Specifying the ELM

Conceptual and Methodological Issues in the Elaboration Likelihood Model of Persuasion: A Reply to the Michigan State Critics

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The Elaboration Likelihood Model of Persuasion (ELM; Petty & Cacioppo, 1981, 1986) was offered as a general framework for organizing and understanding the basic processes responsible for attitude change. Although many reviewers of the theory have found considerable value in it (e.g., Ajzen, 1987; O'Keefe, 1990; Pratkanis, 1989; Sears, 1988), a group of communication scholars associated with Michigan State University has been particularly spirited in attacking the model. In their first round of criticism, Stiff and Boster (Stiff, 1986; Stiff & Boster, 1987) misinterpreted various aspects of the ELM and offered Kahne- man's (1973) elastic capacity model as an alternative. In response, we corrected their misunderstandings and explained why the elastic capacity model did not challenge the ELM (Petty, Cacioppo, Kasmer & Hauugvedt, 1987; Petty, Kasmer, Hauugvedt & Cacioppo, 1987). These issues have apparently been put to rest. In a recent issue of this journal, however, Stiff and Boster returned with new misperceptions and criticisms and were joined by some of their Michigan State associates (Hamilton, Hunter & Boster, 1993; Mongeau & Stiff, 1993; Allen & Reynolds, 1993). Before providing our comments on the individual critiques, we address some general features of the ELM.

The Elaboration Likelihood Model of Persuasion

The ELM assumes that people want to be correct in their attitudes and opinions, but that there are a variety of ways in which a reasonable position may be adopted following exposure to a persuasive message. In particular, the ELM focuses on the extent to which people's attitudes are determined by their careful scrutiny of all of the available information in the persuasion environment along the dimensions central to the perceived merits of the issue (central route to attitude change), versus their reliance on relatively simple "cues" in the persuasion setting that determine attitudes via simpler association (e.g., Staats & Staats, 1958), on-line inference (e.g., Bem, 1972), or memory-based heuristic (e.g., Chaiken, 1987) processes (peripheral route to attitude change).

Although we cannot, of course, detail all of the variables, processes, and effects encompassed by the ELM in this article, we do aim to address the major points of contention raised in the commentaries by Hamilton, Hunter, and Boster (1993), Mongeau and Stiff (1993), and Allen and Reyn-
olds (1993). Before turning to our responses, however, it may be useful to clarify one general aspect of the ELM that appears to be misunderstood (especially by Hamilton et al., 1993).

That is, despite the fact that presentations of the ELM have attempted to convey its probabilistic nature (e.g., elaboration likelihood model), and the fact that the numerous variables, processes, and effects that the ELM addresses are best thought of as falling among various continua, critics sometimes treat the model as if it deals in absolutes. We address some of the relevant continua below.

1. Attitudes: Formation Versus Change

It is not uncommon for authors of persuasion texts to make a distinction between situations involving attitude formation versus those involving attitude change (e.g., Oskamp, 1991). In contrast, the ELM does not emphasize this distinction because central and peripheral processes are thought to be capable of operating both in what have traditionally been called attitude formation and attitude change situations.

Instead of a qualitative distinction between situations involving attitude formation versus change, the ELM adopts what has been called the nonattitude/attitude continuum (e.g., see Fazio, 1989). In order to explicate the nature of this continuum, one can also imagine a continuum of recipient information regarding a potential attitude object that ranges from absolutely no associations or information involving the object (e.g., the person may have never even heard of the object) to many associations and/or much information. Similarly, other characteristics have been proposed to underlie this continuum (e.g., attitude accessibility). This attitude/nonattitude continuum recognizes that attitudes that are very inaccessible or based on few associations may have more in common with nonattitudes than with attitudes that are highly accessible and based on a large number of associations. In targeting an attitude for change, the ELM suggests that it is more important to know something about the underlying qualities of the attitude than simply knowing if a person has an attitude or not.

2. Processes: Central Versus Peripheral Routes to Persuasion

As noted above, the ELM suggests that it is important to understand the process by which an attitude change occurs whether the change is from no attitude to an attitude with few associations or from an attitude with few associations to an attitude with many. A prominent feature of the ELM is that it specifies an elaboration continuum that is bounded at one end by "no thought about the issue-relevant information presented" and at the other end by "complete elaboration" of all of the relevant information (Petty & Cacioppo, 1986, p. 8). The ELM notes that central and peripheral processes determine attitudes with different probabilities at different points along the elaboration continuum. That is, as the likelihood of thinking about the attitude object increases (e.g., the personal relevance of the message increases, external distraction decreases, etc.), the processes specified by the central route become more likely determinants of attitudes, whereas the processes specified by the peripheral route become less likely determinants. Note that the ELM does not hold that a given peripheral process (e.g., invocation of a heuristic;
Chaiken, 1980) is less likely to occur as the elaboration likelihood is increased, but only that the peripheral process is likely to account for less variance in the attitude adopted. Because central and peripheral processes affect attitudes with different probabilities along the elaboration continuum, attitudes are sometimes influenced in part by both central and peripheral processes.

3. Outcomes: Persuasion, Resistance, and Boomerang

The ELM holds that a number of persuasion outcomes can result from exposure to a persuasive message. That is, both central and peripheral processes can result in resistance to influence (no change in attitudes), change in the direction of the advocated position (persuasion), or change in the direction opposite to the position advocated (boomerang). People can even adopt a position more extreme than the one advocated (overpersuasion)! However, the processes leading to these changes differ in the central and peripheral routes. Also, the ELM (like most persuasion theories) makes predictions about the relative placement of individuals along a continuum from “maximum boomerang” to “maximum overpersuasion.”

4. Consequences: Persistence, Resistance, and Behavioral Prediction

As a result of central and peripheral processes, recipients can arrive at the same final attitude by very different means. For instance, a person in a low elaboration situation might become relatively favorable toward the advocacy solely because he or she decided to agree with the position espoused by an expert source (positive peripheral cue) without expending the effort necessary to scrutinize the merits of the issue-relevant information presented. A person in a high elaboration situation might become equally favorable toward the advocacy, however, because he or she expended a great deal of effort scrutinizing the merits of the strong arguments in the communication. Indeed, we have used this feature of the ELM to test predictions about the differential consequences of attitudes formed by the different routes (see Petty & Cacioppo, 1986).

Briefly, the ELM posits that all else equal, attitude changes that take place through the central route should show greater persistence over time, greater resistance to counterpersuasion, and greater prediction of behavior than changes that take place via the peripheral route. Again, the important point here is that the ELM makes relative predictions. Thus, the ELM does not, for example, speak of some attitude changes as absolutely “transitory” whereas others are “permanent,” but rather postulates that changes via the central route will tend to last longer than changes via the peripheral route. The ELM deals with “real” attitude changes, but speaking of a real change does not imply any absolute persistence criterion. In research on human memory, for example, a memory trace is considered enduring if it lasts beyond a few seconds (i.e., the information moves from short-term to long-term memory). The ELM recognizes that some attitude changes that survive the short-term memory criterion are gone by the next day, some have disappeared within a week, but other changes last for years. This variance in the persistence of attitude changes and the processes that contribute to it are of considerable theoretical interest.
Thus, it is useful to think of the endurance or persistence of attitude changes and many other qualities of attitudes as forming a continuum of consequences. Some attitude changes are relatively short lived, others are quite enduring. Some attitudes can resist only weak attacks but others are resistant to very strong challenges. Some attitudes may persist for a long time if not challenged, but succumb easily if attacked. The ELM explicitly attempts to understand how central and peripheral processes lead to relative differences in these qualities of attitudes.

