motivational factor may also be relevant, however. Specifically, the process of scrutinizing issue-relevant arguments may generally be more deliberate than the processes of affective association and the invocation of well-rehearsed (even automatic) decision rules (Cialdini, 1984). Thus, changes induced under the central route may be accompanied by a subjective perception that considerable thought accompanied opinion formation. This perception may induce more confidence in the attitude, and attitudes held with more confidence may be more likely to be reported over time, slower to be abandoned in the face of counterpropaganda, and more likely to be acted upon.

A. PERSISTENCE OF PERSUASION

If extended issue-relevant thinking increases the temporal persistence of opinion change, then conditions that foster issue-relevant elaboration should be accompanied by greater attitudinal persistence than conditions that minimize elaboration. Among all the ways to change attitudes, *role playing* may be the influence paradigm that requires the most issue-relevant thinking in order to

¹⁰Of course, if a peripheral cue is *repeatedly* associated with an attitude object, relative persistence of influence may result (e.g., Weber, 1972).

produce persuasion. In role playing research people are required to generate or improvise their own arguments for a message (e.g., King & Janis, 1956). Importantly, research indicates that to the extent that people have sufficient knowledge and skill to generate their own messages, the attitude changes induced by these messages are especially persistent (e.g., Elms, 1966; Watts, 1967).

In role playing studies subjects are instructed to think about an issue position, whereas in other research the experimental conditions elicit issue-relevant thought spontaneously. For example, in research on anticipatory attitude shifts, subjects are induced to expect to discuss an issue or receive a message on some topic, and attitudes are measured prior to the discussion or message presentation (Cialdini & Petty, 1981). In one anticipatory change study relevant to persistence (Cialdini *et al.*, 1976), we led college students to believe that they would discuss a campus issue with another student who held a position opposite to their own. Subjects were told that the discussion would take place either immediately or 1 week later, and the issue to be discussed was either one that was personally important to the students or unimportant. While waiting for the discussion to begin, subjects listed their thoughts on the issue and then reported their attitudes. Although subjects in all conditions showed some anticipatory shifting of their positions, only one group of subjects maintained their new issue positions after they had been informed that the discussion was cancelled. This group, subjects who expected to immediately discuss a personally important issue, were presumably the most motivated to undertake the cognitive work necessary to prepare for the discussion. Consistent with this analysis, these subjects listed significantly more thoughts that supported their own positions in anticipation of the discussion than subjects in the other cells.

In both the role playing research and the research on anticipatory shifts, attitude changes that were accompanied by considerable issue-relevant cognitive activity led to more persisting shifts than changes induced with less issue-relevant thinking. However, in both of these paradigms, no persuasive messages were presented. According to the ELM, the same result should hold if the attitude changes resulted from exposure to a persuasive communication. Specifically, the greater the elaboration of the message arguments, the more persistent the resulting attitude change should be. In a direct empirical test of this hypothesis (Petty, Cacioppo, & Heesacker, 1985), we had students listen to three persuasive messages. Each message began with a description of the origin of the message and provided a brief biography of the message source. The first two messages served as filler material and were identical for all subjects. The third message contained the experimental manipulations. Half of the subjects were led to believe that the advocacy concerned an imminent change in policy at their own university (high relevance) and half were led to believe that the advocacy concerned a proposed change in policy at a distant university (low relevance). Half of the students received a message from a very prestigious and credible source;

this message contained six strong arguments in support of senior comprehensive exams. The other half of the students received a message from a low prestige, inexpert source; this message contained six weak arguments in support of senior comprehensive exams.

Based on our previous research (Petty & Cacioppo, 1979b; Petty, Cacioppo, & Goldman, 1981; see Section VI,A), and pilot testing of the sources and messages under high and low relevance conditions, we expected both the high and low involvement groups who received the positive source–strong arguments message to show equivalent amounts of initial persuasion. However, the change in the high relevance group should be based mostly on a careful evaluation and elaboration of the strong issue-relevant arguments, whereas the change in the low relevance group should be based mostly on the positive source cue. Similarly, the rejection of the advocacy in the high and low relevance groups exposed to the negative source–weak arguments message should be equivalent initially, but in the high involvement group the rejection should be based mostly on scrutiny of the weak arguments, whereas in the low relevance group the rejection should be based mostly on the negative source.

An analysis of subjects' immediate postmessage attitudes concerning senior comprehensive exams provided support. Both high and low relevance groups of subjects exposed to the strong message/source were more favorable than controls, and both groups of subjects exposed to the weak message/source were less favorable than controls. More interestingly, however, the degree of personal relevance had an impact on whether or not these initial attitudes persisted. From 10 to 14 days following message exposure, subjects were called by phone and were asked their opinions concerning a number of campus issues including the general idea of senior comprehensive exams. An analysis of variance (ANOVA) on the initial and delayed attitudes of high relevance subjects revealed only a main effect for type of communication. The positive source–strong arguments message was more effective than the negative source–weak arguments message both initially and at the delayed testing. An analysis on the attitudes of low relevance subjects, however, revealed a communication $\times$ time of measurement interaction. For these subjects, the initial difference between the two message conditions was no longer apparent at the delayed testing. In short, those subjects who formed their initial attitudes based on a careful consideration of issue-relevant arguments (high relevance) showed greater persistence of attitude change than those subjects whose initial attitudes were based primarily on the source cue (low relevance).

Other persuasion studies also support the view that conditions that foster people's ability or motivation to engage in issue-relevant cognitive activity enhance the persistence of persuasion. Thus, using more interesting or involving issues about which subjects have more knowledge (e.g., Ronis, Baumgardner, Leippe, Cacioppo, & Greenwald, 1977), providing more time to think about the

message (Mitnick & McGinnies, 1958), leading people to believe that they will be interviewed on the attitude issue (Chaiken, 1980), increasing message repetition (Johnson & Watkins, 1971), and reducing distraction (Watts & Holt, 1979) have all been associated with increased temporal persistence of attitude change (see Cook & Flay, 1978; Petty, 1977; for reviews, and Petty & Cacioppo, 1986, for a discussion of how the ELM differs from alternative models of attitude persistence, such as Kelman, 1961).

B. ATTITUDE-BEHAVIOR LINK

The previous section provided support for the view that attitude changes based primarily on thoughtful consideration (or self-generation) of issue-relevant arguments produced more enduring persuasion than changes based primarily on simple cues in the persuasion context. Research is also consistent with the view that attitude changes induced via the central route are more predictive of behavior than changes induced via the peripheral route.

As we noted earlier, perhaps the most effortful form of processing occurs when attitude change results from the self-generation of arguments. These changes, then, should be especially predictive of behavior. In a relevant program of research, Fazio and Zanna (1981) explored the consequences of attitudes formed via direct rather than indirect experience. When an attitude is formed via direct personal experience, the attitude is necessarily based on self-generated information. When an attitude is based on indirect experience (i.e., a message from others), less effortful processing may be involved. In some sense then, the distinction between direct and indirect experience is analogous to the distinction between attitudes based on role-playing (i.e., self-generation of arguments) versus passive exposure. Importantly, the research on direct versus indirect experience clearly indicates that the former attitudes are better predictors of behavior than the latter (see Fazio, 1985). The ELM suggests that one reason for this is that attitude formation based on direct experience may typically require more effortful elaboration of the merits of the object (e.g., puzzle; Regan & Fazio, 1977) than attitude formation based on passive exposure.

In our own research, we have also found that conditions that foster a high elaboration likelihood produce higher attitude-behavior correlations than conditions in which the elaboration likelihood is low. For example, in one study (described previously in Section VI,A,1), we exposed subjects to mock magazine advertisements for a disposable razor under conditions of either high or low personal relevance (Petty, Cacioppo, & Schumann, 1983). The ads that subjects saw contained either strong or weak arguments for the product and featured either a famous (likable) or an ordinary endorser. In addition to assessing product attitudes in this study, we also asked subjects to rate how likely they were to

purchase the product (behavioral intentions). Under high relevance, both attitudes and intentions were affected significantly by the manipulation of argument quality. Under low relevance, however, attitudes were affected by the manipulation of endorser attractiveness, but behavioral intentions were not. The peripheral cue of endorser attractiveness was sufficient to enhance liking for the product when motivation to scrutinize product arguments was low, but was not sufficient to produce a change in behavioral intentions. Overall, the attitude–intention correlation under high relevance was .59, whereas under low relevance it was .36.

Just as increasing motivation to process issue-relevant arguments should enhance the utility of attitudes in predicting behavior, so too should enhancing ability to process the message. In a relevant study, Schumann, Petty, and Cacioppo (1985) exposed subjects to advertisements containing strong arguments for a new pen either one, four, or eight times in the context of a simulated television program. Each repetition of the message, of course, gives subjects an additional opportunity to consider the product-relevant information. After message exposure, subjects rated their attitudes toward the advertised pen, their likelihood of purchasing this brand in the near future, and the amount of time they spent thinking about the product during the program. Subjects reported engaging in more thought about the product as repetition increased, and the attitude–intention correlation also improved significantly with repetition.

Finally, we have obtained evidence that people who differ dispositionally in their tendency to engage in and enjoy thinking also differ in the extent to which their attitudes predict behavior (Cacioppo, Petty, Kao, & Rodriguez, 1985). Specifically, we found that the attitudes toward the candidates in the 1984 presidential election predicted voting intentions and reported behavior better for people who were high rather than low in their “need for cognition” (Cacioppo & Petty, 1982; see Section V,E). In sum, when the experimental conditions or dispositional factors enhanced peoples’ motivation or ability to elaborate issue-relevant information, attitude–behavior correlations were higher than when elaboration was low (Cialdini *et al.*, 1981; see also Pallak, Murrone, & Koch, 1983; Sandelands & Larson, 1985; Sivacek & Crano, 1982).¹¹

¹¹Our argument that the more issue relevant elaboration involved in attitude change the greater the attitude–behavior correlation should be, may appear to conflict with a claim by Wilson, Dunn, Bybee, Hyman, and Rotondo (1984) that analyzing reasons for one’s attitudes *reduces* attitude–behavior consistency. However, in the research supporting the Wilson *et al.* contention, one effect of having subjects think about the reasons behind their attitudes was to produce a change in attitudes. Thus, Wilson *et al.* compared the ability of an *initial* attitude to predict behavior with the ability of a *changed* attitude. The new attitude was less predictive than the old one. Importantly, the ELM addresses a comparison between two initial attitudes (one formed via the central and one formed via the peripheral route) or two newly changed attitudes (one changed via the central and one changed via the peripheral route). The ELM predicts that the central attitudes will predict behavior better than comparable attitudes formed or changed via the peripheral route.

