CHAPTER FOUR

THE ELABORATION LIKELIHOOD MODEL OF PERSUASION

Health Promotions That Yield Sustained Behavioral Change

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The typical goal of health promotion campaigns and research is to induce positive change in health-related behaviors. For example, a media campaign might attempt to convince people to use their seat belts or to stop smoking. However, studies of the effectiveness of media and direct interventions have provided inconsistent results. In particular, efforts in critical areas such as drug and alcohol abuse and prevention of acquired immunodeficiency syndrome (AIDS) have sometimes proved disappointing in terms of concrete successes. This challenge has led to a number of responses. For example, an entire issue of the journal Health Psychology was dedicated to the notion that a distinction has to be made between initiation of behavior change and sustained behavioral change (Rothman, 2000). Numerous investigators have pointed out that simply increasing knowledge about a topic is not sufficient to lead to behavioral change (Helweg-Larsen & Collins, 1997; Petty, Baker, & Gleicher, 1991). In order to understand why certain interventions with high face validity fail to provide sustained behavioral change, health promotion researchers and practitioners have sought insight from basic research on influence processes.

Experimental research has shown that attitudes represent one of the most important theoretical constructs that determine behavior (Eagly & Chaiken, 1993; Fishbein & Ajzen, 1975; Petty & Cacioppo, 1981). As commonly conceived, an attitude is a relatively stable global evaluation of a person, object, or issue. Taking exercise behavior as an example, critical attitudes might include: “Exercise is
good; I feel favorable toward running on the weekends; I feel good enough about myself to believe I can start exercising." Thus, multiple attitudes held toward different objects at different levels of specificity (in the example, the general concept of exercise, a specific behavior such as running, one's own self-efficacy) can affect the likelihood that any behavior is adopted. Thus, one job of those interested in health promotion is to determine which attitudes are the most important for predicting a particular health behavior and which procedures are best used for changing those attitudes and obtaining sustained behavioral change.

Of course, a number of factors other than attitudes determine whether people engage in a certain behavior. These include social norms (Fishbein & Ajzen, 1975), the strength of the attitude (Petty & Krosnick, 1995), feelings of self-efficacy and competence (Bandura, 1986), and prior behaviors and habits (Triandis, 1977). Although this might suggest that we should try to change these factors instead, many of these behavioral determinants result from attitudes as well. For example, when the attitudes of many people change, social norms change as well. Positive attitudes toward the self can increase feelings of self-efficacy, making behavioral change more likely. Negative attitudes toward past behaviors and habits can drive behavioral change. Thus, to change behavior, it is useful to understand how attitudes are changed.

Attitudes are most frequently measured using some type of direct self-report procedure, such as asking a person how favorable or unfavorable and positive or negative he or she is toward wearing seat belts (see Eagly & Chaiken, 1993, for more detail about common attitude measurement procedures). When planning a health promotion program, it is important to select the attitude or attitudes that the promotion is intended to change and to measure each attitude separately to determine the success of the program. Depending on one's goals, it can be useful to measure attitudes toward a general idea (safer sex), a specific object (condom), or a behavior (using a condom). The success of a persuasive attempt is then measured by assessing change in the attitudes targeted. Change can be assessed in a pre-post design or by comparing the attitudes of individuals who have and have not received some persuasion treatment (Campbell & Stanley, 1964).

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Contemporary scientific research on attitude change began in the 1940s as an extension of the U.S. military's effort during World War II to understand propaganda and persuasion (Hovland, Lumsdaine, & Sheffield, 1949). The learning theories developed at that time viewed persuasion as a function of attention, comprehension, acceptance, and retention of the persuasive communication (Hovland, Janis, & Kelley, 1953). This early research identified many of the variables investigators continue to examine as determinants of attitude change. Beginning with the Hovland group and continuing today, researchers focus on features of the source of the message (Is the source attractive? Expert? A member of an in-group?), the message itself (Is the message complex? Composed of cogent arguments? Rational or emotional?), the recipient of the communication (Is the recipient in a good mood? Intelligent? Involved in the topic?), and the context in which the message is presented (Is the environment quiet or distracting? Is the message on the radio, television, or the Internet?).

As the number of persuasion studies began to grow, numerous inconsistencies in findings appeared. For example, increasing the same variable, such as number of arguments, source expertise, or use of fear appeals, would increase persuasion in one experiment, decrease it in another, and have no effect in a third. Furthermore, numerous attitude change theories were developed to describe a number of processes through which persuasion takes place, but each theory seemed to predict persuasion only under certain conditions. Theories were also in disagreement about the effects of any one variable (for example, how source expertise influences attitude change; see Petty, 1994).

The Elaboration Likelihood Model (ELM) was developed to explain past inconsistencies in attitudes research. Whereas past models tended to emphasize one effect of a given variable and one process by which that effect occurred, the ELM organized multiple persuasion processes into two routes to attitude change. The central route involves change that occurs when people are relatively thoughtful in their consideration of the issue-relevant information presented. In contrast, the peripheral route to persuasion involves processes requiring relatively little thought about issue-relevant information. Instead, attitudes are changed by simple association processes (for example, classical conditioning) or the use of various mental shortcuts and heuristics. By noting that variables influence attitudes by different means at different points along an elaboration continuum, the ELM is able to explain seemingly inconsistent findings in the persuasion literature. After describing key ideas from the ELM, we discuss the utility of the model for understanding health communication.

Central Route

The ELM organizes attitude change processes into two routes to persuasion: the central route and the peripheral route. The central route to persuasion involves careful consideration of information pertaining to the attitude object and its
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cuts called heuristics. The persuasion context may elicit an affective state (like happiness) that becomes associated with the advocated position through classical conditioning (Staats & Staats, 1958), or a mental shortcut might be used so that a message from an expert is judged based on the heuristic that "experts are generally correct" rather than careful consideration of the substantive arguments (Chaiken, 1987). Another common method used when either motivation or ability is lacking is simply to count the number of arguments made rather than evaluating them based on their content (Pett & Cacioppo, 1984). Although the peripheral route to persuasion does not involve thoughtful consideration of message content, it can be effective in leading to persuasion, at least in the short term.