**Responding to the Individual Critiques**

We now turn to the individual critiques. Whereas Hamilton, Hunter, and Boster find no value in the ELM, the papers by Mongeau and Stiff and by Allen and Reynolds find some merit in the model, but raise a number of specific reservations. Because of severe space limitations, it is impossible to respond to all of the points raised in these papers and therefore failure to respond to a particular point should not be taken as an endorsement. In dealing with the articles we first summarize our understanding of each of the major points and then provide our response.

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*Reply to Hamilton, Hunter, and Boster (1993) by Wegener, Priester, Fabrigar, Petty, and Cacioppo*

Hamilton, Hunter, and Boster (1993) charge that: (1) the ELM constitutes no theoretical advance beyond previous information processing theories of persuasion, (2) the ELM's prediction that "boomerang" effects can occur under certain conditions is wrong, (3) the ELM's position on "peripheral" theories of attitude change such as reinforcement and balance is contradictory, (4) the peripheral route applies only to attitude formation and not to attitude change situations, and (5) the ELM lags behind persuasion theories in marketing and advertising. Below, we explain why each of these conclusions is erroneous.

**Theoretical Advances of the ELM**

Hamilton and colleagues (1993) compare the ELM to "information processing theory" as interpreted by Hunter, Danes, and Cohen (1984) and by Hamilton, Hunter, and Burgoon (1990). They conclude that the ELM constitutes no theoretical advance beyond this because they believe that central-route processing (high elaboration) in the ELM is "a restatement of information processing theory using neologisms" (p. 62). In contrast, we view the ELM as indebted to but evolving beyond previous information processing models of persuasion (see Petty & Cacioppo, 1981, for the historical context of the ELM). As noted by Hamilton and colleagues (1993), the ELM was preceded by the message-learning approach advocated by Hovland and his colleagues (e.g., Hovland, Janis & Kelley, 1953) and by McGuire's information processing extension of the message-learning approach (e.g., McGuire, 1968). According to traditional interpretations of these approaches, persuasion occurs when a message recipient attends to, comprehends, learns, yields to, and retains arguments in support of the new attitude (e.g., see Insko, 1967).

The initial learning approach viewed any factor in the recipient or situation that facilitated the underlying processes of attitude change (e.g., attention, comprehension, learning, yielding, and retention) as facilitating
persuasion. McGuire (1968) expanded on this basic message-learning model by noting that at least some variables could have opposite effects on the key mediating processes of persuasion. In comparing the ELM with the earlier models, perhaps the most important advances of the ELM are that it (1) advances multiple processes of yielding, (2) specifies when these processes are likely to occur, and (3) postulates different attitudinal consequences of these processes.

Multiple Processes of Yielding and Their Consequences. In previous information processing theory (e.g., McGuire, 1968), “yielding” was one step in the information processing sequence. However, the focus was not on different processes by which yielding could be achieved. In contrast, the ELM postulates different ways in which one might evaluate a message and thus yield to or resist it. As noted earlier, people might evaluate a communication in a cognitively rigorous fashion, scrutinizing all information carefully, or evaluation might proceed in a much less rigorous manner (e.g., relying on simple heuristics). Thus, one major advance of the ELM is that it postulates different processes of yielding (central versus peripheral) that vary in the amount of careful scrutiny given to the perceived merits of the position advocated. Second, in addition to introducing qualitatively different processes of yielding, the ELM specifies circumstances and variables that render each type of process more versus less likely to have an impact on attitudes. Third, the different processes of yielding in the ELM are postulated to produce attitudes that differ in strength. That is, attitudes formed or changed via central route processes are predicted to be more persistent, more resistant, and more predictive of behavior than attitudes changed via peripheral route processes (Petry & Cacioppo, 1981, 1986). Although prior theories dealt with some specific instances of attitude persistence and resistance, they did not put forth a comprehensive framework for relating differential levels of message elaboration to these consequences of persuasion.

Why do Hamilton and colleagues not see the ELM as an advance? The major reason seems to be that they regard many of the ELM concepts as restatements of the constructs contained in previous information processing theories. It is to this misunderstanding that we now turn.

Neologisms or Orthogonal Constructs? One critical problem with Hamilton and colleagues’ assessment of the ELM is their interpretation of the motivation and ability constructs. They believe that motivation is simply another name for “attention,” whereas ability is simply “comprehension.” In making these assertions, it appears that Hamilton and colleagues are attempting to fit the ELM into the language of past theories rather than acknowledging the unique contribution of the ELM.

If one wanted to relate the ELM to past information processing theories, one could think of the relationship in the following manner. The ELM focuses on a new stage after attention and comprehension but before yielding (i.e., a stage of elaboration—which can range from very little issue-relevant thinking to very much; Petry & Cacioppo, 1984b). Motivation and ability to elaborate are not “steps” in the earlier information processing models. In fact, the constructs of moti-
vation and ability could be applied not only to the "elaboration stage" (as is done in the ELM), but also to each of the steps that are hypothesized in past models. Because of this, motivation and ability are orthogonal to attention and comprehension, rather than isomorphic as Hamilton and colleagues assert. One might have motivation and ability to attend, to comprehend, to elaborate, and so forth. The fundamental misunderstanding of the motivation and ability concepts in the ELM, along with the lack of appreciation for the two routes to yielding and the differential consequences of these routes, led Hamilton and colleagues to the erroneous conclusion that there is little difference, and therefore little benefit, in the ELM as opposed to past information processing models. Old Versus New Information and Biased Elaboration. Hamilton and colleagues (1993) believe that the ELM views people in high elaboration conditions as either thinking about new or old information, but not comparing new with old information. Although Hamilton and colleagues question the existence of any comparison between old and new information in the ELM, the authors of the other critiques in this journal do not question this feature of the model. In fact, Allen and Reynolds (1993) state that:

For Petty and Cacioppo the central route involves drawing upon prior experience and knowledge [emphasis added] to carefully scrutinize and elaborate the issue-relevant arguments in the persuasive messages along the dimensions that are perceived central to the merits of the attitude object." (p. 74)

This is an accurate representation of high-elaboration conditions (see Petty and Cacioppo, 1986, p. 21). Thus, Hamilton and colleagues are incorrect in their belief that the ELM does not allow for comparison of old and new issue-relevant information. In fact, it specifically accommodates it.

Hamilton and colleagues also bring up the notion of objective versus biased processing. They assert that objective processing is viewed in the ELM as consideration of only new information, whereas biased processing is viewed as consideration of only old information. This is not correct. The ELM holds that regardless of whether processing is relatively objective or biased, thinking may involve consideration of mostly new, mostly old, or both old and new information. That is, the notions of objective and biased processing are orthogonal to the concepts of new and old information.6

In sum, we believe that the multiple processes of yielding, the specification of when such processes take place, and the delineation of the differential consequences of the routes to persuasion in the ELM constitute important advances over past persuasion theories. Of course, a judgment as to whether or not the ELM and the research it has inspired have made significant contributions to understanding persuasion will ultimately not be rendered by us but by the more general community of persuasion scholars. The Role of Counterargumentation and Boomerang in the ELM

Hamilton and colleagues state that the ELM position on counterargumentation is incorrect because reviews of the literature have failed to show evidence of boomerang effects (i.e., movement in a direction opposite to that implied by the message). Hamilton and colleagues believe that (1) the cognitive
response approach in the ELM predicts that extensive counterarguing invaribly leads to boomerang (i.e., "the ELM predicts a boomerang effect whenever negative thoughts on an issue predominate") (Hamilton et al., 1993, p. 54), and (2) the empirical evidence (e.g., Stiff, 1986; Johnson & Eagly, 1989) suggests either that boomerang effects do not occur or "may be restricted to ELM researchers" (p. 62). Both of these conclusions are demonstrably wrong.