C. RESISTANCE TO COUNTERPERSUASION

The final consequence of the route to persuasion is that attitudes formed via the central route should be more resistant to counterpropaganda than attitudes formed via the peripheral route. Importantly, the *resistance* of an attitude to attack is conceptually distinct from the temporal *persistence* of an attitude. Thus, some attitudes may be highly persistent, but only if they are not attacked. Other attitudes may be very transient even in a vacuum. Likewise, it is possible for some attitudes to be very resistant to change, but only in the short term. Despite the conceptual independence of persistence and resistance, we have already outlined the reasons why the ELM holds that usually these two qualities will go together. Attitudes based on extensive issue-relevant thinking will tend to be both persistent and resistant, whereas attitudes based on peripheral cues will tend to be transient and susceptible to counterpersuasion.

Attitudes for which persistence and resistance do *not* go together provide an intriguing target of study. Perhaps the most dramatic example of the possible independence of persistence and resistance is found in cultural truisms. Truisms such as "you should brush your teeth after every meal" tend to be highly persistent in a vacuum, but very susceptible to influence if attacked. As McGuire (1964) noted, people have very little practice in defending these beliefs because they have never been challenged. Furthermore, the ELM would contend that these beliefs are highly susceptible to persuasion because they were probably *formed* with very little issue-relevant thinking. It is likely that people come to accept many cultural truisms sometime during childhood. The truisms are continually presented by powerful, likable, and expert sources (e.g., parents, teachers, television characters) with little or no justification. The continual pairing of the belief with a positive cue results in a relatively persistent attitude, but one that cannot be defended when subsequently attacked.

Most research on attitudinal resistance has focused on how various treatments can help bolster an attitude that a person already has. For example, in an important program of research, McGuire (1964) has provided impressive evidence for the view that attitudes can be made more resistant by providing people with the requisite motivation and/or ability to counterargue opposing messages. The underlying logic of McGuire's inoculation theory is that a threat to a previously unassailed belief motivates the person to defend that belief when it is attacked in the future. An initial attack on a person's belief also provides practice in defending the belief. In another relevant program of research, Burgoon and his colleagues (e.g., Burgoon, Cohen, Miller, & Montgomery, 1978) investigated how the manner in which an initial message is processed can affect susceptibility to a subsequent message on the same topic (see review by Smith, 1982).

The work of McGuire and Burgoon has focused on how an initial belief held by a person can be made more resistant or susceptible by providing some treat-

ment that enhances or reduces the person's motivation and/or ability to counterargue a subsequent opposing communication. This work is consistent with the ELM in that it demonstrates that attitudes can be made more resistant by motivating or enabling people to engage in additional thought about the reasons or arguments supporting their attitudes. To date, however, no research has explicitly tested the ELM prediction that the manner in which an attitude is formed or changed has important implications for the resistance of the attitude. Specifically, the ELM predicts that people who come to accept an issue position because of a peripheral cue (e.g., source expertise) should be more susceptible to an attacking message than people who adopt the same issue position based on a careful scrutiny and elaboration of the message arguments.

IX. Complicating Factors

We have now presented the major postulates of the Elaboration Likelihood Model and some research relevant to these postulates. In reviewing the evidence for the ELM we have focused deliberately on variables and instances that were straightforward and relatively unambiguous in interpretation. Although it would be nice if we could provide an exhaustive list of variables that serve as peripheral cues and variables that affect message processing in either an objective or a biased manner, we have already seen that this is not possible. For example, we have argued that the effects on information processing of some variables may shift from relatively objective to relatively biased as the variable reaches very high levels. For example, although increasing personal relevance and message repetition may generally enhance subjects' motivation and/or ability to see the merits of strong arguments and the flaws in weak ones, we have suggested that when personal relevance or message repetition reaches very high levels, the initially objective processing may become biased as the person becomes motivated to reject the advocacy (Cacioppo & Petty, 1979b; Petty & Cacioppo, 1979b). In short, some variables have multiple effects on information processing. In addition, we have seen that some variables may affect information processing under certain conditions, but serve as peripheral cues in other contexts. For example, we reviewed evidence in Section VI,A that manipulation of the number of arguments in a message could serve as a peripheral cue when the personal relevance of the message was low, but that increasing the number of arguments in a message could increase the amount of information processing activity when the personal relevance of the message was high (Petty & Cacioppo, 1984a). In this section we will comment briefly on these and other intricacies of the ELM.

A. VARIABLES WITH MULTIPLE EFFECTS ON ELABORATION

In most of the research that we have discussed so far, we have examined the isolated effects of different source, message, recipient, and channel factors on information processing. However, in most natural persuasion situations, many variables combine to create the overall persuasion context. For example, consider a high need for cognition person who is part of a jury whose members share responsibility for evaluating an expert witness who presents weak arguments in a corporate tax case in a courtroom with noisy distractions. All of the many variables present in this situation must be considered jointly to determine the probable persuasive impact of the testimony. Normally, sharing cognitive responsibility with a group reduces information processing activity (Petty, Cacioppo, & Harkins, 1983), but our message recipient dispositionally tends to like to think (Cacioppo, Petty, & Morris, 1983) and is therefore less susceptible to motivation loss in groups (Petty, Cacioppo, & Kasmer, 1985). Therefore, *motivation* to process the message is likely to be high despite the group responsibility. However, due to a lack of prior knowledge about corporate taxes and the distractions inherent in the situation, our message recipient may have little *ability* to process the weak message arguments (Petty, Wells, & Brock, 1976; Wood, Kallgren, & Priesler, 1985). Thus, the perceived expertise of the witness may serve as a potent influence cue (Kiesler & Mathog, 1968).

Our example assumes that each of the features of the persuasion situation (e.g., distraction, group responsibility) can be considered separately and independently regardless of the levels of the other variables with which it is combined. If so, one can roughly add (subtract) the effects of each variable to determine the overall elaboration likelihood. Although this is often possible, as we discuss next, it is also possible for one variable to have very different effects on information processing depending on the level of other variables.

For example, some variables may increase information processing at one level of another factor, but may actually decrease processing at a different level of that factor. In one study exploring this possibility, we varied the personal relevance of a message, whether concluding summaries of the message arguments were framed as statements or as rhetorical questions (cf. Zillmann, 1972), and whether the arguments presented were strong or weak. In this study (Petty, Cacioppo, & Heesacker, 1981), all subjects heard over headphones a message advocating that seniors take a comprehensive exam in their major as a requirement for graduation. The study was designed to test our view that summarizing arguments as rhetorical questions (e.g., "Wouldn't instituting a comprehensive exam be an aid to those who seek admission to graduate and professional schools?") rather than as declarative statements, would motivate more thinking about the arguments. If rhetorical enhance relatively objective processing, then

their use should lead to more agreement if the message arguments are strong, but less agreement if the arguments are weak. However, this enhanced elaboration with rhetorical questions should be evident mostly when people are not naturally devoting much effort to processing the message arguments, such as when the personal

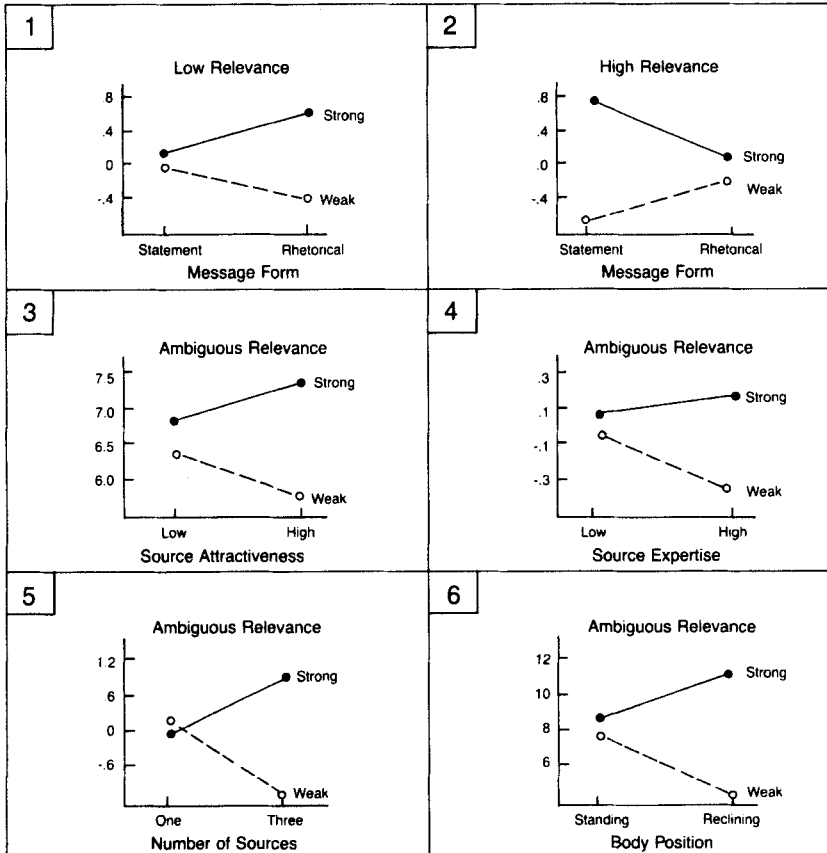


Fig. 8. Additional variables that may affect information processing in a relatively objective manner. (1) Effects of rhetorical questions on attitudes following strong and weak messages of low relevance (data from Petty, Cacioppo, & Heesacker, 1981). (2) Effects of rhetorical questions on attitudes following strong and weak messages of high relevance (data from Petty, Cacioppo, & Heesacker, 1981). (3) Effects of social attractiveness on attitudes following strong and weak messages of uncertain relevance (data from Puckett *et al.*, 1983). (4) Effects of expertise on attitudes of field-dependent subjects following strong and weak messages of uncertain relevance (data from Heesacker *et al.*, 1983). (5) Effects of multiple sources on attitudes following strong and weak messages of uncertain relevance (data from Harkins & Petty, 1981a; Experiment 4). (6) Effects of recipient posture on attitudes following strong and weak messages of uncertain relevance (data from Petty, Wells, Heesacker, Brock, & Cacioppo, 1983).

relevance of the message is low. When people are already naturally motivated to process the message, such as when personal relevance is high, we expected that the use of rhetorical questions would either have no further effect on elaboration, or might even be disruptive of ongoing information processing. The results of our study supported these expectations. When personal relevance was low, the use of rhetorical questions increased elaboration (see Box 1, Fig. 8), but when personal relevance was high, subjects reported that the rhetorical questions were distracting and argument scrutiny was reduced (see Box 2, Fig. 8).