Elaboration Likelihood Continuum

To this point, it has been convenient to break processes of persuasion into two distinct routes for explanatory purposes. However, the ELM holds that persuasion occurs along an elaboration likelihood continuum. The continuum stretches from processes requiring no thinking, like classical conditioning that occurs outside awareness, to processes requiring some effort, like counting arguments or making inferences based on one's experienced affect, to processes requiring careful consideration, like listing the pros and cons to make an important life decision. Along much of the continuum, both peripheral and central processes take place and can influence attitudes simultaneously (Pett, 1994). But as the elaboration likelihood increases, central route processes, that is, careful evaluation of issue-relevant information, tend to dominate in their impact on attitudes over more peripheral processes, such as reliance on simple heuristics.

It is important to emphasize that the distinction between central and peripheral routes is made based on the extent of issue-relevant scrutiny and on how the information is processed rather than on the type of information itself (Pett, Wheeler, & Bizer, 1999). As an example, information about the source of a message can have an impact on attitudes under either the central or the peripheral routes depending on whether the recipient has the motivation and ability to evaluate it carefully. If Magic Johnson is the source of a message about human immunodeficiency (HIV) and we use the heuristic "famous is good," then persuasion will follow the peripheral route. However, if we are more persuaded because he has contracted HIV and knows what he is talking about, then we are examining the central merits of Magic Johnson as a source, as is likely to occur under the central route. Note that under the peripheral route, the use of Magic Johnson could be effective regardless of the message topic because if all one considers is his fame, this is constant across attitude objects. On the other hand, if one processes the information carefully for relevance, Magic Johnson should be more

relationship to pertinent knowledge stored in memory. Careful consideration of the issue-relevant information presented involves generating positive or negative thoughts (or both) toward the advocated position, such as seat belt usage. Under the central route, the valence of those thoughts (whether positive or negative) is related to the direction of persuasion, and the extent to which the thoughts are new and more positive or negative than they were previously determines the extent of attitude change. The thoughts about the message make up the key component that links internal knowledge to the information presented in the message. Also, the more confidence people have in the thoughts that they generate under the central route, the more these thoughts determine a person's attitude (Pett, Tormala, Brehl, & Jarvis, 2001). The focus of the thinking under the central route is often on the perceived desirability of the consequences in the communication and the perceived likelihood that they will occur (Pett & Wegener, 1991; Ajzen & Fishbein, 2000).

Two conditions are necessary for effortful processing to occur: the recipient of the message must be motivated and able to process it thoroughly. A person's motivation to consider message arguments can be influenced by a number of variables, including the perceived personal relevance of the message (Pett & Cacioppo, 1978) and whether the person enjoys thinking in general (Cacioppo, Petty, & Morris, 1983). A person's ability to think can also be influenced by a number of variables, including the amount of distraction present in the persuasion context (Pett, Wells, & Brock, 1976) and the number of times the message is repeated (Cacioppo & Pett, 1979). If a person is both motivated and able to think about the issue-relevant information presented, the result of this careful processing is an attitude that is well articulated, readily accessible, and integrated into the person's overall belief structure.

Peripheral Route

In our daily lives, we often lack either the motivation or the ability to thoughtfully consider every potential persuasive communication in the way characterized by the central route. Attitude change can occur nonetheless because many persuasion processes require little to no consideration of substantive information. In the ELM, such processes are organized into the peripheral route, and they include reliance on simple cues available in the persuasion context as well as mental short-
effective in an HIV message than in a message for swimming pools. We will discuss in more depth how the same variable can influence attitudes in multiple ways in different situations.

Support for the Central and Peripheral Routes

There is extensive empirical support for the utility of the central and peripheral distinction (see Petty & Cacioppo, 1986; Petty & Wegener, 1999a, for reviews). In one early and representative study, the presence or absence of a potential peripheral cue and the quality of the arguments, strong versus weak (as determined in pilot testing), were manipulated (Petty, Cacioppo, & Goldman, 1981).

In this study, college students were given one of four persuasive messages: (1) strong and compelling arguments attributed to an expert source, (2) weak and spurious arguments presented by an expert source, (3) strong and compelling arguments attributed to a nonexpert source, or (4) weak arguments attributed to a nonexpert source. No distractions were present during the procedure and the message was easily comprehended, so all participants had the ability to process the message. However, motivation to process the message was manipulated by informing some of the students that the proposal (supporting a change in campus policy) would take effect in a year (high-relevance condition), whereas others were informed that the proposal would go into effect in ten years (low-relevance condition). The high-relevance condition should motivate effortful processing of the message (Petty & Cacioppo, 1979b). The low-relevance condition offers little motivation to process the message, so low-effort attitude change processes should have a greater impact on attitude change. This was in fact the observed pattern: those in the high-motivation condition processed the message arguments, so their level of persuasion was greatly influenced by the manipulation of argument strength. They responded based on whether the arguments offered good support for the advocated position. Those in the low-personal-relevance condition lacked the motivation to process the message thoroughly, and so their level of persuasion was a function of the expertise of the source rather than strength of the message. That is, they supported the policy change as long as the source was an expert, regardless of the quality of the arguments offered to support the policy.