Perhaps Hamilton and colleagues are confused by the ELM predictions of relative differences in persuasion outcomes. The ELM predicts that arguments that are extensively counterargued will be less effective than arguments that elicit a greater proportion of favorable thoughts and that "the subject's own antagonistic cognitive responses may be so much more persuasive than the arguments contained in the message that a position opposite to that advocated might be adopted" (Petty & Cacioppo, 1981, p. 225). As we noted in the introduction to this article, extensive persuasion and extensive boomerang are simply two points on the influence continuum with no attitude change somewhere in between. Hamilton and colleagues reached their inappropriate "absolute" conclusion by failing to consider the relative rather than the absolute nature of the ELM predictions. The ELM has never required boomerang whenever unfavorable thoughts are generated. Rather, the prediction is that attitudes will be less favorable toward the message position when unfavorable rather than favorable thoughts are elicited.

Hamilton and colleagues cite the Stiff (1986) and Johnson and Eagly (1989) meta-analyses as providing evidence against boomerang effects, but this inference is not correct because the cited analyses never tested for boomerang. In fact, most of the studies cited in these reviews did not include conditions that would allow a test of boomerang! Nevertheless, Hamilton and colleagues go so far on this "nonsense" argument concerning boomerang as to advocate a model of attitude change that predicts no boomerang at all. That is, they see the prediction that it is possible for boomerang to occur as an error. Because some studies with the appropriate conditions to assess boomerang have found it (e.g., Abelson & Miller, 1967; Berscheid, 1966; Gruenfeld & Wyer, 1992; Miller, 1965), it seems unwise for Hamilton and colleagues to take the position they do regarding the existence of boomerang effects.

Operation of Peripheral Processes in Low Elaboration Settings

Hamilton and colleagues raise a number of potential criticisms of the ELM characterization of attitude change in low elaboration (peripheral route) circumstances. Unfortunately, their entire critique is based on the faulty assumption that the ELM holds that all peripheral route theories of attitude change (e.g., reinforcement, balance, social judgment) are correct in all of their details and operate simultaneously. Our purpose here does not include trying to explain the reason for Hamilton and colleagues' misperceptions. To our knowledge, however, in no case have researchers associated with the ELM said that all of the possible peripheral theories are correct or operate simultaneously. In fact, the specifics of many of the peripheral theories have been the subject of considerable criticism by ELM researchers.
For example, Petty and Cacioppo (1981, p. 110) noted that although social judgment theory (Sherif, Sherif & Nebergall, 1965) was reasonably successful in accounting for assimilation and contrast effects in judgment, it was less successful in accounting for attitude change.

One explicit contribution of the ELM was the idea that neither the central nor the peripheral theories were universally correct, but rather the processes outlined by these theories were more likely to operate (i.e., influence attitudes) in some situations than in others (in contrast to the predictions of the original theories!). For example, the processes outlined by cognitive response theory or dissonance theory were more likely to operate in high elaboration settings, but the processes outlined by reinforcement or self-perception theory were more likely to operate in lower elaboration settings. The accumulated literature is quite consistent with the ELM view that the processes outlined by the peripheral route theories are more likely to operate when the likelihood of issue relevant elaboration is low (e.g., see Cacioppo, Marshall-Goodell, Tassinary & Petty, 1992; Chaiken & Baldwin, 1981). When their misrepresentation of the peripheral route is corrected, the basis of their critique evaporates.

Issues of Attitude Formation, Change, and Persistence

Hamilton and colleagues suggest that the low elaboration processes hypothesized in the ELM (i.e., peripheral route processes) can only take place in attitude formation situations. This position is clearly contradicted by studies showing that peripheral processes can operate in situations where people hold prior attitudes. For instance, Mackie and Worth (1989, Experiment 2) manipulated expertise of the source and presented a message on the issue of gun control. Subjects were more persuaded by expert than nonexpert sources, though importantly, this was only the case when elaboration of message arguments was not evident. Thus, the expertise cue was effective for a topic for which subjects likely held a prior attitude (gun control), but only under conditions where processing message arguments was attenuated. Similarly, classical conditioning processes have been shown to be effective in changing attitudes about different nationalities about which subjects likely held at least weak prior opinions (e.g., the Dutch; see Staats & Staats, 1958; see also Cacioppo et al., 1992).

Additional studies have shown the impact of peripheral processes for topics including preservation of the environment (Chaiken & Baldwin, 1981; Wood, 1982), probation versus imprisonment for criminals (Axsom, Yates & Chaiken, 1987), the safety of a popular sweetener product (Haugvedt & Petty, 1992), and others. Thus, Hamilton and colleagues’ claim is simply wrong. People can form attitudes via either the central or the peripheral route, and they can change them by either route depending upon their overall motivation and ability to think about the issue-relevant information presented.

Transitory Attitude Change. Hamilton and colleagues (1993) also take issue with the ELM proposal that peripheral processes tend to induce weaker attitudes than central route processes. In particular, they assert that “the assumption of transitory attitude change in the peripheral route
cannot be true" (p. 60).12 This view is clearly contradicted by the research evidence. Not only has decay of attitude change been demonstrated in the literature, but differential decay of such change has been found in several studies. Of particular interest is that central route attitude changes have been shown to last longer than peripheral route changes (e.g., Chaiken, 1980; Haugrvedt & Petty, 1992; see Petry & Cacioppo, 1986, pp. 175–178). Importantly, differential decay of attitude change has even been shown for topics about which subjects held prior attitudes (e.g., attitudes toward physical exercise, Lydon, Zanna & Ross, 1988). Thus, Hamilton and colleagues’ conclusion that attitude change cannot be transitory is incorrect. Rather, the evidence shows that attitude changes can differ over a wide continuum in the extent to which they persist. Attitudes and attitude changes can also differ in the extent to which they have other qualities as well, such as the extent to which they are accessible from memory, resistant to counter-persuasion, predictive of behavior, and so on (e.g., Cacioppo, Petty, Kao & Rodriguez, 1986; Haugrvedt & Petty, 1992; see Petry & Krosnick, in press, for an extended discussion of attitude strength).

The ELM and the Marketing Literature

The final point raised by Hamilton and colleagues in critiquing the ELM is their assertion that the ELM is behind work on attitude processes done by researchers in the area of marketing. They cite as an example a recently published model by MacInnis and Jaworski (1989).13 Interestingly, this theory, the Ability-Motivation-Opportunity (AMO) model explicitly cites and uses the basic motivation and ability constructs from the ELM. Also, in comparing the AMO model with other prominent models of consumer persuasion, MacInnis and Jaworski (1989) compare the AMO only to the ELM and models formulated after the ELM. Thus, it seems that the ELM was not lagging behind this development in consumer behavior, but instead has been an impetus for research and theoretical development in marketing.

Reply to Mongeau and Stiff (1993) by Fabrigar, Wegener, Priester, Petty, and Cacioppo

The Mongeau and Stiff (1993) critique can be reduced to two central points: (1) the ELM lacks the necessary theoretical specificity to allow straightforward tests of the theory, and (2) the methods used in the past by ELM researchers are inadequate for testing many of the causal relationships proposed in the theory. Below, we explain why these criticisms are misguided.

