34. INSTRUCTIONAL TECHNOLOGY AND ATTITUDE CHANGE

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"A companion's words of persuasion are effective." —*The Iliad,* Homer, c. 700 BC

Attitudes are learned "predispositions to respond." Attitudes serve to provide direction to subsequent actions. Because attitudes are acquired they can be changed fairly predictably (Zimbardo & Leippe, 1991). Increasingly, instructional media have been used to deliver attitude change messages. This chapter will discuss the use of media to present instructional messages that persuade instead of inform. Unfortunately, when media are used for attitude change, the relationship between the medium of delivery and the message of persuasion is unclear.

Chaiken and Egly (1976) reported on the results of what now is considered a classic study of attitude change using media. It demonstrated the difficulty of drawing conclusions about mediated instruction and attitude change. In their experiment, subjects were exposed to either an easy- or difficult-to-comprehend message that was presented in written, audiotaped, or videotaped form. The easy version of the message, which dealt with a dispute between a company and its union, used short sentences with simple vocabulary. The difficult version used complex sentences and sophisticated vocabulary. The results showed that in the difficult message treatment, both attitude change and learning were greater when the message was presented in written form. For the easy-to-comprehend message, a different pattern emerged. Comprehension was high no matter what delivery medium was used, but the amount of attitude change was greatest when the message was videotaped, slightly less when it was audiotaped, and least when the message was written (Table 34-1).

Apparently, the amount of attitude change was related to the difficulty of the message content and to the delivery medium. Chaiken and Egly discussed why this differential effect occurred, but they did not explain the apparent media effect. Results such as this one demonstrate the difficulty of developing conclusions or offering guidelines about the persuasive impact of messages delivered using media. Actually, any careful study of the literature leads the serious, if conservative, reviewer to conclude that there is little if any "medium effect," and to agree with Clark (1994, 1983) that media are "mere vehicles" that do not directly influence attitudes any more than they do achievement. However, instructional media are often used to deliver persuasive messages. There is a wealth of interesting and useful research examining attitudes and media that can be applied by the educator. This literature will be reviewed, criticized, and summarized in this chapter.

34.1 INTRODUCTION

Attitude change and instructional technology will be discussed as follows. First, the nature of attitudes will be explained. Attitudes will be defined and the characteristics of attitude constructs will be presented. Also included will be a rationale for why attitude change is an important concern of those interested in instructional technology. Second, there will be a review of the theories of attitude change. Understanding some of the various theories of attitude change is fundamental to any discussion of the relationship between persuasion and instructional technology. Third, a review of the long-continuing debate about the relationship between attitudes and behaviors will be included. Historically, many have felt that attitudes are not related to actions, but others have taken a more moderate approach. This debate will be summarized.

Next, an overview of the techniques for measuring attitudes will be provided. It is obvious from any review of the literature that attitude measurement is done poorly. Researchers often do not use even the most basic procedures for effective measurement when they investigate attitude variables. Generally accepted procedures for *measuring*

TABLE 34-1. ATTITUDE CHANGE AND RETENTION OF MESSAGE CONTENT AS A FUNCTION OF MEDIUM AND MESSAGE DIFFICULTY (Chaiken & Egly, 1976)

	Easy Message			Difficult Message		
	Written	Audio	Video	Written	Audio	Video
Attitude change	2.94	3.75	4.78	4.73	2.32	3.02
Number of messages recalled	2.45	2.21	2.17	2.29	1.74	1.67
Number of short answer items correct	4.57	3.93	4.45	4.21	3.71	3.36
Perceived message difficulty	4.76	4.21	4.83	5.31	7.50	7.43

Note: Higher numbers indicated greater attitude change, message comprehension, and perceived message difficulty.

attitudes will be presented. Fifth, there will be a review of previous attempts to organize the attitude change and instructional technology literature. At least two schemes (Simonson, 1979; Bednar & Levie, 1993) for explaining the use of instructional technology for attitude change have been proposed and will be discussed.

Finally, a set of six guidelines for designing persuasive instructional messages will be offered. These guidelines will be linked using a "Model of Cumulative Effect" that proposes a method for improving the likelihood of attitude change. The model is an attempt to provide the practitioner with techniques for building a persuasive message that is to be delivered with media.

It is also important to explain what is *not covered* in this discussion of attitude change and instructional technology. First, the very important and rich literature about motivation is not reviewed. Motivation is obviously related to attitude change, especially to most of the current theories used to predict behaviors, such as the theory of reasoned action and the theory of planned action. However, motivation is a broad topic that requires its own discussion. (see 32.5.5).

Second, attitude toward media or technology is presented only peripherally. This is because the main concern of this review is to discuss persuasive instructional messages presented with media. In other words, attitude change toward the content of messages is the focus of this chapter, not attitude toward the medium itself. Finally, this review should not be considered a comprehensive examination of the extremely broad body of literature related to attitudes and attitude change. Rather, it is a handbook-type summary of the literature that relates, at least tangentially, to the chapter's theme: how to design messages using media when attitude changes are desired. For a more complete review of attitude literature, one of the recently published books on this topic should be consulted (e.g. Eagly & Chaiken, 1993; O'Keefe, 1990).

34.2 THE NATURE OF ATTITUDES

Research on attitudes has been popular in many disciplines. However, the construct is considered more central to social psychology than to any other academic area. Allport (1935) claimed 60 years ago that "the concept of attitude is probably the most distinctive and indispensable concept in contem-

porary American social psychology." This assessment is as appropriate today as it was then. Most information on attitudes is reported in the literature of social psychology (see 6.6, 32.5.4.8).

34.2.1 Attitudes Defined

Attitudes and attitude change have been discussed at least since the beginning of this century (Thomas & Znaniecki, 1918). The study of attitudes has been an important area of interest to psychologists, who often were also interested in related concepts such as propaganda. Educators have been interested in attitudes because of their possible impact on learning, and while attitudes have not been convincingly linked to achievement, they have been long considered an important component of the most important outcome of education: learning.

Attitude has been a difficult concept to define adequately, primarily because it has been defined by so many, but also because of the word's differing lay uses and connotations. One of the earliest definitions of attitude was proposed by Thomas and Znaniecki (1918). They defined attitude as:

A mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related.

More recently, Zimbardo and Leippe (1991) defined attitude as:

An evaluative disposition toward some object based upon cognitions, affective reactions, behavioral intentions, and past behaviors . . . that can influence cognitions, affective responses, and future intentions and behaviors.

Attitudes are latent and not directly observable in themselves, but they act to organize or provide direction to actions and behaviors that are observable. Many refer to attitudes as "predispositions to respond" (Zimbardo & Leippe, 1991). Attitudes are related to how people perceive the situations in which they find themselves. Also, attitudes vary in direction (either positive or negative), in degree (the amount of positiveness or negativeness), and in intensity (the amount of commitment with which a position is held; Smith, 1982).

34.2.2 Attitude Systems

Attitude positions are the summary aggregation of four components: (a) *affective responses,* (b) *cognitions,* (c) *behaviors,* and (d) *behavioral intentions* (Zimbardo & Leippe, 1991). The *affective* component of attitude is said to consist of a person's evaluation of, liking of, or emotional response to some situation, object, or person. Affective responses reflect one's attitude with sensations of pleasure, sadness, or other levels of physical arousal. For example, for the attitude construct of *computer anxiety,* a topic of current interest, the affective component would be a person's liking of the computer and his feeling of excitement, or dread, when she or he used one.

The *cognitive* component of an attitude is conceptualized as a person's factual knowledge of the situation, object, or person, including oneself. In other words, the cognitive component refers to how much a person knows about a topic, such as computers. The cognitive component of computer anxiety would be based on how much a person knows about computers and her level of understanding of computer operation.

The *behavioral* component of an attitude involves the person's overt behavior directed toward a situation, object, or person. For example, the behavioral component of computer anxiety would be related to how often a person had used a computer, and what kind of experience he had. Persons who routinely use computers, especially if they choose to use them freely, would be more likely to have positive attitudes toward computers, and be less anxious, than would others who have fewer experiences with computers.

Finally, the *behavioral intention* component involves the person's plans to perform in a certain way, even if sometimes these plans are never acted upon. An example, once again, is the construct of computer anxiety. Computer anxiety is defined by Maurer and Simonson (1993, 1994, p. 206) as "the fear or apprehension felt by an individual when considering the implications of utilizing computer technology, or when actually using computer technology." The behavioral intention component of this attitude construct would be the "apprehension felt by an individual when considering the implications of utilizing computer technology." In other words, if people knew that they were going to have to use computers in an upcoming class, this would partially shape their level of computer anxiety. If the class were to be a difficult one, say in statistics, then computer anxiety would be likely to be increased.

These four components of attitude form an attitude system. The components are not isolated but are interrelated and produce an organizing framework or mental representation of the attitude construct. Cognitive schemata provide structure to interrelated attitudes and guide the information processes of attending, interpreting, and reconstructing (Smith, 1982). Behavioral research supports the idea that actions lead to the formation of cognitive schemata, which lead to the creation of attitudes. It would seem that the opposite is also true. Attitudes help form cognitive relationships, which in turn predispose behaviors.

34.2.3 Attitude Formation

Situational stimuli or events in the environment directly influence behavior and the formation of attitudes. Strict behaviorists would argue that internal events that form attitudes are the result of observable actions. A change in attitude or beliefs occurs as a result of actions that have been influenced by reinforcers. Social-learning theory expands this principle. According to social-learning theorists, it is not essential to learn behaviors directly through action and reinforcement, as traditional behavioral psychologists would propose. Indirect learning through observing a model and receiving verbal instruction has a powerful impact on behavior and attitude formation (Zimbardo & Leippe, 1991).

Situations that include a change in the behavioral component of attitude lead to changes in attitudes. But there is also a reciprocal action. Since the components of attitude systems are interrelated, a change in liking (affect) may result in a change in behaviors (Smith, 1982). For example, the currently popular concept of the cognitive apprenticeship is based on the idea of learners participating as apprentices in real-world activities with those who are more knowledgeable than they. If designed correctly, these situations are perceived by learners as important and realistic, and learners come to value them. The overt activities of cognitive apprenticeships produce in students favorable dispositions (i.e., affects), which in turn promote a sense of value and often a desire to learn more.

34.2.4 An Example

Some professions use computers more than others. For example, stockbrokers use computers routinely, and their use of computers, especially computer networks, is directly related to positive consequences, such as increased profits. Students who work as apprentices with stockbrokers will most likely see the importance of computers and gain an appreciation of them (an affective reaction). They also learn a great deal about using computers (a cognitive reaction) as they navigate through various options included in the stockbroker's network of computer databases and on-line sources of information (a behavioral reaction), and certainly this real-world use of the computer is perceived as important. Finally, future uses (behavioral intentions) are important because the apprentice stockbroker learns quickly from the mentor that financial success may be directly related to continued use of computers and computer systems. In this case, cognitive apprenticeships are effective attitude change strategies because they often place learners in situations where an entire attitude system is influenced.

Maurer (1983) has reported that computer anxiety is lower for those who see an observable benefit to computer use, such as stockbrokers who can use computer skills to increase productivity. Stockbrokers usually have relatively low levels of computer anxiety because their computer attitude systems are continuously and positively modified during their work.

Maurer (1983) also reported, as have others, that all groups, even computer-intensive professionals such as stockbrokers, have individuals that are more or less computer anxious than their peers. These computer-using professionals just tend to be less anxious than some other groups of people. A characteristic of attitudes is that they are variable, not discrete. Attitudes are analog, not digital. Attitudes vary among individuals.

34.2.5 Importance of Attitudes

Traditionally when instruction is designed, there are two categories of outcomes in mind: those directed toward cognitive goals, and those related to the attitudes of the learner. There is little necessity to argue the importance of the acquisition of knowledge by a student as a result of instruction. Achievement is the paramount objective of most instructional activities. However, it may also be important to recognize the need for establishing attitudinal goals and for planning activities designed to facilitate affective outcomes in learners as a consequence of an instructional situation. As a matter of fact, it has become increasingly apparent to those involved in educational technology research that one of the major, and possibly unique, consequences of instructional situations involving media is the likelihood of the development of positive attitudinal positions in students (Simonson, 1985).

The most powerful rationale for the need to promote attitude positions in learners would be to demonstrate a direct relationship between attitudes and achievement, or liking and learning. Numerous researchers have identified such a relationship (Fenneman, 1973; Greenwald, 1965, 1966; Lamb, 1987; Levy, 1973; Perry & Kopperman, 1973; Simonson, 1977; Simonson, 1978; Simonson & Bullard, 1978). However, most educational and psychological researchers are reluctant to claim that there is any cause-and-effect linkage between these two learner variables (Zimbardo & Leippe, 1991). There are too many intervening forces likely to influence the relationship between how a person feels and how he or she behaves. Attitudes are thought to "predispose" persons to act. Positive attitudes toward a topic are felt to orient the person in a positive manner toward that idea, but not to predict actions directly.

The impact of attitude on learning is only one reason for interest in attitudes. There are other arguments that explain why attitudes of learners are important. First, most educators would agree that there are times when it is legitimate, and important, for learners to accept the truth of certain ideas—in other words, to accept an attitudinal position. The importance of voting is an attitude position that most would agree is important. Civics teachers routinely "teach" this attitude.

Second, while the strength of the relationship between attitudes and achievement is unclear, it seems logical that students are more likely to remember information, seek new ideas, and continue studying when they react favorably to an instructional situation or like a certain content area. Students who like chemistry will tend to stay after class to

work on experiments, read about chemistry outside of class, and be more likely to elect to take a chemistry course than will those who do not like chemistry. Learners tend to do what they like, not what they do not like. They gravitate toward their interests.

Third, there are some instances when influencing student's attitudes is not desirable, so educators should be aware of which techniques affect attitudes. In this way, possible bias can be recognized and eliminated. The gender biases found in textbooks are considered partially responsible for gender biases in people. For example, the use of the generic *he* was long considered appropriate by textbook authors and publishers. Now it is obvious that the use of this term helped form an inappropriate attitude position in both boys and girls that males were more important.

Last, student attitudes toward a situation can tell the teacher a great deal about the impact of that situation on the learning process. Obviously, attitudes need to be measured in order to know if they have been influenced. As a result of quantitatively and qualitatively assessing the opinions of students toward the learning activities in which they are participating, it may be possible to improve the quality of procedures. One of the most important techniques of evaluation is to ascertain attitudes toward some event, object, or person. End-of-course evaluations of attitude toward courses and course content are a standard activity in schools and training centers.

In summary, attitudes, as shall be discussed later, are complex phenomena. They have been studied for decades by social scientists and educators and are beginning to be understood as organizers related to learning processes and outcomes. Attitudes are learned "predispositions to respond" held by individuals that make them likely to act in certain ways. Attitudes are not observable, but they do serve to help produce observable actions in people.

Social psychologists, and others, have proposed a number of theories of attitude change. Many of the theories are related, so there has been considerable effort to categorize them. Because of the comprehensiveness of the attitude change literature, it is considered important to review the theories of attitude change as a foundation for proposing guidelines for persuasion.

34.3 THEORIES OF ATTITUDE CHANGE

Several attitude change categorization schemes have been proposed in the literature (Eagly & Chaiken, 1993; O'Keefe, 1990), and most are similar. For this discussion, attitude theories have been organized into four categories (see 11.6):

- Consistency theories
- Learning theories
- Social judgment theories
- Functional theories

The study of attitudes has been approached with varying emphases and methods during most of this century. Prior to

World War II, the emphasis was on definition issues and attitude measurement. Most studies were of a survey nature and provided important correlational findings, but little insight into causality. Experimental techniques such as control groups or comparison groups were notably absent (Himmelfarb & Eagly, 1974).