Burnkrant and Howard (1984) replicated our rhetorical questions study making a few key changes. Again, subjects were presented with the strong or weak version of our senior comprehensive exam message that was made either high or low in personal relevance. Instead of hearing the message over headphones, however, subjects were presented with the message as a written communication. In addition, instead of summarizing each message argument as a rhetorical question after the argument was presented, all rhetorical questions *preceded* the presentation of the message arguments. Burnkrant and Howard argued that these changes should eliminate the distraction effect that we observed under high involvement. First, presenting the message in print rather than orally gives subjects time to stop the message to consider arguments fully (see Section VI,B). Thus, the rhetorical questions need not disrupt processing even if subjects are highly involved. Second, placing the rhetorical questions at the beginning rather than at the end of the arguments has the advantage of generating interest and curiosity while avoiding the disadvantage of interrupting the train of thought concerning the argument just presented. Their results were consistent with this reasoning. The use of introductory rhetorical questions in print enhanced argument elaboration regardless of the personal relevance of the issue. When paired with the strong arguments, rhetorical questions increased agreement, but when paired with the weak arguments, rhetorical questions decreased agreement. The studies on rhetorical questions provide cogent examples of how an independent variable can have different but predictable effects on elaboration depending on the level of other variables, such as personal relevance and modality of message presentation.

A second way in which the impact of one variable may depend on the level of another factor is in whether the variable induces relatively objective or relatively biased information processing. For example, we have demonstrated that increasing the degree of personal relevance of a message can enhance a person's motivation to process the message in a relatively objective manner (Petty & Cacioppo, 1979b). However, we have also seen that this processing may become biased if personal relevance is combined with a threat, such as that induced by a forewarning of persuasive intent (Petty & Cacioppo, 1979a). In short, personal relevance per se may motivate increased processing, but when combined with some threat, the processing may be directed in the defense of one's initial position.

B. VARIABLES THAT AFFECT ELABORATION AND SERVE AS CUES

In Section IX,A we argued that whether or not a particular variable enhances or diminishes processing, or motivates relatively objective or relatively biased processing, may depend on the level of other variables in the persuasion context. Similarly, whether a variable affects information processing or serves as a peripheral cue may depend on the level of other elements in the persuasion situation. We discuss this feature of the ELM below.

1. *Source Expertise/Attractiveness*

In Section I, we noted that one aspect of persuasion research that has disappointed reviewers of the field is that even variables that were expected to be quite simple in their effects on attitude change have instead proved to be quite complex. We also noted that perhaps the most dramatic example of this was the conflicting results of research on features of the message source (Eagly & Himmelfarb, 1974). Postulate 3 (Section IV) of the ELM outlines the several different ways in which source (and other) factors can affect persuasion: they can serve as arguments, they can serve as cues, or they can affect argument processing. In the research that we have reviewed so far, we have focused on how source factors operate when the elaboration likelihood is either very high or very low. We have seen that when people are unmotivated and/or unable to process a message, they rely on simple cues in the persuasion context, such as the expertise or attractiveness of the message source, although other cues may be used if they are more salient. Importantly, since subjects are either unmotivated or unable to evaluate message arguments, a positive source tends to enhance persuasion and a negative source tends to reduce persuasion, regardless of message quality (e.g., see top panels in Fig. 4).

On the other hand, when people are highly motivated and able to process message arguments, strong arguments are more effective than weak ones despite the presence of peripheral cues such as source credibility and attractiveness (e.g., see bottom panels in Fig. 4). When motivation and ability to process are high, people are concerned with evaluating the true merits of the advocacy. In order to do this, they will scrutinize all available and inferred information in the immediate persuasion context, and attempt to relate it to information stored previously in memory. Interestingly, a consideration of source factors may be part of a person's attempt to evaluate issue-relevant information when the elaboration likelihood is high. For example, under some circumstances a source feature may itself serve as a persuasive argument by providing information central to the merits of the attitude object (e.g., a physically attractive source, without saying anything, may provide persuasive visual testimony as to the effectiveness of a

beauty product; Kahle & Homer, 1985; Petty & Cacioppo, 1981b). Additionally, a consideration of source information might help a person in evaluating the true merits of any given argument (e.g., is the expert source biased or does the source have a vested interest?).

It may now appear that the cases of high and low elaboration likelihood are quite clear. Source factors affect agreement with a message by serving as simple acceptance or rejection cues when the elaboration likelihood is low, but do not serve as simple cues when the elaboration likelihood is high. Instead, they are considered along with the message arguments in an attempt to evaluate the true merits of the advocacy. These conclusions, however, are only part of the story of how source factors impact on persuasion. As we noted in Section III,A, we view elaboration likelihood as a continuum anchored at one end by the peripheral route to persuasion, and at the other end by the central route. In all of our research described in the previous sections, we have attempted to create and describe relatively clear instances of central and peripheral routes to persuasion. Thus, for example, in our research on motivation to process, subjects were either highly involved with the topic (e.g., students were confronted with an advocacy that had implications for their own graduation; Petty, Cacioppo, & Goldman, 1981), or very uninvolved (e.g., the students were certain that there were no personal implications of the advocacy). The extreme high and low elaboration likelihood conditions have been quite useful for theory testing purposes and in explicating the two routes to persuasion. However, these conditions represent only part of the elaboration likelihood continuum.

Specifically, many day to day persuasion contexts are unlikely to be as high or as low in elaboration likelihood as the conditions we have deliberately created in our initial research. For example, people are sometimes uncertain as to the personal relevance of an issue, or have moderate rather than very high or very low knowledge on a topic. We have proposed that under more moderate conditions, people use source characteristics to determine how much to think about the message (Petty & Cacioppo, 1981a, 1984c). When the personal consequences or prior knowledge on an issue are moderate or unclear, people may not be sure if the message is worth thinking about or if they are able to do so. Under these circumstances, characteristics of the message source can help a person decide if the message warrants (or needs) careful scrutiny. In our own research on moderate levels of motivation to process, undergraduate students have been led to believe that a change in policy was being advocated for their university, but they were not told when or if this policy ever would be implemented. Thus, unlike our studies on high and low personal relevance (see Section VI,A), subjects could not be certain whether or not the change in policy would affect them.

In one study (Puckett, Petty, Cacioppo, & Fisher, 1983), for example, we told subjects that students in an evening undergraduate continuing education course had written essays on the issue of whether comprehensive exams should

be given in a student's major area of study as a prerequisite for obtaining a bachelor's degree. Each subject was given a folder containing a typed essay along with a card containing a picture and a brief description of the author of the essay. Two major variables were manipulated in the study: (1) the social attractiveness of the author (socially attractive authors were more physically attractive and had better family backgrounds and more prestigious hobbies than the socially unattractive authors), and (2) the quality of the arguments in the editorial (either strong or weak). A third variable, age of the essay author, was also manipulated but this factor had no effect on persuasion. After looking through the appropriate folder, subjects were asked to rate their own opinions about the senior comprehensive exam issue. The major result indicated that the arguments were more carefully processed when they were associated with a socially attractive than a socially unattractive source. More specifically, the significant message quality $\times$ source attractiveness interaction was due to the joint tendencies for attractiveness to enhance agreement with the proposal when the arguments presented were strong, but for attractiveness to reduce agreement when the arguments presented were weak (see Box 3, in Fig. 8). The latter effect (an attractive source reducing agreement), of course, is opposite to what one normally would expect the effect of attractive sources to be (see review by Chaiken, 1985).

In a study conceptually similar to the Puckett *et al.* (1983) study, we again left the degree of personal relevance ambiguous and manipulated the quality of the arguments presented in favor of senior comprehensive exams. This time, however, subjects heard rather than read the message, and we varied source expertise rather than social attractiveness (Heesacker, Petty, & Cacioppo, 1983). Some subjects were led to believe that the source of the message was a professor of education at Princeton University (high expertise), and others were led to believe that the source was a local high school student (low expertise). The subjects in this study were divided into those who were relatively field dependent or independent as assessed by the embedded figures test (Ekstrom, French, & Harmon, 1962). The data for field-dependent subjects showed a message quality $\times$ source expertise interaction (see Box 4, Fig. 8). Similar to the effect observed for social attractiveness, the arguments were more carefully processed when they were presented by the expert than by the inexpert source. Again, the interaction was due to the joint tendencies for strong arguments to be more persuasive when presented by an expert, but for weak arguments to be less persuasive when presented by an expert, and again the latter effect is opposite to what one normally would expect the effect of expertise to be.¹²

¹²Field-independent subjects showed only a main effect for argument quality, probably because these subjects were generally more motivated and/or able to extract meaning from stimuli (Witkin, Goodenough, & Oltman, 1979). If field-independent subjects generally have a higher elaboration likelihood, then they would be more likely to process message arguments regardless of the source.

In sum, although the operation of source factors may seem quite simple on the surface, the ELM indicates that their operation, although orderly and predictable, is quite complex. In separate experiments, we have seen that when personal relevance is high, source factors can serve as persuasive arguments or assist in the evaluation of arguments; when personal relevance is low, source factors can serve as simple cues; and when personal relevance is moderate or ambiguous, source factors can affect the extent of message processing. Since all of these effects are obtained under different conditions, however, it is not surprising that a great diversity of results has been observed in the literature.

2. *Other Variables with Multiple Functions*

We have now seen how some source variables can serve as arguments in some contexts, cues in other contexts, and affect argument processing in still other situations. This general principle, which is stated explicitly in Postulate 3 (Section IV), was applied mostly to separate variables as we explicated the various postulates of the ELM. However, it should now be clear that any *one* variable can serve in all of these roles. A few more examples should help to elucidate how one variable can serve in multiple roles depending on the specific features of the persuasion context.