Theoretical Specificity

Mongeau and Stiff appear to be confused about the theoretical specificity of the ELM because of their failure to differentiate between moderating and mediating variables and to understand how these two types of variables are incorporated into the ELM.

The Distinction Between Moderators and Mediators. Baron and Kenny (1986) noted that in the past, researchers have sometimes failed to distinguish between moderator and mediator variables. Moderators influence the strength or direction of a relationship between a predictor or causal variable and a dependent variable. The nature of this influence can take
one of several different forms. For example, a moderating variable (B) can regulate the strength of the relationship between a predictor variable (A) and a dependent variable (C) such that as the value of the moderator changes, the strength of the \( A \rightarrow C \) relationship gets stronger or weaker. In addition, a moderating variable can regulate the direction of the relationship between a predictor variable and a dependent variable so that at one level of the moderator the relationship between the predictor variable and the dependent variable is negative but at another level of the moderator the relationship is positive. Mediators, on the other hand, account for the relationship between a predictor or causal variable and the dependent variable. If one assumes that \( A \rightarrow B \rightarrow C \) represents a situation in which A causes B, and B in turn causes C, then B represents a mediator. If B provides complete mediation, there should be no effect of A on C except via A's effect on B, and B's on C (see Baron & Kenny, 1986).

Moderators and Mediators in the ELM. The ELM incorporates both moderator and mediator variables in its theoretical framework. There are numerous moderator variables that have been incorporated into the ELM (e.g., issue involvement, distraction, need for cognition). These moderators have one thing in common: all affect the level of issue-relevant elaboration in persuasion settings. In fact, a central theme of the ELM is a prediction of moderational relationships. The ELM posits that various moderator variables influence the level of issue-relevant elaboration and thereby determine the effectiveness of various independent (predictor) variables in influencing attitudes. For example, argument cogency is hypothesized to have a greater impact on attitudes when issue involvement is high than when issue involvement is low. On the other hand, variables operating via peripheral processes (i.e., peripheral cues) are hypothesized to have a greater impact on attitudes when issue involvement is low than when it is high. Thus, issue-involvement serves as one variable that can moderate the route to persuasion.

The ELM also makes predictions concerning mediational relationships. There are a number of mediators addressed by the ELM but these mediators do not necessarily represent one common process. The mediators of persuasion are dependent on the nature of the independent variable being examined. For example, the ELM predicts that under certain conditions, issue-relevant cognitions will mediate the impact of variables on attitude change. Under other conditions, however, identification with the source, or the invocation of decision heuristics (i.e., peripheral processes) will mediate the impact of variables on attitude change.

It is important to note that one valuable feature of the ELM is that mediational hypotheses are made in conjunction with moderational hypotheses. This can be illustrated by returning to the A-B-C analogy. Assume that A represents argument strength, B represents cognitive responses to the issue-relevant information presented, and C represents attitude. Assume that the subjects are able to think about the information presented and the moderating variable of interest is issue involvement (D). The ELM predicts that the relationships be-
between A and B, and B and C should be relatively strong when the moderating variable of involvement is high. In contrast, the relationships between A and B, and B and C should be weaker when involvement is low. This is because subjects will engage in less scrutiny of the arguments presented as involvement decreases.

As is evident in our example, the ELM posits that universal predictions concerning independent, mediating, and dependent variables (e.g., such as “argument strength always influences issue relevant cognitions that in turn always influence attitudes”) are inappropriate because the effects of mediators must be understood in the context of moderators. The fact that mediational hypotheses are made in conjunction with moderation hypotheses renders the ELM empirically testable on multiple levels. As explicated further below, Mongeau and Stiff’s failure to recognize this fact might have given rise to their concerns.

Specificity of Relationships. Mongeau and Stiff (1993) argue that the ELM has never been adequately specified such that causal relationships among variables can be determined and they state that one key prediction of the theory is that “some type of interaction between involvement, source, and message variables will influence attitudes” (p. 68). As we have explained, however, the ELM makes a number of specific predictions concerning the operation of moderating and mediating variables. The impact of moderators is tested by examining the interaction between the moderator and independent variable on the dependent variable (ELM tests of mediators are discussed shortly). If the ELM vaguely predicted that “some type of interaction” would occur, then the theory would definitely lack specificity in predictions because a statistically significant interaction between two variables can reflect any one of several patterns of results. As just one example, consider the predicted Argument Strength × Involvement interaction. The ELM predicts that argument strength will have a greater impact on attitudes under relatively high involvement than under relatively low involvement. Other patterns could also produce statistically significant interaction tests, but would be inconsistent with the model (e.g., greater differentiation of argument strength under low than under high involvement). The specificity of the theory rests in the fact that it predicts very specific patterns of data (see Petty & Cacioppo, 1990, for further discussion and illustration).

Alleged Contradictions in the ELM. Mongeau and Stiff have also suggested that the lack of specificity in the theory has resulted in seemingly contradictory predictions. As noted above, Mongeau and Stiff (1993) state that one of the key predictions of the ELM is “some type of interaction between involvement, source, and message variables will influence attitudes” (p. 68). They also state that “another of the model’s key predictions is that cognitions generated by message recipients determine the direction and extent of attitude change” (p. 68). They state that these two predictions are contradictory when they assert,

It is difficult to understand how both these predictions could be accurate representations of persuasive message processing. That involvement, message, and source manipulations interact to influence attitudes directly implies a lack of important mediating cognitive processing. (p. 68)
Mongeau and Stiff’s assertion that the predicted interactions in the ELM contradict the mediating role of cognitive processing is demonstrably incorrect. The ELM simply postulates that under specifiable conditions (i.e., high motivation and ability), issue-relevant cognitions will play a greater mediating role in attitude change than under other conditions (i.e., low motivation and/or ability). Similarly, the theory asserts that under some specifiable conditions (i.e., low motivation and/or ability), peripheral mediating processes (e.g., self-perception, conditioning, invocation of heuristics) will have a relatively stronger impact on attitude change than under other conditions (i.e., high motivation and ability). That is, the ELM specifies that various moderating variables (e.g., personal relevance of the issue, distraction) determine the extent to which different mediating processes (e.g., issue-relevant thinking, self-perception processes) are responsible for persuasion. There is no contradiction in the moderation and mediation hypotheses. Specifying a Causal Model of the ELM. Another criticism is that the ELM is not sufficiently precise to allow a clear and unequivocal representation of the ELM in the form of a covariance structure model (CSM). Mongeau and Stiff propose a covariance structure model that they believe is consistent with the ELM. Unfortunately, their CSM representation of the ELM does not accurately reflect the theory. We believe that the difficulties experienced by Mongeau and Stiff in specifying a structural model for the ELM rest on two key factors.

First, they experienced difficulties in specifying a model not because the theory lacks precision but because of their failure to distinguish between predictor variables, mediator variables, moderator variables, and dependent variables in the ELM. In their model, they have classified variables as input variables, process variables, and output variables. Although process variables can be thought of as mediators and output variables as dependent variables, their categorization of input variables is problematic. This is because their input variables include both predictor variables and moderator variables. As we have already noted, an understanding of the ELM requires that one recognize that these two types of variables are conceptually distinct and that these two types of variables will interact in specific ways. Mongeau and Stiff’s model fails to represent the moderating role of the level of elaboration (which can be manipulated using involvement, distraction, etc.). For example, their diagram does not represent in what way issue involvement (the moderator) changes the impact of argument strength (the predictor variable) on issue-relevant cognitions (the mediator), or how issue-relevant cognitions in turn impact on attitudes (the dependent variable). Thus, much of the specificity of the ELM is not captured by their model.