Variables Influencing the Elaboration Likelihood

Taken as a whole, the evidence supporting the ELM shows that a number of variables exist that can have an impact on persuasion by influencing a message recipient’s motivation or ability to think about the communication. In this way, these variables determine whether high or low effort processes are more likely to influence attitudes. For example, if a woman has a family history of breast cancer, then she might be motivated to think about a persuasive message about breast self-exams based on perceived self-relevance (Rothman & Schwarz, 1998). However, if the perceived self-relevance is so intense as to induce fear, defensive avoidance might occur (Janis & Feshbach, 1953). In addition to motivational variables, ability variables also influence processing. For example, if the message is delivered in the hall of a busy hospital, the ability to think will be lowered. Variables that influence motivation and ability to think can be part of the situation (context) or internal to the person (recipient).

The breast exam example mentioned variables that influence the extent of thinking (whether many or few thoughts are generated). Other variables influence the direction of thinking (whether favorable or unfavorable to the message). For example, telling an audience that they are about to receive a negative message about an important issue can bias responses to the message because the audience becomes motivated to actively resist a change in their current opinion (Petty & Cacioppo, 1979b). Conversely, if a person is in a good mood when exposed to a message on an important topic, the good mood increases the likelihood of generating positive thoughts to the communication (Petty, Schumann, Richman, & Strathman, 1993). Thus, responses to a persuasive message are determined by both situational and personal factors that influence motivation or ability to think in ways that change the extent or direction of thinking.

Consequences of the Route to Persuasion

The route used to produce attitude change is critical, because central route attitude changes tend to have different consequences and properties from peripheral route attitude changes (see Petty, Haugtvedt, & Smith, 1995, for a review). Overall, attitudes that result from central route processes tend to be stronger than those from peripheral route processes. As compared to weak attitudes, strong attitudes are more durable because they persist over time and resist change when challenged by contrary information. In addition, strong attitudes guide thinking, and, perhaps most important, strong attitudes guide behavior (Kronick & Petty, 1995). As an example, consider an individual who engaged in thoughtful processing of a message on exercise that resulted in a strong positive attitude toward this behavior. Strong attitudes are more predictive of behavior, so thoughtful attitude change makes the initiation of exercise behavior more likely. In addition, because strong attitudes persist in memory, they will continue to influence behavior over time. Furthermore, when a friend suggests going to an exercise class, the strong attitude will be resistant to change. It will also bias thinking in favor of the attitude,
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so the friend's statement may be reinterpreted as, "Stay in and be a sloth," increasing the likelihood of behavior maintenance. Thus, stronger attitudes produced through central route processes have a number of features that increase the chance of eliciting sustained behavioral change.

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A number of studies provide evidence that attitudes resulting from more effortful thinking better predict behavioral intentions and guide actions than do attitudes resulting from little thinking. As one example, Brown (1974) assessed the attitudes of high school students toward various health-related behaviors such as using drugs and obeying traffic safety laws. Students who reported giving the issues greater thought exhibited greater attitude-behavior consistency than those who reported giving the issues little thought.

Research on the need for cognition, a measure of the extent to which people engage in and enjoy thinking (Cacioppo & Petty, 1982), has also supported this proposition. For example, Cacioppo, Petty, Kao, and Rodriguez (1986) found that the attitudes toward presidential candidates of individuals who enjoy thinking were more predictive of their votes than the attitudes of individuals who did not enjoy thinking (see Cacioppo, Petty, Feinstein, & Jarvis, 1996, for a thorough review of work on need for cognition).

In these studies, existing attitudes based on high or low amounts of thought were examined. Other studies have created new attitudes and assessed how well the attitudes predict behavior. In one study, for example (Sivacek & Crano, 1982, experiment 2), undergraduate students were informed that their university was exploring the possibility of implementing senior comprehensive exams (an issue new to them), and they then read a message describing these exams. Then students reported their attitudes toward the proposal and were given the opportunity to sign petitions opposing the exams and to volunteer their services to a group that opposed the exams. The sample was divided into high- and low-relevance groups on the basis of the students' self-reports of whether the issue was high or low in perceived personal relevance (that is, whether it would affect them or not). The high-relevance group exhibited larger correlations between their attitudes toward senior comprehensive exams and their relevant behaviors (petition signing and volunteering). That is, students for whom the message was more personally relevant demonstrated higher attitude-behavior consistency than students who considered the message less relevant. Based on the assumption that students in the high-relevance group engaged in greater issue-relevant thought when forming their attitudes than students in the low-relevance group (as would be expected based on numerous experiments; Petty & Cacioppo, 1990), this study supports the notion that thoughtful attitudes are more predictive of behavior than unthoughtful attitudes. Other studies that have changed attitudes to a similar degree under conditions of high or low elaboration have also shown that thoughtful attitude changes are more predictive of behavioral intentions and actions than unthoughtful attitude changes (Leippe & Elkin, 1987; Petty, Cacioppo, & Schumann, 1983). Thus, attitudes formed by the central route exhibit greater attitude-behavior consistency.

Research evidence suggests that attitudes formed by the central route are more persistent over time and more resistant to counterpersuasive attempts than attitudes formed by the peripheral route. For example, in two studies (Haugevd & Petty, 1992), similar attitude changes were produced in individuals who differed in their need for cognition. In each study, college students were presented with a message containing strong arguments from a credible source, so there were two possible factors on which persuasion could be based. Both high- and low-need-for-cognition individuals became more favorable toward the position taken in the message, but what is critical in that they did so through different processes. Students who generally enjoy thinking changed based on a careful consideration of the high-quality arguments. Low-need-for-cognition students, who avoid thought, changed to the same extent but because of the positive source cue. When attitudes toward the issue were examined just two days after the persuasive message, recipients low in need for cognition had returned to their initial positions, but high-need-for-cognition students persisted in their new attitudes. In a second study, the students' new attitudes were challenged just a few minutes after they were created. High-need-for-cognition students resisted the message attacking their attitude to a greater extent than low-need-for-cognition individuals.