This changed dramatically during World War II. Attitude change was an important topic of Army-sponsored research (see 1.10). Because of the influence of experimental psychologists such as Carl Hovland, true experimental techniques were used to study the persuasive effects of propaganda. The work of Hovland and his associates in the area of attitude change research was continued after the war at Yale University. Theories developed by this group served as an organizational framework for the study of attitude change (Hovland, Janis & Kelley, 1953; Himmelfarb & Eagly, 1974; Insko, 1967; O'Keefe, 1990). Most of Hovland's attitude change research can be considered classical. Most of this research and theory building approached the concept of attitude from the behaviorist perspective, and most research activities dealt with trying to relate attitudes to observable outcomes in learners.

An example of research of the classical type that demonstrated a consistency theory approach was Simonson's (1977) study of dissonance theory principles. In this study, cognitive dissonance theory (Festinger, 1957) assumptions, one of the most influential consistency theories, were used in a formal program of attitude change in order to improve student attitude toward an instructional activity. Student achievement in this instructional activity was then measured to determine if achievement was influenced by a change in student attitude toward instruction.

Randomly assigned to one of three treatment groups were 218 students. Students in the experimental treatments were asked to make a videotape about their attitudes toward an instructional activity. An "Instructional Improvement Needs Assessment" was the title given to the fictitious activity that in reality was the research study. First, students were given a camouflaged attitude pretest. Then, students were met individually by a researcher who told them that:

> I am a member of a committee in the college called the Instructional Improvement Needs Assessment Committee. We are attempting to obtain as much information as possible about student's opinions of college courses. This is difficult, so we are asking for several different types of information.

Then, depending on the random treatment group assignment, the students were told:

1. Control group: "I would like you to complete this Needs Assessment opinionnaire. You can fill it out in the next room. Answer on the score sheet and when you finish place the opinionnaire and answer sheet in the box."

2. Nonrelevant treatment group: "The entire committee would like to study your opinions, so I will give you several minutes to think of everything positive you can about (a course irrelevant to the study and to the attitude tests). Then I will take you to the next room where we will ask you to state your positive comments while you are being videotaped. We need to videotape you so that the entire committee can get together and observe all the videotapes. I'll give you 5 minutes to collect your thoughts.

3. Relevant experimental group: The experimenter read the same comments to students assigned to this group, with one exception; they were given the name of the course that the study was attempting to change attitudes about.

Students in the "irrelevant" and "relevant" groups were given time to jot down ideas and then were escorted into the video-recording room where their comments were recorded. When they were finished, they were told that "faculty and students will be viewing this tape." Next, they signed a release and were given a questionnaire that contained the attitude test embedded among other items.

Subjects in the "relevant experimental treatment" who initially had low attitudes toward the course in question were expected to experience dissonance when they stated positive comments about this course. The dissonance-producing experience was heightened by leading the students to believe that a group of peers and faculty would view the videotapes. The videotaping session and the signing of the release were included to make the treatment procedures as forceful and irreversible as possible. The two other treatments were included to control for the impact of videotaping and for change due to extraneous events.

Results of this classical dissonance theory study demonstrated that attitude changes could be produced. Students in the relevant videotaping group changed their attitudes toward the course they were asked to talk about more than one standard deviation ($p < .0001$). Simonson (1977) also tested the persistence of the attitude changes and reported that while there was a regression to the mean, student's attitudes remained positive 6 weeks later. There was only a minor and statistically insignificant relationship between attitude change and achievement.

This study showed in an experimental situation with real-world implications, that it was possible, even simple, to modify student attitudes toward an instructional event, in this case a college course. Simonson used video recording as a technique to "cement" and make irreversible a student's attitude positions. No one would argue that the video recording itself changed attitudes. The forces that changed attitudes were the arguments created by the student that were recorded on the video. In this situation, the video recording was a methodological tool of the researcher. This chapter will tend to show that in media and attitude research the role of media is as a tool. Media do not influence attitudes; messages and methods do.

Simonson's (1977) study is an example of the type of attitude change research often reported in the literature between the 1950s and today. Certainly, human subject reg-

ulations would force modification in Simonson's approach if it were replicated today. However, the behavioral and experimental approach taken is typical of the research used to identify and support the consistency theories of attitude change summarized next. Early attitude change literature is firmly anchored in traditional experimental psychology and draws heavily on behaviorism (see 2.2; Eagly & Chaiken, 1993).

34.3.1 Consistency Theories

The basic assumption of these theories is the need of the individual for consistency. There must be consistency between attitudes, between behaviors, and among attitudes and behaviors. A lack of consistency causes discomfort so that an individual attempts to ease the tension by adjusting attitudes or behaviors in order to once again achieve balance or consistency. One of the earliest consistency theories was balance theory (Himmelfarb & Eagly, 1974; Kiesler, Collins & Miller, 1969; O'Keefe, 1990).

Relationships among the perceiver, another person, and an object are the main focus of balance theory (Heider, 1958). Relationships are either positive or negative, based on the cognitive perceptions of the perceiver. In this theory, there are eight possible configurations; four balanced and four unbalanced. Unbalanced states are recognized as being unstable. Under these conditions, perceivers attempt to restore balance by changing their attitudes toward objects or other persons.

Two extensions of Heider's balance theory include the work of Newcomb (1961) and that of Abelson (Abelson & Rosenberg, 1958). Newcomb studied interpersonal situations as well as cognitive balancing and transferred these ideas to research on the pressures for uniformity in groups. Abelson proposed four additional modes of restoring balance: (a) denial, (b) bolstering, (c) differentiation, and (d) transcendence (Himmelfarb & Eagly, 1974; Kiesler, Collins & Miller, 1969; Insko, 1967; O'Keefe, 1990). Establishing balance was critical to individuals. Attitude changes occurred when the individual attempted to reestablish balance by modifying their attitudes.

Affective-cognitive consistency theory examines the relationship between attitudes and beliefs (Rosenberg, 1956). An unstable state occurs when an individual's attitudes toward an object and knowledge about an object are inconsistent. Persuasive communications (see 4.4) attempt to change the affective component of an attitude system by changing the cognitive component of attitude. In other words, providing an individual with new information that changes the cognitive component of attitude will tend to cause that individual to change overall attitudes toward an object.

An alternative to Rosenberg's theory is Festinger's theory of cognitive dissonance (Festinger, 1957). While Rosenberg's theory deals with affect and cognition, Festinger's theory examines consistency among cognitive elements or beliefs about oneself, behavior, or environment. Dissonance occurs when elements are logically inconsistent or psychologically inconsistent because of cultural mores, specific opinions deviating from more encompassing opinions, or information or experiences that are contrary to previous information or experiences. Dissonance motivates the individual to reduce the dissonance and return to consonance. When faced with dissonance, the individual seeks to avoid situations or information that may increase dissonance.

To test dissonance theory, Festinger and Carlsmith (1959) reported on an experiment that is considered one of the most controversial ever conducted in the area of attitude change. It was also one of the most influential. This study lead to numerous modified replications, including Simonson's (1977) study reported here earlier.

Male undergraduates spent an hour performing two tasks that had been designed to be very boring: putting spools onto a tray and turning pegs on a board. Afterwards, the experimenter told them that the study concerned the effect that a prior expectation had on task performance and explained that participants in another experiment were being given a favorable expectation about the task. According to the researcher, this expectation was usually conveyed by an assistant who told a waiting subject of the study that the experience had been enjoyable and intriguing. The experimenter then claimed (a white lie, one of several told by researchers) that the assistant who was supposed to perform the chore had not shown up. The researcher then asked the student who had just finished the boring task to fill in for the absent assistant by conveying this story to the study's next participant. The researcher promised the student money for this service and for being on call in the future if help were needed again. The college male was told that the decision to help was up to him.

Festinger and Carlsmith (1959) introduced the critical dissonance theory incentive at the point when money was mentioned. Half the study's subjects were offered $1, and half were offered $20, for engaging in the counterattitudinal behavior. Because the inducement to comply with the researcher's request was much greater with the larger amount of money, the counterattitudinal behavior should have been considered by the students as justified, and little dissonance and attitude change produced. The $1 payment was designed to provide just enough pressure to induce compliance but insufficient reason for subjects to believe their actions were warranted by money alone. This was predicted to produce maximum dissonance and maximum attitude change.

In both the $1 and the $20 conditions, the students engaged in a brief role playing by praising the experiment to a confederate of the researcher who pretended to be waiting to participate in the study. This person appeared to be convinced by the student's story. Next, the students were referred to an interviewer who was supposedly conducting a survey unrelated to the experiment. This interviewer asked, among other things, how interesting and enjoyable the experimental tasks involving the spools and pegs had

been. The results showed that the subjects who had been offered $1 for praising the experiment evaluated the tasks significantly more favorably than did the subjects who had been offered $20. The attitudes of students who received $20 did not differ from the control subjects, who participated in the dull tasks, but not the part of the experiment that involved making insincere statements to the confederate.

The results of the experiment confirmed Festinger's prediction that increased justification for role playing (i.e., more money) would reduce attitude change. In other words, the students who received $1 for their actions experienced dissonance. Their actions advocating the enjoyability of the peg and spool activity, and the reality of the boring activity, were dissonant from one another. In order to reduce the dissonance, it was easier to change their attitudes toward the activity to be more positive than it was to change their praising of the activity. Thus, attitude change occurred to reduce the student's level of dissonance. The $20 subjects did not experience dissonance. They were able to say in their minds: "I did it for the money; it really was boring." This study was the first of many that demonstrated clearly the need for consistency between attitude positions and behaviors. Consistency theories, notably cognitive dissonance theory, provide relatively straightforward, if incomplete, information about attitude change.

Studies on counter-attitudinal advocacy are based on dissonance theory. Individuals who are asked to write an essay or present a speech promoting a position contrary to their beliefs become committed to certain aspects of the contrary position. This causes dissonance, which the individuals attempt to reduce by changing their original position or attitude. The stronger the magnitude of the dissonance, the stronger the need to change the original attitude.

The simple act of decision making creates dissonance, too. The magnitude of the dissonance is related to the importance of the decision and the attractiveness of both the chosen and the unchosen alternatives (O'Keefe, 1990). For example, hypermedia-based instructional systems (see 21.1, 23.3.), with their many learner choices, provide a great deal of decision making that may influence learner's attitudes in either a positive or negative direction, depending on the success and attractiveness of the decisions.

One of the major criticisms of consistency theories is that there are too many of them. Since they all work from the similar theme of an individual's trying to maintain consistency, it has been suggested that the area would be stronger if the various subtheories were consolidated. Today, interest in dissonance theory specifically, and consistency theories generally, has waned considerably in social psychology (Eagly & Chaiken, 1993). This loss of interest is, in part, due to the growth of understanding about the conditions and processes responsible for the phenomena dissonance theorists investigated. Researchers have a better understanding of the interactions between attitudes and opinions and actions and behaviors, so consistency theories that are not directly related to processes are of little interest

to today's cognitive scientists who tend to be more process oriented than behaviorists who studied consistency theories.

34.3.2 Early Learning Theories

This section might more accurately be called *behavioral theories of attitude change*. These theories were also developed during the 1950s and 1960s. During this time, learning theories reflected behavioral psychology (see 2.2). A major commonality of these theories was their emphasis on the stimulus characteristics of the communication situation.

Staat's (Insko, 1967) work reflected the ideas of classical conditioning, and focused almost entirely on the formation of attitudes. Events in the environment create an emotional response in an individual. As new stimuli are consistently paired with old stimuli (events), the new stimuli develop the power to create an emotional response in the individual (O'Keefe, 1990).

Learning theories of attitude change received major emphasis by Hovland and his associates in the Yale Communication Research Program (Hovland, Janis & Kelley, 1953). They proposed that opinions tended to persist unless the individual underwent some new learning experience. Persuasive communications that both present a question and suggest an answer serve as learning experiences. Acceptance of the suggested answer is dependent on the opportunity for mental rehearsal or practice of the attitude response, and on the number of incentives included in the communication. Hovland and his colleagues assumed that as people processed persuasive message content, they rehearsed the message's recommended attitudinal response, as well as their initial attitude. For attitude change to occur, more than rehearsal and practice had to take place. The Yale researchers emphasized the role of incentives and the drive-reducing aspects of persuasive messages as mechanisms for reinforcement, thereby creating acceptance of new beliefs and attitudes.

In the Yale model of attitude change emphasis is placed on attention, comprehension, and acceptance. An individual must attend to and comprehend the communication before acceptance can occur. It is during the attending and comprehending phases that the individual has the opportunity to practice the recommended new opinion. Practice alone does not lead to acceptance, but when combined with incentives and recommendations imbedded in the communication, attitude change is likely. Incentives are broadly defined by Hovland et al. (1953). They could be direct financial or physical benefits (e.g., money, improved health), or they could take on more abstract forms such as the knowledge gain from persuasive arguments, social acceptance by others who are respected, or self-approval from the feeling that one is correct.

Hovland and his associates identified three classes of variables that influenced the effectiveness of the message: (a) source characteristics, (b) setting characteristics, and (c) communication content elements. Research using the

Yale model focuses on variables in one or more of these three classes. Examples include research in communicator credibility (trustworthiness and degree of expertness), fear-arousing appeals, and the placement of persuasive arguments within the communication (Himmelfarb & Eagly, 1974; Kiesler et al., 1969; Insko, 1967).

A Skinnerian approach (see 2.5) to the study of attitude change was employed by Bem (1967), whose major assumptions reflected the viewpoint that attitudes were learned as a result of previous experience with the environment. Bem proposed that since the person trying to change attitudes usually lacked direct knowledge of the internal stimuli available to the learner, it was necessary to rely on external cues in order to reward and punish the individual. It was the combination of external cues and observable behaviors that produced changes in attitude (Himmelfarb & Eagly, 1974; Kiesler et al., 1969; Insko, 1967).

Today, few attitude change theorists feel that the early research by Hovland and others has direct impact on current procedures (Eagly & Chaiken, 1993). Newer research and theory building is directed toward approaches that emphasize multiple modes of processing information. However, these early researchers investigated basic issues, such as reinforcement, incentives, and drive-reduction constructs, that are related to how motivational states influence information processing and persuasion. Early-learning theorists' efforts provided a foundation for more modern process models of attitude change.

34.3.3 Social Judgment Theory

Social judgment theory focuses on how people's prior attitudes distort their perceptions of the positions advocated in persuasive messages, and how such perceptions mediate persuasion. In general terms, the theory assumes that a person's own attitudes serve as a judgmental standard and anchor that influences where along a continuum a persuader's advocated position is perceived to lie (Sherif & Hovland, 1961). Social judgment theory is an attempt to apply the principles of judgment to the study of attitude change.

According to Sherif, Sherif, and Nebergall (1965), an individual's initial attitude serves as an anchor for the judgment of related attitude communications. Opinions are evaluated against this point of reference and are placed on an attitudinal continuum. Opinions that most characterized the individual's own opinion are in the latitude of acceptance. Those opinions found most objectionable are placed in the latitude of rejection. The latitude of noncommitment consists of those opinions that are neither accepted nor rejected.

Communication that falls within the latitude of acceptance is assimilated, and if judged to be fair and unbiased will result in a change in attitude. Within the limits of the latitude of acceptance, the greater the difference between the initial opinion and the communicated opinion, the greater the attitude change. Though some change is possible when opinions fall within the latitude of rejection, the greater the

discrepancy the less the change in attitude (Himmelfarb & Eagly, 1974; Kiesler et al., 1969; Insko, 1967).

Social judgment theory's core propositions can be summarized as follows (Eagly & Chaiken, 1993):

1. A person's current attitude serves as a judgmental anchor for new attitude positions.
2. Latitude widths determine whether a message's position will be assimilated or contrasted (e.g., accepted or rejected). Positions falling within the latitude of acceptance will be assimilated toward a person's current attitude. Positions falling within the latitude of rejection will be contrasted away from the person's own attitude.
3. Ego involvement of a person broadens the latitude of rejection and narrows the latitude of noncommitment.
4. Both assimilation and contrast effects increase as a positive function of a message's position and the recipient's attitude.
5. Ego involvement increases the anchoring property of initial attitudes.
6. Greater assimilation produces more positive evaluation of message content, which produces greater amounts of attitude change. Conversely, greater contrast produces more negative evaluations of message content, which produces lesser amounts of attitude change.
7. Ambiguity enhances the likelihood of judgmental distortions. Therefore, other effects are greater when recipients are exposed to persuasive messages whose content positions are ambiguous.