A second factor that might have contributed to their difficulties is that methods and procedures for testing interactions among latent variables in CSM are in their early stages (e.g., Kenny & Judd, 1984), and it is somewhat difficult to incorporate interaction tests in many popular CSM programs including LISREL VII (Joreskog & Sorbom, 1989). Also, there is no commonly agreed upon notation for how such moderators should be directly represented in path diagrams (e.g., see Baron & Kenny, 1986; and Cohen & Cohen, 1983).
Fortunately, various strategies have been employed to capture the moderational and mediational aspects of the ELM (and other theories) in CSM. Perhaps the most common strategy is to specify the same mediational model under different levels of the moderator. Thus, the researcher can test how the hypothesized mediational relationship changes at different levels of the moderator. For example, in one study (Petty, Schumann, Richman & Strathman, 1993, Experiment 2), subjects who were placed in either a positive or neutral mood were exposed to a persuasive message under conditions of relatively high or low issue involvement. Following the message, attitudes and issue-relevant thoughts were measured. The ELM predictions were examined by running the basic model depicted in Figure 1 separately at each level of involvement. The results for both analyses were then compared to see if the strength or direction of relationships appeared to differ between the two levels of involvement. In this manner, the impact of both the moderators and mediators was studied. Consistent with the ELM, the analyses showed that mood had an impact on attitudes via its impact on issue-relevant thoughts only when involvement was high. When involvement was low, mood had a direct effect on attitudes unmediated by thoughts.

That is, mood served as a simple cue under low elaboration conditions, but modified attitudes by influencing the ongoing information processing activity under high elaboration conditions (see Petty, Gleicher & Baker, 1991, for further discussion).

Testing Causal Relationships in the ELM

After critiquing the conceptual specificity of the ELM, Mongeon and Stiff assert that many of the hypothesized causal relationships between variables in the ELM have never been adequately demonstrated. In general, using the A-B-C analogy, they argue that ELM researchers have assessed the relationship between A and B (e.g., distraction and counterarguing) or between A and C (e.g., distraction and attitude change) but not between B and C (e.g., counterarguing and attitude change). More specifically, they suggest that ELM researchers have relied almost entirely on ANOVA techniques for testing the ELM. They go on to argue that this technique is inadequate for testing some of the causal relationships in the ELM (i.e., the B-C relationship). They recommend covariance structure modeling (CSM) as a means of accomplishing this task. In addition to this, they critique the role of argument strength in the ELM.

In order to address their criticisms it is useful to consider two popular
strategies for examining a new theory that proposes a particular set of causal relationships. Both of these strategies have their strengths and weaknesses and should be regarded as complementary approaches rather than competing methods. One strategy, hypothetico-deductive reasoning, relies in part on "critical tests." This strategy involves generating unique testable predictions based on the theory that cannot be readily derived from competing approaches (Platt, 1964). If a study supports the predictions of the new theory over its rivals, the study provides support for the pattern of relevant relationships hypothesized in the theory over the pattern of relevant relationships proposed in the alternate theories. A second strategy is to use statistical methods (e.g., CSM, ANCOVA, multiple regression) to assess the relationships among the key variables. As we explain below, both strategies have been employed by ELM researchers.

Critical Tests and Argument Strength. As we noted above, the ELM predictions are quite specific. These predictions provide critical tests of the ELM in that the specific data patterns hypothesized were directly inferred from the ELM but were not easily derivable from other existing theories of attitude change. For example, one of the early critical tests concerned the effect of personal relevance (involvement) on attitude change. The ELM predicts an Involvement × Argument Strength interaction that reflects a greater impact of argument strength on attitudes when involvement is relatively high compared to when it is low. Additionally, the ELM predicts higher correlations between issue-relevant cognitions and attitudes under high involvement than under low involvement (see Petty & Cacioppo, 1979). These predictions are based on the notion that greater self-relevance leads to enhanced scrutiny and elaboration of the central merits of the information presented in the persuasive communication. It is important to note that these predictions are not readily derivable from earlier theories of persuasion dealing with involvement such as social judgment theory (Sherif et al., 1965; see Petty, Cacioppo & Haugtvedt, 1992 for a detailed discussion). The observed Argument Strength × Involvement interaction provides evidence for the hypothesized relationships in the ELM because the results conform to the predictions derived from the ELM and are inconsistent with alternate hypothesized relationships such as those proposed by social judgment theory. Although the Argument Strength × Involvement interaction is not the only critical test of the ELM, we will spend some time discussing this particular interaction as well as argument strength in general because Mongeau and Stiff advance several criticisms of the way argument strength has been used in ELM research.

In critiquing the use of manipulations of argument strength in ELM research, Mongeau and Stiff (1993) first argue that ELM researchers have manipulated argument strength in a way that may really have tapped into "the valence of message cognition" (p. 69). Second, they state that by empirically defining argument strength, ELM researchers have weakened the theory because they have ignored what makes arguments strong and weak. Third, they assert that the Argument Strength × Involvement interaction is
a logical necessity that could not have happened otherwise.

These criticisms appear to stem from a misunderstanding of the purpose of using argument strength manipulations (i.e., strong versus weak arguments) in ELM research. The ELM has never attempted to provide a theory of argument strength, cogency, or quality per se. Instead, argument strength manipulations have been used as a methodological tool for indexing the level of argument-based processing underlying postcommunication attitudes (see Petty & Cacioppo, 1986, pp. 31–33). In ELM research, argument strength has been operationalized by pretesting arguments to determine the extent to which they are strong (elicit mostly favorable thoughts and attitudes when people are instructed to think about them carefully) or weak (elicit mostly unfavorable thoughts and attitudes when people are instructed to think about them carefully). That is, the argument strength manipulation deliberately taps into the valence of issue-relevant cognitions for the purpose of allowing one “to determine under what conditions individuals are thinking about and elaborating upon the arguments provided” (Cacioppo, Petty & Stoltenberg, 1985, p. 224).

