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Persuasion and computer-based instruction: the impact of various involvement strategies in a computer-based instruction lesson on the attitude change of college students toward the use of seat belts

Annette Smith Lamb

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Persuasion and computer-based instruction: The impact of various involvement strategies in a computer-based instruction lesson on the attitude change of college students toward the use of seat belts

Lamb, Annette Smith, Ph.D.

Iowa State University, 1987
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Persuasion and computer-based instruction:
The Impact of various involvement strategies
in a computer-based instruction lesson on the attitude change
of college students toward the use of seat belts

by

Annette Smith Lamb

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Department: Professional Studies in Education
Major: Education (Curriculum
and Instructional Technology)

Approved:

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Iowa State University
Ames, Iowa
1987
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INTRODUCTION

Historically, people have attempted to persuade one another. Whether the persuasive message involved a plea to the masses to "Save the Whales" or pressure on a friend to quit smoking, the basic goal has been the same. A person or group was attempting to change the attitudes and/or behaviors of another.

Many types of media have served as vehicles for the delivery of persuasive messages. For example, television commercials have attempted to convince viewers to buy Burger King's hamburgers instead of McDonalds' hamburgers. The hazards of drinking and driving have been the focus of many fear provoking films. Even music videos have become tools of persuasion for such issues as drug abuse and adult literacy.

Recently, a new form of media has emerged as having the potential to persuade. The computer presents new possibilities in the area of persuasion. No longer must media serve only as one-way information delivery devices. The computer is able to provide an environment for two-way interaction between the computer and the human user. This interaction may play an important role in producing desired attitude change.
Currently, limited numbers of computer programs have been produced with persuasion as their primary goal. Although some persuasive, computer-based instruction on topics, such as seat belt safety, smoking, drinking and driving, and nutrition have been marketed, very little research could be found to support the effectiveness of these packages or how they should be used in educational settings.

This chapter will introduce the need for developing a research base on the use of the computer as a tool for the delivery of persuasive messages. After the problem has been established, the purpose of the study will be addressed. Finally, an examination of the goals and research questions will conclude the chapter.

The Problem

Our independence is becoming so strong that persuasive communication is increasingly becoming the only acceptable means of social control. We must all come to a better understanding of the use and effects of persuasion. (Bettinghaus, 1980, p. 3)

Although most people are unaware of it's influence, persuasion plays an important role in all aspects of our lives. According to Fishbein and Ajzen (1975), every day people are being "exposed to persuasive communications designed to influence their
beliefs, attitudes, intentions, and behaviors" (p. 451). The health attitudes topic provides a good example of how media have been used to promote attitude change. For example, on any given day an individual might be confronted with many persuasive messages concerning health, such as commercials on motorcycle helmet use, the use of nutritional labeling at the supermarket, and newspaper ads stressing the importance of joining health clubs.

An understanding of how these persuasive messages affect individuals is very important. Zimbardo, Ebbersen, and Maslach (1977, p. 1) have stated that "it is impossible to overestimate the extent to which you are influenced daily to be the kind of person other people want you to be". Hovland, Janis, and Kelley (1953), have identified three major areas of importance related to the effectiveness of persuasive communications: (a) the source, (b) the message, and (c) the audience. The source is related to the likability, status, expertise, and trustworthiness of the conveyor of the persuasive message. The sidedness, type of appeal used, and content of the persuasive message also influences its acceptance. Finally, individual differences in the audience and the strategies used to involve the audience with the persuasive message have also been found to be important in promoting attitude change. These interrelated components of the communication process have
attempted to address the classical question in the study of persuasive communication, "who says what to whom with what effect?"

**Persuasion and Media**

Winett (1986) advocated the use of media to convey prosocial persuasive messages. According to Winett, media are capable of promoting both negative and positive values and behaviors. There is a need to study effective and ineffective approaches to attitude change and to understand what conditions will lead to prosocial behaviors (Winett, 1986).

As early as 1931, researchers began examining the use of media as tools for promoting attitude change through persuasion. Thurstone (1931) used films to change the attitudes of students about Chinese people and their culture. Since that time, considerable research has been conducted in the area of attitude change and the use of persuasive messages (Simonson, 1979). Little research, however, could be identified that examined the elements of effective persuasive messages delivered via a computer.
Computers are rapidly becoming an integral part of people's lives. Increasingly, people are using computers not only in their workplace, but also at home. It is essential that researchers examine how the computer can be used for the delivery of persuasive messages.

The role of computers for the delivery of persuasive messages can be viewed as distinct from the use of other forms of media. For example, television, like many other forms of media, is a passive delivery system. Computer use, on the other hand, is active. According to Rice (1984), this distinction can be seen in the terminology associated with the two forms of media. People sitting in front of a television are referred to as "viewers", while those sitting in front of a computer are "users". This active involvement may play an important role in persuasion. Rice (1984) has stated that future research in the area of computer-based instruction should move away from the study of individual software packages, and focus instead on the specific features and capabilities of the computer.

In a review of the literature on computer-based education (Waugh & Currier, 1986), it was concluded that student achievement and attitudes were generally improved as a result of exposure to computer-based education programs and that this
improvement was accomplished in less time than traditional instruction. A need for additional research to confirm and extend the knowledge in this area was also cited. Specifically, Waugh and Currier noted the need to concentrate on four key issues. These were the mode of computer use, the nature of computer involvement, student characteristics, and the design of instructional materials.

**Learner Involvement Strategies and Persuasion**

The computer presents a unique opportunity to examine learner involvement strategies as a contribution to effective persuasive messages. For example, the computer, unlike other forms of media, is an "interactive medium" that is capable of permitting a user to be actively involved with the program. This active involvement in learning may play an important role in persuasion and attitude change. According to Bettinghaus (1980, p. 33), "active participation in a project is perhaps the best method of facilitating the development of favorable responses toward a topic".

A number of researchers have concluded that active, rather than passive, participation by an individual promotes attitude change (Applebaum & Anatol, 1974; Fishbein & Ajzen, 1975; Hovland, Janis & Kelley, 1953; Karlins & Abelson, 1970). In
addition, Applebaum and Anatol (1974) concluded that face-to-face communication is more effective than communication delivered by mass media. According to Simonson (1983), "learner involvement is a powerful technique for the continuing educator to use if attitudinal outcomes are to be an important consequence of instruction" (p. 34). Simonson (1983) developed a set of six guidelines for use in the design of mediated persuasive messages. Three of these guidelines are related directly to the importance of learner involvement.

Zimbardo (1960) emphasized that involvement is created by setting up specific conditions for learning. Based on Simonson's guidelines related to involvement, three major involvement strategies can be identified, including active participation, emotional involvement, and social interaction. Each relates to a different aspect of learner involvement. Active participation relates to the extent that a learner is intellectually and/or physically active in the delivery of the persuasive message. The level of arousal felt by the learner during the delivery of the message would relate to the emotional involvement of the learner. Finally, the social environment where the message is presented and reinforced affects the level of social interaction. This social environment includes elements such as the physical arrangement of the room,
and the opportunity for discussion. Each of these involvement strategies may influence attitude change.