Taken together, these results suggest that attitude change might have less impact if it comes about through low rather than high amounts of issue-relevant thinking. Thus, although central route attitude changes are typically more difficult to produce than peripheral route changes, the benefits are considerable. A key contribution of the ELM is the finding that it is insufficient to know simply what a person's attitude is or how much change in attitude was produced. It is also important to know how the person's attitude was changed. Attitudes that are identical in valence can be quite different in terms of their underlying psychological antecedents (how they were formed or changed) and consequences (for example, whether they predict behavior; see Petty & Krosnick, 1995, for a review of attitude strength research).

The difficulties of creating central route attitude change are familiar to health promotion researchers. For example, there are great challenges in engaging young adults in health-related topics like safer-sex practices and substance abuse simply because they often do not see them as personally relevant or important to their lives (Scott, 1996; Scott & Ambroson, 1994). Due to these challenges, it is tempting to suggest that the use of peripheral cues and heuristics is the best way to create
attitude change. However, attitude change produced through peripheral route processes can represent an empty victory, since weak attitudes produce little in the way of tangible results. Instead, more needs to be done to understand what variables successfully engage the thoughtful processing of such messages in each population. One possible hybrid strategy is to use the peripheral route in combination with the central route. That is, one might make a health position, such as using condoms, more acceptable to an unmotivated audience by the use of cues, and then when it is temporarily more desirable, more active processing techniques can be employed, such as getting people to justify their new attitudes in a role-playing exercise (Janis & King, 1954).

Multiple Roles of Variables in the ELM

One critical component of the ELM is that it allows for any one variable, such as the credibility of the message source or the mood a person is in, to influence persuasion through different processes in different situations. The capacity of one variable to affect judgments through different processes explains how such simple variables as the credibility of the source or one's mood can produce complex outcomes. It also makes it essential to identify the conditions under which a variable influences attitudes by one process rather than another. We have hinted at the limited number of ways that variables can affect attitudes according to the ELM: by serving as a simple cue, by serving as an argument, or by affecting one's thoughts (amount of thoughts, valence of thoughts, or confidence in thoughts).

Situations of low elaboration likelihood occur when people are unmotivated or unable to scrutinize the issue-relevant information presented. Under low elaboration conditions, then, persuasion-relevant variables such as a person's mood or the expertise of the source, to the extent that they have any impact at all, influence attitudes primarily through peripheral route processes. This is because people are either not motivated or not able to forcefully evaluate the merits of the information presented. Thus, if any evaluation is formed, it is likely to be the result of a relatively simple association or inference process that can occur without much cognitive effort (for example, “Experts are correct”). For example, under low-elaboration conditions, one's mood could serve as a simple cue either because the mood becomes associated with the advocated position through classical conditioning or because people infer their attitude from their mood (“I feel good, so I must like it”). Both of these peripheral processes assume that mood can influence attitudes without much issue-relevant thinking.

The ELM holds that under high elaboration conditions, however, people want to evaluate on the merits of the arguments presented, and they are able to do so.

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In these high-elaboration situations, persuasion-relevant variables have relatively little impact by serving as simple cues. Instead, the variable is scrutinized, like a message argument, and can result in attitude change if the variable provides information relevant to the merits of the attitude object (for example, an emotional factor such as how much you “love” someone is central to the merits of selecting a spouse and can serve as an argument in favor of marriage). Even variables not central to the merits of the object can influence attitudes under high processing conditions by biasing the direction of thought taking place. For example, people might be motivated to generate mostly favorable thoughts about the message if the source is credible (Chaiken & Maheswaran, 1994), or they might overestimate the likelihood that some good consequence mentioned in the message will happen if they are in a good mood (Wegener, Petty, & Klein, 1994). Finally, if thoughts are generated when people are in a good mood or the source is expert, people might have more confidence in their thoughts than if the thoughts are generated when they are feeling bad or are in response to an unknowable source (Petty, Briñol, & Tormala, in press). The more confidence one has in one's thoughts, the more they will impact attitudes.

The final role a variable can have is influencing the amount of thinking that takes place. For example, we previously noted that people are generally motivated to think more about messages of high rather than low personal relevance (Petty & Cacioppo, 1979b) and are generally unable to think carefully about messages when distraction is high (Petty et al., 1976). But many other variables can influence the extent of thinking when the elaboration is not already constrained to be high or low. For example, the variables of source expertise and a person's mood can influence the extent of thinking when other variables have not already constrained thinking to be very high or low. In such circumstances, people may be more motivated to pay attention to and think about what an expert rather than a nonexpert source advocates (Heesacker, Petty, & Cacioppo, 1983). Or when in a happy mood, people will be more likely to think about a message that promises to be uplifting and less likely than individuals in a sad mood to think about a message that promises to be depressing (Wegener, Petty, & Smith, 1995). This suggests that positive mood influences message processing, at least in part, due to mood management concerns (Isen & Simmonds, 1978; Wegener & Petty, 1996). That is, people in a positive mood tend to avoid message processing when they think it might attenuate their good feelings such as when the message is expected to be unpleasant or counter to one's own attitude, but engage in message processing when it will maintain or enhance their mood, such as when it is pleasant or supports their own attitude (see Wegener & Petty, 1996; Petty, Febrigar, & Wegener, 2001, for reviews of research on mood and persuasion).
Summary of the Elaboration Likelihood Model

Figure 4.1 presents a schematic depiction of the ELM and highlights the major features of the model. In the simplest sense, the ELM does three things. First, it points to two routes to persuasion: a thoughtful and cognitively effortful route that occurs when the person is both motivated and able to think about the merits of the issue under consideration, and a less thoughtful route that occurs when motivation or ability is low. Second, the model points to consequences of these two routes. Thoughtful attitude changes are postulated to be more accessible to memory, persistent over time, resistant to counterpersuasive attempts, and predictive of behavior. Third, the model specifies how variables have an impact on persuasion. That is, the model specifies certain roles that variables can play in the persuasion process. Variables can influence a person’s motivation to think or ability to think. They can influence the valence of one’s thoughts or the confidence in the thoughts generated. Finally, they can serve as simple cues and change attitudes by one of several peripheral processes (for example, identification with the source, invocation of simple decision heuristics). With these features of the ELM in mind, we turn to the potential relevance of this model for health promotion.