It should be obvious that our operational definition of argument strength and our pretesting procedure do not insure any particular outcome when argument strength is crossed with some other variable. It is not clear why Mongeau and Stiff would think that a manipulation of the personal relevance of a message (Petty & Cacioppo, 1979) must interact with argument strength especially since it is possible to derive other predictions from other theories (e.g., social judgment theory predicts greater rejection of both strong and weak arguments as self-relevance increases), and self-relevance manipulations play no part in the pretesting of the arguments. The interaction of self-relevance and argument strength is no more guaranteed than the interaction of argument strength with any number of other variables with which it has been shown to interact (e.g., distraction, Petty, Wells & Brock, 1976; need for cognition, Cacioppo, Petty & Morris, 1983). The manipulation of argument strength simply provides one means of examining the effects of variables on the extent of message processing.15 The empirical definition of argument strength does necessitate that under conditions where thinking is high (as in the pretests), strong arguments will elicit more favorable thoughts (and be more persuasive) than weak ones, but it in no way requires that a particular variable being examined in combination with argument strength (e.g., self-relevance, distraction, number of message endorsers) will interact with it. Only empirical tests are sufficient to establish these interactions. Indeed, it is useful to note that prior to the ELM, variables such as self-relevance and distraction were generally treated as exerting main effects on persuasion.16 The manipulation of argument strength as a methodological tool has been widely adopted and used with considerable success by numerous persuasion scholars studying a diverse list of variables (e.g., Axsom et al., 1987; Bless, Bohner, Schwarz & Strack, 1990; Burnkrant & Unnava, 1989; Leippe & Elkin, 1987; Mackie & Worth, 1989; Wood, Kallgren & Preisler, 1985).
In conclusion, we note that the strategy of developing critical tests is a powerful method that has been used to test a number of hypothesized relationships (A-B-C) in the ELM. In order to criticize evidence based on this strategy, it is important to do one of two things. One could challenge the accumulated evidence by producing new critical tests that produce results clearly inconsistent with the theory. On the other hand, one could provide convincing alternative explanations for the critical tests that have been found to be consistent with the ELM. Mongeau and Stiff have done neither. Direct Assessments of Relationships. A second strategy for testing causal processes is to use statistical methods that attempt to assess the hypothesized relationships. Mongeau and Stiff argue that ELM researchers have not done this. We disagree with their characterization of ELM research as having relied almost exclusively on ANOVA and by implication not having adequately tested the various relationships in the theory (specifically, they refer to the B-C relationship in their A-B-C analogy). For instance, some of the earliest ELM-relevant research used ANCOVA's to assess the directional relationship between issue-relevant cognition (what Mongeau and Stiff refer to as B in their A-B-C analogy) and attitude change (the C variable) (e.g., Cacioppo & Petty, 1979; Petty & Cacioppo, 1977; Petty et al., 1976). These analyses revealed that the effects of variables (A) thought to influence attitudes (C) by affecting issue-relevant cognitions (B) disappear when issue relevant cognitions (B) are used as a covariate. In contrast, the significance of effects are unaffected when the test is reversed such that message relevant cognitions are the dependent variable and attitudes serve as the covariate. This provides evidence consistent with the directional relationship of issue-relevant thinking leading to attitude change (B-C). Other studies have used correlational techniques to demonstrate that the B-C relationship is stronger under high than low elaboration conditions (e.g., Chaiken, 1980; Mackie, 1987; Petty & Cacioppo, 1979). Similarly, as we have shown in Figure 1, path analyses have also been conducted that examine the relationships between independent variables (A), issue-relevant cognition (B), and attitudes (C) (e.g., Petty, Gleicher & Baker, 1991; Petty et al., 1993). These analyses provide further evidence for some of the causal relationships in the ELM that Mongeau and Stiff incorrectly suggest have remained untested.

Reply to Allen and Reynolds (1993) by Priester, Fabrigar, Wegener, Petty, and Cacioppo

Allen and Reynolds present their criticisms of the ELM under three principal categories: methodological, theoretical, and experimental. As in the other critiques, Allen and Reynolds have a number of misperceptions about the ELM. For example, we do not know why they think that the ELM separates emotion and cognition into separate routes. In fact, the peripheral route has always included both emotional (e.g., conditioning) and cognitive (e.g., self-perception) processes (Petty & Cacioppo, 1981). Similarly, the central route includes both emotional and cognitive factors. Although there are a number of other ancillary points we could address, be-
low we confine our comments to the primary concerns they raise.

**Methodological Criticisms**

Although the ELM postulates the existence and consequences of two routes to persuasion, Allen and Reynolds (1993) assert that "operationally ... no clear separation between the routes exists consistent with the theory" (p. 77). Presumably, Allen and Reynolds do not believe that it is possible to distinguish the central from the peripheral routes to persuasion or to assess the extent of message elaboration.

Concerning ELM studies, Allen and Reynolds (1993) claim that "the elaboration evidence gathered in some studies may not assist in determining the route of persuasion" (p. 77). Rather, Allen and Reynolds admonish that "any comparison of the central and peripheral routes must include a comparison of the rates of attitude decay not the amount of attitude change" (p. 76). That is, Allen and Reynolds appear to believe that the only acceptable way to distinguish the central from the peripheral route to persuasion is by examining the persistence of attitude change. As explained below, this is not true.

**Temporal Consequences of Elaboration.** Allen and Reynolds correctly point out that the ELM postulates differences in the temporal stability of attitudes changed via the central versus the peripheral routes. The ELM predicts that, all other factors being equal, centrally formed attitudes will last longer than peripherally formed attitudes. Allen and Reynolds (1993) also correctly note that this "result should be viewed as relative rather than absolute" (p. 74) and that differences in temporal persistence are but "one consideration for distinguishing between the routes" (p. 74). So far, so good. Unfortunately, they go on to make the incorrect assertion that "the only [emphasis added] methodological distinction offered by Petty and Cacioppo [for distinguishing the central from the peripheral routes] considers the difference in the temporal effects of the message" (p. 76). Because of this, they call for research examining the differential attitude-decay functions for central and peripheral attitude changes. Although such research would surely prove useful, their critique of the ELM puzzled us for two reasons. First, as already noted in our response to Mongeau and Stiff, research has already been reported that demonstrates different persistence outcomes for attitudes changed via the central versus the peripheral routes. Second, and perhaps more important, Petty and Cacioppo (1986, pp. 29-30) have previously articulated the problems associated with assessing the central versus peripheral routes or the degree of elaboration solely via the various consequences of the routes to persuasion. Rather, they explicitly suggested several methodologies to distinguish central from peripheral routes to persuasion by assessing the underlying processes inherent in these routes.

**Assessment Techniques Offered by the ELM.** As noted above, a number of methods have been proposed to examine the extent of issue-relevant thinking. One assessment device is the technique of having subjects write down the thoughts that occurred to them while being exposed to a persuasive message and then coding these thoughts into appropriate categories (e.g., thoughts focused on the central merits of the issue; thoughts about peripheral cues; see Cacioppo, Harkins & Petty, 1981). Allen and Reynolds (1993) object to this thought-listing
procedure because "thought-listing evidence can be arguably a measure of affect" (p. 77). It is not entirely clear what is meant by this charge, but since they cite the high correlation between thought listing and attitudes, we assume that their criticism entails the notion that thought listing is merely a measure of attitude. If, as Allen and Reynolds charge, cognitive responses are isomorphic with attitudes, the correlations between thought listing and attitudes should show no systematic variance across conditions. Yet, studies have reported systematic and predicted variation in these correlations across conditions (e.g., Chaiken, 1980; Mackie, 1987; Petty & Cacioppo, 1979). Specifically, subjects exposed to a message under conditions thought to foster relatively high elaboration have exhibited higher correlations between their substantive issue-relevant thoughts and attitudes than subjects who were exposed to the same message under conditions posited to produce relatively low elaboration. Conversely, cue-based inferences and other peripheral thoughts have correlated more highly with postmessage attitudes in conditions where the elaboration likelihood was low rather than high (e.g., Haugvedt & Petty, 1992; Rameshwar & Chaiken, 1991). In any case, it is incorrect to imply that the thought-listing procedure and attitude measures invariably measure the same thing. Furthermore, the differential correlation of issue-relevant thoughts versus cue-based thoughts with attitudes provides additional support for distinguishing the extent to which attitude change is based more on central versus peripheral processes.

Petty and Cacioppo (1986, pp. 30-54) suggest and evaluate other procedures for assessing elaboration such as self-reports of thinking, message recall, psychophysiological techniques, and manipulations of argument strength. Our point is that the ELM does not rely exclusively on the consequences of the routes to persuasion in order to establish their existence. Rather, consistent with the idea of triangulation inherent in the principle of multiple operationalism (Cook & Campbell, 1979), multiple procedures have been employed to establish the existence of the two routes. These procedures have involved examining the differential consequences of the routes to persuasion as well as assessing the processes underlying the routes.