First, consider the impact of the number of other people who endorse a particular attitudinal position. Traditional analyses of the number of message sources have assumed that the more people who are perceived to advocate a position (up to some limit), the more conformity pressure that is induced, and the more agreement that results (e.g., Asch, 1951; White, 1975). One popular explanation for this conformity effect is that people shift toward the majority view out of a desire to hold a correct opinion (Festinger, 1954). An alternative point of view is that the more people who are associated with a particular position, the more recipients may think about the position advocated (Burnstein & Sentsis, 1981; Burnstein & Vinokur, 1977) or about the specific arguments presented (Harkins & Petty, 1981a,b). This enhanced thinking might lead to more or less agreement depending on the nature of the thinking. For example, Harkins & Petty (1981a) found that when the personal relevance of a proposal was left ambiguous, increasing the number of sources who presented strong arguments enhanced persuasion, but that increasing the number of sources who presented weak arguments reduced persuasion (see Box 5, Fig. 8).

Importantly, we do not mean to suggest that expert/attractive sources invariably enhance information processing when involvement is moderate. Under some conditions, for example, it may be more adaptive and/or necessary to engage in more scrutiny of a moderate or low than a clearly credible source (Petty & Cacioppo, 1981a, 1984c).

The initial (conformity) explanation of multiple source effects is consistent with the view that the mere number of other people advocating a position serves as a simple peripheral cue as to the validity of the advocacy. The second (information processing) interpretation, however, is more consistent with the view that the attitude changes induced by multiple sources follow the central route to persuasion (Harkins & Petty, 1983). The ELM, of course, suggests that both of these processes may operate in different situations. When the elaboration likelihood is very low (such as when personal relevance is low or distraction is high), people will be unmotivated to evaluate the issue-relevant information presented and may use the number of people who support the issue as a simple cue as to the worth of the proposal. When the elaboration likelihood is moderate, people may use the number of sources advocating a position as an indication of whether the message is worth considering. Finally, when the elaboration likelihood is very high, message recipients will undertake a deliberate assessment of the message arguments and the number of endorsers will have little further value as a motivator of thought or as a simple acceptance cue. No experiment to date, however, has examined the impact of the number of sources across the full elaboration likelihood continuum.¹³

Factors associated with the message source, of course, are not the only variables that can both serve as cues and affect message processing. Message variables can likewise serve in both roles. We have already discussed how the number of arguments could serve as a simple cue when personal relevance was low, but affect information processing when personal relevance was high (Petty & Cacioppo, 1984a). Similarly, recipient and context variables may serve in multiple roles. For example, we have shown that the physical posture of a message recipient can affect the extent of elaboration under moderate involvement conditions. In one study (Petty, Wells, Heesacker, Brock, & Cacioppo, 1983), people who were reclining comfortably during message exposure showed greater attitudinal differentiation of strong from weak message arguments than people who were standing (see Box 6, Fig. 8). If subjects were presented with a message they were unmotivated or unable to elaborate, however, then posture (or other factors related to comfort during message exposure) might serve as simple positive or negative affective cues (e.g., Griffit & Veitch, 1971).

Importantly, even though the ELM holds open the possibility that variables can affect agreement either by having an impact on information processing or by serving as simple cues, the ELM specifies, in a general manner at least, the conditions under which each process is likely to operate. Thus, a whole list of source (e.g., credibility, attractiveness, number of sources), message (e.g.,

¹³Our analysis of multiple sources assumes that all sources are advocating the same position. When conflicting positions are advocated by different numbers of people (as in minority influence), the situation becomes more complex (see Maass & Clark, 1984).

number of arguments, use of rhetorical devices, discrepancy), audience (e.g., recipient posture, presence of hecklers, false physiological feedback), and other variables may affect attitudes by modifying information processing under certain conditions (e.g., ambiguous personal relevance), but affect attitudes by serving as simple cues in other contexts (e.g., low prior knowledge).

X. Summary and Conclusions

At the most general level, we have outlined two basic routes to persuasion. One route is based on the thoughtful (though sometimes biased) consideration of arguments central to the issue, whereas the other is based on affective associations or simple inferences tied to peripheral cues in the persuasion context. When variables in the persuasion situation render the elaboration likelihood high, the first kind of persuasion occurs (central route). When variables in the persuasion situation render the elaboration likelihood low, the second kind of persuasion occurs (peripheral route). Importantly, there are different consequences of the two routes to persuasion. Attitude changes via the central route appear to be more persistent, resistant, and predictive of behavior than changes induced via the peripheral route.

In the body of this article we have discussed a wide variety of variables that proved instrumental in affecting the elaboration likelihood, and thus the route to persuasion. In fact, one of the basic postulates of the Elaboration Likelihood Model, that variables may affect persuasion by increasing or decreasing scrutiny of message arguments, was highly useful in accounting for the effects of a seemingly diverse list of variables (see Figs. 3 and 8). The effects of these variables had been explained with many different theoretical accounts in the accumulated persuasion literature. The ELM was successful in tying the effects of these variables to one underlying process. We have also seen that many different variables could serve as peripheral cues, affecting persuasion without issue-relevant thinking. Finally, we saw that some variables were capable of serving in multiple roles, enhancing or reducing thinking in some contexts, and serving as simple acceptance or rejection cues in others.

We began this article by noting that reviewers of the attitude change literature have been disappointed with the many conflicting effects observed, even for ostensibly simple variables. For example, manipulations of source expertise have sometimes increased persuasion, sometimes have had no effect, and have sometimes decreased persuasion. Similarly, studies testing different theories have sometimes found the theory to be useful in predicting attitude change, and at other times have found the theory to be unproductive. For example, self-perception processes appear to operate under some conditions, but not others.

The Elaboration Likelihood Model attempts to place these many conflicting results and theories under one conceptual umbrella by specifying the major processes underlying persuasion and indicating how many of the traditionally studied variables and theories relate to these basic processes. Thus, we have seen that a seemingly simple variable like source credibility actually is capable of affecting persuasion in rather complex ways. The ELM, however, elucidates the conditions under which these different effects are likely to operate. Similarly, we have seen that a theoretical process such as self-perception, which emphasizes a simple inference based on behavioral cues, is likely to operate when the elaboration likelihood is relatively low but not when the elaboration likelihood is very high.

We believe that perhaps the greatest strength of the Elaboration Likelihood Model is that it specifies the major ways in which variables can have an impact on persuasion, and it points to the major consequences of these different mediational processes. In one sense, the ELM is rather simple. It indicates that variables can affect persuasion in a limited number of ways: A variable can serve as a persuasive argument, serve as a peripheral cue, or affect argument scrutiny in either a relatively objective or a relatively biased manner. In confining the mediational processes of persuasion to just these possibilities, the ELM provides a simplifying and organizing framework that may be applied to many of the traditionally studied source, message, recipient, and context variables. The postulates of the ELM do *not* ultimately indicate *why* certain arguments are strong or weak, why certain variables serve as cues, or why certain variables affect information processing. Instead, the ELM limits the mediational processes of persuasion to a finite set, and specifies, in a general way at least, the conditions under which each mediational process is likely to occur and the consequences of these processes. In doing this, the ELM may prove useful in providing a guiding set of postulates from which to interpret previous work, and in suggesting new hypotheses to be explored in future research.

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REFERENCES

- Abelson, R. (1972). Are attitudes necessary. In B. T. King & E. McGinnies (Eds.), *Attitudes, conflict, and social change*. New York: Academic Press.
- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, **84**, 888-918.

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology* (Vol. 2). Worcester, MA: Clark University Press.
- Allyn, J., & Festinger, L. (1961). The effectiveness of unanticipated persuasive communications. *Journal of Abnormal and Social Psychology*, **62**, 35-40.
- Anderson, N. (1981). Integration theory applied to cognitive responses and attitudes. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Andreoli, V., & Worchel, S. (1978). Effects of media, communicator, and message position on attitude change. *Public Opinion Quarterly*, **42**, 59-70.
- Apsler, R., & Sears, D. O. (1968). Warning, personal involvement, and attitude change. *Journal of Personality and Social Psychology*, **9**, 162-166.
- Asch, S. (1948). The doctrine of suggestion, prestige, and imitation in social psychology. *Psychological Review*, **55**, 250-276.
- Asch, S. (1951). Effects of group pressure upon the modification and distortion of judgment. In H. Guetzkow (Ed.), *Groups, leadership, and men*. Pittsburgh: Carnegie.
- Baron, R. S., Baron, P., & Miller, N. (1973). The relation between distraction and persuasion. *Psychological Bulletin*, **80**, 310-323.
- Batra, R., & Ray, M. (1984). Advertising situations: The implications of differential involvement and accompanying affective responses. In R. J. Harris (Ed.), *Information processing research in advertising*. Hillsdale, NJ: Erlbaum.
- Batra, R., & Ray, M. (1985). How advertising works at contact. In L. Alwitt & A. Mitchell (Eds.), *Psychological processes and advertising effects: Theory, research and application*. Hillsdale, NJ: Erlbaum.
- Belch, G. E. (1982). The effects of television commercial repetition on cognitive responses and message acceptance. *Journal of Consumer Research*, **9**, 56-65.
- Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, **74**, 183-200.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6). New York: Academic Press.
- Bettman, J. R., & Park, C. W. (1980). Effects of prior knowledge and experience and phase of the choice process on consumer decision processes: A protocol analysis. *Journal of Consumer Research*, **7**, 234-248.
- Bobrow, D. G., & Norman, D. A. (1975). Some principles of memory schemata. In D. G. Bobrow & A. Collins (Eds.), *Representation and understanding: Studies in cognitive science*. New York: Academic Press.
- Borgida, E., & Howard-Pitney, B. (1983). Personal involvement and the robustness of perceptual salience effects. *Journal of Personality and Social Psychology*, **45**, 560-570.
- Bower, G. H. (1981). Mood and memory. *American Psychologist*, **11**, 11-13.
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Brehm, J. W. (1972). *Responses to loss of freedom: A theory of psychological reactance*. Morristown, NJ: General Learning Press.
- Brickner, M. A., Harkins, S. G., & Ostrom, T. M. (1985). The effects of personal involvement: Thought provoking implications for social loafing. *Journal of Personality and Social Psychology*, in press.
- Britton, B. K., & Tesser, A. (1982). Effects of prior knowledge on use of cognitive capacity in three complex cognitive tasks. *Journal of Verbal Learning and Verbal Behavior*, **21**, 421-436.
- Brock, T. C. (1967). Communication discrepancy and intent to persuade as determinants of counterargument production. *Journal of Experimental Social Psychology*, **3**, 269-309.