In summary, social judgment theory predictions for attitude change are largely borne out by the research literature and by practice. Recently however, researchers have questioned the basic principles of social judgment theory and how the theory's principles relate to one another. Social judgment theory is important because it demonstrates the importance of people's prior attitudes. Most other approaches only deal marginally with previous attitudes. Newer theories incorporate social judgment principles as covariates and control variables in experimental designs (Wood, 1982).

34.3.4 Functional Theories

A fundamental question about attitudes concerns their purpose: That is, what functions do attitudes serve? Understanding the purposes of attitudes is the identifying characteristic of functional theories. Attitudes serve different functions for different individuals or for the same individual in different settings. The reasons for attitude changes are individualized and related to personal functions of attitudes.

Functional theories of attitude entered the literature in the 1950s when researchers developed the idea that attitudes served varying psychological needs and thus had variable motivational bases. A common and central theme

of these early efforts was the listing of the specific personality functions that attitudes served for individuals. Unlike other theoretical approaches developed during this golden decade of attitude research, functional theories are still relevant and important today (Eagly & Chaiken, 1993).

Functional theories hold that successful persuasion entails implementing change procedures that match the functional basis of the attitude one is trying to change. Katz (1960) proposed that any attitude held by an individual served one or more of the four distinct personality functions. The more of these functions that contributed to an attitude system, the stronger and less likely it was that the attitude could be changed.

Katz (1960) identified four personality functions of attitudes as follows: (a) utilitarian function, (b) knowledge function, (c) ego-defensive function, and (d) value-expressive function. In order for attitude change to occur, there must be a discrepancy between the need being met by the attitude and the attitude itself. Attitude change is accomplished by recognizing the function of the attitude for the individual, and designing strategies to produce a disparity between the attitude and one or more of the attitude functions.

The *utilitarian function* acknowledges the behaviorist principle that people are motivated to gain rewards and avoid punishments from their environment. Utilitarian attitudes are instrumental in securing positive outcomes or preventing negative ones. For example, parents' opposition to busing might be based on the utilitarian belief that it would be harmful to their child. Often, utilitarian beliefs are associations to stimuli. For example, children often acquire a positive feeling about the month of December because they associate it with holidays, presents, and vacations (Eagly & Chaiken, 1993).

The *knowledge function* of attitudes presumes a basic human need to gain a meaningful, stable, and organized view of the world. Attitudes supply a standard for organizing and simplifying perceptions of a complex and ambiguous environment. Attitudes provide a way of sizing up objects and events so they can be reacted to in a meaningful way. If people's attitudes toward school are positive, then when they are asked about schools they will be likely to say positive things without needing to "think about it too much."

Katz's *ego-defensive function* emphasizes the psychoanalytic principle that people use defense mechanisms such as denial, repression, and projection to protect their self-concepts against internal and external threats. People protect their feelings by developing convenient, if sometimes biased, attitudes that do not require active involvement in threatening or unfamiliar situations. For example, a high school student may think: "Chemistry is for nerds, and I do not want to be a nerd; that is why I do not like chemistry." Or a student might think: "Only really smart people study chemistry, and I study chemistry, so I must be really smart; that is why I like chemistry."

Finally, Katz's *value-expressive function* acknowledges the importance of self-expression and self-actualization.

Attitudes are a means for expressing personal values and other aspects of self-concept. A person who draws self-esteem from being a liberal and an environmentalist is motivated to hold attitudes that reflect these ideologies (Eagly & Chaiken, 1993).

The central theme of functional theories is that changing an attitude requires understanding its motivational basis, or its function for the individual. Knowing what function an attitude performs for a person helps guide the designer of the persuasive message who wants to change the attitude. Whatever function attitudes perform they provide a frame of reference for comprehending and categorizing objects, persons, and events, and only by understanding an attitude's function can attitude change efforts be successful.

An alternative and related theory looks at social relationships that occur in social influence situations (see 6.2). Kelman (1958) looked at three processes of opinion change: (a) compliance, (b) identification, and (c) internalization. Compliance results in only a surface level change. Attitudes are changed only to receive a favorable reaction from another person or group. This attitude is only expressed when the other person is present.

The attitude change resulting from identification occurs both publicly and privately but does not become part of the person's value system. The change is dependent on the relationship with the source but not with the source's presence. Attitudes that are internalized become part of an individual's value system.

McGuire's (1964) inoculation theory is concerned with resistance to change (see 37.4). Research in this area investigates the treatments individuals could receive which would allow them to resist successfully attacks on their belief systems. An analogy is drawn from the biological process of inoculation. Once people are inoculated, they are immune when exposed to the disease. Attitudes are often established in a relatively "germ-free" environment, free from attack. Thus, the individual has little chance to develop resistance to future attacks. McGuire's research strategy was to expose the individual to mild attacks in a control setting in order to motivate the individual to defend his or her beliefs (Himmelfarb & Eagly, 1974; Kiesler et al., 1969; Insko, 1967).

Functional theories are in the mainstream of attitude research. Their theoretical approaches remain conceptually intriguing to investigators because of their breadth and unique focus on the functional bases for attitudes. Functional theories provide a link between the behavioral theories proposed during the 1950s (consistency theories, early-learning theories, social judgment theories) and the processing and cognitive themes of more recent theorizing.

Attitude and persuasion research is a major area of interest to those in social psychology. Theory building has been characteristic of this research. Only a fraction of this literature has been reviewed in this section of this chapter; however, the information presented provides a basis for information presented later. These theories, especially the

functional theories discussed last, provide guidance to the development of recommendations for the design of persuasive messages delivered by media.

34.4 ATTITUDES AND BEHAVIOR

In 1969, Wicker reported on a review of 42 experimental studies that assessed attitudes and then included an observation of related behaviors. Wicker found few studies where the correlation between attitudes and behavior were as high as .30 ($r = .30$). The average correlation was about .15 ($r = .15$). Wicker concluded that "taken as a whole, these studies suggest that it is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviors than that attitudes will be closely related to actions" (p. 65).

The impact of Wicker's review was immediate. By the early 1970s most social psychologists had readily accepted the negative verdict about the attitude-behavior link. Most felt that attitudes had little importance and direct relation to actions. Also during this time frame, many studies were conducted and reported that examined the impact of behaviors on attitudes, rather than the other way around. Festinger's (1957) dissonance theory was very popular, and its emphasis on the influence of behaviors on attitudes seemed to make it difficult for researchers to believe that the opposite link could be strong or even stronger.

Simonson's (1977) study discussed earlier showed that attitudes could be changed predictably by following dissonance theory guidelines, but that the impact of attitudes on achievement was not easily identified. Simonson's results demonstrated a one standard deviation improvement in attitude scores, but no significant improvement in related achievement scores. This study was one of many reported during this period which supported the position taken by many that attitude and behavior had little relationship to each other. Most research of the 1970s dealing with attitudes did not attempt to demonstrate a direct link between attitudes and behavior (Eagly & Chaiken, 1993).

Since then, however, there has been a serious reexamination of the attitude-behavior link, and a resurgence of interest in this area has occurred. As a matter of fact, the generalization that attitudes do not predict behavior is now considered inaccurate (Eagly & Chaiken, 1993). Parenthetically, as one reads the debate about attitudes and behaviors that raged in the social psychology literature during the 1970s and 1980s, it is interesting to compare it to the ongoing debate in instructional technology between those who say "media will never influence achievement" (Clark, 1983, 1994) and those who take a more moderate approach to the relationship between mediated instruction and achievement. The similarities are interesting. In the attitude-behavior debate, subsequent research has shown that neither extreme position was correct, and the following section of this chapter will present what currently is known about the attitude-behavior link.

This section will include a brief explanation of the approaches taken recently by attitude researchers and will concentrate on theories of social psychology. The section will conclude with a discussion of attitudes and instructional behaviors.

First, while Wicker's (1969) premise about the weak link between attitudes and behavior gained widespread acceptance, many took issue with his study's methods. Wicker reviewed only a narrow sample of studies that were heavily weighted toward laboratory research. Many outstanding studies were not examined by Wicker, and several writers who reviewed survey research reported that this literature showed a moderately strong relationship between attitudes and behaviors (Kelman, 1974; Schuman & Johnson, 1976). This critique of Wicker led to a series of new proposals about, and new examinations of, the relationship between attitudes and behavior.

First, researchers began to examine attitudes as being related to an aggregate of behaviors. It was found that relatively high attitude-behavior correlations were obtained by comparing a general attitude (e.g., attitude toward chemistry or attitude toward homework) to a measure with an aggregate of attitude-relevant behaviors (e.g., taking chemistry courses, talking about chemistry in the study hall with friends, using chemistry examples in other classes).

Fishbein and Ajzen (1975) reported that attitudes typically predicted multiple-act criteria better than single-act criteria. They generalized that attitudes and behaviors must be compatible to ensure a strong relationship. In other words, general attitudes are good predictors of general behaviors (e.g., attitudes toward affirmative action are predictors of actions related to affirmative action), and specific attitudes, especially attitudes toward behaviors, are good predictors of specific actions (attitudes toward studying chemistry predict nicely the act of studying). Unfortunately, many researchers had examined, and still are examining, quite general attitudes (e.g., attitudes toward chemistry), and quite specific behaviors (e.g., achievement on a chemistry test).

Fishbein and Ajzen maintained that a consistent terminology was needed. In other words, specific attitude constructs should be identified if specific actions are to be correlated to them. An attitude toward studying chemistry every evening could be measured by an attitude test, and subsequent studying of chemistry could be determined by asking students' parents to keep a journal of their child's study habits. Fishbein and Ajzen predicted that the correlation between this kind of specific attitude and specific behavior would be quite high.

Fishbein's efforts in this area produced a model that he and Ajzen called the *theory of reasoned action*. It is now considered an excellent model of the psychological processes that explain observed links between attitudes and behaviors. The theory of reasoned action suggests that the cause of behavior is a person's intention to engage in the behavior. Attitudes influence behavior by their influence on

intentions, which are decisions to act in a particular way. The issue of how an attitude was transformed into action was resolved by adding another psychological event, the formation of an intention. Intention was explained to be the person's motivation to exert effort to carry out a behavior.

This theory was popular since it had an inherent reasonableness about it. People were assumed to behave as they intended to behave. They were theorized to act in ways that allowed them to obtain favorable outcomes and to meet the expectations of others. The theory of reasoned action can be summarized as follows:

a. Behavior is determined by the intention to engage in the behavior.
b. Intention is determined by attitude toward the behavior and the subjective norm to which the attitude is related.
c. Attitude is determined by behavioral beliefs and evaluation of the likely outcomes of a behavior.
d. Subjective norms are determined by the normative beliefs of the person and the motivation to comply with the relevant actions.

Many believe that this theory provides a complete theory of voluntary behavior. Critics have indicated that they do not consider the theory of reasoned action to be a general theory of behavior. Rather, it is considered by them to be a theory of the immediate causes of voluntary action.

In part because of criticisms, Ajzen proposed an alternative *theory of planned behavior* that attempted to enlarge the Fishbein-Ajzen model (Ajzen, 1991). Ajzen stated that for nonhabitual behaviors that are easily executed by almost everyone without special circumstances, the theory of reasoned action was adequate. When behaviors are more difficult to execute, and when a person needs to take control over needed resources in order to act, the theory of planned behavior is a better predictor of behavior than the theory of reasoned action. In the theory of planned behavior, control is taken into account as a variable labeled "perceived behavioral control," which is defined as a person's perception of how easy or difficult it would be to perform the action.

Perceived control affects behavior in two ways: First, it influences the intention to perform the behavior. Second, it may have a direct impact on the behavior itself. Ajzen proposed that people tend to engage in behaviors to the extent that they believe that they have control over the behaviors, in other words, to the extent that they have confidence in their ability to perform the behavior.

In a series of studies that examined the prediction of behavior, it was found that when perceived behavioral control was taken into account, along with attitude toward a behavior, the average R for predicting intentions was .71 (Ajzen, 1991). Research suggests that the addition of perceived control to the model of reasoned action results in a more comprehensive model that applies to behaviors that require skills, resources, and other inputs that are not available merely because people decide to act.

From the low point of the late 1960s, when many social scientists believed that attitudes were not closely related to

behaviors, new information has been made available to the point where most now believe there is considerable interaction between attitudes, behaviors, and other variables. High correlations between attitudes and overt behaviors can be produced by aggregating several behaviors to create a measure that corresponds to the attitude measure. The theory of reasoned action and the theory of planned action provide direction to the study of the prediction of behavior, especially where attitudes are concerned.

Eagly and Chaiken (1993) also proposed a composite attitude-behavior model that is especially attractive because of its comprehensiveness (Fig. 34-1). This model demonstrates that behavior is likely to be partially determined by attitudes, but that the relation between attitudes and behavior is best understood by placing attitudes in the context of other factors that also help to determine behavior, such as habits, intentions, and perceived utilitarian outcomes.

Ultimately we must return to the purposes of this chapter: the design of persuasive messages that are delivered by media, and the relationship between media and attitudes. It is apparent from the literature of social psychology that a direct relationship between attitude formation and the production of educational behaviors such as achievement is not straightforward. Rather, the development of attitude positions that are desirable and planned is only one step in the process of promoting educational relevant actions. Attitudes contribute to learning outcomes, but are only one of several important variables. Arguments listed previously in this chapter provide support for the need to understand the use of mediated messages designed to persuade. Later in this chapter, a series of guidelines for producing attitude changes will be proposed.

It would be inappropriate to assume that the development of new attitude positions will directly and predictably influence educational behaviors. Rather, attitudes are one component of a system that predicts behaviors. For those interested in predicting behavior from attitudes, the literature provides guidelines. First, single general attitudes are not likely to predict general actions. At the very least, very specific attitudes and very specific behaviors should be identified for correlation. Second, general attitudes are probably related to a collection, an aggregate, of behaviors. Finally, other variables such as motivation, intention, and personality traits are intervening forces that should be considered in the attitude-behavior formula. Interestingly, even the critics of attitude-behavior research are consistent in their opinion that it is possible, even easy, to modify attitudes predictably, and that attitudes play *some* role in determining actions.

34.5 MEASURING ATTITUDES

When reviewing the literature that deals with attitude change and instructional technology, it is very apparent that attitude measurement is often done very poorly. Simonson (1979a) commented on the sad state of attitude measurement in the educational technology literature, and more recent reviews have not revealed any improvements in testing

methodology (Simonson & Maushak, 1995). The move to more qualitative-based research (see 40.2) and measurement has not changed this situation, and may be contributing to a decline in the quality of attitude testing (see 6.1).

Before beginning this discussion of attitude measurement, it is important once again to establish a frame of reference for this review. Attitude research is largely conducted by those called *empiricists, objectivists,* and *reductionists.* They tend to take the approach of the scientific empiricist who believes that there are laws of nature that the scientist must discover. The vast body of attitude and attitude-change literature is authored by those attempting to "discover the answer" and to determine "truth." These researchers usually apply quantitative approaches in their research designs (see 39.4).

Those advocating naturalistic inquiry (see 40.2) may be uncomfortable with the approach taken by this chapter. A general question often asked by qualitative researchers, "What is going on here?", does not readily translate to results of the kind summarized in this chapter and the type of measurement techniques recommended next. Certainly, it would be unwise to discount qualitative techniques for examining the critical issues of the field. Just as certainly, the vast body of literature about attitudes and attitude measurement were generated by scientists who applied quantitative approaches to measurement.