Involvement Strategies and Persuasive. CBI

Since persuasive communication has always been viewed as a major strategy of influencing people, it has held the interest of scholars and practitioners. (Fishbein & Ajzen, 1975, p. 457)

According to Roloff and Miller (1980), persuasion is an important area of study because it is a critical process in our society. With the ever-increasing use of the computer, it is important to study how the computer can be used as a tool for promoting attitude change. Very little research could be identified in the literature that dealt with the emerging area of persuasive messages delivered via the computer. There is a need to study the use of computers for attitude change. In order to make the best use of the computer as a tool for the delivery of persuasive messages, specific characteristics of the computer learning environment, such as student involvement with instruction, need to be studied. Active participation, emotional involvement, and social interaction during instruction are all learner involvement strategies that need to be studied in conjunction with the study of persuasive.
The purpose of this study was to examine three learner involvement strategies that were incorporated into a persuasive, computer-based instruction lesson, and to determine whether all, or some combination of these strategies, were needed to produce changes in knowledge, attitude, and behavior. Research and theory from a number of areas will be examined in order to meet this goal. These areas include, information about persuasion, the design and use of computer-based instruction, and the need for student involvement in learning. In addition, a synthesis of these three areas will be provided. It is hoped that this study will serve as a foundation for research in the combined areas of persuasion, computer-based instruction and learner involvement.

Simonson (1982) has developed a series of guidelines for the planning, production, and delivery of persuasive, mediated instruction. These research-based guidelines were designed to serve as recommendations for the development of mediated instruction when attitude change was the primary goal. Three of these guidelines related to active involvement of the learner will be examined in this study. According to Simonson (1983),
there is no best medium for producing attitudinal outcomes, but there is probably a best approach for maximizing desirable outcomes in a specific situation. (p. 29)

This study identified a number of approaches for the use of persuasive, computer-based instruction. In addition, it was hoped that this research would serve as validation of Simonson's guidelines related to learner involvement and that it would also serve as a guide for computer software developers interested in designing effective, persuasive, computer-based instruction.

This researcher located a persuasive, computer-based instruction program that was both well-designed, and commercially produced. The persuasive, computer-based instruction lesson chosen for use in this study was one that promoted the use of seat belts. Although many topics could have been selected for the examination of persuasive messages delivered via the computer, this computer program was chosen because it fit criteria established in the areas of content, persuasive message design, computer program design, student involvement, and technical support. In addition, the topic was useful in the area of persuasion because of its timeliness, its importance in saving lives, and its lack of ethical problems often associated with persuading human subjects.
Seat belts save lives and people need to be persuaded that they are important, lifesaving tools that should be used. Although mandatory seat belt laws have had some success in increasing seat belt use, other measures are needed to convince people to wear them.

The Goal

The goal of this study was to examine three learner involvement strategies that were incorporated into a persuasive, computer-based instruction lesson, and to determine whether all, or some combination of these strategies, were needed to produce changes in knowledge, attitude, and behavior. In order to make this determination, a number research questions were addressed.

A) Is there a difference in knowledge about seat belts for learners who were exposed to different learner involvement strategies?

B) Is there a difference in attitudes about seat belts for learners who were exposed to different learner involvement strategies?

C) Are there other factors that may have affected the learners who were exposed to different learner involvement strategies?
Summary

Since the beginning of time, people have attempted to persuade one another. During a single day, a person is bombarded by hundreds of persuasive messages that are delivered through such media as television, radio, newspapers, billboards, and pamphlets. During the last fifty years, researchers have studied how media can be used as a tool for the delivery of persuasive messages. As the computer becomes an increasingly integrated part of our lives, it is essential that researchers examine how this tool can best be used for the delivery of persuasive messages.

The computer possesses some distinct characteristics that are difficult to duplicate using other forms of media. These characteristics may be used to produce increased levels of attitude change. This study examined how one of these characteristics, the type of learner involvement strategies used with a persuasive, computer-based lesson affected student knowledge, attitudes, and behaviors.
LITERATURE REVIEW

This chapter will focus on four major topics that provide a foundation for use of the computer as a tool for the delivery of persuasive messages. These areas are (1) persuasion, (2) computer-based instruction, (3) involvement strategies, and (4) persuasive, computer-based instruction.

A discussion of persuasion will begin the chapter. This section will examine definitions and theories related to persuasion, and will discuss alternative approaches to the development of effective persuasive messages. The next section will examine computer-based instruction. The foundations and research related to computer-based instruction will be discussed, in addition to research dealing with the design of effective computer-based instruction.

The third section of this chapter will examine the importance of active student involvement in learning and persuasion. Specific types of involvement strategies, including active participation, emotional involvement, and social interaction will be emphasized. Finally, the information from these areas will be synthesized. In addition, seat belt safety, the specific content area chosen for the persuasive message in this study, will be examined. A summary will conclude the chapter.
Persuasion

The review of literature on persuasion was divided into several sections. These sections are (1) definitions of persuasion, (2) the attitude-behavior link, (3) theories of attitude change, (4) approaches to the design of persuasive messages, (5) persuasion and media, (6) media alternatives for the delivery of persuasive messages, and (7) summary.

A Definition of Persuasion

Many definitions of persuasion can be found in the literature. The following definition of persuasion was chosen for use in this study because it seemed the most appropriate and most comprehensive. Bettinghaus has defined persuasion as

a conscious attempt by one individual to change the attitudes, beliefs, or behaviors of another individual or group of individuals through the transmission of some message. (Bettinghaus, 1980, p. 4)

Based on this definition, persuasion can be said to be an activity that involves both a persuader and a persuadee. Persuasion differs from other types of communication in that it involves intent. For example, unlike an instructional situation, a persuasive situation is used when an individual possesses an initial stand on an issue. In addition to requiring attention and comprehension on the part of
the learner, a certain amount of yielding must take place on the part of the persuadee (Campbell, 1963). The persuader puts forth conscious effort to influence the attitudes and behaviors of the other person. According to Roloff and Miller (1980, p. 11), "persuasive attempts fall short of blatant coercion: persuasion, as typically conceived of, is not directly coercive". Coercion may take the form of guns or economic sanctions, while persuasion relies on the power of verbal and nonverbal symbols to trigger the emotions of the persuadee.

Definitions and theories of persuasion have been developed and studied throughout history. According to Brembeck and Howell (1976, p. 1),

Persuasion has been and will continue to be the chief instrument in the conduct of human affairs. Today our society-as well as the world in general-faces the greatest density and intensity of competing persuasions in man's history. To live effectively in such an environment the study of persuasion is not only necessary, but a requisite for all who produce and use persuasion in daily life.

The formal study and use of persuasion has been traced to the Greek philosopher, Aristotle. In ancient Greece, persuasion was used as a means of achieving power. Aristotle (1924) noted that persuasion could be based on a reputation for credibility (ethos), in addition to the use of logical argument (logos) and emotion-stirring
appeals (pathos). In addition, the Romans stressed the importance of message structure and arguments in persuasive speaking. These early Greek and Roman philosophers emphasized the important role of the source of the message including the persuader's skill at persuading. Since that time, persuasion theorists have focused their attention on specific mechanisms and techniques the persuader can use to produce attitude change (Brembeck & Howell, 1976). With the expanded use of mass media in the 1940s and 1950s, communication researchers began to stress the importance of the receiver of the communication, in addition to the source and the structure of the persuasive message. Specific research areas included audience motivation and participation, as well as the use of media for the delivery of persuasive messages.

Although the study of persuasion was not popular during the 1960s, a renewed interest in it has emerged during the last ten years. Larson and Sanders (1975) highlighted three propositions implicit in persuasion research:

1) Persuasion brings about changes in people's attitudes.
2) Attitudes are constraints on behavior, or predispositions to respond.
3) Persuasion brings about changes in what people will (or will not) do, because it affects attitudes which in turn affect behavior. (p. 178)
Persuasion is only one of a number of factors that may affect attitudes, including genetic factors, physiological factors, direct experience, and institutions. According to McGuire (1969), many persuasive situations can lead to attitude change. These include situations involving suggestions or conformity, group discussion situations, persuasive messages, and indoctrination.