Theoretical Criticisms

At the basis of Allen and Reynolds' theoretical question lies a concern about the notion in the ELM that persuasion variables can assume multiple roles. Postulate three of the ELM (Petty & Cacioppo, 1986) states that "variables can affect the amount and direction of attitude change by (1) serving as persuasive arguments, (2) serving as peripheral cues, and/or (3) affecting the extent or direction of issue and argument elaboration" (p. 5). Allen and Reynolds raise two problems with this postulate. First, Allen and Reynolds (1993) assert that "some basis must exist on which to categorize cues clearly as central or peripheral" (p. 78). Second, Allen and Reynolds suggest that by allowing variables to assume multiple roles, the ELM loses its ability to make a priori predictions. We address these concerns below.

ELM's Avoidance of Lists. The request for some basis on which to categorize variables (e.g., number of message arguments, source attractiveness) as central or peripheral is similar in nature to an issue raised previously by
Stiff (1986). According to the ELM, one cannot place variables into simple lists because, depending upon the meaning of the variable in the specific context, and the overall elaboration likelihood, variables can sometimes act as cues, sometimes act as arguments, and sometimes affect the extent or direction of elaboration. To take a simple example, beautiful scenery can serve as a peripheral cue in a television ad for a new car, but is likely to serve as a central argument in an advertisement for a vacation destination (Petty, Unnava & Strathman, 1991). Thus, it is inappropriate to label a variable (e.g., beautiful scenery) as influencing attitudes by only the central or the peripheral route. Of course, as noted below, the ELM specifies the conditions under which variables serve in the different roles.

**ELM’s Predictions Regarding Multiple Roles.** The ELM does not state that any variable can assume any role at any time. If a theory were to offer such “predictions,” it would indeed be vacuous. Rather, the ELM offers predictions as to when variables assume different roles. In a response to Stiff (1986), Petty and colleagues (1987) provided the rationale and supporting data to show how source factors could serve in different roles depending upon the elaboration likelihood and other factors. Since then, multiple roles for other variables have been investigated. For example, Petty, Gleichner, and Baker (1991) outline the multiple roles that a person’s mood can play in persuasion situations. In responding to Mongeau and Stiff, we presented data from a study (Petty et al., 1993, Experiment 2) in which a positive mood was shown to influence attitudes via central or peripheral processes depending upon the overall likelihood of elaboration (see Figure 1).

The important point is that the ELM’s multiple-roles postulate allows *a priori* predictions. In brief, when the elaboration likelihood is low, and individuals are unmotivated or unable to think about a message, attitude change induced by a variable will most likely stem from the potential of this variable to act as a peripheral cue. When the elaboration likelihood is high and people are motivated and able to think about a message, attitude change is determined more by scrutiny of the issue-relevant information, and variables will most likely affect persuasion either by serving as arguments (if they are relevant to the central merits of an issue) or by biasing the ongoing elaboration. Finally, when the elaboration likelihood is moderate and people may be unsure whether to think about the message or not, variables can affect persuasion by indicating to the person that they either should or should not expend the cognitive resources necessary to scrutinize the issue-relevant information presented. In short, it is necessary to know the overall elaboration likelihood in order to anticipate the likely role a variable will assume. But this necessity does not impugn the fact that the ELM does offer *a priori* predictions, and explanations, for when and how variables affect persuasion.

**Experimental Criticisms**

As noted above, Allen and Reynolds incorrectly suggest that examination of differential attitude-decay functions is the only way to distinguish between central and peripheral routes to persuasion. According to Allen and Reynolds, it is this very reliance that uncovers crucial inadequacies of the ELM.
In particular, Allen and Reynolds state that the ELM's attitude-persistence predictions are incompatible with current findings from experiments on the sleeper effect. A sleeper effect occurs, for example, when initial attitude change is depressed as a result of associating the message with a low-credible source, but over time, there is an increase in persuasion. The ELM predicts that a sleeper effect should be more difficult to produce when the low-credible source is revealed prior to the message than when it is revealed after the message (see Petty & Cacioppo, 1986, for details). Based upon a meta-analysis conducted by Allen and Stiff (1989), Allen and Reynolds (1993) conclude strongly that "all relevant studies demonstrated the SE [sleeper effect]" (p. 79) and that the sleeper effect is "not dependent on the timing of the discounting cue" (p. 79). Thus, Allen and Reynolds believe that the available data disconfirm the pattern expected by the ELM. This is not true, however.

Evidence from the Allen and Stiff (1989) Meta-analysis. Because Allen and Reynolds conclude that the Allen and Stiff (1989) meta-analysis shows that the sleeper effect is not dependent on the placement of the discounting cue, we were surprised to find that Allen and Stiff never reported a test of this hypothesis! In order to examine the effect of source timing, each of the studies in their analysis would need to be coded as to whether the source preceded or followed the message. Then, one would examine whether the sleeper effect occurred more reliably when the source preceded versus followed the message. Because Allen and Stiff did not do this, the meta-analysis they report is not at all informative for the current controversy. However, when we coded the studies in their meta-analysis as to whether the source preceded or followed the message (and assumed that the information they provided about each study was accurate), the results showed an overall sleeper effect when the source followed the message ($Z = 3.09$, $p < .01$), but no sleeper effect when the source preceded the message ($Z = .01$, n.s.). This result is compatible with the ELM.

Additional Evidence About the Sleeper Effect. In an article published prior to the Allen and Stiff meta-analysis, Pratkanis, Greenwald, Leippe, and Baumgardner (1988) reported the most extensive program of research on the sleeper effect to date. Specifically, they conducted 17 experiments with 29 tests of the sleeper effect. In some of these studies the discounting source preceded the message, and in others it came after. In conducting a meta-analysis of their studies these researchers concluded that (1) "treatments [in which the source precedes the message] failed to produce reliable sleeper effects" and (2) "sleeper effects were obtained . . . by having subjects . . . receive a discounting cue immediately after the message" (p. 214). That is, the sleeper effect was found when the source followed, rather than preceded, the message. Pratkanis and colleagues also conducted an experiment in which they explicitly manipulated the placement of the source. The result was the same—a sleeper effect was present when the source followed but not when it preceded the message. Thus, in contrast to Allen and Reynolds' assertions, the available evidence supports Petty and Cacioppo's (1986) claim that "the best evidence for a
sleeper effect comes from studies in which a discounting cue is presented after rather than prior to message exposure" (p. 183).

Summary of Responses to Critiques and Conclusions
The criticisms by Hunter, Hamilton, and Boster appear to be grounded in misunderstandings and misperceptions of the ELM. Unfortunately, the bases of these misunderstandings were not always clear to us. One general misperception, however, appeared to be the belief that the ELM made absolute rather than relative predictions such as "the ELM predicts boomerang whenever negative thoughts on an issue predominate," rather than the more appropriate prediction that resistance and boomerang become more likely as negative thoughts increase. In response to their particular criticisms, we explained that the ELM is different from previous information processing theories in a number of meaningful ways and has provided an impetus for research and theory building. We also pointed out that the studies they cited as evidence against boomerang effects were incapable of testing for it, and the peripheral route applies to more than attitude formation situations. Finally, we explained that the peripheral route does not place theories in "competition" with each other, but rather the processes specified by the peripheral theories are more likely to influence attitudes when the elaboration likelihood is low.

Although we agreed with Mongeau and Stiff that covariance structure modeling can help contribute to persuasion research, including research on the ELM, we disagreed with their criticism concerning the lack of specificity of the ELM. We suggested that their objections stemmed from their failure to appreciate the basic hypotheses and assumptions of the theory and the separate role of moderating and mediating variables. Finally, we noted that there are a number of critical tests that have provided compelling evidence for the ELM and that Mongeau and Stiff were misleading in their characterization of ELM research as having ignored all of the links in the A-B-C chain they presented.