Problems with attitude measurement are of three types. First, researchers are not clearly defining their attitude variables. In other words, they are not operationalizing the constructs that they are setting out to measure. This prob-

lem is heightened by the failure of many to include attitude hypotheses or research questions in their research designs. Rather, attitude constructs are often included as post-hoc components of research studies. Qualitative researchers also tend to show little interest in attitude constructs.

Second, attitudes are not measured well. Certainly, quantitative measurement of attitudes has evolved into a fairly exact process (Henerson, Morris & Fitz-Gibbon, 1987). However, reports about the methods used to develop measures of attitudes are reported in only a minority of the research studies found in the literature. Simonson (1979a) reported that only 50% of the studies reviewed reported on the validation of attitude measures, and only 20% reported descriptive information about their attitude tests. Most measures then, and today, tended to be locally prepared and used only once—in the specific study reported. Researchers who were otherwise extremely careful to standardize their achievement measures did not do the same for their tests of attitudes.

One alarming trend was the use of single items to measure attitudes. Researchers reported using a single item to determine a person's attitude (e.g., Do you like chemistry?), and then used the responses to this question in powerful statistical analyses. Apparently, reliability and validity concerns were not worrisome to these researchers.

Finally, attitude measurement has tended to be of only peripheral importance to researchers. Often, as stated above, attitudes are relegated to post-hoc examinations, often conducted without controls or design considerations being taken into account. As a matter of fact, it is obvious that attitude
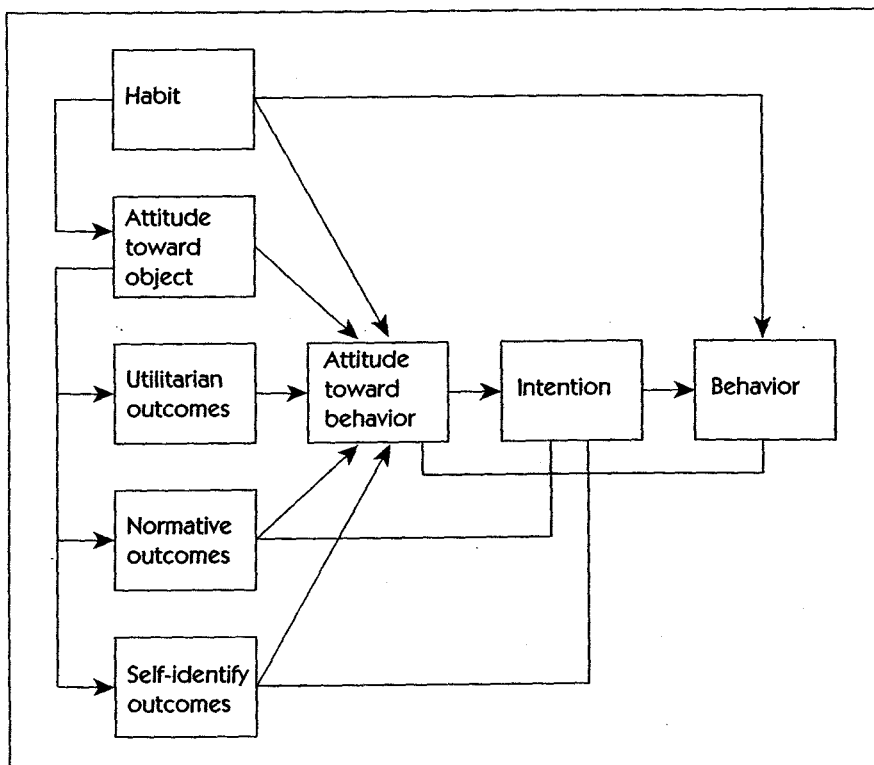

Figure 34-1. A composite model of the attitude-behavior relationship (Eagly & Chaiken, 1993).

study is not an area of interest or importance in mainstream instructional technology research. Of the hundreds of studies published in the literature of educational communications and technology since Simonson's review (1979a) of attitude research, less than 5% examined attitude variables as a major area of interest. This lack of interest was discouraging, especially when contrasted with the wealth of attitude research in the literature of social psychology.

One reason attitudes may be studied so rarely is the difficulty many have in clearly identifying how attitudes should be measured. The characteristics of attitude contribute to this perception of difficulty, as does the recent move away from quantitative research procedures. In a recent review of the indexes of five textbooks dealing with methods of qualitative analysis, the term *attitude* was not found in any, even in the recently published *Handbook of Qualitative Research* (Denzin & Lincoln, 1994).

Since attitudes are defined as latent, and not observable in themselves, the educator must identify some action that would seem to be representative of the attitude in question so that this behavior might be measured as an index of the attitude. This characteristic of attitude measurement is justifiably one of the most criticized of this area of educational evaluation. However, there are several generally recognized procedures used to determine quantitatively an individual's, or group's, attitude toward some object or person. It is those procedures that are described below. Two excellent sources for information on attitude measurement should be reviewed by those interested in quantitatively testing for attitudes. First is Himmelfarb's (Eagly & Chaiken, 1993) comprehensive review of the basic concepts and ideas behind attitude measurement. It also contains an explanation of the various techniques for quantifying attitude positions. Himmelfarb's discussion is a scholarly explanation of attitude measurement.

For those interested in more specific procedures for attitude measurement, Henerson, Morris, and Fitz-Gibbon's (1987) manual is excellent. It would be unfair to call the manual a *cookbook* because it is more than that. It does contain step-by-step, cookbook-like, procedures for validly and reliably developing measures of attitudes. It is a *must* reference for those interested in quantifying attitudes as part of a research study, but who do not wish to become attitude measurement experts. Henerson, Morris, and Fitz-Gibbon even include a section labeled "alternative approaches to collecting attitude information" designed to appeal to the qualitative researcher.

34.5.1 Characteristics of Quantitative Attitude Measurement

Before procedures for measuring attitudes are discussed, there are several general characteristics of measurement that should be considered in order to determine if an evaluation technique is an effective one. Good tests have these characteristics. Basically, a quantitative approach to attitude measurement requires that measures be:

- Valid. The instrument must be appropriate for what needs to be measured. In other words, a valid test measures the construct for which it is designed. A test of "attitude toward chemistry" will have items that deal directly with the concept of chemistry.
- Reliable. The measure should yield consistent results. In other words, if people were to take a reliable test a second time, they should obtain the same, or nearly the same, score as they got the first time they took the test, assuming no changes occurred between the two testings.
- Fairly simple to administer, explain, and understand. Generally, the measures that yield a single score of an attitude position epitomize the intent of this characteristic, although the single score may be deficient in meeting the intent of other characteristics of good measurement. Most tests of single attitudes have about 10 to 30 items, are valid, and have reliability estimates above .80.
- Replicable. Someone else should be able to use the measure with a different group, or in a different situation, to measure the same attitude. Replicable tests of attitude should be usable in a variety of situations. In other words, a test of computer anxiety should measure the existence of that construct in college students, parents, elementary schools students, and even stockbrokers.

34.5.2 Categories of Attitude Measurement Techniques

There are four widely used and accepted categories, or approaches, for collecting attitude information. These approaches are:

- Self-reports, where the members of a group report directly about their own attitudes. Self-reports include all procedures by which a person is asked to report on his or her own attitudes. This information can be provided orally through the use of interviews, surveys, or polls, or in written form through questionnaires, rating scales, logs, journals, or diaries. Self-reports represent the most direct type of attitude assessment and should be employed, unless the people who are being investigated are unable or unwilling to provide the necessary information. Questions like "How do you feel about X?" where X is the attitude construct under investigation are often asked in self-reports.
- Reports of others, where others report about the attitudes of a person or group. When the people whose attitudes are being investigated are unable or unlikely to provide accurate information, others can be questioned using interviews, questionnaires, logs, journals, reports, or observation techniques. Parents of children can be asked how their children feel about X, where X is the attitude construct under investigation.
- Sociometric procedures, where members of a group report about their attitudes toward one another. Sociometrics are used when the researcher desires a picture of the

patterns within a group. Members of groups can be asked questions like "Who in your group fits the description of X?" where X is the attitude position being studied.

• Records, which are systematic accounts of regular occurrences, such as attendance reports, sign-in sheets, library checkout records, and inventories. Records are very helpful when they contain information relevant to the attitude area in question. For example, when a researcher is trying to determine if a schoolwide program to develop a higher level of school pride is working, the school's maintenance records might give an index of the program's effectiveness. If school pride is improving, then vandalism should decline, and maintenance costs should be lower. The amount of trash picked up from the school's floors might yield relevant information, too. Students who have school pride are less likely to throw trash on the floor.

Within each of these categories, there are strategies for measuring attitude-related behaviors. Most commonly, attitude measurement is accomplished by one of the following techniques:

• Questionnaires and rating scales. Questionnaires and rating scales are instruments that present information to a respondent in writing and then require a written response, such as a check, a circle, a word, a sentence, or several sentences. Attitude rating scales are special kinds of questionnaires. They are developed according to strict procedures that ensure that responses can be summed to yield a single score representing one attitude. Questionnaires and rating scales are often used because they permit anonymity, permit the responder time to answer, can be given to many people simultaneously, provide uniformity across measurement situations, permit relatively easy data interpretation, and can be mailed or administered directly. Their main disadvantage is they do not permit as much flexibility as do some other techniques.

• Interviews. Interviews are face-to-face meetings between two or more people in which the respondent answers questions. A survey is a highly structured interview. Often surveys are conducted over the telephone, an approximation of face-to-face interviewing. A poll is a headcount. Respondents are given a limited number of options and asked to select one. For example, word-of-mouth procedures, such as interviews, surveys, and polls, are useful because they can be read to people who cannot read or who may not understand written questions. They guarantee a relatively high response rate, they are best for some kinds of information especially when people might change their answers if responses were written, and they are very flexible. There are two major problems with interviews. First, they are very time consuming. Second, it is possible that the interviewer may influence the respondent.

• Written reports, such as logs, journals, and diaries. Logs, journals, and diaries are descriptions of activities, experiences, and feelings written during the course of the program. Generally they are running accounts consisting of many entries prepared on an event, on a daily or weekly basis. The main advantage of this approach is that reports provide a wealth of information about a person's experi-

ences and feelings. The main problem is in extracting, categorizing, and interpreting the information. Written reports require a great deal of time by both the respondent and the researcher.

• Observations. These procedures require that a person dedicate his or her attention to the behaviors of an individual or group in a natural setting for a certain period of time. The main advantage of this approach is its increased credibility when pretrained, disinterested, unbiased observers are used. Formal observations often bring to attention actions and attitudes that might otherwise be overlooked. Observations are extremely time consuming, and sometimes observers produce discomfort in those they are observing. The presence of an observer almost always alters what is taking place in a situation.

A specific strategy for attitude measurement should be chosen which is appropriate for the type of attitude construct of interest, the type of learner, and the situation being examined (Henerson, Morris & Fitz-Gibbon, 1987). The procedures summarized above are those most often used. Others strategies are available, but attitude researchers are cautioned to select a technique appropriate to their research questions and a technique they are competent to carry out.

34.5.3 A Recommended Process for Attitude Measurement

Attempts at measurement, including the evaluation of attitude, require that a systematic process be followed. Using structured procedures increases the likelihood of an effective measurement taking place. Guidelines for attitude measurement usually recommend that at least six steps be followed (Henerson, Morris & Fitz-Gibbon, 1987):

1. *Identify the construct to be measured.* A construct is simply defined as the attitude area of interest. It is usually best to identify specific attitude constructs. Narrow attitude constructs such as "desire to take a course in chemistry" are probably better than "liking of chemistry," and "importance of knowing about the chemical elements" might be an even better attitude to measure. A learner can conceivably have an attitude position toward any object, situation, or person. When mediated instruction is designed, those attitudes that are important to the learning activity should be clearly identified and defined. An example of an attitude that an instructional developer might be interested in would be "attitude toward learning about titrations by video."

2. *Find an existing measure of the construct.* Once a certain attitude construct has been identified, an attempt should be made to locate an instrument that will measure it. Published tests are the first choice for measuring attitudes because they have usually been tried out in other instructional situations and include some statement of test validity and reliability. Additionally, instructions for administration of published tests often are available. The use of standardized measures simplifies the job of attitude evaluation.

The most obvious disadvantage to using a predesigned test is that it may not be evaluating the specific attitude

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being studied. Even if this is the case, it may sometimes be possible to extract valuable information from an instrument designed to test an attitude position similar to the one of specific instructional interest.

Possibly the best source of published tests is the research literature. Researchers who have conducted attitude research will often have developed or identified measures of their dependent variables that can be used in new experimental situations. If the research literature does not yield an appropriate measure of an attitude construct, then published indexes of tests can be reviewed. *Mental Measurements Yearbooks,* and *Tests in Print* are general sources for tests of all kinds. Often, standardized tests, such as those listed in general indexes, can be used to provide direction to the development of more specific attitude tests.

3. *Construct an attitude measure.* If no existing test of the relevant attitude is available, and a quantitative measure is needed, then it is necessary to construct a new test. Of the many types of attitude measurement possible, one widely used technique that seems to possess most of the characteristics of a good measure is the Agreement, or Likert-type, Scale. This technique involves the use of statements about the attitude that are either clearly favorable or unfavorable. Each student responds to each test item according to his or her perceived attitude "intensity" toward the statement. Often, students are asked to answer test items using a five-point scale that has responses varying in the amount of agreement to the statement from "strongly disagree" to "strongly agree." Advantages of this technique are ease of scoring and ease of summarizing the information obtained.

When a test is constructed, it is critical that validity and reliability information be collected for the measure. Of these two concepts, validity (i.e., appropriateness of instrument) is the most difficult to determine.

Validity for a test depends on a number of factors, such as the type of test and its intended use. Basically, there are four categories of validity:

• *Construct validity.* This concept refers to the extent to which the measure accurately represents the attitude construct whose name appears in its title. This can be determined by:

a. *Opinions of experts.* Experts are asked to review the test, and their reactions to it are used to modify the test, or if they do not have negative reactions, then the test is considered valid.

b. *Correlations to other measures of the same construct.* In some situations there may be other, often more complex, measures of the same variable that are available. Validity can be determined by asking a sample of learners to complete both the complex and the simpler versions and then correlating their scores. This procedure was used by Maurer (1983) when he validated his Computer Anxiety Index by correlating student's scores on it to Spielberger's (1970) much more complex and expensive State Anxiety Index.

c. *Measures of criterion group subjects (those who have been proved to possess the construct).* Maurer (1983) vali-

dated his computer anxiety index also using this technique. He observed learners and identified those who possessed the obvious characteristics of the computer anxious person. He then examined their Computer Anxiety Index scores and determined that their Index scores were also high, indicating that it was validly measuring computer anxiety.

d. *Appeals to logic.* Many times, particularly when the attitude can be easily defined, audiences will accept an instrument as logically related to the attitude, as long as they know it will be administered fairly.

• *Content validity.* This refers to the representativeness of the sample of questions included in the instrument. Content validity is usually determined by careful analysis of the items in the test. There is no simple process to determine content validity other than a close, thoughtful examination of each item separately, and all items collectively.

• *Concurrent validity.* This refers to the agreement of a test with another test on the same topic that was administered at approximately the same time. Concurrent validity is determined by correlating the results of the two parallel measures of the same attitude. This correlation coefficient is reported as an index of concurrent validity. For example, if an attitude test measuring "willingness to study chemistry" was administered and scores were obtained, it could be correlated to the instructor's assessments of the "completion rate of chemistry homework assignments" in order to determine an index of concurrent validity.

• *Predictive validity.* This refers to how well a measure will predict a future behavior, determined by comparing the results of an attitude test to a measure of behavior given in the future. This type of validity is usually expressed by a correlation coefficient found by comparing the results of two measures. For example, the results of an attitude test that measured "willingness to take additional chemistry courses" could be compared to actual course enrollment figures to determine the predictive validity of the attitude test.