- Burgoon, M., Cohen, M., Miller, M., & Montgomery, C. (1978). An empirical test of a model of resistance to persuasion. *Human Communications Research*, 5, 27-39.
- Burnkrant, R. E., & Howard, D. J. (1984). Effects of the use of introductory rhetorical questions versus statements on information processing. *Journal of Personality and Social Psychology*, 47, 1218-1230.
- Burnkrant, R. E., & Sawyer, A. (1983). Effects of involvement on information processing intensity. In R. J. Harris (Ed.), *Information processing research in advertising*. Hillsdale, NJ: Erlbaum.
- Burnstein, E., & Sents, K. (1981). Attitude polarization in groups. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion* (pp. 197-216). Hillsdale, NJ: Erlbaum.
- Burnstein, E., & Vinokur, A., (1977). Persuasive argumentation and social comparison as determinants of attitude polarization. *Journal of Experimental Social Psychology*, 13, 315-332.
- Burnstein, E., Vinokur, A., & Trope, Y. (1973). Interpersonal comparison versus persuasive argumentation: A more direct test of alternative explanations for group induced shifts in individual choice. *Journal of Experimental Social Psychology*, 9, 236-245.
- Cacioppo, J. T., Harkins, S. G., & Petty, R. E. (1981). The nature of attitudes and cognitive responses and their relationships to behavior. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Cacioppo, J. T., & Petty, R. E. (1979a). Attitudes and cognitive response: An electrophysiological approach. *Journal of Personality and Social Psychology*, 37, 2181-2199.
- Cacioppo, J. T., & Petty, R. E. (1979b). Effects of message repetition and position on cognitive responses, recall, and persuasion. *Journal of Personality and Social Psychology*, 37, 97-109.
- Cacioppo, J. T., & Petty, R. E. (1980a). Persuasiveness of communications is affected by exposure frequency and message quality: A theoretical and empirical analysis of persisting attitude change. In J. H. Leigh & C. R. Martin (Eds.), *Current issues and research in advertising*. Ann Arbor: University of Michigan Graduate School of Business Administration.
- Cacioppo, J. T., & Petty, R. E. (1980b). Sex differences in influenceability: Toward specifying the underlying processes. *Personality and Social Psychology Bulletin*, 6, 651-656.
- Cacioppo, J. T., & Petty, R. E. (1981a). Electromyograms as measures of extent and affectivity of information processing. *American Psychologist*, 36, 441-456.
- Cacioppo, J. T., & Petty, R. E. (1981b). Electromyographic specificity during covert information processing. *Psychophysiology*, 18, 518-523.
- Cacioppo, J. T., & Petty, R. E. (1981c). Social psychological procedures for cognitive response assessment: The thought listing technique. In T. Merluzzi, C. Glass, & M. Genest (Eds.), *Cognitive assessment*. New York: Guilford.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42, 116-131.
- Cacioppo, J. T., & Petty, R. E. (1984a). The Elaboration Likelihood Model. *Advances in Consumer Research*, 11, 673-675.
- Cacioppo, J. T., & Petty, R. E. (1984b). The need for cognition: Relationship to attitudinal processes. In R. McGlynn, J. Maddux, C. Stoltenberg, & J. Harvey (Eds.), *Social perception in clinical and counseling psychology*. Lubbock: Texas Tech University Press.
- Cacioppo, J. T., & Petty, R. E. (1985). Central and peripheral routes to persuasion: The role of message repetition. In A. Mitchell & L. Alwitt (Eds.), *Psychological processes and advertising effects*. Hillsdale, NJ: Erlbaum.
- Cacioppo, J. T., & Petty, R. E. (1986). Stalking rudimentary processes of social influence: A psychophysiological approach. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario symposium* (Vol. 5). Hillsdale, NJ: Erlbaum, in press.
- Cacioppo, J. T., Petty, R. E., & Kao, C. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48, 306-307.

- Cacioppo, J. T., Petty, R. E., Kao, C., & Rodriguez, R. (1985). *Central and peripheral routes to persuasion: An individual difference perspective*. Unpublished manuscript, University of Iowa, Iowa City.
- Cacioppo, J. T., Petty, R. E., & Morris, K. (1983). Effects of need for cognition on message evaluation, recall, and persuasion. *Journal of Personality and Social Psychology*, **45**, 805–818.
- Cacioppo, J. T., Petty, R. E., & Sidera, J. (1982). The effects of a salient self-schema on the evaluation of proattitudinal editorials: Top-down versus bottom-up message processing. *Journal of Experimental Social Psychology*, **18**, 324–338.
- Cacioppo, J. T., Petty, R. E., & Stoltenberg, C. (1985). Processes of social influence: The elaboration likelihood model of persuasion. In P. Kendall (Ed.), *Advances in cognitive behavioral research and therapy* (Vol. 4). New York: Academic Press.
- Calder, B. J., Insko, C., & Yandell, B. (1974). The relation of cognitive and memorial processes to persuasion in a simulated jury trial. *Journal of Applied Social Psychology*, **4**, 62–93.
- Calder, B. J., & Sternthal, B. (1980). Television commercial wearout: An information processing view. *Journal of Marketing Research*, **17**, 173–186.
- Cantor, G. N. (1968). Children's "like-dislike" ratings of familiarized and nonfamiliarized visual stimuli. *Journal of Experimental Child Psychology*, **6**, 651–657.
- Cantor, N., & Mischel, W. (1979). Prototypes in person perception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 12). New York: Academic Press.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, **39**, 752–756.
- Chaiken, S. (1985). Physical appearance and social influence. In C. P. Herman, M. P. Zanna, & E. T. Higgins (Eds.), *Physical appearance, stigma and social behavior: The Ontario symposium* (Vol. 4). Hillsdale, NJ: Erlbaum, in press.
- Chaiken, S., & Baldwin, M. W. (1981). Affective-cognitive consistency and the effect of salient behavioral information on the self-perception of attitudes. *Journal of Personality and Social Psychology*, **41**, 1–12.
- Chaiken, S., & Eagly, A. H. (1976). Communication modality as a determinant of message persuasiveness and message comprehensibility. *Journal of Personality and Social Psychology*, **34**, 605–614.
- Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology*, **45**, 241–256.
- Cialdini, R. B. (1984). Principles of automatic influence. In J. Jacoby & C. S. Craig (Eds.), *Personal selling: Theory, research, and practice*. Lexington, MA: Heath.
- Cialdini, R. B., Levy, A., Herman, P., & Evenbeck, S. (1973). Attitudinal politics: The strategy of moderation. *Journal of Personality and Social Psychology*, **25**, 100–108.
- Cialdini, R. B., Levy, A., Herman, P., Kozlowski, L., & Petty, R. E. (1976). Elastic shifts of opinion: Determinants of direction and durability. *Journal of Personality and Social Psychology*, **34**, 663–672.
- Cialdini, R. B., & Petty, R. E. (1981). Anticipatory opinion effects. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion* (pp. 217–235). Hillsdale, NJ: Erlbaum.
- Cialdini, R. B., Petty, R. E., & Cacioppo, J. T. (1981). Attitude and attitude change. *Annual Review of Psychology*, **32**, 357–404.
- Clark, M. S., & Isen, A. M. (1982). Toward understanding the relationship between feeling states and social behavior. In A. Hastorf & A. Isen (Eds.), *Cognitive social psychology*. New York: Elsevier-North Holland.
- Cohen, A. (1957). Need for cognition and order of communication as determinants of opinion change. In C. Hovland et al. (Eds.), *The order of presentation in persuasion*. New Haven, CT: Yale University Press.

- Cohen, A., Stotland, E., & Wolfe, D. (1955). An experimental investigation of need for cognition. *Journal of Abnormal and Social Psychology*, **51**, 291-294.
- Cook, T. D., & Flay, B. (1978). The temporal persistence of experimentally induced attitude change: An evaluative review. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 11). New York: Academic Press.
- Cooper, H. M. (1979). Statistically combining independent studies: meta-analysis of sex differences in conformity research. *Journal of Personality and Social Psychology*, **37**, 131-146.
- Cooper, J., & Croyle, R. T. (1984). Attitudes and attitude change. *Annual Review of Psychology*, **35**, 395-426.
- Cooper, J., & Jones, R. A. (1970). Self-esteem and consistency as determinants of anticipatory opinion change. *Journal of Personality and Social Psychology*, **14**, 312-320.
- Craik, F. I. M. (1979). Human Memory. *Annual Review of Psychology*, **30**, 63-102.
- Crocker, J., Fiske, S. T., & Taylor, S. E. (1984). Schematic bases of belief change. In R. Eiser (Ed.), *Attitudinal judgment*. New York: Springer-Verlag.
- Deaux, K. (1984). From individual differences to social categories: Analysis of a decade's research on gender. *American Psychologist*, **39**, 105-116.
- Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 13). New York: Academic Press.
- Eagly, A. H. (1967). Involvement as a determinant of response to favorable and unfavorable information. *Journal of Personality and Social Psychology Monograph*, **7**(3 Pt. 2).
- Eagly, A. H. (1974). Comprehensibility of persuasive arguments as a determinant of opinion change. *Journal of Personality and Social Psychology*, **29**, 758-773.
- Eagly, A. H. (1978). Sex differences in influenceability. *Psychological Bulletin*, **85**, 86-116.
- Eagly, A. H., & Carli, L. (1983). Sex of researchers and sex-typed communications as determinants of sex differences in influenceability. *Psychological Bulletin*, **90**, 1-20.
- Eagly, A. H., & Chaiken, S. (1984). Cognitive theories of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 17). New York: Academic Press.
- Eagly, A. H., & Himmelfarb, S. (1974). Current trends in attitude theory and research. In S. Himmelfarb & A. Eagly (Eds.), *Readings in attitude change*. New York: Wiley.
- Eagly, A. H., & Himmelfarb, S. (1978). Attitudes and opinions. *Annual Review of Psychology*, **29**, 517-554.
- Eagly, A. H., & Manis, M. (1966). Evaluation of message and communication as a function of involvement. *Journal of Personality and Social Psychology*, **3**, 483-485.
- Eagly, A. H., & Warren, R. (1976). Intelligence, comprehension, and opinion change. *Journal of Personality*, **44**, 226-242.
- Eagly, A. H., Wood, W., & Chaiken, S. (1978). Causal inferences about communicators and their effect on opinion change. *Journal of Personality and Social Psychology*, **36**, 424-435.
- Ekstrom, R. B., French, J. W., & Harmon, H. H. (1962). *Kit of factor referenced cognitive tests*. Princeton, NJ: Educational Testing Service.
- Elms, A. C. (1966). Influence of fantasy ability on attitude change through role-playing. *Journal of Personality and Social Psychology*, **4**, 36-43.
- Fazio, R. H. (1985). How do attitudes guide behavior? In R. M. Sorrentino & E. T. Higgins (Eds.), *The handbook of motivation and cognition: Foundations of social behavior*. New York: Guilford.
- Fazio, R. H., Chen, J., McDonel, E., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object-evaluation association. *Journal of Experimental Social Psychology*, **18**, 339-357.