**The Attitude-Behavior Link**

"By means of changing the attitudes of individuals it is possible to influence their behavior, to improve social relations, or to produce social change. Thus, if it is possible to influence attitudes toward products, politicians, or minority groups, changes in consumer behavior, voting decisions, or interracial relations may follow" (Fishbein & Ajzen, 1975, p. 387).

The literature contains considerable discussion of the link between attitudes and behavior. In order to examine this link, it is necessary to define the two terms. Behavior has been defined by Fishbein and Ajzen (1975) as "an observable act". Fishbein and Ajzen (1975) have stressed that behaviors are determined by behavioral intentions, which are functions of attitudes toward the acts in question.

Although many different definitions for attitude could be found in the literature, an early, and still widely accepted definition was developed by Allport (1935, p. 810). Attitude was defined 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.

Simonson (1982) has noted that,

while attitudes are latent and not directly observable in themselves, they do act to organize, or to provide direction to, actions and behaviors that are observable. (p. 2)

Attitudes have three components: affective, cognitive, and behavioral (Zimbardo et al., 1977).

The affective component consists of a person's evaluation of, liking of, or emotional response to some object or person. The cognitive component is conceptualized as a person's beliefs about, or factual knowledge of the object or person. The behavioral component involves the person's overt behavior directed toward the object or person. (p. 20)

Based on these three elements of attitudes, it is clear to many that knowledge, attitudes, and behaviors are all linked. Research on the relationship between attitudes and behavior, however, has been found to be conflicting. According to Ritchey (1981), even though research findings concerning attitudes and behavior are inconsistent, there is evidence that there is some sort of relationship. Although it appears that an one-to-one, or direct relationship between attitudes and behavior does not exist, there is a less distinct link between the two (Zimbardo et al., 1977).
There are a number of reasons why the relationship between attitudes and behavior is not always strong. Attitudes and behaviors do not work in isolation. For example, situational constraints sometimes make it difficult to link the two variables (McGuire, 1981). A number of attitudes may affect a single behavior. Only when the link between attitude and behavior is direct can predictions be made. For example, in a review of the literature, Fishbein and Ajzen (1975) found that a subject's attitudes toward a behavior, rather than an object, was more predictive.

The best method of approaching this attitude-behavior link may involve examining trends in entire populations rather than individuals. According to Zimbardo et al. (1977),

> even though we cannot predict the behavior of single individuals, we should be able to predict that people (in general) will change their behavior if we can change their attitudes of greatest relevance to the behavior in question. (p. 52)

Some researchers have concluded that more is needed than a persuasive message to produce attitude change. Situational conditions may play an important role in attitude change for the population as a whole. For example, Winkler and Winett (1982) noted that some type of supportive context may be needed to produce behavior change, such as public interest, legal levers, or
economic contingencies. For example, in the past, mass media campaigns have been ineffective in producing changes in public attitudes toward the hazards of drugs. However, public interest has been sparked recently through the efforts of popular individuals, tougher drug laws and increased political pressure, in addition to the traditional use of mass media campaigns.

A number of recent studies examining persuasion have reported significant changes in knowledge, attitudes, and behaviors of their subjects. Two studies involving national television programs have been successful in producing changes in attitudes and behaviors (Keegan, 1982; Mielke & Swinehart, 1976).

Over Easy, a public television program developed in 1977, was targeted at an audience over 55 years of age. The goals of the program were to reverse negative attitudes about aging, inform viewers of services for the aging, and encourage viewers to initiate self-help behaviors. The basic objectives of the program were met. Significant positive increases in cognitive, affective, and behavioral measures toward these constructs were found (Keegan, 1982).

In a study conducted in the early 1970s, Mielke and Swinehart (1976) found that the television program Feeling Good was effective at changing simple behaviors toward health practices including seeking health-related information and participating in
"early-detection" cancer screening examinations. However, significant changes were not found for more complex health areas such as dietary planning. The researchers concluded that television may only be useful for changing simple health-related behaviors.

A television program relating to home energy conservation, titled Summer Breeze, was the focus of a 1985 study (Winett et al., 1985). The program, intended to inform and motivate consumers to conserve energy, produced significant, positive changes in attitudes and behaviors related to energy conservation after only one 20 minute episode. The program modeled energy savings strategies and the benefits of using these strategies. Households viewing the program reduced their overall electricity use by eleven per cent for a period of two months following the program.

A Theory of Attitude Change

Although a number of theories can be identified in the literature concerning persuasion and attitude change, Hovland's Reinforcement Theory is of particular interest to the present study. Hovland's Reinforcement Theory was developed by Carl Hovland and associates as part of the Yale Communication Research Program.
The theory set forth by Hovland, Janis, and Kelley (1953) drew from principles of learning and social behavior. The researchers maintained that merely memorizing or learning an answer was not enough to produce attitude change. Acceptance of the message was contingent upon incentives, such as rewards or punishments, or possibly arguments or reasons for supporting the message.

The model developed at Yale involved a three-step process of attitude change. Included were the concepts of the learner's attention, comprehension, and acceptance of the message. The first step in Hovland's model involved the importance of audience attention. It was found that the type of media chosen to deliver the persuasive message played an important role in audience attention. Based on the Reinforcement Theory, it could be assumed that the numbers and types of cues embedded in the mediated instruction would affect audience attention. Increased attention would be likely to positively influence attitudes. Such elements as visual appearance, sound, color, and motion were also found to be important in the development of persuasive messages because they were found to cause an increase in audience attention.

According to Hovland's model, in addition to attending to the message, the audience must also comprehend the message. In
order to do this, the learner must be able to assimilate any new information that is presented. A well-organized, easy-to-follow message has been found to be most effective at promoting attitude change. Hovland contended that comprehension could be assumed to operate the same in persuasion as in learning. For example, a student must fully understand the concept being introduced in order for learning or attitude change to occur.

The final step in the Reinforcement Theory involved acceptance of the message. At this point, the differences between learning and persuasion need to be clearly identified. Acceptance is often assumed in a learning environment such as a classroom. For example, because of the status of the teacher, students often accept information without question. In addition, because grading is often associated with acceptance in a learning environment, for the most part, students automatically comply to the teacher's wishes. In a persuasive environment, however, acceptance is often dependent on motivation. In some cases, acceptance may be contingent on some type of incentive, such as monetary reward or social pressure.

Hovland, Janis, and Kelley (1953) identified three learner expectations that may affect the acceptance of a message. First is the expectation of being right or wrong. The use of a credible
source is important for the acceptance of a message because credible people are often perceived as being right. For example, a person would be more likely to accept the surgeon general's position about the hazards of smoking than the position of an army general.

The second expectation involves the presence of manipulative intent. This deals with whether the receiver of the communication views the source as trustworthy. In a 1951 study by Hovland and Weiss, it was found that people were more likely to accept an article that appeared to be from an American published journal than a Soviet published journal. The subjects viewed the American journal with more trust.

Social approval or disapproval is the final expectation. Conclusions advocated by prestigious individuals, or by persons the viewer identifies with, would be perceived favorably. For example, several of the major "supplemental medical insurance" companies hire famous movie stars and athletics to advertise for their insurance. These companies hope that the general public will select their plan because they wish to be associated with the famous individual. Since Pat Boone is the representative for a particular insurance company, many people assume that the insurance is good and wholesome, like its spokesperson.
Alternative Approaches to Persuasive Messages

Several alternative approaches have been offered for the development of persuasive messages. McGuire (1981) has developed a model for communication and information technology for this purpose. This model has been found to be useful in examining different aspects of the communication process as they relate to changes in the persuadee. Two sets of variables have been identified: independent and dependent. Independent variables include source, message, medium, and audience. These are the elements that can be varied or manipulated.