Determining validity is not simple, however. Every educator who constructs a test of any type should be acutely aware of the need to develop valid instruments. Because there is no single, established method for determining validity, the test originator should exercise great care when constructing, administering, and interpreting tests.

Reliability is the ability of a measure to produce consistent results. It is usually less difficult to determine than validity. Reliability also refers to the extent to which measurement results are free of unpredictable kinds of error.

There are several methods of determining reliability that can be easily used by the attitude test developer. The "Test-Retest" method involves a second administration of the instrument to the target group and correlation of the results. The "Split-Half" method uses a random division of the instrument into two halves. Results from each half are correlated and reported as a reliability coefficient. "Alternate-Form" reliability involves the correlation of the results of two parallel forms of tests of the same attitude construct. In this method, each subject takes each form, and the resulting

correlation is reported as a reliability estimate. Internal consistency reliability is a determination of how well the items of an attitude test correlate with one another. Measures of internal consistency, such as the Cronbach-alpha, are often used by attitude test developers (Ferguson, 1971).

Both the Test-Retest and Alternate Form techniques will yield a score between -1.00 and +1.00. The higher the number, the more reliable the test. Reliability coefficients above .70 are considered respectable. Scores above .90 are not uncommon for standardized attitude tests. As with validity, the results of reliability estimation should be reported to the test's consumer (Anastasi, 1968; Cronbach, 1970; Talmage, 1978; Henerson et al., 1987).

4. *Conduct a pilot study.* While it is possible to obtain validity and reliability data during the actual testing portion of the instructional activity, it is preferable to administer attitude instruments to a pilot audience before any formal use is undertaken. This is done to obtain appropriate data, and to uncover minor and potentially troublesome administrative problems such as misspellings, poor wording, or confusing directions. A group of learners similar to those who are the target group for the attitude test should be given the measure. Results should be used to revise the test and to determine validity and reliability information.

5. *Revise tests for use.* Results of pilot testing are used to revise, and refine, attitude instruments. Once problems are eliminated, the measure is ready to be used with its intended target audience.

6. *Summarize, analyze, and display results.* After testing is completed, the resulting data should be interpreted. Attitude test results are handled similarly to any other quantitative test information. Attitude responses should be summarized, analyzed, and displayed in such a manner that results are easily and quickly understood by others.

Descriptive statistics should be reported about the attitude test results. Most often, means, standard deviations, and the range of scores should be reported. In experimental situations, tests of inference are often performed using the results of attitude tests. Most attitude test results can be analyzed using standard parametric tests, such as *t* tests and analysis-of-variance tests. However, attitude data about instructional method or content area are often useful even if they are only averaged and compared to other averages. In other words, did the class average change for "Attitude Toward the Happiness of People in India" after viewing the video, or did the class react favorably to "The Importance of Wearing Seat-Belts" after participating in a hypermedia computer lesson?

Displaying data is another effective method of analysis. Charts, graphs, and bar diagrams are examples of data display techniques that are useful in assisting the reader in developing an understanding of what test results indicate. Whatever the process, the developer of an attitude test should make every effort to decipher the results of the measure and to explain apparent conclusions and implications derived from the test.

Attitude measurement is certainly not an exciting topic, and may be of less interest than other issues discussed in this chapter. However, attitude testing specifically, and identifying attitudes generally, are apparently not understood and probably not valued by many educational technology researchers. Certainly, the trend toward more qualitative approaches to investigation may convince some that attitude measurement, and even attitude identification, are irrelevant to the important issues of the field. However, those who are still approaching research questions from an objectivist perspective will want to be sure that they are correctly following the accepted principles of measurement.

34.6 ATTITUDES AND INSTRUCTIONAL MEDIA—THE LITERATURE

In the last 15 years, two attempts have been made to organize the literature related to attitude change and instructional technology. In the late 1970s and early 1980s, Simonson reported on a series of reviews of the literature that culminated in a set of guidelines for designing mediated messages for obtaining attitudinal outcomes. Several studies were reported during the following years that attempted to validate Simonson's (1979) guidelines.

In 1993, Bednar and Levie proposed a series of attitude change principles. These principles facilitated the design of instruction to change attitudes and for the processes used for structuring lessons that targeted affective goals.

Simonson's research will be summarized first, then Bednar and Levie's principles will be reviewed. Finally, there will be a discussion of other research literature that relates to the use of media for persuasion.

34.6.1 Designing Instruction for Attitudinal Outcomes—The Iowa State Studies

In 1977, the first of a number of reviews and research studies dealing with media-attitude research was published by Simonson. A three-part approach was followed. First, literature about media and attitudes was located, reviewed, and synthesized (Simonson & Burch, 1977; Simonson, Thies & Burch, 1979a; Simonson, 1979; Simonson, 1980). Next, Simonson proposed a series of guidelines for designing instruction for attitudinal outcomes (Simonson, 1979, 1983, 1984). Finally, a series of research studies were conducted that evaluated various aspects of Simonson's guidelines (Simonson, 1985; Simonson, Aegerter, Berry, Kloock & Stone, 1987; Treimer & Simonson, 1988; Dimond & Simonson, 1988). This research agenda will be reviewed.

Several publications by Simonson reviewing the media and attitude literature were published during the 3-year period between 1977 and 1980. The purpose of these reviews was to summarize the status of the research in this area and to attempt to synthesize conclusions about the results of this research. Simonson identified 211 research

studies that experimentally examined some aspect of the relationship between attitudes, attitude change, and instructional media. Published or abstracted in *AV Communications Review* were 138 articles, and 73 articles were found that were published elsewhere (Simonson, Thies & Burch, 1979; Simonson, 1979a).

Simonson (1979a) arrived at several general conclusions after reviewing this literature. Five observations, with each having impact on those preceding it, were offered.

Observation #1: Mediated instruction *does* contribute to desired attitudinal outcomes in learners, especially when the instruction is designed specifically to produce certain attitudes or attitude changes.

Observation #2: The state of the art of media-attitude research is such that no specific guidelines for producing attitudinal outcomes can be generated. This is no theory of "media-produced attitude change."

Observation #3: Procedures *most likely* to produce desired attitudinal outcomes toward content as a result of instruction delivered by media include:

- Use of follow-up activities (e.g., discussions) and open-ended questions after the mediated instruction
- Maximum use of realistic types of media with as many nondistracting/noncontradictory visual cues (e.g., color, motion) as possible (e.g., the story film)
- Creation of an aroused state in the learner through direct participation, intermittent distractions to reorient the learner from previously held attitudinal positions, or dramatic presentations that involve the viewer emotionally and intellectually in the content shown

Observation #4: Procedures *least likely* to produce desired attitudinal outcomes toward content as a result of instruction delivered by media include:

- Varying only the channel through which the instruction is delivered (e.g., a videotaped replay of a live lecture probably would not produce more favorable viewer attitudes toward the lecture topic, and might even produce more negative attitudes than would the live lecture)
- Including distractions in the form of extraneous information or cues in the mediated instruction (e.g., a videotaped presentation on the need for better study habits probably would not change viewers' attitudes toward the use of the public library as a source of information even though this was included as part of the videotape script; too much irrelevant information inhibits attitude change)
- Presenting unrealistic, highly symbolic information using visual media (e.g., a slide set which included many frames containing written information probably would not produce positive attitudes toward the topic presented)
- Presenting problem/conflict situations but providing no mechanism for conflict alleviation or problem solving, either as part of the mediated messages or in

follow-up discussions (e.g., a film on the problem of soil erosion probably would not change farmer's attitudes unless the film showed solutions to the problem of soil erosion)

Observation #5: Media-attitude experimentation is not currently a high priority for researchers in media or related areas.

Simonson (1979a) stated that these five observations were opinions, but that any careful review of the 221 studies summarized would produce the same or similar conclusions. Simonson (1980) stated that if mediated instruction was broadly defined to include the entire learning process of which television, film, or still pictures were a part, then mediated instruction did seem to contribute to attitude formation and change. When only the media were evaluated, then conclusions were much less conclusive. Simonson stated that only one, broad, general conclusion about the relationship between media and attitudes was apparent and that this conclusion was an obvious one. Instructional media are primarily carriers of information and play their greatest role in the attitude change process as delivery vehicles. Characteristics of media such as flexibility of use, accessibility of information, and ability to encode ideas were more important than any inherent communication-related characteristics of a medium, which probably were of secondary importance to any development of attitudes or attitude changes (Simonson, 1980).

Simonson, Thies, and Burch (1979) also identified four trends in media-attitude research. These trends were listed as phases that characterized the research about media and attitudes.

Phase #1. Liking. A number of early research studies evaluated the media-attitude link in the simplest form by attempting to determine if the learner liked the lesson delivered by media or the medium itself. Usually, researchers reported on the results of an evaluation of learners. They were asked questions like, "Did you like this lesson?" or "Do you like learning from film?"

Phase #2. Change in liking. The logical second level of attitude evaluation conducted by media researchers was the study of *change in liking* as a result of media exposure. Usually pre- or postsurveys of learner attitude were conducted in order to determine if there was a positive or negative change.

Phase #3. Attitude comparison. A slightly more sophisticated design was the use of two treatments to determine the impact of attitude change procedures. Often, one treatment was a mediated one and the other was traditional, teacher-centered instruction. These comparison studies suffered from the same problems as media comparison studies of achievement: Results from many studies produced contradictory findings.

Phase #4. Media-attitude interaction. In the late 1970s, researchers began to design experimental studies using an aptitude-treatment-interaction approach (Allen, 1975). This approach made it possible to determine with greater speci-

ficity the relationship between attitudes and media. While relatively few studies were found that used this approach, the ones that were found did provide considerable information for the development of guidelines for designing persuasive mediated instruction (Simonson, 1979).

Next, a number of methodological problems common to the media-attitude literature were summarized by Simonson. These concerns related directly to the problems encountered by those who subsequently attempted to synthesize this area of research.

First, attitudes were poorly defined. Often researchers did not operationally define the attitude constructs they were investigating. Rather, statements such as "attitudes were measured and students liked learning about chemistry from films" were reported. Measurement of attitudes was also considered inadequate. Most measures were locally prepared, and most researchers did not report validity or reliability information about their attitude tests.

Most studies reviewed by Simonson were considered to be quasi-experimental or experimental (Campbell & Stanley, 1963). Often, however, attitude testing was only of peripheral importance to the main purposes of the research study. Many times, attitudes were evaluated after the fact, as follow-ups to an experiment. Clearly stated attitude hypotheses or research questions were rarely reported.

Finally, it was rare that follow-ups of the results of attitude change treatments were reported. Many critics of attitude research considered then, as they do now, that attitudes are transitory and attitude changes short-lived. Social psychology literature tends to refute this criticism. Few media-attitude researchers reported studying the long-term consequences of their persuasive efforts.

Simonson (1979a) concluded that the research on media and attitudes was not significantly different from media research in general. However, Simonson did feel that there were important implications to the research that made possible the proposal of general guidelines pertaining to the design of mediated instruction for attitudinal outcomes. Simonson offered a series of six guidelines (1979, 1983, 1984), which are included next.

34.6.2 Guidelines for Designing Instruction for Attitudinal Outcomes

Several versions of six guidelines for designing mediated instruction for attitudinal outcomes were proposed by Simonson (1979, 1983, 1984). In all cases, they were supported by research literature and were offered with two purposes in mind. First, the guidelines were generated for instructional developers to apply during the instructional design process (1979). They were also offered to researchers so they could test the effectiveness of the guidelines.

Simonson's six guidelines for designing instruction of attitudinal outcomes are:

Guideline #1: Learners react favorably to mediated instruction that is realistic, relevant to them, and technically stimulating.

Guideline #2: Learners are persuaded, and react favorably, when mediated instruction includes the presentation of new information about the topic.

Guideline #3: Learners are positively affected when persuasive messages are presented in as credible a manner as possible.

Guideline #4: Learners who are involved in the planning, production, or delivery of mediated instruction are likely to react favorably to the instructional activity and to the message delivered.

Guideline #5: Learners who participate in postinstruction discussions and critiques are likely to develop favorable attitudes toward delivery method and content.

Guideline #6: Learners who experience a purposeful emotional involvement or arousal during instruction are likely to change their attitudes in the direction advocated in a mediated message.

Simonson (1979) concluded his discussion of these six guidelines by repeating the position, taken several times previously, that media are primarily carriers of information. There was no "best medium" found for producing attitude outcomes. However, there apparently was a best approach for the maximizing of the likelihood of desirable attitudes being fostered in learners in a specific situation. The guidelines were thought to be useful for developing specific attitude change messages.

Apparently, the six guidelines received a lukewarm reception from the profession. While no rebuttals were published, neither were there many research studies published that cited the guidelines as the basis for either a research plan or an instructional design process. One exception to this were the studies conducted at Iowa State University during the 1980s that attempted to investigate one or more of the guidelines. Six of these studies will be discussed next.

34.6.3 Media and Attitude Change: Six Studies

Simonson's (1979) guidelines were derived from previous research dealing with media and attitudes. In order to evaluate them, a number of research studies were completed and reported. The first four were published as a group (Simonson, Aegerter, Berry, Kloock & Stone, 1987). One was published in the journal *Teaching and Learning Technologies* (Simonson, 1985) and replicated and presented at a convention of the Association for Educational Communications and Technology (Dimond & Simonson, 1988), and the last study was published in the *Journal of Social Psychology* (Treimer & Simonson, 1988).

The first four studies were part of a research program that investigated whether instructional media could be used to deliver persuasive messages effectively. The studies attempted to provide evidence about the following questions:

1. Is there a hierarchy of media types related to effectiveness in delivering persuasive messages? In other words, are media that deliver messages realistically,

as defined by Dale (1946), more effective than media that depict messages less realistically?

2. Does learner aptitude interact with media type when attitude change is the goal of the message? Specifically, do the learner characteristics of field dependence/field independence and hemisphericity interact with media type when persuasive messages are delivered?

Study #1. This study attempted to determine if a motion picture was more effective than a nearly identical slide with audiotape presentation at changing attitudes of viewers toward the need for greater soil conservation efforts. This study used a posttest only, control group design (Campbell & Stanley, 1963). There were three randomly assigned groups of subjects, two experimental and one control. The two experimental treatments were based on a 23-minute film entitled *We Are of the Soil.* This motion picture was designed to introduce soil conservation practices, such as conservation tillage, and to convince viewers that these practices were important. It was selected by a panel of experts as a film that was technically excellent (Cook, 1979), and as one that seemed to have been produced more to change attitudes than to provide information.

Subjects in the first treatment viewed the motion picture. Students in the second treatment watched a 2 × 2 slide presentation and listened to an accompanying audiotape. To produce this slide presentation, each scene in the film was analyzed, and the most important still picture from each scene was made into a slide. The film's narration was duplicated on an audiotape. The slides were projected using a dissolve unit and two carousel slide projectors, a treatment that was reported by Cook (1979) to be comparable in technical quality to the motion picture from which it was derived. The motion picture was considered to be the medium that would deliver the message the most realistically (Dale, 1946).

Subjects. Students enrolled in an undergraduate teacher education course were assigned randomly to one of the three treatment groups. Before treatments were administered, all subjects were given the Group Embedded Figures Test (GEFT) (Witkin, Oltman & Raskin, 1971). The GEFT was used to determine whether students tended to be either field-dependent (FD) or field-independent (FI) learners. This learner characteristic was examined because it was felt that the impact of the mediated treatments might be different for subjects who were either FD or FI.

FD and FI are considered to be pervasive, stable cognitive styles that influence a person's perception of messages (McLeod, McCormack, Carpenter & Skvarcius, 1978). FD learners are influenced more by their surroundings than are FI learners, who are influenced more by internal factors. FD individuals seem to be more socially oriented and are more affected by praise and criticism from their peers. FD persons tend to take a passive, spectator role in learning. FI learners, on the other hand, seem more adept at taking a message apart and at understanding its component parts, and tend to be more active learners who often have a strong self-concept. People are not totally field dependent

or field independent, rather they have tendencies one way or the other.