- Fazio, R. H., & Zanna, M. P. (1981). Direct experience and attitude behavior consistency. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. (Vol. 14, pp. 161–202). New York: Academic Press.
- Festinger, L. (1950). Informal social communication. *Psychological Review*, **57**, 271–282.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, **7**, 117–140.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Festinger, L., & Maccoby, N. (1964). On resistance to persuasive communications. *Journal of Abnormal and Social Psychology*, **68**, 359–366.
- Fishbein, M. (1980). A theory of reasoned action: Some applications and implications. In H. Howe & M. Page (Eds.), *Nebraska symposium on motivation, 1979*. Lincoln: University of Nebraska Press.
- Fishbein, M., & Ajzen, I. (1972). Attitudes and opinions. *Annual Review of Psychology*, **23**, 487–544.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fishbein, M., & Ajzen, I. (1981). Acceptance, yielding and impact: Cognitive processes in persuasion. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Fiske, S. T., Kinder, D. R., & Larter, W. M. (1983). The novice and the expert: Knowledge-based strategies in political cognition. *Journal of Experimental Social Psychology*, **19**, 381–400.
- Folkes, V. (1985). Mindlessness or mindfulness: A partial replication and extension of Langer, Blank and Chanowitz. *Journal of Personality and Social Psychology*, **48**, 600–604.
- Forer, B. (1949). The fallacy of personal validation. *Journal of Abnormal and Social Psychology*, **44**, 118–123.
- Freedman, J. L. (1964). Involvement, discrepancy, and change. *Journal of Abnormal and Social Psychology*, **69**, 290–295.
- Freedman, J. L., & Sears, D. O. (1965). Warning, distraction and resistance to influence. *Journal of Personality and Social Psychology*, **1**, 262–266.
- Freedman, J. L., Sears, D. O., & O'Conner, E. F. (1964). The effects of anticipated debate and commitment on the polarization of audience opinion. *Public Opinion Quarterly*, **28**, 615–627.
- Gorn, G. (1982). The effects of music in advertising on choice behavior: A classical conditioning approach. *Journal of Marketing Research*, **46**, 94–101.
- Gorn, G., & Goldberg, M. (1980). Children's responses to repetitive TV commercials. *Journal of Consumer Research*, **6**, 421–425.
- Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and attitude change. In A. Greenwald, T. Brock, & T. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 148–170). New York: Academic Press.
- Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, **35**, 603–618.
- Greenwald, A. G. (1981). Ego task analysis: An integration of research on ego-involvement. In A. Hastorf & A. Isen (Eds.), *Cognitive social psychology*. Amsterdam: Elsevier.
- Griffit, W., & Veitch, R. (1971). Hot and crowded: Influences of population density and temperature on interpersonal affective behavior. *Journal of Personality and Social Psychology*, **17**, 92–98.
- Harkins, S. G., Latané, B., & Williams, K. D. (1980). Social loafing: Allocating effort or taking it easy. *Journal of Experimental Social Psychology*, **16**, 457–465.
- Harkins, S. G., & Petty, R. E. (1981a). The effects of source magnification of cognitive effort on attitudes: An information processing view. *Journal of Personality and Social Psychology*, **40**, 401–413.

- Harkins, S. G., & Petty, R. E. (1981b). The multiple source effect in persuasion: The effects of distraction. *Personality and Social Psychology Bulletin*, *7*, 627-635.
- Harkins, S. G., & Petty, R. E. (1982). Effects of task difficulty and task uniqueness on social loafing. *Journal of Personality and Social Psychology*, *43*, 1214-1229.
- Harkins, S. G., & Petty, R. E. (1983). Social context effects in persuasion: The effects of multiple sources and multiple targets. In P. Paulus (Ed.), *Basic group processes*. New York: Springer-Verlag.
- Harkness, A. R., DeBono, K. G., & Borgida, E. (1985). Personal involvement and strategies for making contingency judgments: A stake in the dating game makes a difference. *Journal of Personality and Social Psychology*, *49*, 22-32.
- Harrison, A. A. (1977). Mere exposure. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10). New York: Academic Press.
- Harvey, O. J., Hunt, D. E., & Schroder, H. M. (1961). *Conceptual systems and personality organization*. New York: Wiley.
- Hass, R. G. (1981). Effects of source characteristics on cognitive responses and persuasion. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Hass, R. G., & Grady, K. (1975). Temporal delay, type of forewarning, and resistance to influence. *Journal of Experimental Social Psychology*, *11*, 459-469.
- Heesacker, M., Petty, R. E., & Cacioppo, J. T. (1983). Field dependence and attitude change: Source credibility can alter persuasion by affecting message-relevant thinking. *Journal of Personality*, *51*, 653-666.
- Heider, F. (1946). Attitudes and cognitive organization. *Journal of Psychology*, *21*, 107-112.
- Higgins, T., Herman, C. P., & Zanna, M. P. (Eds.). (1981). *Social cognition: The Ontario symposium* (Vol. 1). Hillsdale, NJ: Erlbaum.
- Himmelfarb, S., & Eagly, A. H. (1974). Orientations to the study of attitudes and their change. In S. Himmelfarb & A. Eagly (Eds.), *Readings in attitude change*. New York: Wiley.
- Hovland, C. I., Harvey, O. J., & Sherif, M. (1957). Assimilation and contrast effects in reactions to communications and attitude change. *Journal of Abnormal and Social Psychology*, *55*, 244-252.
- Hovland, C. I., Janis, I., & Kelley, H. H. (1953). *Communication and persuasion*. New Haven, CT: Yale University Press.
- Hovland, C. I., & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly*, *15*, 635-650.
- Ingham, A., Levinger, G., Graves, J., & Peckham, V. (1974). The Ringelmann effect: Studies of group size and group performance. *Journal of Experimental Social Psychology*, *10*, 371-384.
- Insko, C. A. (1981). Balance theory and phenomenology. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Insko, C. A. (1984). Balance theory, the Jordan paradigm, and the Wiest tetrahedron. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 18). New York: Academic Press.
- Insko, C. A., Lind, E. A., & LaTour, S. (1976). Persuasion, recall, and thoughts. *Representative Research in Social Psychology*, *7*, 66-78.
- Insko, C. A., Turnbull, W., & Yandell, B. (1974). Facilitating and inhibiting effects of distraction on attitude change. *Sociometry*, *37*, 508-528.
- Janis, I. L., & Gilmore, J. B. (1965). The influence of incentive conditions on the success of role playing in modifying attitudes. *Journal of Personality and Social Psychology*, *1*, 17-27.
- Janis, I. L., Kaye, D., & Kirschner, P. (1965). Facilitating effects of "eating while reading" on responsiveness to persuasive communications. *Journal of Personality and Social Psychology*, *1*, 181-186.

- Johnson, E. J., & Russo, J. E. (1981). Product familiarity and learning new information. *Advances in Consumer Research*, 8, 151-155.
- Johnson, H. H., & Watkins, T. A. (1971). The effects of message repetitions on immediate and delayed attitude change. *Psychonomic Science*, 22, 101-103.
- Kahle, L. R., & Homer, P. M. (1985). Physical attractiveness of the celebrity endorser: A social adaptation perspective. *Journal of Consumer Research*, 11, 954-961.
- Kahneman, D., Slovic, P., & Tversky, A. (Eds.) (1982). *Judgment under uncertainty: Heuristics and biases*. London and New York: Cambridge University Press.
- Karabenick, S. A. (1983). Sex-relevance of content and influenceability: Sistrunk and McDavid revisited. *Personality and Social Psychology Bulletin*, 9, 243-252.
- Katz, D. (1960). The functional approach to the study of attitudes. *Public Opinion Quarterly*, 24, 163-204.
- Keating, J. P., & Brock, T. C. (1974). Acceptance of persuasion and the inhibition of counterargumentation under various distraction tasks. *Journal of Experimental Social Psychology*, 10, 301-309.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15). Lincoln: University of Nebraska Press.
- Kelman, H. C. (1961). Processes of opinion change. *Public Opinion Quarterly*, 25, 57-78.
- Kelman, H. C., & Eagly, A. H. (1965). Attitude toward the communicator, perception of communication content, and attitude change. *Journal of Personality and Social Psychology*, 1, 63-78.
- Kelman, H. C., & Hovland, C. I. (1953). Reinstatement of the communicator in delayed measurement of opinion change. *Journal of Abnormal and Social Psychology*, 48, 327-335.
- Kerr, N., & Bruun, S. (1981). Ringelmann revisited: Alternative explanations for the social loafing effect. *Personality and Social Psychology Bulletin*, 7, 224-231.
- Kiesler, C. A., Collins, B., & Miller, N. (1969). *Attitude change: A critical analysis of theoretical approaches*. New York: Wiley.
- Kiesler, C. A., & Kiesler, S. (1964). Role of forewarning in persuasive communications. *Journal of Abnormal and Social Psychology*, 68, 547-549.
- Kiesler, S. B., & Mathog, R. (1968). The distraction hypothesis in attitude change. *Psychological Reports*, 23, 1123-1133.
- Kiesler, C. A., & Munson, P. A. (1975). Attitudes and opinions. *Annual Review of Psychology*, 26, 415-456.
- King, B. T., & Janis, I. L. (1956). Comparison of the effectiveness of improvised versus non-improvised role-playing in producing opinion change. *Human Relations*, 9, 177-186.
- Kleinheselink, R. R., & Edwards, R. E. (1975). Seeking and avoiding belief-discrepant information as a function of its perceived refutability. *Journal of Personality and Social Psychology*, 31, 787-790.
- Kohlberg, L. (1963). The development of children's orientations toward a moral order. I. Sequence in the development of moral thought. *Vita Humana*, 6, 11-33.
- Kunst-Wilson, W. R., & Zajonc, R. B. (1980). Affective discrimination of stimuli that cannot be recognized. *Science*, 207, 557-558.
- Lammers, H. B., & Becker, L. A. (1980). Distraction: Effects on the perceived extremity of a communication and on cognitive responses. *Personality and Social Psychology Bulletin*, 6, 261-266.
- Landman, J., & Manis, M. (1983). Social cognition: Some historical and theoretical perspectives. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 16). New York: Academic Press.
- Langer, E. (1978). Rethinking the role of thought in social interaction. In J. Harvey, W. Ickes, & R. Kidd (Eds.), *New directions in attribution research* (Vol. 2). Hillsdale, NJ: Erlbaum.