The dependent variables are various aspects of the persuasion process that can occur in response to the communication. These variables can be viewed as the effects of the communication. Exposure, attending, liking, comprehending, developing skills, yielding (attitude change), memorizing, information search and retrieval, decision-making, reinforced behavior and maintenance are all variables of this type.

Depending on the goal of the communicator, emphasis may be placed on one or more of the dependent variables by manipulating the independent variables. In most persuasive situations, the communicator would place most emphasis on yielding or acceptance of a message. This is an important
consideration because a message may be quite effective at gaining attention, yet be ineffective in producing changes in behavior. Winett (1986) has argued that in order for a communication to be effective, a number of elements must be attended to, including receiver characteristics, message content and quality, delivery channel, type of change needed, constraints to change, and the extent of exposure.

In order to study the elements involved in the structure and delivery of persuasive messages, the following topics will be examined: source variables, message structure, use of fear appeals, use of emotional appeals, involvement strategies, and the importance of the message channel.

Source Variables

The attitude of the audience toward the communicator or the persuader is an important factor in the effectiveness of a communication. According to Kelman (1961), three areas can be identified as source variables: source credibility, source attractiveness, and source power. Source credibility, as noted earlier in this section, refers to whether the persuadee views the source of the message as being knowledgeable about the content. Source attractiveness relates to the likability of the source.
According to a study by McGuire (1969), the more the subject liked the source of a persuasive message, the more the subject was persuaded. For example, rarely does a company select an "ugly nobody" to present a product. In advertising, a great deal of time and effort is spent identifying the type of individual that the potential buyer will like. For example, attractive women are used to advertise cosmetics and macho men are used to advertise beer. Source power involves the about of power and influence the persuader is capable of exerting. For example, individuals tend to side with the "winning team". This is evident immediately after political elections when people listen closely to the new leader and abandon the loser. Those individuals who are viewed by the persuadee as having power and influence will be followed.

**Message Structure**

According to Burgoon and Bettinghaus (1980), when designing persuasive messages, structured messages are preferred to unstructured messages. The specific structure of the message may relate to its ability to persuade. Persuasive messages may be one or two-sided. Messages that are one-sided deal with only one aspect of an issue. For example, pro-life advocates might deal with only those issues related to life at conception and the rights of the
unborn. They would not discuss the needs or rights of the pregnant woman.

The two-sided message, on the other hand, would place emphasis on both sides of the argument. For example, an anti-nuclear power plant demonstrator would cite the hazards of the nuclear power plant, but might also discuss the importance of an adequate power supply. In addition, this demonstrator might also cite evidence that refutes evidence provided for one-side of the argument. For example, the demonstrator might state that while electrical power is desired, conservation would be a better alternative.

Bettinghaus (1980) summarized the research in this area with the following statements:

1. Two-sided messages seem to be preferable for audiences with higher educational levels, when the audience initially disagrees with the communicator's position, or when it is possible the audience will be exposed to opposing views.
2. One-sided messages are more effective when the receiver is already in agreement with the source, provided that the receiver is not likely to be exposed to later opposing messages.
3. Prior attitude and commitment may interact with sidedness, attitude and tending to cover up the potential effects of message sidedness. (p. 143)

Some researchers have argued that the primacy or recency approach should be used when considering the order of messages.
This approach relates to whether the climax of the message should occur near the beginning or end of the message. Rosnow and Robinson (1967) have argued that "order effects", such as primacy or recency, are not always the most important factor to consider in the development of persuasive messages. Other factors, such as source variables and type of appeal have been found to be more important considerations.

Use of Fear Appeals

Considerable research has been conducted on the use of fear appeals in persuasive messages. Fear involves the anticipation of misfortune or pain, while fear appeals attempt to frighten individuals into thinking of acting a certain way. Some of the earliest studies in this area were conducted by Janis and Feshbach (1953). Their research on student reactions to films on tooth decay suggested that high levels of fear appeal can produce an avoidance reaction. The more intense fear appeals seemed to produce higher anxiety in students resulting in lack of attention to the film. Mild levels of fear appeal were found most effective in changing attitudes toward tooth brushing.

Rogers (1973) also studied the impact of public health films. It was found that the amount of fear aroused in the subjects was
related to the noxiousness of the film. The fear appeals were most effective in producing attitude change when the probability of exposure to the fear arousing condition was high and when effective preventatives were presented.

Recently, Kohn, Goodstadt and Cook (1982) conducted a study examining the effectiveness of fear appeals in messages about drinking and driving. It was found that threatening films physically upset many subjects in addition to causing fear. High and low threat films actually evoked more permissive attitudes toward impaired driving than the attitudes found in the control group.

Fear appeals relating to the hazards of smoking were also found to be effective in producing attitude change. Berry and Simonson (1983) found that filmed fear appeals containing fear alleviation techniques were effective in changing students' attitudes toward smoking.

Other researchers have broadened the scope of their studies of fear appeals to include other strategies. For example, Hewgill and Miller (1965) concluded that when a highly credible source was used, high levels of fear appeal were successful. In a recent study by Leventhal, Safer and Panagis (1983), it was suggested again that strong fear tactics were generally ineffective in promoting behavior change.
Use of Emotional Appeals

As early as 1936, researchers noted the importance of emotional appeals in promoting attitude change. Hartmann (1936) found that pamphlets using emotional appeals were more effective at soliciting votes for Socialist candidates than factual appeals. Emotional appeals can take many forms (Bettinghaus, 1980). Highly affective language such as name calling and powerful statements elicit strong, emotional responses. For example, pro-life groups often use terms such as "murders" and "criminals" to describe doctors associated with abortions. The association of proposed ideas in conjunction with popular or unpopular ideas is another type of emotional appeal. The use of rock stars to convey the "Don't Do Drugs" message stresses this type of appeal.

Appeals may also take the form of visuals, such as the pictures of starving children used by the Save the Children organization, and the photographs of the mistreated animals used by the Humane Society. In the same way, happy, healthy, and attractive actors are often selected to advertise products because they will convey positive, nonverbal cues to the audience related to the appeal of the product. Because each individual reacts differently to emotional appeals, it is difficult to advocate the use of emotional appeals in specific situations.
Humor has been identified as an important type of emotional appeal. Political campaigns and commercial product sales have effectively used humor as a key element within persuasive messages. Brembeck and Howell (1976) noted that appeals to joy or delight are useful in persuading people to accept recommended social and personal goals. For example, humor and laughter has been used to reduce frustrating or tense situations, and can disarm an antagonistic receiver.

According to Applebaum and Anatol (1974), humor acts as a distractor. Viewers initially opposed to a message position are more persuaded by a humorous than a serious message. Based on a review of the research in this area, Applebaum and Anatol also concluded that individuals possessing neutral or favorable positions would be equally persuaded by messages containing humorous or serious messages.

As with the other types of message structures and appeals, strategies incorporating a combination of elements may be most effective. For example, Markiewicz (1972) found that humorous sources were rated more trustworthy than serious sources. As a result, the most effective persuasive messages contained two elements: humor and source credibility.
Involvement Strategies

Involvement and active participation strategies should be given serious consideration when persuasive messages are designed and when persuasive environments are developed. Various involvement strategies will be discussed in later in this chapter.

Message Channels

The channel chosen for conveying the message plays an important role in persuasion. A number of studies have compared different media types that can be used for the delivery of persuasive messages. The next part of the persuasion section of this chapter will examine the literature in the area of media for attitude change. In addition, it will examine guidelines for the development of mediated, persuasive messages.