Subjects were given the GEFT, then were categorized as being either FD or FI, depending on their score on the GEFT. Students who had scores within one raw score of the average of all scores were not included in treatments. They were excused from the experiments because the GEFT did not satisfactorily identify them as tending to be either FD or FI.

Design. This study employed a 2 × 3 factorial design. There were three treatment groups. One group watched the motion picture, one group watched the slide presentation, and the third was a control group. Within each group there were two levels of each treatment: those students considered to be FD and those considered to be FI.

After treatments were viewed, subjects were given the Soil Conservation Attitude Test (SCAT). The SCAT was developed by Cook (1979) and revised by Kloock (1981). It contained 24 statements to which subjects reacted using a five-response Likert-type scale. The SCAT was reported to have a reliability estimate of .85 (Kloock, 1981).

Results of Study #1. Descriptive statistics are reported in Table 34-2. There was a statistically significant difference in attitude reported that was attributable to the experimental treatments. The average scores of students in all four experimental treatment cells indicated a more positive attitude toward the importance of soil conservation than did the scores of control subjects. Because one of the main goals of this study was to determine if any of the experimental groups of subjects reacted to treatments significantly differently from the others, a Duncan's test (Ferguson, 1971) was used to identify where significant differences occurred among cells. It was found that the subjects in the motion picture treatment who were identified as being field independent had more positive attitudes than did subjects in any of the other five treatment groupings.

Study #2. This study was a modified replication of study 1, with the same general purpose. However, three changes were made. First, the topic of the experimental

TABLE 34-2. ATTITUDES TOWARD SOIL CONVERSATION: STUDY #1

		Film	Slides	Control	Total
			Treatments		
Field-dependent subjects	$\bar{x}=$	64.69	65.33	61.14	63.62
	$N=$	13.00	12.00	14.00	39.00
	$sd=$	6.76	7.39	8.47	7.64
Field-independent subjects	$\bar{x}=$	69.86	65.31	63.69	66.19
	$N=$	14.00	13.00	16.00	43.00
	$sd=$	4.85	7.69	7.95	7.42
Totals	$\bar{x}=$	67.37	65.32	62.50	64.96
	$N=$	27.00	25.00	30.00	82.00
	$sd=$	6.31	7.53	8.16	7.59

Higher scores indicate a more positive attitude toward soil conservation. Possible range of scores was 24 to 120.

treatments was changed. A film entitled *The Right Approach* was selected by a jury of media specialists as an excellent persuasive film. Its topic was the employment of the handicapped. A slide presentation, with accompanying audiotape, was produced from the most relevant scenes of the film in a manner similar to the slide treatment produced for study 1. The two treatments (motion picture and slide with audiotape) were judged by experts to be generally of comparable technical quality.

Since the topic of the treatments changed, the test of the dependent variable also had to be changed. A standardized text of attitude toward disabled persons was found in the *Mental Measurements Yearbook* (Buros, 1978). The Attitudes Toward Disabled Persons (ATDP) was reported to have a reliability estimate of .76 (Yucker, Block & Young, 1970).

The second change for study 2 was to use fifth- and sixth-grade students as subjects. They ranged in age from 10 to 13. Last, a follow-up test was given to a small subsample of subjects 3 weeks after treatment to determine if attitude changes produced by the treatments persisted.

The posttest-only design for this study had two independent variables, field dependence/field independence and treatment. The 2 × 3 factorial design had three treatments (motion picture, slide with audiotape, and control), and two levels of the cognitive style, field dependence/independence.

Results of Study #2. Results of descriptive tests are reported in Table 34-3. There was a statistically significant difference in attitude attributable to treatments and to the learner cognitive style field dependence/independence. After treatments, the subjects who had viewed the motion picture generally had more positive attitudes toward disabled persons than did subjects who watched the slide/audiotape presentation. Average attitude scores of subjects in both of the experimental treatments were significantly more positive than were the average scores of control subjects.

Average scores of several treatment cells deserve note. Three of the experimental treatment cells, Film/FD, Film/FI, and Slide/FI, had approximately equal attitude scores, while the fourth treatment group, Slide/FD, had significant-

ly less positive attitudes toward the disabled than did students in any of the other three experimental cells.

This study added a follow-up testing session. Three weeks after treatments were administered, a smaller number of the subjects were randomly selected for retesting. There were no significant differences found, even though the trends of scores were similar to those obtained from the original administration of the attitude test. There seemed to be a regression effect. It was also apparent that field-independent subjects generally remained more positive toward disabled persons than did field-dependent subjects. However, because such a small number of subjects were included in this retesting, it is not possible to draw generalizable conclusions from the data.

Study #3. This experiment could also be considered a modified replication of study 1. For this experiment, there were two major changes made to the design of study 1. First, junior and senior high school students were used as subjects. These students attended school in a small town in an agricultural state in the Midwest and ranged in age from 13 to 18. The second change in this study was the examination of the independent variable hemisphericity instead of field dependence/independence.

Researchers have reported that in spite of a great deal of overlap of function, the two hemispheres of the brain organize and encode information in two different ways. Generally, the left hemisphere is more logical, convergent, and analytical. It is responsible for language and processes information sequentially. The right hemisphere is more holistic, intuitive, spatial, and divergent (Ornstein, 1977).

It also has been determined that individuals tend to have a dominant hemisphere. That is, one hemisphere tends to take priority when information is processed. It has been proposed that this hemispheric dominance is related to effective learning. In other words, how a person's brain perceived data determines in part how much is learned.

In order to assign subjects to treatments, the Conjugate Lateral Eye Movement (CLEM) Test was used to identify a person's dominant hemisphere (Day, 1964). The CLEM is an individually administered test that requires observation of a subject's eye movement after reflective questions are asked of them. The CLEM Test has a reliability of .78 ($r = .78$).

Subjects were tested using the CLEM and were assigned to treatment groups. Individuals who did not have a clearly dominant hemisphere, as indicated by the CLEM, were excused from the experiment. Specifically, subjects who did not move their eyes in a predictable pattern when they were asked reflective questions were not included in data analyses.

The first treatment group viewed the persuasive film *We Are of the Soil.* The second group watched the slides with accompanying audiotape prepared from this motion picture. The third group was a control. After treatments were completed, the SCAT was administered. This study used a 2 × 3, posttest only, control group design.

Results of Study #3. Descriptive statistics are reported in Table 34-4. There were no statistically significant differences found, although the trends of the mean scores

TABLE 34-3. ATTITUDES TOWARD DISABLED PERSONS: STUDY #2

		Film	Slides	Control	Total
		Treatments			
Field-dependent subjects	$\bar{x} =$	86.08	75.25	67.83	76.64
	$N =$	25.00	24.00	23.00	72.00
	$sd =$	14.61	18.96	21.29	19.65
Field-independent subjects	$\bar{x} =$	85.17	87.24	78.35	83.50
	$N =$	24.00	21.00	23.00	68.00
	$sd =$	4.85	7.69	7.95	7.42
Totals	$\bar{x} =$	85.63	80.84	73.09	79.97
	$N =$	49.00	45.00	46.00	140.00
	$sd =$	15.67	17.91	19.52	18.35

Higher scores indicate a more positive attitude toward disabled persons. Possible range of scores was 24 to 120.

**TABLE 34-4. ATTITUDES TOWARD SOIL
CONSERVATION: STUDY #3**

		Treatments			
		Film	Slides	Control	Total
Right-brain– dominant subjects	$\bar{x}=$ $N=$ $sd=$	57.26 19.00 8.26	57.47 17.00 11.35	55.56 16.00 9.80	56.81 52.00 9.65
Left-brain– dominant subjects	$\bar{x}=$ $N=$ $sd=$	59.78 18.00 4.85	60.64 14.00 7.69	57.29 21.00 7.95	59.02 53.00 7.42
Totals	$\bar{x}=$ $N=$ $sd=$	58.49 37.00 9.84	58.90 31.00 9.81	56.54 37.00 8.54	57.92 105.00 9.36

Higher scores indicate a more positive attitude toward soil conservation.
Possible range of scores was 24 to 120.

were interesting. Left-brain–dominant subjects generally were more positive than were right-brain subjects in all treatment categories.

In order to examine the data more completely, a post-hoc analysis of SCAT scores for subjects in grades 9 through 12 was conducted. While results were not significant, it was found that subjects in the senior high school grades who were in experimental treatments had more positive attitudes when compared to control subjects in the same grade. In other words, the difference between control group subjects' and experimental group subjects' attitude scores were greater in the higher grades than they were in the lower grades.

Study #4. This experiment took a slightly different approach than studies 1, 2, or 3. At its foundation was the principle reported by Simonson (1984) and Rogers (1973) that the use of fear may be an effective technique for attitude change, especially if cures to the problem or probabilities of exposure to a fear-provoking event are included in the message. In other words, a persuasive message that showed the dire consequences of not following some course of action—such as stopping smoking, or wearing seat belts—could be made more effective if cures for the problem or techniques for how to change behavior were included in the message.

Study #4 used a 2 × 3, posttest only, control group design. As before, field dependence/independence was the second factor in the design. This learner characteristic was hypothesized as possibly being related to the impact of a fear-provoking message, especially when information to reduce the tension produced in viewers as a consequence of the fear was included in one treatment and not in the other. The college students who participated in the experiment were tested using the GEFT and assigned to one of the three treatment groups, just as they were in study 1.

Experimental treatments were based on a film entitled *The Feminine Mistake*, a 23-minute, antismoking motion picture sponsored by the American Cancer Society. This film was selected by a group of media specialists because

of its high technical quality. Permission was obtained from the copyright holder to produce two 15-minute videotape versions of the film. The first version showed only the fear-provoking scenes included in the film. Narrated by Bonnie Franklin, star of the television program *One Day at a Time*, this version showed scenes designed to scare viewers so they would stop smoking. These scenes included an interview with a young woman undergoing chemotherapy for lung cancer, sequences showing how smoke deteriorated the tissues of the skin, and a presentation by a doctor of the results of medical tests that demonstrated the effects of cigarette smoke on the unborn.

The second 15-minute videotape version included the most dramatic, fear-provoking scenes used in the first version, but also included about the 5 minutes of information on how to stop smoking. These scenes gave information on smokers' support groups and how the body recovered once a smoker quit.

The two video versions of the motion picture were evaluated several times during production. They were also evaluated by subjects during the experiment and in all cases were judged to be generally of high and comparable technical quality.

After treatments were administered, subjects completed the Smoking Attitude Scale (SAS; Baer, 1966). The SAS is a 21-item measure using a five-response, Likert-type scale. It is reported to have a reliability estimate of .84.

Results of Study #4. Results are reported in Table 34-5. It was found that both experimental treatments were successful at significantly influencing subjects' attitudes toward smoking. Subjects assigned to one of the two versions of the videotaped adaptations of *The Feminine Mistake* had more negative attitudes toward smoking after viewing treatments than did control subjects. There was no statistical difference found between subjects categorized as being either field dependent or field independent, nor was there a significant interaction between field dependence and treatment.

34.6.3.1. Discussion of the Four Studies. Earlier, two specific questions were posed that served as guides for the design of the four studies included in this research program.

**TABLE 34-5. ATTITUDES TOWARD
SMOKING: STUDY #4**

Treatments

		Fear with Alleviation	Fear Alone	Control
Field-dependent subjects	$\bar{x}=$ $N=$ $sd=$	41.23 22.00 11.67	38.93 15.00 7.78	47.50 14.00 6.76
Field-independent subjects	$\bar{x}=$ $N=$ $sd=$	40.21 24.00 8.95	39.85 20.00 10.87	48.32 22.00 13.16

Higher scores indicate a more positive attitude toward smoking. Possible range of scores was 21 to 105.

Question 1. Is there a hierarchy of media types related to effectiveness in delivering persuasive messages? It seems obvious that media can be used to effectively deliver persuasive messages. Studies 1, 2, and 4 all reported attitude positions that were significantly different for subjects who viewed experimental treatments when compared to control subjects. There also seemed to be some evidence that motion pictures generally were more effective at persuading than were slide presentations. This conclusion was supported by the results of studies 1 and 2.

The impact of realistic persuasive messages on attitude change has been studied by social psychologists for over 4 decades. Reinforcement theory is based on the assumption that realistic messages have more cues for the viewer, and thus are more effective at persuading. Specifically, since motion pictures have more visual information, theoretically this should make motion pictures more effective than still pictures at persuading. The results from these studies seem to support the assumptions of this theory. While no hierarchy of media types could be developed based on this series of experiments, it does seem that this question should be investigated further.

Question 2. Does learner aptitude interact with media type when attitude change is the goal of a message? Based on the results of studies 1 and 2, there may be a relationship between field independence and filmed persuasive messages for the topics of soil conservation and hiring the disabled. Field-independent subjects seem more likely to be influenced favorably. It also seemed that films were, in general, better than slide presentations at delivering messages that changed attitudes.

34.6.3.2. Conclusions from the Four Studies.

A fundamental assumption of the research presented above was that attitude change is an important concern of the educator, and that if attitudes are important, information on how attitudes might be formed or changed with media is needed. These four studies were conducted to examine the use of media to deliver persuasive messages. The results of the four studies tended to support the following conclusions: First, attitudes toward educationally relevant topics, such as conservation, smoking, and disabled persons, can be modified by using persuasive messages delivered by media. Next, it appeared that some types of media may be more effective than others at delivering information designed to change attitudes. Motion pictures seem to be more effective than slides. There also seems to be sufficient evidence to warrant further investigation into the relationship between the content of persuasive messages, the media used to deliver those messages, and the characteristics of the students who view the message.

Realistic media, such as films and video, were reported most often to be vehicles for delivering attitude change messages. The next step in Simonson's research agenda was to query filmmakers about the techniques they used when they designed persuasive motion pictures.

Study #5. Persuasive Films: Techniques Used to Change Attitudes (Simonson, 1985; Dimond & Simonson, 1988)

Purpose of the study. The four studies reported above indicated that persuasive films can change attitudes. The next study attempted to determine how films were planned and produced, and what makes it possible for a film to persuade a viewer to accept an attitudinal position.

Alfred Hitchcock is supposed to have once remarked to an executive producer that he never looked at motion pictures, to which the producer replied, "But where do you get all your ideas then?" (Rose, 1963). "How they did it" in a film starts a description heard in many film production conferences. The techniques used by one filmmaker in a successful film are often used as models for similar films. Filmmakers often produced films by formula. Many times they do not even realize what formula they are following (Rose, 1963). Most often, filmmakers decide on, or are hired, to present a position in a film. The filmmaker then works backwards, planning the presentation to include, through emphasis and selection, the ideas and techniques that would be most likely to elicit the desired reaction in the viewer. In other words, the desired attitude is identified, then filmmakers decide how to persuade the audience to accept this attitude as a consequence of viewing their film (Rose, 1963).

The identification of the specific techniques used by the filmmaker to accomplish these persuasive goals was the purpose of this study. Simonson's (1979) guidelines were used in the development of the questions asked.

Procedures. In order to obtain information from filmmakers about persuasive films, a *Film-Makers Survey* (FMS) was developed. A pilot version of the FMS was sent to a small sample of filmmakers and a revised version based on their comments and suggestions was developed. This revised FMS had two parts. Part 1 dealt with the filmmaker's background and experience. Part 2 asked the filmmaker to rate, discuss, or evaluate techniques used in persuasive filmmaking. Each item in part 2 of the FMS was directly related to one of the six design guidelines identified by Simonson (1979).