- Langer, E., Blank, A., & Chanowitz, B. (1978). The mindlessness of ostensibly thoughtful action. *Journal of Personality and Social Psychology*, **36**, 635–642.
- Lastovicka, J., & Gardner, D. (1979). Components of involvement. In J. Maloney & B. Silverman (Eds.), *Attitude research plays for high stakes*. Chicago: American Marketing Association.
- Latané, B., Williams, K., & Harkins, S. G. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, **37**, 822–832.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology*, **28**, 129–137.
- Lingle, J. H., & Ostrom, T. M. (1981). Principles of memory and cognition in attitude formation. In R. E. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Linville, P. (1982). The complexity-extremity effect and age based stereotyping. *Journal of Personality and Social Psychology*, **42**, 193–210.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, **37**, 2098–2109.
- Lowin, A. (1967). Approach and avoidance as alternate modes of selective exposure to information. *Journal of Personality and Social Psychology*, **6**, 1–9.
- Maass, A., & Clark, R. D. (1984). Hidden impact of minorities. Fifteen years of minority influence research. *Psychological Bulletin*, **95**, 428–450.
- Maddux, J. E., & Rogers, R. W. (1980). Effects of source expertness, physical attractiveness, and supporting arguments on persuasion: A case of brains over beauty. *Journal of Personality and Social Psychology*, **38**, 235–244.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, **35**, 63–78.
- McDavid, J. (1959). Personality and situational determinants of conformity. *Journal of Abnormal and Social Psychology*, **58**, 241–246.
- McGuire, W. J. (1964). Inducing resistance to persuasion: Some contemporary approaches. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 1). New York: Academic Press.
- McGuire, W. J. (1968). Personality and attitude change: An information-processing theory. In A. Greenwald, T. Brock, & T. Ostrom (Eds.), *Psychological foundations of attitudes*. New York: Academic Press.
- McGuire, W. J. (1969). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (2nd ed., Vol. 3). Reading, MA: Addison-Wesley.
- McGuire, W. J. (1981). The probabilistic model of cognitive structure and attitude change. In R. E. Petty, T. M. Ostrom, & T. C. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- McGuire, W. J. (1985). Attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (3rd ed., Vol. 2.). New York: Random House.
- McGuire, W. J., & Papageorgis, D. (1962). Effectiveness of forewarning in developing resistance to persuasion. *Public Opinion Quarterly*, **26**, 24–34.
- Millar, M. G., & Tesser, A. (1984). *Thought-induced attitude change: The effects of schema structure and commitment*. Unpublished manuscript. University of Georgia, Athens.
- Miller, N. (1965). Involvement and dogmatism as inhibitors of attitude change. *Journal of Experimental Social Psychology*, **1**, 121–132.

- Miller, N., & Baron, R. S. (1973). On measuring counterarguing. *Journal for the Theory of Social Behavior*, 3, 101-118.
- Miller, N., & Colman, D. (1981). Methodological issues in analyzing the cognitive mediation of persuasion. In R. E. Petty, T. M. Ostrom, & T. C. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Miller, N., Maruyama, G., Beaber, R., & Valone, K. (1976). Speed of speech and persuasion. *Journal of Personality and Social Psychology*, 34, 615-625.
- Miller, R. L., Brickman, P., & Bolen, D. (1975). Attribution versus persuasion as a means for modifying behavior. *Journal of Personality and Social Psychology*, 31, 430-441.
- Mills, J. (1966). Opinion change as a function of the communicator's desire to influence and liking for the audience. *Journal of Experimental Social Psychology*, 2, 152-159.
- Mills, J., & Aronson, E. (1965). Opinion change as a function of the communicator's attractiveness and desire to influence. *Journal of Personality and Social Psychology*, 1, 173-177.
- Mitnick, L., & McGinnies, E. (1958). Influencing ethnocentrism in small discussion groups through a film communication. *Journal of Abnormal and Social Psychology*, 56, 82-92.
- Moscovici, S. (1980). Toward a theory of conversion behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 13). New York: Academic Press.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.
- Osterhouse, R. A., & Brock, T. C. (1970). Distraction increases yielding to propaganda by inhibiting counterarguing. *Journal of Personality and Social Psychology*, 15, 344-358.
- Ostrom, T. M., & Brock, T. C. (1968). A cognitive model of attitudinal involvement. In R. Abelson et al. (Eds.), *Theories of cognitive consistency: A sourcebook*. Chicago: Rand McNally.
- Pallak, M. S., Mueller, M., Dollar, K., & Pallak, J. (1972). Effect of commitment on responsiveness to an extreme consonant communication. *Journal of Personality and Social Psychology*, 23, 429-436.
- Pallak, S. S., Murrioni, E., & Koch, J. (1983). Communicator attractiveness and expertise, emotional versus rational appeals, and persuasion. *Social Cognition*, 2, 122-141.
- Papageorgis, D. (1968). Warning and persuasion. *Psychological Bulletin*, 70, 271-282.
- Petty, R. E. (1977). *A cognitive response analysis of the temporal persistence of attitude changes induced by persuasive communications*. Unpublished doctoral dissertation. Ohio State University, Columbus.
- Petty, R. E., & Brock, T. C. (1976). Effects of responding or not responding to hecklers on audience agreement with a speaker. *Journal of Applied Social Psychology*, 6, 1-17.
- Petty, R. E., & Brock, T. C. (1979). Effects of "Barnum" personality assessments on cognitive behavior. *Journal of Consulting and Clinical Psychology*, 47, 201-203.
- Petty, R. E., & Brock, T. C. (1981). Thought disruption and persuasion: Assessing the validity of attitude change experiments. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion* (pp. 55-79). Hillsdale, NJ: Erlbaum.
- Petty, R. E., & Cacioppo, J. T. (1977). Forewarning, cognitive responding, and resistance to persuasion. *Journal of Personality and Social Psychology*, 35, 645-655.
- Petty, R. E., & Cacioppo, J. T. (1978). *A cognitive response approach to attitudinal persistence*. Paper presented at the annual meeting of the American Psychological Association, Toronto, Canada.
- Petty, R. E., & Cacioppo, J. T. (1979a). Effects of forewarning of persuasive intent and involvement on cognitive responses and persuasion. *Personality and Social Psychology Bulletin*, 5, 173-176.
- Petty, R. E., & Cacioppo, J. T. (1979b). Issue-involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology*, 37, 1915-1926.

- Petty, R. E., & Cacioppo, J. T. (1981a). *Attitudes and persuasion: Classic and contemporary approaches*. Dubuque, IA: Wm. C. Brown.
- Petty, R. E., & Cacioppo, J. T. (1981b). Issue involvement as a moderator of the effects on attitude of advertising content and context. *Advances in Consumer Research*, **8**, 20–24.
- Petty, R. E., & Cacioppo, J. T. (1983a). Central and peripheral routes to persuasion: Application to advertising. In L. Percy & A. Woodside (Eds.), *Advertising and consumer psychology* (pp. 3–23). Lexington, MA: Heath.
- Petty, R. E., & Cacioppo, J. T. (1983b). The role of bodily responses in attitude measurement and change. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook*. New York: Guilford.
- Petty, R. E., & Cacioppo, J. T. (1984a). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, **46**, 69–81.
- Petty, R. E., & Cacioppo, J. T. (1984b). Motivational factors in consumer response to advertisements. In R. Geen, W. Beatty, & R. Arkin, *Human motivation: Physiological, behavioral, and social approaches* (pp. 418–454). Boston: Allyn & Bacon.
- Petty, R. E., & Cacioppo, J. T. (1984c). Source factors and the elaboration likelihood model of persuasion. *Advances in Consumer Research*, **11**, 668–672.
- Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag, in press.
- Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology*, **41**, 847–855.
- Petty, R. E., Cacioppo, J. T., & Harkins, S. G. (1983). Group size effects on cognitive effort and attitude change. In H. Blumberg, A. Hare, V. Kent, & M. Davies (Eds.), *Small groups and social interaction* (Vol. 1, pp. 165–181). London: Wiley.
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1981). The use of rhetorical questions in persuasion: A cognitive response analysis. *Journal of Personality and Social Psychology*, **40**, 432–440.
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1984). Central and peripheral routes to persuasion: Application to counseling. In R. McGlynn, J. Maddux, C. Stoltenberg, & J. Harvey (Eds.), *Social perception in clinical and counseling psychology* (pp. 59–89). Lubbock: Texas Tech University Press.
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1985). *Persistence of persuasion: A test of the Elaboration Likelihood Model*. Unpublished manuscript. University of Missouri, Columbia.
- Petty, R. E., Cacioppo, J. T., & Kasmer, J. (1985). *Effects of need for cognition on social loafing*. Paper presented at the Midwestern Psychological Association Meeting, Chicago.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, **10**, 134–148.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1984). Attitude change and personal selling. In J. Jacoby & S. Craig (Eds.), *Personal selling: Theory, research, and practice* (pp. 29–55). Lexington, MA: Heath.
- Petty, R. E., Harkins, S. G., & Williams, K. D. (1980). The effects of group diffusion of cognitive effort on attitudes: An information processing view. *Journal of Personality and Social Psychology*, **38**, 81–92.
- Petty, R. E., Harkins, S. G., Williams, K. D., & Latané, B. (1977). The effects of group size on cognitive effort and evaluation. *Personality and Social Psychology Bulletin*, **3**, 579–582.
- Petty, R. E., Ostrom, T. M., & Brock, T. C. (Eds.) (1981). *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.