Persuasion and Media

Rosnow and Robinson (1967) noted that the choice of a medium for persuasion should be based on the probability that the message will be attended to, understood, accepted, and retained. It should also be able to influence affect, cognition, and/or action-type behavior. A number of studies have examined the use of persuasive messages in media to promote attitude change.
Simonson (1979) proposed six guidelines for the planning, production, or use of persuasive media based on a review of over two hundred research studies on instructional media, and attitude formation and change. According to Simonson (1982),

these guidelines were an attempt to translate general theoretical information and specific research results into a series of procedures that could be reliably applied in the message design process. (p. 7)

The six guidelines are as follows:

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 guided post-instruction 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 the mediated message.
Many school curricula have attempted to change attitudes through programs designed to produce attitude change using persuasive messages. Only a few, however, have formulated and evaluated their programs based on established guidelines, such as those proposed by Simonson.

**Media Alternatives for Persuasive Messages**

Generally, it appears that media do not affect learning in and of themselves. Rather, some particular qualities of media may affect particular cognitions that are relevant for the learning of the knowledge or skill required by students with specific aptitude levels when learning some task. (Clark & Salomon, 1986, p. 474)

Based on reviews of over 1000 studies, Schramm (1977) also concluded that there were no differences in learning outcomes between media and traditional instruction. However, Clark and Salomon (1986) stated that there may be unique characteristics of some media types that make them powerful and cost-effective in specific learning situations.

Schramm (1977) provided a framework for the use of media in communication. Schramm described the need to examine the Task Vector, the Media Vector, and the Cost Vector. The task vector was defined as a specific analysis of the task to be completed. The media vector and cost vectors involved examining
the best media for the job, and the cost-effectiveness of each media type.

Researchers have found that only specific, relatively unique features of a medium make a difference in learning. For example, in many ways a slide/tape presentation and a textbook assignment would produce similar learning outcomes. However, there are some features of a medium that make it more effective than others for delivering specific types of instruction. For example, video and film allow the option of showing motion or zooming in on specific aspects of a visual. The computer allows an interactive environment that is difficult to produce using other types of media. Some of these specific, media-type features need to be examined more closely (Salomon & Gardner, 1986).

Hawkins et al. (1985, p. 244) identified an alternative to traditional educational media for promoting knowledge, attitude, and behavior change.

...(T)he problem is to find media or strategies (or both) that allows the economies of scale and expert knowledge traditionally part of mass communication while simultaneously allowing individuals to get information when they want it, translated into individualized responses, and in forms that are easy and convenient to use...we think that interactive computer programs may provide an answer.

Specific characteristics of the computer may provide a unique environment for promoting attitude change. The computer
possesses some characteristics that may be difficult or expensive to duplicate using other media types. For example, the computer is able to manipulate and apply input entered by the student. In this way the student is able to interact with the computer as a student might interact with a teacher. The computer also affords a convenient, consistent, and novel presentation of materials. According to Hawkins et al. (1985), the back-and-forth exchange between the computer program and user provides for a more active and alert student than with more passive mass communication techniques.

Researchers are beginning to examine the importance of interactive learning environments. For example, Levenson, Morrow and Signer (1985) compared noninteractive and interactive video instruction to determine their affect on knowledge and attitudes toward smokeless tobacco. The treatment groups consisted of students viewing a videotape in a classroom setting, viewing a videotape individually, or viewing the videotape as part of an interactive lesson.

It was found that the students in the interactive video group had greater changes in attitude and behavior than did students in the classroom setting or the control group. The interactive video group was also more willing to promote cessation of use of
smokeless tobacco. It was found that 69.1 percent of the students using the interactive video would suggest that users stop the practice of chewing smokeless tobacco. Also, learner satisfaction with the interactive video lesson was high. Many of the gains attained by learners resulting from the use of the interactive video appeared to be related to the system's capability to question the learner and provide appropriate feedback and/or remediation. The interactive format allowed the learner to practice using the information and to rehearse taking various positions regarding smokeless tobacco.

According to Levenson, Morrow and Signer (1985, p. 194), this type of interactive environment provided opportunities for the following to occur:

1. to create an instructional program with a variety of options that meet the diversified needs and learning patterns of individual participants and provide immediate feedback in a manner tailored to particular individuals.
2. to react to a wide variety of possible learner responses evaluating complex performances, and coaching the learner through judgemental and even psychomotor progressions.
3. to provide actual performance opportunities through realistic life-like simulations, observations, and development of decision-making progressions.
4. to manage lessons and track learner progress through computer documentation of responses.
Summary

Since the time of ancient Greece, people have been interested in the study of persuasion. Although many definitions of persuasion have been developed, the following current and comprehensive definition will be used in this study. Persuasion is a conscious attempt by one individual to change the attitudes, beliefs, or behaviors of another individual or group of individuals through the transmission of some message. (Bettinghaus, 1980, p. 4)

Although research on the relationship of knowledge, attitudes, and behaviors has been conflicting, there is evidence that some sort of link exists.

The theory of persuasion set forth by Hovland, Janis, and Kelley (1953) served as a foundation for this study. The model included a three-step process of attitude change, including the learner's attention, comprehension, and acceptance of the persuasive message. A number of researchers have examined the structure and delivery of persuasive messages including elements, such as source variables, message structure, use of fear appeals, use of emotional appeals, involvement strategies, and the importance of the message channel.
Computer-based Instruction

This section of the literature review will examine computer-based instruction. First, definitions of computer-based instruction will be discussed. Next, the theoretical foundations of computer-based instruction will be addressed. A review of the elements of effective computer-based instruction will follow. Computer anxiety will then be discussed. The research in computer-based instruction will be examined, followed by a summary of the section.

Definitions of Computer-based Instruction

The computer can play a number of roles in education. Taylor (1980) described three roles for the computer in the schools: tutee, tool, and tutor. First, the computer may be used as a tutee. In this role, the student teaches the computer. The computer serves as a vehicle for problem-solving and thinking. The computer may also be used as a tool for students to use. For example, writing and data manipulation can be simplified through the use of the computer as a tool. Finally, the computer can be viewed as a tutor. The role of the computer as a tutor will be the focus of this study.

Computers have been used extensively for instruction since the early 1960s. A number of terms have been used to describe
this use of the computer for teaching, including computer-assisted instruction (CAI), computer-based instruction (CBI), computer-assisted learning (CAL), and computer-learning environments (CLE). Regardless of the label, the notion is that of the computer being placed in an instructional role.

Many definitions could be found in the literature regarding the instructional role of the computer. The definition developed by Wright and Forcier (1985) was selected because it was a complete, yet concise description of the computer-student learning environment. Wright and Forcier (1985) defined computer-assisted instruction as a "learning environment characterized by instructional interaction between a computer and a student" (p. 96). The terms CAI and CBI are often used interchangeably, however the term "computer-based instruction" will be used in this study.

The Foundations of Computer-based Instruction

The foundations of computer-based instruction can be identified in the research on programmed instruction, as well as research in media, such as film and slides. Gagne (1974) emphasized that the computer itself is not a medium for instruction, rather, it employs a combination of features from
several different media for instructional delivery.

According to Gagne (1974, p. 7), "the computer integrates the activities of a display component, a response component, and a feedback component of instruction". Each of these components is important when examining the potential use of the computer. It is Gagne's contention that the characteristics of the display portion of a computer system would be similar to those of other media that employ displays. For example, reading of text on a screen would be similar to the reading and learning from text in a book. In the same way, viewing a graphic illustration on the computer would be similar in many respects to viewing an illustration on film.

The response aspects of a computer system could be compared to the questioning used in film or programmed instruction. As a method of review, some films require students to respond to questions during the film. In the same way, throughout the programmed instruction lesson, the student is asked to respond to questions. Based on the response, the student is branched to a particular part of the lesson.