The catalog of the Council on International Non-Theatrical Events (CINE) listed 150 filmmakers who were sent a copy of the FMS with a cover letter explaining the purpose of this study. These filmmakers were sampled because their films were listed in the CINE catalog as Golden Eagle Award winners and because the accompanying descriptions of their films seemed to indicate that their motion pictures were persuasive. A random selection of cinematographers was not considered appropriate because the purpose of this study was to have individuals with experience in persuasive filmmaking evaluate techniques used to produce this type of film. Experience in persuasive filmmaking was necessary in order for a person to be able to satisfactorily complete the FMS. Included with the questionnaire and cover letter was a stamped, addressed, return envelope. No follow-ups to filmmakers who failed to return the questionnaire were attempted, because the cover letter stated that if addressees had not produced persuasive films, they should disregard the FMS. Because subjects were

selected based on a two- or three-sentence description of one of their films in the CINE catalog, it was very likely that many of them were not actually persuasive filmmakers and, consequently, discarded the FMS.

Results. Of the questionnaires, 51 were returned, for a response rate of 34%. This fairly small percentage of returns was expected because of the technique used to select subjects and because no follow-ups were attempted. A careful analysis of the completed questionnaires did not reveal any discernible, confounding pattern. An analysis of the known characteristics of those filmmakers who completed the survey as compared to those who did not return it failed to reveal any significant relationships that might have indicated that a biased subset of filmmakers answered the FMS as compared to those who did not.

Background information on the responding filmmakers. All 51 of the filmmakers who responded indicated that producing motion pictures was their primary method of employment. The average length of time respondents had been employed as filmmakers was slightly more than 18 years. The range of years of employment was 1 to 40. Of the respondents, 91% were males. Their average age was 46. Ages ranged from 25 to 68 years.

The average number of films of all types produced by each filmmaker was 142. The average number of persuasive films produced was 29 (range = 1 to 200). For persuasive films, the average film length was 18.3 minutes. The shortest persuasive film was reported to be 2 minutes. The longest was 30 minutes. There were a large number of 28-minute films reported, probably because this was a popular length for films that were to be broadcast. Filmmakers reported working in production companies with an average of 11 employees. The smallest company was a one-person freelance operation. The largest company employed 35.

Of the filmmakers, 37% reported that they had no formal school training in filmmaking, only on-the-job training; 16% had some college experience. Those who had masters degrees or more were 21%; 5% reported that they had attended a trade school. Only 9% reported having any formal training in producing persuasive films.

The definition of persuasive film used for this study was considered appropriate by 78% of the filmmakers who answered the FMS. Almost without exception, those who did not like the definition thought that it was too narrow and should be expanded to include broadcast, noneducational uses of films. The definition used for this study was: "A persuasive film is a training or educational film that has influencing, persuading, or changing of attitudes as its primary purpose.

Most respondents thought that the market for persuasive films would increase in the future (73%), and that about 40% of the educational film market was for films that primarily persuade rather than inform. The average cost of a 10-minute persuasive film was estimated at $29,000, or $2,900 per minute (range = $13,000 to $65,000). This price was estimated as being only slightly higher than the cost of an informative film of the same length.

Persuasive-film production techniques. One of the major goals of this study was to determine how filmmakers would go about producing a film when persuasion was their goal. Filmmakers responding to the FMS considered persuasive films to be planned and produced a little differently than other educational films ($X = 3.79$; 5 = very differently; 1 = exactly the same). One major difference was the importance of a prescript writing target audience assessment that most filmmakers considered critical to the success of their persuasive films ($X = 4.27$; 5 = critical; 1 = not necessary). Technical quality of persuasive films was considered important, but only slightly more so than for any film ($X = 3.59$; 5 = critical; 1 = less important than for other films). The "outs," the percentage of film not used, for persuasive motion pictures was estimated at being only slightly greater than for informative films ($X = 3.59$; 5 = much greater; 3 = about the same; 1 = much less).

To determine the production techniques considered most effective for persuasive films, several somewhat overlapping groups of procedures were presented in the FMS for the filmmakers to rate. An analysis of this rating process follows.

I. WHEN COMPARING PERSUASIVE FILMS TO OTHER EDUCATIONAL FILMS, HOW IMPORTANT IS IT TO:

Rank

Most important	1.	Use motion rather than static actors, objects, or graphics?
	2.	Use believable, realistic scenes, events, and actors?
	3.	Present new information on the topic?
	4.	Use an arousing or dramatic musical score?
	5.	Use many rather than few scenes?
	6.	Produce a shorter rather than longer film?
Least important	7.	Use color rather than black and white?

II. HOW WOULD YOU RATE THE FOLLOWING TECHNIQUES IN TERMS OF THEIR LIKELIHOOD OF INFLUENCING YOUR AUDIENCE?

Rank

Most effective	1.	Conduct a target audience pre-assessment.
	2.	Hire professional actors rather than amateurs.
	3.	Present new information on the topic.
	4.	Have people in the film that are as similar to the target audience as possible.
	5.	Include a teacher's guide with the film to use during follow-up discussions.
	6.	Use testimonials from the "man on the street."
	7.	Hire a big-name star to promote your position.
	8.	Present inspirational messages.
	9.	Use title scenes to present verbal information visually.
Least effective	10.	Use graphs and charts for presenting facts.

III. RATE THE FOLLOWING CHARACTERISTICS OF FILMS IN TERMS OF THEIR IMPORTANCE FOR USE IN A PERSUASIVE FILM.

Rank

Effective techniques	1.	Attempt to "arouse" the audience intellectually, sexually, or emotionally.
	2.	Be as realistic in presenting the story as possible.
	3.	Make the film "fun" to watch.
	4.	Present facts.
	5.	Be as nonverbal as possible.
	6.	Use physically attractive actors and actresses.
	7.	Present both sides of an argument.
	8.	Use animation.
	9.	Use talking faces.
Not effective techniques	10.	Scare the audience by presenting the dire consequences of not following the recommendations presented in the film.
	11.	Use many written scenes.

When asked to rank three general statements concerning how important each was to persuasive filmmaking, the filmmakers considered the need to arouse the viewer emotionally or to promote some reaction in the viewer relative to the content of the persuasive film as the most important of the three presented ($X = 1.23$; 1 = most important; 3 = least important). The technical quality of the film ($X = 2.37$) and the need to present considerable information in the film about the topic ($X = 2.31$) were not considered as important as involving the viewer in the message of the motion picture.

Because the production of persuasive films is considered controversial by some, several questions were included in the FMS to determine what filmmakers thought about the propriety of producing films that were meant to persuade rather than to inform. Most considered persuasive films to be much more exciting to produce than other types of motion pictures ($X = 4.25$; 5 = much more exciting; 1 = not much fun). Only 10% reported having problems with the morality of producing attitude change films. However, most indicated that they would refuse to produce a film that was intended to promote a position they did not believe in.

Based on the FMS results reported above, it would seem that there were several ingredients agreed on by the filmmakers as being likely to promote attitude changes when they were included in the planning or production of persuasive films. Techniques considered important for successful persuasive films were that they should:

- Be planned and based on the results of a target audience assessment
- Arouse and promote in the viewer some action, either intellectual or behavioral
- Present new information to the viewer on the topic
- Be realistic and believable to the viewer
- Include motion and action in scenes rather than static visuals

- Be enjoyable, or fun, to watch
- Be as nonverbal as possible
- Be used with follow-up discussions as outlined in a teacher's guide that should accompany the film

This hypothetical persuasive film should be no longer than necessary and have a budget of about $3,000 per minute. Technical quality would be important for this motion picture, but only slightly more so than for any film. The "outs" ratio would probably be slightly greater for this film than for a regular informative motion picture of the same length.

Techniques not considered important or effective for persuasive films were the use of considerations of:

- Color rather than black and white
- Film length
- Graphs, charts, and other written scenes
- "Scare" tactics that would attempt to show the dire consequences of not adhering to the message of the persuasive film
- Talking faces
- Animation
- Inspirational messages

Generally, it was thought that an effective persuasive film was one that was believable and realistic, presented new information, was fun to watch, promoted involvement or action in the viewer, was more visual than verbal, and was used correctly by the teacher. These results were the amalgamation of those found in two studies (Simonson, 1985; Dimond & Simonson, 1988).

Study #6. Subliminal Messages, Persuasion, and Behavior Change (Treimer & Simonson, 1988). In 1988, Treimer and Simonson published the results of a slightly different type of study that attempted to investigate the impact of subliminal messages on the level of emotional involvement felt by the viewer of videotapes. It was felt that subliminal messages, if effective, might provide an alternative method of intellectually or emotionally involving the viewer of a videotape in the persuasive message, as proposed by guideline #6 (Simonson, 1979).

Subliminal perception was defined as any word, image, or sound that is not perceived within the normal range of consciousness but that makes an impression on the mind. This phenomenon involves words or pictures that are flashed so quickly that the eye cannot transmit them to the conscious brain, or words spoken at such a volume that they evoke no conscious memory.

The purpose of the Treimer and Simonson (1988) study was to determine whether viewing a commercial videotape containing written and aural subliminal messages was more effective at producing weight loss and attitude change toward weight loss than a videotape containing the same visible message but with no subliminals. *Weight Loss Video Programming,* by Hypnovision, Inc., was the videotape selected for this study. It endorsed no specific weight loss or exercise plan and required nothing of viewers other than

their willingness to change diet and exercise habits and to watch the videotape that contained subliminal messages daily for 30 days.

Participants were measured to see if changes occurred in the following areas:

1. Food and Exercise Attitude (FEAT; $r = .72$). This test of attitudes was administered at the beginning and end of the treatment period.
2. Food Intake Recall (FIR). FIR was measured by using a 1-day recall of food intake at the end of the testing period.
3. Weight and Skinfold Test (WST). WST was measured at the beginning and end of the treatment period.

It was hypothesized that participants who viewed the videotapes with subliminals would change their attitudes toward dieting, would have a healthier food intake, and would lose weight. A pretest/posttest control group design was used. Participants were volunteers who were randomly assigned to one of two treatment groups: video with subliminals or video with no subliminals. Both groups watched the 22-minute video at least 25 times in a 35-day period. Two versions of the video were prepared, one with the subliminals and one without.

Results of Study #6. The results of the study showed that FEAT scores improved for the group watching the video with the subliminals (11.8 vs. 7.37), but that the difference was not statistically significant. Results of the FIR and WST testing showed little numerical difference in the scores of participants in either group. It was concluded that subliminal messages did not appear to have an impact on either attitude or behavior.

This study is included in this review because it represents a slightly different approach than the five studies summarized previously. The results of this study effectively closed the door on research on subliminals. As a matter of fact, several months later Hypnovision, Inc., stopped marketing subliminal videos.

34.6.4 Attitudes and Instructional Media (Bednar & Levie, 1993)

Fleming and Levie proposed a series of attitude change principles in 1978 that were based on their comprehensive review of the media and attitude research. Their discussion had three categories of information. The first was based on the classic SMCR model of communication (see 4.3). (The *Source* presents a *Message* through a *Channel* to a *Receiver*). They also developed principles related to modeling of appropriate behaviors, and they concluded with principles related to creating and managing dissonance. In 1993, Fleming and Levie included an updated and revised series of attitude change principles (Bednar & Levie, 1993) that are included next.

SMCR Principles—the Source. The first series of guidelines proposed by Bednar and Levie were concerned with the source of the persuasive message and were based on the position that "the likelihood that a receiver will accept the conclusion advocated in a given lesson is in part a function of the receiver's perception of the source's or model's credibility" (p. 286).

Principle 1.1. High-credibility sources exert more persuasive influence than low credibility sources.

Principle 1.2. Sources perceived by the receiver as attractive are more influential.

Principle 1.3. The quality and structure of the arguments in a persuasive message are more critical for credible sources than for attractive sources.

Message Principles. Next, Bednar and Levie identified principles that were concerned with the content of the persuasive message. Message principles were considered to be closely related to source-based principles.

Principle 1.4. Be sure the receiver is informed of the expertise of a high-credibility communicator.

Principle 1.5. To enhance communicator attractiveness, establish belief congruence with the receiver by arguing in favor of positions the receiver is known to hold.

Principle 1.6. Arguments are more effective if they are relevant to the receiver's needs.

Principle 1.7. Generally, two-sided arguments are slightly more effective than one-sided messages.

Principle 1.8. It is almost always advisable to state the conclusion explicitly rather than to allow receivers to draw their own conclusions.

Principle 1.9. Repetition helps, but only one or two repetitions are likely to have any additional effect.

Channel Principle. A principle related to the channel of communication was presented next by Bednar and Levie. Channels were explained to refer to both media and to senses.

Principle 1.10. No one media type has been explicitly shown to have greater persuasive effectiveness than any other media type. Face-to-face communication, however, is more effective in promoting acceptance than mediated communication, particularly in difficult cases.

Receiver Principle. Finally, Bednar and Levie proposed one principle related to the receiver of a persuasive message. They stated that is very important for the designer of the attitude change lesson to know as much as possible about the student who will receive the lesson.

Principle 1.11. It is very difficult to change the attitudes of receivers who are highly committed to their positions on an issue.

Modeling Principles. Next, Bednar and Levie proposed five principles that dealt with the use of modeling as an instructional strategy and with the credibility of the model.

Principle 2.1. High-credibility models exert more persuasive influence than low-credibility models.

Principle 2.2. In order for modeling to be effective, the learners must comprehend the presentation as a demonstration of specific behaviors.

Principle 2.3. In addition to observing the model demonstrating the behavior, learners should observe the model being reinforced for that behavior.

Principle 2.4. Role playing can have a powerful persuasive impact.

Principle 2.5. Active participation produces more attitude change than passive reception of information.

Dissonance Principles. Last, Bednar and Levie offered six principles for creating and managing dissonance in order to produce attitude changes. Their principles were based on Festinger's (1957) cognitive dissonance theory.

Principle 3.1. If a person can be induced to perform an important act that is counter to the person's own private attitude, attitude change may result.

Principle 3.2. When a person is induced to perform an attitudinally discrepant act because of promise of reward or punishment, attitude change will occur only to the extent that the person feels that the magnitude of the reward or punishment was insufficient to justify the attitudinally discrepant behavior.

Principle 3.3. A message should demonstrate the social acceptability of the desired attitude and the reward available socially for behavior consistent with the attitude.

Principle 3.4. The message should alternate between presenting information discrepant with existing beliefs and inducing behaviors discrepant with existing attitudes to maximize dissonance.

Principle 3.5. Attitude change lessons should be structured so that attention is paid to the cognitive (information), affective (feeling), and behavioral (acting) elements of the attitude.

Principle 3.6. Messages should use approximations to move attitudes gradually between a current status and a desired state.

Bednar and Levie (1993) included with each principle a discussion of the literature that supported it. The Bednar and Levie principles are practical and effective, and provide considerable guidance to the designer of persuasive messages. They stated in their conclusion that "common to all of these (principles) are opportunities for free choice and control by students, opportunities for success, and lessons which present and confront alternative perspectives" (p. 302).

34.6.5 Summary

Simonson's six studies, Bednar and Levie's 22 principles, and other research reported during the 1980s and 1990s have provided considerable information about attitude change and instructional technology. The next section of this chapter will propose a set of guidelines for designing mediated messages that persuade. These guidelines are based on the research reviewed above and on the other studies that were found in the literature. It is important to note that revisiting this research area produced no startling changes from the reviews reported a decade and a half ago. Attitude change is quite predictable if mediated instruction is correctly designed. Media, at best, play a minor role in persuasion when compared to the message delivered by the medium or the methodology of instruction.

34.7 CONCLUSION: DESIGNING MEDIATED MESSAGES FOR ATTITUDE CHANGE AND THE MODEL OF CUMULATIVE EFFECT

Based on the literature reviewed above, a series of guidelines have been developed for designing mediated messages that change attitudes. These guidelines are based on Simonson's (1979) previous work in this area and have been modified in three ways. First, the recent attitude literature of social psychology was incorporated where appropriate. Second, the Iowa State University research agenda reviewed above provided guidance about techniques that seemed effective. Finally, Bednar and Levie's (1993) 22 principles for attitude change validated the proposed guidelines. Bednar and Levie's principles can be subsumed within one or more of the following guidelines.