Allen and Reynolds raised methodological, theoretical, and experimental critiques. In response, we corrected their view that the only way to distinguish the routes to persuasion was by examining the persistence of persuasion. In fact, ELM researchers have employed multiple methods to distinguish the routes. Next, in response to their request for a list of central versus peripheral variables, we articulated the ELM position about how variables can serve in different roles under specifiable conditions. Finally, we refuted their challenge to the ELM prediction that the sleeper effect would, in general, be more likely to occur if a discounting source cue followed rather than preceded a message. In fact, the available data is exactly consistent with the ELM prediction.

Since at least the time of Aristotle, philosophers, social scientists, and others have written about or engaged in the study of human influence processes. Considerable progress has been made, especially in the last 40 years, in understanding how some of the most studied variables (e.g., source credibility, issue involvement) operate to produce persuasion. The ELM builds on previous persuasion theories and has stimulated considerable re-
search addressing its principal postulates. We believe that this research has provided overall support for the utility of the ELM. Nevertheless, until the field reaches some consensus on what has already been established, it is unlikely that researchers will begin to tackle the next generation of interesting research questions.

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Notes
1 For simplicity we refer to the collective papers as authored by the Michigan State critics because Boster, Stiff, and Hunter are current or former faculty members at MSU and Allen, Hamilton, Mongeau, and Reynolds are former MSU doctoral students.
2 Although the ELM also accounts for attitude change that is not instigated by a persuasive communication (e.g., Cacioppo et al., 1992; see Petty & Cacioppo, 1981, 1986), we concentrate on issues relevant to message-based influence here since this is the focus of the commentaries.
3 Perhaps not surprisingly given the role of evaluation in organizing one’s environment (e.g., Osgood, Suci & Tannenbaum, 1957), to the extent that people hold any information about a class of objects from which an exemplar is drawn, people tend to have a ready evaluation of that object stored in at least a weak form (see Bargh, Chaiken, Govender & Pratto, 1992).
4 Hamilton and colleagues (1993) use the term “message evaluation” as though it inherently refers to a relatively rigorous process. Yet, when they describe message evaluation, they describe comparison of one’s own position with that of the source of the message. Simple comparison of positions need not involve any careful scrutiny of the central merits of the position advocated. On the contrary, evaluating a source’s position may be accomplished quite simply by determining whether the position falls in one’s latitude of acceptance (Sherif et al., 1965) or by assessing the mere number of arguments presented (Petty & Cacioppo, 1984a).
5 It is important to note that we do not mean to imply that comprehension of an argument must be accurate for elaboration of it to occur. Rather, people can elaborate information that they misunderstand. Also, depending upon what one means by “comprehension,” one can also view elaboration as a stage that precedes and contributes to what is ultimately understood or comprehended (i.e., what the argument means may be a result of elaboration rather than a prerequisite to it).
6 Of course, if a person has absolutely no stored (or no accessible) issue-relevant information on a topic, the person must rely on new information. Similarly, when a person is not presented with a message on a topic but instead generates his or her own arguments regarding the issue (e.g., mere thought, Tesser, 1978), he or she must rely on “old” information and newly generated thoughts. The important point is that either of these cases can proceed in a relatively objective or in a biased manner.
7 Judging from the evidence cited by Hamilton and colleagues, it appears that they were attempting to argue that any failure to find a decrease in the effectiveness of weak arguments in high as opposed to low elaboration conditions constitutes evidence against boomerang (and therefore, the ELM). However, a decrease in the effectiveness of weak arguments under high elaboration conditions does not necessarily imply boomerang effects if one cannot ascertain what the premessage attitudes of subjects were since one cannot tell if subjects became less favorable to the advocacy than they were initially). Nevertheless, Johnson and Eagly (1989) did find reliable decreases in persuasion with weak arguments for the category of studies they labeled high in value involvement. Hamilton and colleagues ignore this finding (see Petty & Caci-
ioppo, 1990, and Petty et al., 1992, for further discussion). More importantly, Johnson and Eagly (1989) explicitly cautioned that the analyses they conducted were "not concerned with testing the elaboration likelihood model" (p. 305).

As a side note, Hamilton and colleagues (1993) appear to argue that transitory attitude change is by definition impossible (i.e., "an oxymoron," p. 60). As noted earlier, we favor a continuum of attitude change persistence. That is, the associative bond between an attitude object and its evaluation can become weaker over time making it less likely that an initial attitude will be retrieved.

Although we, of course, support any attempts to build on the foundations of the ELM (or develop alternative models), the suggestions of MacInnis and Jaworski for expanding the ELM into the AMO model have not yet been submitted to any empirical tests, and several of the factors in the AMO model have already been modified by MacInnis, Moorman, and Jaworski (1991).

We do not agree with Mongeau and Stiff's (1993, p. 71) dismissal of the usefulness of this critical tests strategy in the case of dissonance theory. For example, the misattribution of arousal paradigm has been widely accepted as an excellent example of a critical test that established the soundness of dissonance theory over its chief rival, self-perception theory, in certain domains (see Cooper & Fazio, 1984).

Although we have confined our discussion to two-way interactions (i.e., Variable x Argument Quality) for purposes of simplicity, it is obviously possible to test higher order interactions with argument strength as well (e.g., see Petty, Cacioppo & Heesacker, 1981).

It is important to note that when using argument strength to assess the extent of message processing, researchers must carefully construct their experiments. Neglecting to do so can result in a failure to obtain an interaction between the variable of interest (e.g., distraction) and argument strength for theoretically explicable reasons. For example, when attempting to examine a variable thought to enhance elaboration, the researcher should insure that the background elaboration likelihood is not so high that ceiling effects are operating. Similarly, researchers should be careful to insure that the sample being tested is not unusually high on relevant factors such as need for cognition. In contrast, when testing a variable thought to decrease elaboration, the researcher should attempt to guard against employing a persuasion con-
text in which the baseline elaboration likelihood is quite low. Similarly, populations who might be particularly unable or unmotivated to elaborate should also be avoided. These caveats follow directly from the theory.

17 Mongeau and Stiff favor CSM for this purpose. Although we have no objections to CSM, there are certain problems associated with CSM such as the difficulties in making causal inferences (e.g., Baumrind, 1983) and the existence of equivalent models (e.g., Lee & Hershberger, 1990; Maccallum, Wegener, Uchino & Fabrigar, 1993).

18 We do not mean to imply that there are no problems with using thought listings as the sole indication of differential elaboration. In fact, there are weaknesses associated with this methodology that are not raised by Allen and Reynolds. For example, the differential correlations between attitudes and thoughts could be due to other, nonmeasured third factors. Also, rather than thoughtful processing of the message leading to attitudes, the thoughts could reflect justification of the attitudes. Differential correlations across experimental conditions could result if the different conditions invoked different levels of motivation to justify one's attitudes. These weaknesses suggest that the exclusive use of thought listings as an assessment technique is not ideal (as Petty and Cacioppo point out; 1986, pp. 39–40), though thought listings are useful within the context of multiple assessment in a program of research.

19 The basic idea is that if people are unaware of the low credible source initially, they may process the message and find it convincing. Upon learning that the source lacks credibility, however, change is depressed, but over time as the source cue is dissociated from the message, attitudes become more favorable. If people know the source lacks credibility initially, then they can discount or not process the message, and thus there is no substance to emerge over time.

References


when prior knowledge about the attitude stimulus is low than high. *Journal of Experimental Social Psychology*, 28, 207–233.