Using the ELM to Understand Health Communication Efficacy

Over the past decade, researchers in the area of health promotion have made use of the ELM to develop health promotion campaigns and interventions including AIDS and condom use (Bakker, 1999; Dinoff & Kowalski, 1999; Helweg-Larsen & Collina, 1997; MacNair, Elliott, & Yoder, 1991; Mulvihill, 1996), exercise (Brock, Brannon, & Bridgwater, 1990; Rosen, 2000), diet counseling (Kersens & van Yperen, 1996), substance abuse interventions (Scott, 1996; Scott & Ambroson, 1994), smoking cessation (Quinlan & McCaul, 2000), compliance in breast cancer screening (Drossaert, Boer, & Seydel, 1996), maternal attitudes toward baby bottle tooth decay (Kanellos, Logan, & Jakobson, 1997), compliance with hospital infection control procedures (Bartzokas & Slade, 1991), prenatal care for low-income Mexican women (Alcalay, Ghee, & Scrinshaw, 1993), and organ donor program participation (Skumanich & Kinsffather, 1996). Dissertations in the health domain have also made use of the ELM in research related to phenomena such as the fear associated with heart disease and ulcers (Rosenthal, 1997), adolescent AIDS interventions (Weiskotten, 1993), attitudes toward health maintenance organizations (Chan, 1999), and responses to unfavorable medical diagnosis (Lockhart, 1999).
As a general theory of information processing, the ELM has considerable utility for understanding the outcomes of different persuasive attempts on resulting attitudes and behaviors. Because attitudes are a primary determinant of behavior, attitude change can be a central focus of any health promotion program.

ELM Analysis of Message Tailoring

One area of health research in which the ELM has been fruitfully applied is in the domain of message tailoring. Although there are occasionally contradictory results (Quinlan & McCaul, 2000), the bulk of research has indicated that matching health messages to different aspects of an individual's personal characteristics can increase the effectiveness of the messages in changing attitudes and behavior (Kreuter, Bull, Clark, & Oswald, 1999; see Kreuter, Farrell, Olevitch, & Brennan, 2000, for a review). Although tailoring strategies have generally been successful, little is known about why tailoring is an effective strategy. Moreover, little is known about what differentiates the situations in which tailoring will or will not be effective in generating short-term or long-term behavioral change.

In this final section, we use the ELM to examine some mechanisms by which message tailoring could work and provide illustrative examples. In addition, we speculate about conditions that are likely to maximize the effectiveness of message tailoring, as well as those in which tailoring may lead to null or even reversed effects.

Tailoring. Within the health domain, tailoring typically refers to those instances in which the arguments contained in health communications are altered to match the particular concerns of the message recipient. For example, a pretest of Susie's concerns about condom use might indicate that she believes that they are awkward and inhibit pleasure. Susie may be less concerned about the cost of condoms or about their efficacy in preventing pregnancy or disease. A message tailored to Susie, then, would address the social and physical issues associated with condom use while leaving out information about their efficacy or cost.

Tailoring procedures can be used to match not only the types of concerns an individual has about a particular health behavior, but also the individual's stage of behavioral change. Stages of change models hold that there are a number of qualitatively distinct stages through which an individual must pass when adopting a health behavior (Prochaska, DiClemente, & Norcross, 1992; Weinstein, 1988; Weinstein & Sandman, 1992; also see Weinstein & Sandman, Chapter Two, this volume). For example, the Transtheoretical Model (Prochaska et al., 1992) suggests that individuals pass through five distinct stages (precontemplation, contemplation, preparation, action, and maintenance) on the path to behavioral change and that messages that match the individual's stage of change should be more effective in changing behavior. With some exceptions, the available literature generally indicates that this is the case.

Matching Effect. The finding that tailoring arguments to personal health concerns can increase persuasion bears more than superficial similarity to findings in other persuasion domains showing that matching a persuasive message to various facets of the person or his or her attitude can increase persuasion. For example, matching a message to the functions of an individual's attitude can increase persuasion (for example, providing image-related arguments to a person concerned about social image; see Shavitt, 1988; Snyder & DeBono, 1985). Making an emotional appeal to a person whose attitude is based on emotion can be more effective than making a more rational or cognitive appeal (see Edwards, 1990; Fabrigar & Petty, 1999). Finally, matching a message to one's group identity can be effective (for example, framing the message as "for men" or "for women" for individuals highly identified with their gender; see Fleming & Petty, 2000; Mackie, Worth, & Asuncion, 1990).

Although some researchers (for example, Kreuter et al., 1999) draw a distinction between personalization (putting a person's name on the communication) and tailoring, we believe that these types of matching share important underlying conceptual similarities. Petty, Wheeler, and Bizer (2000) reviewed matching effects in a variety of social-psychological research traditions, including attitude function matching, self-schema matching, group identity matching, and affect-cognition matching. Noting the remarkable similarity in induction procedures and persuasion outcomes, they suggested that these matching effects might stem from the same underlying factor: establishing a link to the self.