According to Gagne (1974), the outstanding aspect of the computer system is its ability to provide differential feedback in order to provide for individual needs. For example, a computer program, providing practice for a student in the area of math, may
contain contingencies for multiple responses. Based on the management system of the computer program, it may provide remediation for students with continuing problems, provide "hints" for incorrect answers, or provide a "happy face" graphic for correct answers. At a more complex level, the computer might diagnose a specific problem, such as multiplying by 3s or dividing two digit numbers. The computer would then provide the individual student with feedback regarding the nature of the difficulty and prescribe remediation in the form of a tutorial and addition practice problems.

The theoretical underpinning of computer-based instruction can be identified in behavioral psychology. The "Law of Effect" developed by Thorndike is the basis for much of the work in this area. The "Law of Effect" states that behavior which is followed by pleasure is more likely to be repeated than behavior which is not followed in this way. B. F. Skinner applied this law in developing the Stimulus-Response technique of behaviorism theory to human learning. Stimulus involves cueing that elicits a response. This response is then reinforced. Skinner applied this theory to the development of programmed instruction.

The history of programmed instruction has provided the foundation for the design of computer-based instruction lessons.
Programmed instruction involves the presentation of instruction to a student in a pre-planned, pre-sequenced order. The sequence of the materials is determined by the inherent structure of the media, along with well-defined sets of procedures and constraints. One advantage of programmed instruction that was noted early in its development was its ability to individualize instruction while maintaining consistency in presentation. For example, although each student would progress through the same basic geography lesson, those students who did not demonstrate an understanding of the content might be provided with additional examples and activities. In the same way, a student that demonstrated a deep understanding of a concept might have been required to read a short summary rather than completing the entire activity.

Because the events in programmed instruction are easy to reproduce and examine, a large body of experimental research exists in this area. Many of these programmed instruction studies are valuable resources for use when examining the elements of effective computer-based instruction. For example, the value of active student responses, recitation, and participation have been cited in a number of studies on programmed instruction (Lumsdaine, 1961). These techniques are also widely recognized as important for effective computer-based instruction.
As early as 1959, researchers examining programmed instruction were identifying the unique contributions of "teaching machines" that combined the design aspects of programmed instruction and the technological aspects of computers. Lumsdaine (1961) identified three properties of these "new" machines, including the ability to provide for continuous and active responses, the ability to provide information to a student regarding the acceptability of a response, and the ability to meet the needs of individual students by providing for varying rates of learning.

Three main characteristics found in both programmed instruction and computer-based instruction include the use of small steps, active responding, and feedback (Burke, 1982). For example, in both programmed instruction and computer-based instruction, only one concept is presented at a time. Following this presentation, the student is asked to demonstrate an understanding of the concept by making some type of response. Often this response is in the form of an answer to a multiple choice question. Finally, the student is given feedback regarding the adequacy of the response.

According to Lumsdaine (1961), a researcher in the area of programmed instruction,
(t)he most productive orientation for research which seeks to improve the effectiveness of instructional media is to identify those stimulus conditions through which appropriate responses of the student, overt and implicit, can be controlled effectively during the process of learning". (p. 2)

Lumsdaine (1961) identified four broad categories, or factors, of programmed instruction, including cue factors, transfer factors, response factors, and organizational factors. These factors were cited as important in the development of quality programmed instruction.

Cue factors were defined as those involving the use of prompts, arrows, and highlighting. For example, in order to gain a student's attention, key words or phrases in a paragraph would be highlighted. Another option could include color coding specific areas. For example, a red area might have been used to indicate an important new point, while a blue area might have been used for summary statements.

In addition to cue factors, transfer factors were also found to be important in promoting learning. Transfer was defined as the ability of a student to apply the information learned in a given situation to another situation. Fading was one aspect of transfer. For example, during the introduction of a new word, the complete definition might have accompanied the word. As the student became more familiar with the word, only a partial definition was
supplied. Eventually, the student was able to apply this word without the support of a definition.

Response factors involved covert or overt learner involvement. For example, after the presentation of a new concept, the student might be asked to respond to a series of questions relating to the concept. Overt responses might involve circling a lettered option or writing a definition. Feedback would be provided to the student regarding the adequacy of the response. This feedback might take the form of a statement about the correctness of the student's answer, an explanation of the correct answer, or a request for an additional response through additional questioning.

Finally, sequencing, repetition, and review were organizational factors that were incorporated into programmed instruction lessons. The sequencing of the lesson was found to be important for student comprehension. For example, in the case of a procedure, the sequencing of the presentation was found to be vital. In teaching students the procedure for making a cake, students must be instructed that the ingredients must be mixed before the cake can be placed in the oven to bake.

In addition to these factors, repetition and review were also found to be important. Chapter or section summaries would be an
example of the review factor.

According to Skinner (1958), one of the most important aspects of the programmed instruction learning environment was the use of student responses. A mixture of constructed responses and fixed alternative choices allowed the student to practice originating a response. This attribute of programmed instruction kept the student active in the learning situation, and this was considered an important contribution to learning. Skinner viewed the design of instruction, including such aspects as the format of responses, as critical to the success of programmed instruction.

Elements of Effective Computer-based Instruction

Many of the principles for the design of effective computer-based instruction are based in the research on programmed instruction. There are a number of basic "building blocks" in the construction of computer-based instruction, such as directions, succession, format, questions, branching, and screen design (Burke, 1982).

The Design of Computer-based Instruction

Directions. Directions are provided for a student as instructions for what to do within the computer program. These
directions must be clear and consistent in order to be effective. Students quickly lose their patience and motivation when directions are confusing. For example, the same key should be used when proceeding from screen to screen, such as the space bar or the return key.

**Succession.** The movement between messages or screens involves succession. The computer, the student, or both may have control over this movement. When the computer controls all movement, screens may move too fast or too slow for some readers. In addition, students lose their sense of control when screens are automated. However, when students are given unlimited control, they often make poor choices for themselves, such as skipping important sections of the program.

**Format.** The format of the program includes such considerations as the placement of text and graphics on the screen. The size and amount of type, the font, and the organization of text are all important in providing consistency for the student within the program. The type and placement of questions and responses should also be appropriate, consistent, and easy-to-follow. The spacing and timing of text and graphics also influence the effectiveness of the program.

**Questions.** There are a number of questioning techniques
that may be incorporated into a computer program. The questioning process involves asking questions, judging responses, and responding to the student. As with all types of instruction, well-constructed questions are essential. In addition, all possible answers must be anticipated.

**Branching.** Branching involves the logical flow of the lesson along alternative paths. Depending on the response of a student, a program may move ahead to the next frame, skip forward and omit some frames, or repeat a section of the program. This may be done automatically by the program, or be based on a "menu-driven" system controlled by the student.

**Screen design.** The final "building block" of computer-based instruction programs is screen design. Screen design involves the selection of appropriate text, graphics, and sound for the content of the program. For example, in teaching the concept of frog dissection, detailed graphics would be essential. A combination of graphics and sounds would be important in music instruction, including graphics representing the staff and sounds indicating pitch.

According to Heines (1984), quality instructional sequences require two-way communication, where students are responding or posing questions to the computer as often as the computer
questions or responds to them. This type of active student involvement is useful in gaining and keeping student attention, in addition to checking student comprehension.

The Systematic Design of Instruction

Many approaches have been presented for the design of instruction. According to Dick and Carey (1985, p. 2), a contemporary view of "the instructional process is that instruction is a systematic process in which every component is crucial to successful learning". The systems approach to the design of instruction consists of carefully organized lessons that address specific behavioral objectives with emphasis placed on student achievement. The term system refers to a set of interrelated parts that are working together toward a defined goal. All of the parts of a system depend on each other and rely on feedback to determine whether the goal has been met. If necessary, the system is modified to reach its goal. The learning process can be viewed as a system with learning as its primary goal.