- Petty, R. E., Wells, G. L., & Brock, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and Social Psychology*, **34**, 874-884.
- Petty, R. E., Wells, G. L., Heesacker, M., Brock, T., & Cacioppo, J. T. (1983). The effects of recipient posture on persuasion: A cognitive response analysis. *Personality and Social Psychology Bulletin*, **9**, 209-222.
- Puckett, J., Petty, R. E., Cacioppo, J. T., & Fisher, D. (1983). The relative impact of age and attractiveness stereotypes on persuasion. *Journal of Gerontology*, **38**, 340-343.
- Regan, D. T., & Cheng, J. B. (1973). Distraction and attitude change: A resolution. *Journal of Experimental Social Psychology*, **9**, 138-147.
- Regan, D. T., & Fazio, R. (1977). On the consistency between attitude and behavior: Look to the method of attitude formation. *Journal of Experimental Social Psychology*, **13**, 28-45.
- Rhine, R., & Severance, L. (1970). Ego-involvement, discrepancy, source credibility, and attitude change. *Journal of Personality and Social Psychology*, **16**, 175-190.
- Ronis, D. L., Baumgardner, M., Leippe, M., Cacioppo, J. T., & Greenwald, A. G. (1977). In search of reliable persuasion effects: I. A single session procedure for studying persistence of persuasion. *Journal of Personality and Social Psychology*, **35**, 548-569.
- Rosenberg, M. (1956). Cognitive structure and attitudinal affect. *Journal of Abnormal and Social Psychology*, **53**, 367-372.
- Ross, E. A. (1908). *Social psychology: An outline and a sourcebook*. New York: Macmillan.
- Ross, L. (1981). The "intuitive scientist" formulation and its developmental implications. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures*. London and New York: Cambridge University Press.
- Ross, L., Lepper, M., & Hubbard, M. (1975). Perseverance in self-perception and social perception: Biased attributional processes in the debriefing paradigm. *Journal of Personality and Social Psychology*, **32**, 880-892.
- Sadler, O., & Tesser, A. (1973). Some effects of salience and time upon interpersonal hostility and attraction during social isolation. *Sociometry*, **36**, 99-112.
- Sandels, L. E., & Larson, J. R. (1985). When measurement causes task attitudes: A note from the laboratory. *Journal of Applied Psychology*, **70**, 116-121.
- Sawyer, A. G. (1981). Repetition, cognitive responses and persuasion. In R. Petty, T. Ostrom, & T. Brock (Eds.), *Cognitive responses in persuasion* (pp. 237-261). Hillsdale, NJ: Erlbaum.
- Schneider, W., & Shiffrin, R. M. (1977). Controlled and automatic human information processing: I. Detection, search, and attention. *Psychological Review*, **84**, 1-66.
- Schumann, D., Petty, R. E., & Cacioppo, J. T. (1985). *Effects of involvement, repetition, and variation on responses to advertisements*. Unpublished manuscript. University of Missouri, Columbia.
- Sherif, C. W., Kelly, M., Rodgers, H. L., Sarup, G., & Tittler, B. (1973). Personal involvement, social judgment, and action. *Journal of Personality and Social Psychology*, **27**, 311-327.
- Sherif, C. W., Sherif, M., & Nebergall, R. E. (1965). *Attitude and attitude change: The social judgment-involvement approach*. Philadelphia: Saunders.
- Sherif, M. (1977). Crisis in social psychology: Some remarks towards breaking through the crisis. *Personality and Social Psychology Bulletin*, **3**, 368-382.
- Sherif, M., & Hovland, C. I. (1961). *Social judgment: Assimilation and contrast effects in communication and attitude change*. New Haven, CT: Yale University Press.
- Sherif, M., & Sherif, C. W. (1967). Attitude as the individual's own categories: The social judgment-involvement approach to attitude and attitude change. In C. W. Sherif & M. Sherif (Eds.), *Attitude, ego-involvement, and change*. New York: Wiley.
- Sherman, S. J., & Fazio, R. H. (1983). Parallels between attitudes and traits as predictors of behavior. *Journal of Personality*, **51**, 308-345.

- Sistrunk, F., & McDavid, J. W. (1971). Sex variable in conforming behavior. *Journal of Personality and Social Psychology*, *17*, 200–207.
- Sivacek, J., & Crano, W. D. (1982). Vested interest as a moderator of attitude–behavior consistency. *Journal of Personality and Social Psychology*, *43*, 210–221.
- Smith, B. L., Lasswell, H. D., & Casey, R. D. (1946). *Propaganda, communication, and public opinion*. Princeton, NJ: Princeton University Press.
- Smith, M. J. (1982). *Persuasion and human action*. Belmont, CA: Wadsworth.
- Snyder, M., & DeBono, K. G. (1985). Appeals to image and claims about quality: Understanding the psychology of advertising. *Journal of Personality and Social Psychology*, *49*, 586–597.
- Srull, T. K. (1983). The role of prior knowledge in the acquisition, retention, and use of new information. *Advances in Consumer Research*, *10*, 572–576.
- Staats, A. W., & Staats, C. K. (1958). Attitudes established by classical conditioning. *Journal of Abnormal and Social Psychology*, *57*, 37–40.
- Staats, C. K., & Staats, A. W. (1957). Meaning established by classical conditioning. *Journal of Experimental Psychology*, *54*, 74–80.
- Steiner, I. (1972). *Group process and productivity*. New York: Academic Press.
- Sternthal, B., Dholakia, R., & Leavitt, C. (1978). The persuasive effect of source credibility: A test of cognitive response analysis. *Journal of Consumer Research*, *4*, 252–260.
- Taylor, S. E. (1975). On inferring one's attitude from one's behavior: Some delimiting conditions. *Journal of Personality and Social Psychology*, *31*, 126–131.
- Taylor, S. E., & Fiske, S. (1978). Saliency, attention, and attributions: Top of the head phenomena. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol.11). New York: Academic Press.
- Taylor, S. E., & Fiske, S. (1984). *Social cognition*. Reading, MA: Addison-Wesley.
- Tesser, A. (1976). Thought and reality constraints as determinants of attitude polarization. *Journal of Research in Personality*, *10*, 183–194.
- Tesser, A. (1978). Self-generated attitude change. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol.11). New York: Academic Press.
- Tesser, A., & Conlee, M. C. (1975). Some effect of time and thought on attitude polarization. *Journal of Personality and Social Psychology*, *31*, 262–270.
- Tesser, A., & Leone, C. (1977). Cognitive schemas and thought as determinants of attitude change. *Journal of Experimental Social Psychology*, *13*, 340–356.
- Thurstone, L. L. (1928). Attitudes can be measured. *American Journal of Sociology*, *33*, 529–544.
- Tsal, Y. (1984). *The role of attention in processing information from advertisements*. Unpublished manuscript. Cornell University, Ithaca, New York.
- Vinokur, A., & Burnstein, E. (1974). The effects of partially shared persuasive arguments on group-induced shifts: A group problem solving approach. *Journal of Personality and Social Psychology*, *29*, 305–315.
- Watts, W. A. (1967). Relative persistence of opinion change induced by active compared to passive participation. *Journal of Personality and Social Psychology*, *5*, 4–15.
- Watts, W. A., & Holt, L. E. (1979). Persistence of opinion change induced under conditions of forewarning and distraction. *Journal of Personality and Social Psychology*, *37*, 778–789.
- Weber, S. J. (1972). *Opinion change is a function of the associative learning of content and source factors*. Unpublished doctoral dissertation. Northwestern University, Evanston, Illinois.
- Wells, G. L., & Petty, R. E. (1980). The effects of overt head-movements on persuasion: Compatibility and incompatibility of responses. *Basic and Applied Social Psychology*, *1*, 219–230.
- White, G. L. (1975). Contextual determinants of opinion judgments: Field experimental probes of judgmental relativity boundary conditions. *Journal of Personality and Social Psychology*, *32*, 1047–1054.

- Wicker, A. (1971). An examination of the "other variable" explanation of attitude-behavior inconsistency. *Journal of Personality and Social Psychology*, **19**, 18-30.
- Wilson, T. D., Dunn, D., Bybee, J., Hyman, D., & Rotondo, J. (1984). Effects of analyzing reasons on attitude-behavior consistency. *Journal of Personality and Social Psychology*, **47**, 5-16.
- Witkin, H. A., Goodenough, D. R., & Oltman, P. K. (1979). Psychological differentiation: Current status. *Journal of Personality and Social Psychology*, **37**, 1127-1145.
- Witt, W. (1976). Effects of quantification in scientific writing. *Journal of Communication*, **26**, 67-69.
- Wood, W. (1982). Retrieval of attitude-relevant information from memory: Effects on susceptibility to persuasion and on intrinsic motivation. *Journal of Personality and Social Psychology*, **42**, 798-810.
- Wood, W., Kallgren, C., & Priesler, R. (1985). Access to attitude relevant information in memory as a determinant of persuasion. *Journal of Experimental Social Psychology*, **21**, 73-85.
- Wyer, R. S., & Srull, T. (1984). *The handbook of social cognition*. Hillsdale, NJ: Erlbaum.
- Yalch, R. F., & Elmore-Yalch, R. (1984). The effect of numbers on the route to persuasion. *Journal of Consumer Research*, **11**, 522-527.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monograph Supplement*, **9**, 1-27.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, **35**, 151-175.
- Zajonc, R. B., & Markus, H. (1982). Affective and cognitive factors in preferences. *Journal of Consumer Research*, **9**, 123-131.
- Zanna, M. P., Kiesler, C. A., & Pilkonis, P. A. (1970). Positive and negative attitudinal affect established by classical conditioning. *Journal of Personality and Social Psychology*, **14**, 321-328.
- Zanna, M. P., & Pack, S. J. (1975). On the self-fulfilling nature of apparent sex differences in behavior. *Journal of Experimental Social Psychology*, **11**, 583-591.
- Zillmann, D. (1972). Rhetorical elicitation of agreement in persuasion. *Journal of Personality and Social Psychology*, **21**, 159-165.
- Zimbardo, P. G. (1960). Involvement and communication discrepancy as determinants of opinion conformity. *Journal of Abnormal and Social Psychology*, **60**, 86-94.