Matching Under Low Elaboration Conditions. In line with the multiple roles postulate of the ELM, linking a message to some aspect of the self ("me-ness" matching) could influence persuasion in a number of different ways. Under low-elaboration conditions, the match could act as a simple cue, for example, "If it's for me or "relates to me," or is "similar to me"), I like it." This notion derives support from the numerous findings indicating that objects or ideas that are associated with the self are preferred to those that are not. Thus, individuals prefer products that they own to those that they do not, whether the products were chosen by the individual (Brehm, 1956) or received as an unselected gift (Kahneman, Knetsch, & Thaler, 1991). Individuals prefer arguments that they have generated to those that others have generated (Greenwald & Albert, 1968) and even prefer the first
letters in their own names to other letters of the alphabet (Nuttin, 1985). Given the typically high self-esteem that most individuals possess (Taylor & Brown, 1988), it is not surprising that the self serves as a positive cue so frequently (an "own-ness" bias; Perloff & Brock, 1980).

Thus, under low-elaboration conditions, matching a message to some aspect of the individual's self, such as one's concerns, values, goals, groups, or possessions, could act as a positive cue in the absence of much issue-relevant thinking. Although this cue strategy could be fruitful in the short run, durable attitude change is more likely when a message is processed under high-elaboration conditions. By engaging in active elaboration on the message topic, the individual forges more linkages between the new information and knowledge already stored in memory. Greater elaboration is therefore likely to render the resulting attitude more persistent, more resistant, and more likely to influence thought and behavior.

Matching Under Moderate Elaboration Conditions. When baseline elaboration likelihood conditions are moderate (that is, motivation and ability factors are not constrained to be high or low), a persuasion variable can act to increase the amount of elaboration that takes place. For example, we already noted that a variable that increases the perceived personal relevance of a message can increase the extent to which an individual thinks carefully about all of the issue-relevant information present (Pett & Cacioppo, 1979b). In line with this prediction, a number of studies in the literature have provided evidence consistent with the idea that tailoring a message to the recipient can increase elaboration (see Pett & Wegener, 1994). For example, Brug, Steenhuis, Van Assema, and de Vries (1996) found that tailored messages were perceived by recipients as more personally relevant and as written especially for them. Perhaps because of this increased perception of relevance, tailored messages are more likely to be read by the recipients and result in greater recall for the message content (Brug et al., 1996; Campbell et al., 1994; Skinner, Strecher, & Hopers, 1994).

Matching Under High-Elaboration Conditions. Under high-elaboration conditions, tailoring or matching a message to an individual could lead to biased message processing. For example, arguments that are tailored to address individual concerns, such as those about cost, could be perceived to be stronger than those that are not so tailored, such as messages about social benefits, even though there are no differences (or even a reverse difference) in actual argument quality. For example, people may be more likely to fill in positive interpretations for matched than mismatched arguments. Alternatively, tailored arguments could address health concerns about which the individual has a biased store of issue-relevant knowledge. This could lead to an ability bias even when the individual has an accu-

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racy motivation. That is, the person's biased store of knowledge might enable the person to see the merits in some types of arguments more easily than other types. Finally, people might have more confidence in the thoughts that they generate to tailored rather than nontailored messages, leading thoughts in response to tailored messages to have a greater impact on attitudes.

Illustrative Research on Tailoring

In a prototypical tailoring experiment, Kruger et al. (1999) collected an initial set of data on participants' beliefs, motives, perceived barriers, and so forth concerning weight loss. Participants were then sent one of three messages. Tailored messages included participants' names and fourteen arguments tailored toward their particular concerns. Another group received messages from the American Heart Association that were not tailored but contained general information and tips concerning weight loss. In a third condition, people received a message that contained the exact same information as the nontailored message group, but the message was formattted to resemble the tailored pamphlets in appearance. Results indicated that participants who received the tailored materials generated more positive personal connections (that is, links between the materials and their lifestyle, attitudes, social norms, or behavior) and more positive thoughts than those who received materials that were not tailored. In addition, participants indicated that the tailored messages elicited more attention. Although results on the attitude measures were somewhat equivocal, the experiment generally supported the conclusion that tailored messages can be effective in increasing message processing. Although many studies within the health literature have tailored arguments to match the specific dimensions of concern the individual had expressed in that particular health domain, messages have also been matched on the basis of more general characteristics. For example, Brock et al. (1995) conducted a study in which they tailored persuasive messages to match the self-schemas of the message recipients. To create the tailored messages, they first contacted a pool of over seven thousand former customers of a weight-loss company with a letter from the (fictional) Center for Personality Research. Using a card-sorting procedure and adjective-rating task, participants indicated their overall personality types. Brock et al. (1990) used these data to classify participants into one of four schema sets (one was "warmcommunicative-compassionate"). These same individuals were later sent a packet of materials from the weight loss company. The materials included an insert that was tailored to either match or mismatch the schema set of the recipient and a business reply card that could be used to reactivate membership with the company. Control group participants received an insert designed to be neutral with regard to schema set. Results indicated that individuals who received an insert
stringently matched to their schema set were over 12 percent more likely to return the business reply card than were individuals who received a mismatched insert. These results lend support to the hypothesis that tailoring messages to individuals' self-schemas can be another effective means of tailoring.

In addition, some work has shown that simply tailoring the message format to match some aspect of the recipient can increase persuasion. For example, Bakker (1999) reasoned that individuals who are high or low in the need for cognition (Cacioppo & Petty, 1982) would respond differently to messages presented in a way that made them appear easy or more difficult to process. Need for cognition is an individual difference variable that corresponds to a person's propensity to engage in and enjoy effortful cognitive activities (Cacioppo & Petty, 1982).

In this experiment, high school students were exposed to one of two messages about AIDS and STDs. Although the messages contained essentially the same information, one message was presented in a concise, written format, whereas the other message was presented in a cartoon format. Bakker (1999) reasoned that low-need-for-cognition individuals should be particularly motivated to think about the cartoon message because it would appear easier and more enjoyable to process. High-need-for-cognition individuals, on the other hand, could be more motivated to process the written message because it would appear to be more interesting and important. He reasoned that the cartoon message could actually inhibit persuasion among high-need-for-cognition participants by creating additional distraction or by leading to negative cognitive responses, such as responses about the potentially "childish" or simplistic nature of the message format.