The systematic design of instruction is essential to the development of any type of effective instructional materials. It is of particular importance when designing computer-based materials because the instruction must be "layed out" precisely prior to
programming. Although a number of models exist that use the systems approach for the development of instruction, the Dick and Carey model is one of the most popular (Dick & Carey, 1985).

This model encompasses a number of interrelated steps for the design of instruction including:

1. Identifying an Instructional Goal
2. Conducting and Instructional Analysis
3. Identifying Entry Behaviors and Characteristics
4. Writing Performance Objectives
5. Developing Criterian-Referenced Test Items
6. Developing an Instructional Strategy
7. Developing and Selecting Instruction
8. Designing and Conducting the Formative Evaluation
9. Revising Instruction
10. Conducting Summative Evaluation

Dick and Carey (1985) have cited three major reasons why the systems approach to instructional design is effective in promoting learning. First, because the approach focuses on what a student will be able to do as a result of instruction, the designer has a clear goal. Without this specific goal, planning and implementation would be unorganized and ineffective. For example, the designer could easily develop a precise plan of instruction given the following statement. The student will ride a bike fifty feet down the sidewalk without assistance.

The systems approach also places emphasis on the relationship between each component in the model. For example,
the process closely links the desired learning outcomes with specific, and appropriate instructional strategies. Rather than focusing on the range of possible instructional activities, the systems approach stresses the importance of selecting only those activities that can be targeted to specific knowledge, skills, and attitudes that are being taught. As result, it is the conditions for learning that are the system's emphasis.

The replicable nature of the systems approach is the final reason for its effectiveness. Because it is an empirical process, the instruction is designed to be used a number of times. As a result, according to Dick and Carey "it is worth the time and effort to evaluate and revise it" (p. 7).

When planning specific events of instruction, Gagne indicated that the model used for the planning of other types of instruction also applies to computer lessons (Gagne et al., 1981). Gagne described external events of instruction that should be considered when planning instruction. These events included:

1. Gaining Attention
2. Informing learner of lesson objective
3. Stimulating recall of prior learning
4. Presenting stimuli with distinctive features
5. Guiding learning
6. Eliciting performance
7. Providing informative feedback
8. Assessing performance
9. Enhancing retention and learning transfer
The instructional design process is crucial to the development of quality computer courseware since it provides the guidelines necessary to establish uniform standards for high quality. Paulauskas and Holunga (1985) developed a model for the design of computer-based instruction that included the following steps: assess learner characteristics, conduct task analysis, design assessment instruments, develop an instructional strategy, produce instructional materials, and conduct a formative evaluation. The model contains many of the same steps as the Dick and Carey model discussed.

In a similar model, Burke (1982) recommended the systems approach to the development of computer lessons. Burke's model begins with a front-end analysis involving the examination of the rationale behind developing the lesson and analyzing the needs of the audience. Outcome specifications are stated next, based on the topic and a list of tasks. In addition, objectives for the lesson are developed. The lesson is then designed in the form of a flowchart. Based on this flowchart, the lesson is created and validated.

According to Kearsley and Hillelsohn (1982), "the instructional design considerations for CBT materials are the same as for any other type of instruction" (p. 78). There are three areas, however, that are especially important to the development of
computer-based instruction, including (1) the design of simulations, (2) the design of screen displays, and (3) the design of interactive sequences.

The ability to develop and use effective instructional simulations is one of the unique capabilities of computer-based instruction. Skills requiring an understanding of cause and effect are well-suited to this type of instruction. Because instructional situations can be well-planned and controlled, the computer environment offers an advantage over traditional types of simulations. The design of simulations is a very time-consuming and sophisticated process that requires an understanding of the interactive capabilities to the computer.

The design of screen displays is another area that is somewhat unique to computer-based instruction. In addition to the elements of text and visuals that are used in video productions, the design must also deal with the use of overlays and sophisticated graphics. Good screen design can be important for motivation, participation, and comprehension (Kearsley & Hillelsohn, 1982). The third instructional design area involves the design of interactive sequences. The designer must determine the type and sequence of questions. Multiple choice, fill-in-the-blank, and essay are formats that can be used for questioning. Formatting, upper
and lower case, spacing, and spelling must all be consider when analyzing and interpreting student answers. The feedback provided to students can also take many forms. For example, will the student be provided with a number of opportunities to respond to the question? Will the student be given information or remediation for incorrect answers? Will the student be given the correct answer?

The Format of Computer-based Instruction

Various techniques can be used by a designer to format computer-based instruction. For example, computer courseware designers can facilitate learning by making appropriate and judicious use of cueing devices. Paulauskas and Holunga (1985) identified the following cueing features available for use in computer-based instruction: color, graphics, flashing and inverse text, pauses, menus, spacing, sound, scrolling, nonverbal devices, self-pacing, and prompts. These techniques can be used to focus student attention on learning.

A number of studies have examined specific aspects of the computer learning environment. For example, Schloss, Schloss, and Cartright (1984) found that the use of questions and highlights were superior to "straight" text. They also concluded that
questions should be limited to critical concepts and should occur less often than every screen.

Heines (1984) described the importance of screen design strategies to the development of computer-assisted instruction. The use of functional areas, visual symbols, menus, and text displays were described as important elements of an effective screen design.

**Functional areas.** Functional areas are used by computer-based instruction developers to provide a consistent and easy-to-use lesson for students. A discreet, screen display area is provided for each of the standard components, including orientation information, directions, student questions and responses, error messages, and student options. Each element should be located in a separate functional area on the screen. For example, student options, such as how to move forward or back in the program, may always appear at the bottom of the screen in a rectangular box. Error messages may always appear in a red box in the center of the screen. The use of functional areas contributes clarity, consistency, and continuity to the program.

**Visual symbols.** Visual symbols may be used to provide guidance for students. Without adding clutter to the screen display, a visual symbol may serve as a reminder to a student about where
the student is within the program or what should be done next in
the program. They can also be used to add emphasis to standard
prompts. For example, a small "R" icon may be used to remind
students to press the return key in order to enter a response. A
highlighted area may indicate that this section of the program is
important. Visual symbols may also be used to provide structure to
the lesson. For example, the title or icon representing the section
of a lesson the student is in may appear in the corner of the screen
to remind the student that he or she is in the review section or the
enrichment section of the lesson.

**Menus.** Menus provide a way for students to control their
own instruction. A menu provides a student with a list of options.
For example, a menu may indicate what sections the student has
yet to complete and allow the student to select the next section to
begin. A menu might also be used to provides options for additional
information or practice. In some cases, a student may have the
option to skip sections of instruction that are not of interest.

**Text displays.** Because text is the major channel for the
communication of messages, it is important that the text is clear
and well-written. Formatting including the use of easy-to-read type
styles and fonts, short line lengths, appropriate justification, and
logical break points between screens, all contribute to text clarity.
The design of instructional sequences also is important in the development of effective computer-based instruction. According to Kearsley and Hillelsohn (1982), the proper sequence should provide students with hints, and ultimately, lead to the correct answer. The smaller the opportunity for guessing the correct answer, the more accurate will be the appraisal of the student's ability.

Human Factors Elements

Tom Love, a General Electric psychologist, has identified a new area of study termed software psychology. Software psychology is defined as the study of human performance when using computer and information systems (Sheiderman, 1980). There are a number of psychological issues involved with the development of computer software, including human memory, closure, attitude and anxiety, control, response time, interface modes, and error handling.

Human memory. Limitations on human memory must be considered when creating computer software. Only small amounts of information should be presented at one time. In addition, students should not be required to remember complex keystrokes in order to save information or move between screens.