The guidelines are organized into two groupings. The first three guidelines refer to *message design,* and the second three relate to *learner involvement.* A "model of cumulative effect" is also proposed (Fig. 34-2). This model states that for attitude change, at least one guideline should be selected from each category, and the more of the guidelines that are appropriately included in a persuasive communication, the more likely will be the development of attitude changes.

34.7.1 Message Design Guidelines

Guideline #1: *Learners are persuaded, and react favorably, when mediated situations include the discovery of useful new information about a topic.*

Most students like to learn. They react positively when relevant new information is presented to them. Inert knowledge, knowledge that can be recalled but is not spon-

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Message Design Guidelines:

1. New information

2. Realistic, relevant, and technically stimulating

3. Presented in a credible manner

PLUS

Learner Involvement Guidelines:

4. Involved in planning, production, and/or delivery

5. Purposeful emotional involvement or arousal

6. Participation in postinstruction discussions or critiques

Figure 34-2. Model of cumulative effect.

taneously used in problem solving (Whitehead, 1929), is often not perceived positively by learners. Sherwood, Kinzer, Hasselbring, and Bransford's (1987) interesting work on logarithms demonstrates this point. Most youngsters do not see the importance of learning logarithms, even though almost everyone remembers studying them. To many students, logarithms are inert knowledge. On the other hand, mathematicians, statisticians, and computer programmers do not feel this way. They use logarithms and realize their power as tools to solve problems. While no attitude study investigating attitudes toward logarithms was found in the literature, it is safe to say that those who use these powerful tools have a much more positive attitude about them than those that do not use them. To the users of logarithms, they are important tools, not inert knowledge. This is because mathematicians use logarithms to solve real-world problems.

Levonian's (1960, 1962, 1963) landmark studies support this guideline. As a critical part of Levonian's study, the audience for a film was surveyed about India. The developer of the film used this information to ascertain previous knowledge about India so that new information could be presented. This new information was included in the film to support the attitude position desired by Levonian. In other words, Levonian produced a film that presented useful and relevant information. The content of the film was selected so that it would not be knowledge for the sake of knowledge but that it would be cognitively relevant to the previous knowledge and needs of the audience.

Jouko (1972) reported related results. It was found that the less preinstruction knowledge students had about a topic, the more attitude change that was produced after an informational and persuasive lesson. There was a negative relationship between preinstruction familiarity about a topic and attitude change as a result of participating in a relevant persuasive situation.

A similar conclusion was proposed in a study by Knowlton and Hawes (1962). In this study, it was determined that knowledge about a topic was often a necessary prerequisite

for a positive attitude position toward the idea. Stated another way, new knowledge may need to be discovered by learners when attitude changes are desired (e.g., Jouko, 1972), or knowledge may need to be present for learners to have a favorable attitudinal position toward the situation in which they are involved (Knowlton & Hawes, 1962). The results of two additional studies using video reported similar findings (Thirion, 1992; Harkins & Petty, 1981).

Guideline #2: *Attitude change is likely because of, and learners react favorably to, mediated situations involving the use of instructional technologies that are authentic, relevant to them, and technically stimulating.*

One practical technique for instruction using technology is based on the concept of anchored instruction. Anchored instruction, as described by the Vanderbilt Cognition and Technology Group (1990), uses technology to provide a realistic situation for learning. Media are used to present real-world events that become the anchor for learning. While the Vanderbilt Group's studies concentrated on the cognitive consequences of anchored instruction, there is ample anecdotal evidence that anchored instruction also influences attitudes.

Simonson et al. (1987) reported on a series study that attempted to determine if a situation where media were used to deliver messages authentically was more effective in creating attitude change than media that presented a situation less authentically. It was found that authentic mediated situations could be designed to promote desired attitudinal change.

Dimond and Simonson (1988) studied filmmakers who produced persuasive films. These filmmakers indicated that presenting authentic situations in their films was critical to the success of their persuasive messages, much more so than for informational films and videos. In other words, filmmakers indicated that the presentation of authentic, real-world situations was a critical ingredient of successful persuasive films. Filmmakers also indicated that when they produced persuasive films, they almost always "believed" in the attitudinal positions advocated in their films. Dimond and Simonson hypothesized that the act of filmmaking was an authentic situation that acted to influence the filmmaker's attitudes.

Similar results have been reported in the literature for decades. Levonian's (1960, 1962, 1963) landmark study that incorporated the use of a preproduction survey of the target audience to determine their attitudinal positions towards India was summarized above. The results of this survey were used as input for the production of a persuasive film on India. This approach made the resulting motion picture about India more authentic and realistic to the audience, and this contributed to desired attitude changes.

Authenticity and realism were examined further by Croft, Stimpson, Ross, Bray, and Breglio (1969) and Donaldson (1976). Both studies reported that authentically presented situations were most effective in producing attitude changes toward intercollegiate athletics and the disabled. Booth and Miller (1974) and Winn and Everett

(1978) investigated the authenticity provided by pictures produced in color versus those produced in black and white. They reported a relationship between the use of color, authenticity, and attitude formation.

Authentic instruction, typically instruction anchored in technically stimulating media such as the Vanderbilt Group's Jasper series (Vanderbilt, 1990), has a positive attitudinal impact on learners. The assumption is that positive predispositions, developed during participation in authentic situations, orient students to actively pursue additional learning.

> Guideline #3: *Learners are positively affected when persuasive messages are encountered in mediated situations that are as authentic and credible as possible.*

Modern strategies such as situated learning are based, in part, on the concepts of the credibility and authenticity of instruction. A direct relationship exists between attitude about a situation and the individual's perception of the authenticity and relevance of the situation. For example, source credibility has been recognized as an important criteria for attitude change since the early 1950s. When mediated situations are planned, they will often be valued positively, and attitudinal positions advocated in the materials will be influential, if persuasive messages are delivered by a credible source or discovered in a credible situation. Kishler's (1950) classic study found that when the actor in a persuasive film was cast as a member of a highly credible occupational group, it was likely that the attitude changes advocated by the actor would be produced. Viewers considered the message to be authentic, so it influenced them.

A study by Carter (1990) supports this relationship between source credibility and attitude change. Results indicated that when subjects were told that the message was prepared by an expert, attitude changes tended to be more positive.

Physical attractiveness and celebrity status also contribute to source credibility. Maddux and Rogers (1980) used photographs of people with varying levels of physical attractiveness to identify the relationship between physical attractiveness and source credibility. The attractive source was evaluated as being more sociable, warm, outgoing, poised, and more credible. In a study by Mehta (1990), celebrities were rated significantly higher on source variables of trustworthiness, believability, and physical attractiveness and were found to be effective persuasive sources. This was especially true for field-dependent subjects.

Two studies reported that the use of social modeling was an effective means of promoting attitude change. Slide/tape and print materials using positive role models had a significant effect on student attitudes toward nontraditional careers (Savenye, 1990). Evans, Rozelle, Maxwell, Raines, Dill, Guthrie, Henderson, and Hill (1981) used students as real-world models in films created to deter smoking. Groups viewing the films considered their messages to be credible and authentic and exhibited less smoking behavior and indicated less intention to smoke.

These studies have looked at human sources of information delivered by media. However, one study in the literature examined the effects of credible and noncredible computer sources of information. Gahm (1986) found that persuasion increased as the authenticity of the computer message increased.

The content of media-based instructional situations is a critical variable in determining attitude formation and change. If information is presented authentically and intelligently (i.e., credibly), it is likely that it will be favorably received and will be persuasive.

34.7.2 Learner Involvement Guidelines

> Guideline #4: *Learners who are involved in a situation requiring their participation in the planning, production, or delivery of media-based instruction are likely to react favorably to the situation and to the message delivered by the media.*

Involving learners in the planning, production, and delivery of mediated lessons can be considered a form of cognitive apprenticeship (see 20.4). If learners participate in a situation they feel is realistic and not fabricated, they will generally react by indicating they have a positive attitude about it. Simsek (1993) investigated the issue of audience involvement by studying the effects of learner control in computer-based cooperative learning. A comparison was made between students exercising control over pacing and sequencing and students using software that controlled the pacing and sequencing. The students with control over the lesson had a more positive attitude toward the delivery system and the subject matter. Learner control as opposed to program control was found to promote better attitudes (see 33.5).

Video is traditionally a very passive instructional medium. When merged with computer technology, video allows the learner to become involved in the instruction. In other words, it becomes more real. Dalton and Hannafin (1986) found that interactive video instruction produced significant improvements in learner attitudes when compared with computer-based instruction and video alone.

Active involvement (see 12.3.1.1) in the learning situation has been examined as a component of many research studies. For example, Erickson (1956) found that students who actually produced a film on science concepts reacted more favorably toward instruction and toward science than did students who only watched science films. Coldevin (1975) involved students in message delivery through the use of various review and summarization techniques that were a part of the instructional sequence. It was found that a short review after the TV lesson subunits produced the most favorable attitude reports from students.

Simonson (1977) conducted an experiment in which students were convinced to make counter attitudinal videotapes without realizing that attitude change was the primary purpose of the activity. The process of involving subjects in making these videotapes was found to be successful in producing significant attitude changes in subjects. In these studies, learners were solving real-world problems. They

were learning by doing, and were often apprentices to more knowledgeable mentors.

It would seem that in the affective domain, the active learner perceives instruction and information more favorably than does the passive learner. Student involvement is an important technique for promoting desirable attitudinal outcomes.

Guideline #5: *Learners who experience purposeful emotional involvement or arousal during media-rich instructional situations are likely to change their attitudes in the direction advocated in the situation.*

Participating in an authentic event requires intellectual involvement that can elicit emotions in the learner. For this reason, the research seems to indicate that this guideline is extremely powerful. For example, the use of subliminal messages to arouse emotion and therefore affect attitude change was examined in two studies. In a pretest-posttest control group study on weight loss, videotapes were used that differed only in the inclusion of visual and aural subliminals. While the subliminal messages had no identifiable impact on weight loss, subjects who viewed the videotape with subliminal messages showed an improved attitude toward food and exercise (Treimer & Simonson, 1988).

Edwards (1990) used a series of 10 supraliminal and 10 subliminal slides in a study of affect-based and cognition-based attitude change. Subjects were aware of the cognitive manipulation, but not the affective manipulation (subliminal slides). Results indicated that emotion-arousing subliminal slides were effective in inducing affect-based attitude changes, and supraliminal knowledge, or information slides, were effective in inducing cognition-based attitude changes.

Janis and Feshbach (1953) presented a slide/audiotape program on the effects of poor dental hygiene to high school students. The intensity of a fear-arousing appeal in three versions of the presentation were varied to determine the most influential delivery technique. All three methods were successful in producing aroused, affective reactions in the students. However, it was found that a minimal fear-arousing appeal was most successful in modifying attitudes because the stronger versions left students in a state of tension that was not alleviated by the remedies offered during the slide show.

Janis and Feshbach concluded that strong, fear-producing appeals were not as effective in changing attitudes as were more moderate appeals, because the audience became motivated to ignore the importance of the threat to reduce the tension they felt. The more-frightening message was not as authentic, and therefore was not as effective. It was found that only those fear-provoking messages that were considered to be authentic influenced attitudes. The more dramatic and fearsome presentations were not considered to be realistic or authentic, and were less effective.

Rogers (1973) reported on a study that supported this position. Public-health films dealing with cigarette smoking, safe driving, and venereal disease were tested in three different studies. It was found that the more noxious a film was, the more fear was aroused in viewers. However, it was also reported that these fear-arousing films were most effective in changing attitudes when preventatives or statements of probability of exposure to the malady discussed in the film were included as part of the motion picture.

Another study addressing the relationship between fear-arousing videos and attitude change was conducted by Berry and Simonson (1983). Subjects viewed either a fear-provoking persuasive video or a fear-provoking video with remedies. The message was about smoking. Experimental treatments significantly influenced subjects' attitudes as compared to subjects in the control group, and the more authentic situations presented by the videos were considered to be the most effective at changing attitudes.

The studies supporting guideline #5 indicate also that viewers' participation in the learning process is important when attitudinal outcomes are desired. In these cases, involvement was emotional rather than behavioral. It would seem that learner involvement in a situation is a powerful technique if attitudinal outcomes are to be important consequences of instruction.

Guideline #6: *Learners who participate in situations where technology-based instructional situations are openly critiqued in an attitudinally appropriate way are likely to develop favorable attitudes toward the situations and toward the message.*

The learner who is actively involved in what is perceived as a real event is more likely to react in an attitudinally positive way to the situation and to instruction. Johnson (1989) found that the use of discussion questions following a mediated situation resulted in significant attitude changes toward careers with regard to learners' confidence in their ability to be successful.

Follow-up discussions, a powerful technique for promoting positive attitudes, were evaluated by several researchers (Howard, 1990). Follow-ups usually involved learners in an analysis or critique of the instructional situation and message presented. Allison (1966) found that significant attitude changes occurred only when postviewing discussions were held. Fay (1974) reported similar findings in a study that used follow-ups to a film on the problems of the handicapped and the need for barrier-free buildings. Attitudes toward continuing education were significantly altered after classroom teachers saw a film and participated in a discussion on the subject (Burrichter, 1968). These studies demonstrated the importance of learner involvement in authentic situations which, in these cases, were discussion activities. The researchers carefully constructed the learning situations to make sure the students felt that their opinions were important.

Lamb (1987) found that including social interaction in the form of postinstruction discussion was an effective instructional technique to promote changes in attitudes toward wearing seat belts. This study examined the effects of three learner involvement strategies incorporated into a persuasive, computer-based instruction lesson. The situations that included postinstruction discussions were found to be the most effective in promoting attitude change.

The study also found that the absence of emotional involvement by the learner toward the message was shown to be detrimental to attitude change. Students stated that they considered the discussion to be real (i.e., authentic), and that this was important to them.

These six guidelines can be used singly or in combination to design mediated instructional situations that are likely to change attitudes. However, it is hypothesized that there is likely to be a cumulative effect that will take place if more than one technique from each category is used. Certainly, one media design guideline and one learner involvement guideline should be considered as part of any persuasive instructional strategy (Fig. 34-2).

34.7.3 Summary

The "model of cumulative effect" is based on the principle that a persuasive message must be designed effectively. First, *new information* should be presented (guideline #1). Next, the message should be *realistic, relevant, and stimulating* (guideline #2). Finally, a persuasive message should be delivered in as *credible* a manner as possible (guideline #3).

The effectiveness of persuasive messages is improved if the target of the message, the learner, is involved actively, cognitively, and emotionally. First, learners who are involved in the *planning, production, or delivery* of persuasive messages are more likely to be influenced (guideline #4). *Purposefully emotional involvement* of the learner is an extremely powerful attitude change activity. The aroused learner is the involved learner (guideline #5). Finally, the use of *postinstruction activities* that relate to the intent of the persuasive message is extremely powerful and may produce attitude changes even if other guidelines are improperly or inadequately followed (guideline #6).

Certainly, these guidelines and the model of cumulative effect must now be offered to the researchers of the discipline for further validation. However, based on current evidence, it is safe to assume that attitudes of learners can be changed if mediated instructional events incorporate as many of the activities referred to in the guidelines as possible.

Attitudes are predispositions to respond, and media are primarily carriers of information. There is no best medium for attitude change. However, there probably are best situations involving media that will maximize the likelihood of developing desirable attitudes in learners. Critically applying the general guidelines listed above will promote the discovery of attitudinal positions by students that are likely to contribute to healthy, positive learning situations.

> *Companion none is like*
> *Unto the mind alone;*
> *For many have been harmed by speech,*
> *Through thinking, few or none.*
>
> *Of a Contented Mind,* 1557
> Sir Thomas Vaux

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