Results indicated that participants in both the cartoon and written message conditions had significantly more knowledge about AIDS after reading the message than did participants in a no-message control group. However, analyses on attitudes toward condom use indicated a main effect of message type as well as a significant need for cognition by message type interaction. The main effect was such that individuals in both the cartoon and written message conditions showed more positive attitudes toward condom use than did participants in the no-message control group. The interaction, however, indicated that low-need-for-cognition individuals expressed more positive attitudes toward condom use after reading the cartoon message than the written message, and high-need-for-cognition individuals indicated more positive attitudes toward condom use after reading the written message than the cartoon message. Thus, message format appears to be an additional type of tailoring or matching variable that can have a significant impact on health attitudes and behaviors.

Interpreting Tailoring Research

The three research examples of tailoring described demonstrate self-matching effects with three different types of manipulations. Kreuter et al. (1999) tailored their arguments to match the specific concerns of the message recipients (the most typical tailoring procedure), Brock et al. (1990) matched the arguments to aspects of the individuals' personality schemas, and Bakker (1999) matched the format of the message to the individuals' cognitive processing style. Although it is certainly possible to obtain similar findings for different reasons, it is possible that each of these results shares an important underlying similarity. That is, each of the studies reviewed matched an aspect of the persuasive message to a corresponding aspect of the message participant and may have therefore influenced persuasion as a result of the self-match.

Although each of the studies found increased persuasion under matched rather than mismatched conditions, the precise mechanism responsible for each finding is not entirely clear. Recall that according to the ELM, a given variable like a message match can serve in multiple roles depending on the overall level of elaboration present in the persuasion context. Consequently, additional manipulations and measures are necessary to draw strong inferences about the processes operating in each experiment. The authors of the experiments just reviewed all favored the explanation that matching increased elaboration. If one assumes that the arguments presented were strong and that elaboration was not constrained at high or low levels by other variables, this explanation would be quite plausible and consistent with the ELM. However, other researchers have provided support for the idea that self-matching can have other effects besides increasing elaboration, such as biasing elaboration in a favorable direction (Cacioppo, Petty, & Scilier, 1982; Levine & Snyder, 1996) or serving as a peripheral cue (DeBono, 1987), and so, in the absence of empirical process indicators, multiple accounts for the data reviewed above are possible. For example, in the Bakker (1999) study, was a cartoon more effective than a written message for individuals low in need for cognition because the cartoon served as a simple cue or because it increased processing of the strong message arguments? Given that the individuals were low in need for cognition, it seems unlikely that the cartoon served in one of the roles reserved for high-elaboration conditions, such as biasing processing. In any case, the multiple roles reviewed earlier provide examples of how the same effects could be obtained using different processes under different elaboration conditions. The
ELM holds that it is important to understanding the underlying processes of change because of the strength properties that follow from the different processes.

Of our example studies, the one that provided the most extensive process evidence was that of Kreuter et al. (1999), who included manipulations of self-reported attention and cognitive responses. These researchers found that participants found the tailored messages to be more attention getting and that participants generated more positive cognitive responses in response to tailored messages. Although not significant, results further indicated that the total number of thoughts generated in response to the message was highest among individuals who read the tailored messages. Thus, it seems plausible that in the Kreuter et al. experiment, tailoring increased message elaboration.

From the standpoint of understanding the processes responsible for self-matching effects, it would be very useful to include a manipulation of argument quality in future research designs. Argument quality manipulations can provide an additional source of information about the role of the variable by indicating the extent of elaboration (Petty & Cacioppo, 1986). That is, if a variable (like tailoring) increases persuasion equally when both strong and weak arguments are presented and argument quality makes little difference, then tailoring is likely to be operating as a peripheral cue. If, on the other hand, tailoring increases sensitivity to differences in argument quality, then it may be increasing objective message elaboration. If that were the case, tailoring would increase persuasion when the message arguments were strong but decrease persuasion when the message arguments were weak. When an argument quality main effect is found in conjunction with a main effect of the experimental variable, the variable may be biasing the already high levels of elaboration. Of course, to examine the multiple roles for message tailoring fully, it would be necessary to include a manipulation of tailoring and argument quality along with a manipulation of the extent of thinking.

It is also useful to assess ancillary measures such as the number and valence of cognitive responses generated and the confidence in one’s thoughts and attitudes to determine the underlying processes of persuasion more thoroughly. That is, the positivity of cognitive responses can also be indicative of the direction and extent of message processing. For example, cognitive responses should be more likely to mediate the impact of argument quality on attitudes under high elaboration conditions. Thought positivity can be computed as the ratio of positive minus negative thoughts to the total number of thoughts generated (see Cacioppo, Harkins, & Petty, 1981, for more on thought-listing techniques). Finally, additional measures of cognitive processing such as message recall, reading times, or self-reported effort can provide further information about the extent of elaboration, although they are imperfect when used in isolation.

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Of course, the use of multiple manipulations and measurements can be difficult to achieve in practice. Field settings can often provide pragmatic limitations on the types of manipulations and measures that one is able to implement. More important, there could be serious ethical concerns associated with providing weak arguments for engaging in positive health behaviors. No doubt, this is likely one of the reasons for the limited use of argument-quality manipulations in health communication research to date. However, argument-quality manipulations have been used in some experiments (Rosen, 2000), and when combined with a thorough debriefing, including distribution of appropriate materials, argument-quality effects can provide important insight into the functioning of variables like tailoring. More likely, treatments can be pilot-tested in a controlled laboratory context in which strong and weak arguments are used to understand the mechanisms behind an effect (such as whether the variable is operating as a cue or increasing thinking). Once the desired outcome is obtained, the treatment can be taken to the field where only strong arguments would be used.

Implications for Practitioners

Research shows that the ELM can be used to derive more effective health communications and persuasion interventions.

To effect durable and influential attitude change, practitioners should attempt to increase the elaboration of the message recipients, that is, to the extent to which people relate the ideas in the message to their prior knowledge and beliefs (see Petty & Krosnick, 1995; Petty & Cacioppo, 1986). A common problem noted by researchers is that recipients of health communications are often unmotivated to process carefully the materials they receive (Scott, 1996; Scott & Ambroson, 1994). This might lead some to suggest that developers of health messages should put their energies toward injecting peripheral cues into their communications. Although this could have a positive short-term impact, long-lasting attitude changes are unlikely to result from this strategy. Instead procedures that increase the formation of highly elaborated, accessible, and well-integrated attitudes will be most likely to result in actual and sustained behavioral change.

One means of inducing elaboration is by increasing the perceived personal relevance of the communication (Johnson & Eagly, 1989; Petty & Cacioppo, 1979b). Different kinds of message matching or tailoring could be effective in this regard (Kreuter et al., 1999; Petty et al., 2000), even for those who are dispositionally prone to engaging in low-effort cognitive strategies (Bakker, 1999). Making individuals feel personally responsible or accountable for their own health
outcomes could also increase attention to health-related communications (see Petty, Harkins, & Williams, 1980; Teloek, 1983). In addition, if individuals believe that their current health beliefs or practices place them in the minority, they may elaborate more on the message to resolve the surprise that can result from being discrepant from others (Baker & Petty, 1994). Other variables with an impact on message elaboration have been reviewed extensively elsewhere (Petty & Wegener, 1998a; Petty, Wheeler, & Tormala, in press) and could prove useful in health communication campaigns.

In addition to these motivational variables, ability variables can have an effect on message elaboration. Elaboration of health communications should be higher when the communications are presented in a medium that permits self-pacing, for example, by using a written medium rather than audio or video media (Chaiken & Eagly, 1976) in an environment without distractions (Petty et al., 1976) and in a language that recipients easily understand (Hafer, Reynolds, & Obertynski, 1996). Because the language used to describe health conditions and treatments is often quite technical, this latter prescription may require pretesting of the recipient population to ensure that the language is not perceived to be too technical. Perceptions that the message is too technical can decrease elaboration by its impact on perceived ability, even though actual ability may be adequate for elaborative processing (see Yech & Elmore-Yechl, 1984). Alternatively, the educational background of the targets of many health communications could inhibit their ability to process verbal information, and such limitations should be taken into account.

High levels of elaboration will increase the impact of argument quality. Thus, the use of strong arguments is another important aspect of any health intervention. Argument strength can be determined by pretesting arguments on subsets of the target population. Particularly effective messages can be developed when the concerns of the target population are measured and arguments are developed to address each concern. More finely grained procedures may isolate subpopulations of the larger population that share similar concerns. For example, single individuals with multiple partners may be more interested in the efficacy of condoms for preventing sexually transmitted diseases, whereas married individuals with a single partner may be more interested in the efficacy of condoms for preventing conception. Once developed, the tailored arguments can be pretested not only to ensure that they are perceived as cogent by the target segments, but that they also elicit favorable thoughts rather than counterarguments. Adjustments can be made on the basis of such pretests before a broader distribution of the materials. Argument tailoring can thus serve as one means of ensuring that each population receives arguments that are perceived to be relevant and are compelling (Kreuter et al., 2000). Recent technological advances have made tailoring procedures increasingly efficient and affordable (Kreuter et al., 2000). Of course, tailoring

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the message arguments is only one type of self-matching strategy that might be used effectively to increase message elaboration.

Finally, assessment of the intervention's efficacy should be made, and adjustments should be made on the basis of the assessment. An important element in such an assessment is a measure of the recipients' attitudes. Message learning can occur in the absence of attitude change (Helweg-Larsen & Collins, 1997; MacNair et al., 1991), and differing levels of attitude change can occur with equal increases in knowledge (Bakker, 1999). Also, since all attitude change is not the same, indicators of the strength of the changed attitude, such as the accessibility of the attitude or the confidence in the attitude, should also be taken (Petty & Krosnick, 1995).

Conclusion

The ELM, a useful framework for interpreting and predicting the impact that health communications have on subsequent attitudes and behavior, proposes that attitudes can be formed as the result of different types of processes. Peripheral route processes are those that involve minimal cognitive effort and instead rely on superficial cues or heuristics as the primary bases for attitude change. Central route processes are those that involve effortful cognitive elaboration and rely on careful scrutiny of issue-relevant information and one's own cognitive responses as the primary bases for attitude change. Although each process can sometimes result in attitudes with similar valence, the two processes typically lead to attitudes with different consequences. High-effort central route processes are more likely to lead to attitudes that are persistent over time, resistant to counterattacking, and influential in guiding thought and behavior than are peripheral route processes (Krosnick & Petty, 1995). Because enduring attitude and behavioral change are likely to be key goals of any health communication campaign, promoting attitude formation by central route processes is important. Consequently, using techniques that increase the perceived relevance of the communication and the quality of the arguments will promote achievement of the communicators' goals. A thorough understanding of these principles should result in more effective health communication campaigns that efficiently promote the adoption of health-protective behaviors.

Notes

1. Our aim here is not to assess the validity of stage models. As Weinstein, Rothman, and Sutton (1998) noted, the fact that personalization or tailoring can alter persuasion outcomes does not bear on the validity of stage models.
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2. It might be argued that tailoring itself constitutes a manipulation of argument quality. However, the goal of most tailoring research is to uncover the dimensions of an object or issue that are important for a person, such as price or social consequences. The information that is presented on these dimensions, however, can constitute strong (for example, "less expensive than all leading brands") or weak ("costs just slightly more than the leading brands") evidence in favor of the position advocated (see Petty & Wegener, 1999b).

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