Closure. Students prefer small, self-contained segments of
instruction that contain clear ending points. Closure involves "tying up loose ends" and provides a conclusion at the completion of a unit. Programs should be designed in a modular fashion, so that closure can be obtained to provide relief for users. Without these structured units, student may grow apprehensive and tired of the instruction.

**Attitudes and anxieties.** User attitudes and anxieties should also be considered in the development of software. For example, when designing a program for novice users, every attempt should be made to make the user feel at ease. Complicated instructions and keystroke commands can confuse and frustrate students. In the same way, endless instructions and tutorials can be boring for advanced users. In addition, unless a formal testing environment is required, less formal questioning will be more effective particularly for students who may possess test anxiety.

**Control.** A driving force in human behavior is the desire to be in control. The computer presents an interactive environment where the student can be allowed a degree of control over the lesson. Even limited control, such as the ability to move backward or forward through the program, is useful for a student.

**Response time.** Users of computer lessons expect immediate responses in the form of useful feedback. Delayed responses can be
frustrating for students.

**Interface modes.** The method a student uses for the input of information is dictated by the interface mode. Menus, fill-in-the-blanks, and parametric responses such as multiple-choice options, are common interface modes. A combination of interface modes is the most appropriate.

**Error handling.** Error handling involves the way the computer handles errors within the program. For example, if a student pressed the space bar instead of the return key, an error message might be presented on the screen. Error messages should include brief, informative messages that provide guidance for the student. Errors should be handled quickly and efficiently. The lesson should contain contingencies for all types of system or student errors.

Based on investigations regarding human information processing, the capacity and duration of short-term memory and the encoding or chunking of information are important considerations in the design of human-computer dialogs. According to Simes and Sirky (1985), designers must consider the following questions:

1. How much information should be displayed?
2. How rapidly should it be displayed?
3. What else on the screen may be interfering with short-term memory?
4. How should data and information be "chunked" effectively to increase informational content without increasing the number of items that must be perceived?
5. How fast should responses be to prevent short-term memory decay?

The natural rhythm of a communication or interaction that meets an individual's expectations is called closure. An interaction that is unnaturally delayed, out of context, or does not satisfy the individual's expectation for that interaction lacks closure. The lack of closure can create frustration and decrease productivity. For example, a response to the pressing of a key on the computer keyboard should be almost instantaneous or a student will become anxious (Galloway, 1981).

According to Hansen (1971), the first principle of developing interactive systems is to know the user. Additionally, the designer should attempt to minimize memorization of computer lesson-specific commands through such techniques as providing menus with selections, requesting names rather than numbers, developing a predictable format, and providing access to the system for information. Operations should be rapidly executed so that the user does not become frustrated waiting for common operations to occur. For example, after a student has entered a response to a question, immediate feedback should be provided. Also, students
often become upset at the length of time it takes to load a simulation within a program. This frustration can be reduced by informing students about the length of the wait. Hansen has also stated that there must be an effective method for handling errors, such as quality error messages, and methods of working around errors.

Wasserman (1973) advocated the design of "idiot-proof" interactive systems. Specific design specifications for this type of system would provide for program action for every possible type of user input. In addition, a large number of explicit diagnostics along with extensive user assistance should be designed into the system. The user should not need to be knowledgeable about the system and should be provided with short-cuts through the system. Also, the user should be allowed to express the same message in more than one way.

**Computer Anxiety**

Researchers agree that people do not always react favorably to student-computer interactions. Melnyk (1972) found that some people find using the computer distasteful. According to Simes and Sirky (1985), the apprehension and tension frequently experienced by users of a computer terminal during an interactive session is
known as "anxiety". Anxiety takes its toll by inhibiting effective performance in situations requiring initiative, adaptation, or utilization of complex cognitive processes. Anxiety may be displayed by feelings of tension, apprehension, uncertainty, or panic.

Researchers suggest that individuals who exhibit high levels of anxiety are less susceptible to persuasion. Nunnally and Bobren (1959) concluded that individuals with high anxiety tend to show low interest in persuasive messages regardless of message form. According to Bettinghaus (1980), anxiety seemed to exhibit a curvilinear relationship to persuasion. Individuals with very high and very low levels of anxiety seemed to be less persuadable, than those in the middle range. This state of uneasiness or reluctance to use the computers, termed "computer anxiety", has been identified and measured by Maurer (1983).

Research on Computer-based Instruction

In the last two decades, interest in computer-based instruction (CBI) has grown enormously. Many studies have cited the value of using CBI as a way to individualize learning, reduce the costs of instruction, provide active involvement in learning, promote positive attitudes toward the content, and
reduce the time needed for instruction (Edwards et al., 1975; Thomas, 1979). Meta-analysis techniques have been used in a number of studies by Kulik and associates to examine the effectiveness of computer-based instruction at various grade levels, including elementary instruction (Kulik, Kulik & Bangert-Drowns, 1985), secondary instruction (Kulik, Bangert & Williams, 1983; Kulik, Kulik & Bangert-Drowns, 1984), college instruction (Kulik, Kulik, & Cohen, 1980), and adult education (Kulik, Kulik & Schwalb, 1986).

The results of the meta-analyses varied, but significant contributions by computer-based instruction were cited in four major areas. Generally, these meta-analyses studies found that computer-based instruction produced increased achievement, positive attitudes toward instruction and the computer, and a reduction in the amount of time needed for instruction.

Summary

The foundations of computer-based instruction can be identified in the research of programmed instruction. For example, the four factors described by Lumsdaine for the development of quality programmed instruction are similar to those described by researchers of computer-based instruction.
The systematic design of instruction is crucial to the development of quality computer-based instruction. In addition to general models related to the design of instruction, specific techniques have been identified for developing quality instructional sequences including such considerations as the format of the lesson and human factors related to use of the lesson.

Learner Involvement Strategies and Persuasion

The review of literature on involvement strategies is divided into a number of sections. The first section will provide an overview of the nature of communication. Next, research in the area of involvement strategies will be examined. Three types of involvement strategies will be discussed, including active participation, emotional involvement, and social interaction. Finally, the link between involvement strategies and persuasion will be analyzed.

The Nature of Communication

In the past, communicators were forced to choose between two mutually exclusive modes of communication: either conducting a dialog with one or a few partners, or delivering a monolog to a large audience (Nievergelt, Ventura & Hinterberger, 1986).
According to McGuire (1969),

the reciprocal nature of face-to-face communication elicits greater activity from the receiver and also confers advantages by virtue of the greater feedback obtained by the source. (p. 229)

This one-on-one communication may also reduce the selective avoidance identified with communication through traditional mass media. For example, when watching television, a viewer may be easily distracted by the surroundings. However, when a person is engaged in a one-on-one conversation, the listener is less likely to selectively avoid attending to the speaker because the listener is constantly being asked to respond to the speaker.

A number of researchers have concluded that traditional mass media, including newspapers, radios, and television, have been ineffective in changing attitudes. McGuire (1969) concluded that

the outcome has been quite embarrassing for proponents of the mass media, since there is little evidence of attitude change, much less changes in gross behavior such as buying or voting. (p. 227)

The important difference between traditional media types and the computer is the level of active participation by the receiver of the communication. The computer has been identified as the "only two-way mass communications medium" (Nieergelt, Ventura & Hinterberger, 1986). As a result, it is possible to combine the
advantages of the one-on-one interaction of personal dialog with the large access and consistency of mass media.

Research on Involvement Strategies

Considerable research has been conducted on active involvement and interaction with learning activities, such as programmed instruction, noncomputerized simulations, and traditional media types. Little research, however, could be found that examined computer-learner involvement strategies.

Research in programmed instruction has addressed active involvement as one element in learning. As early as 1917, experimental studies examined the value of active response, recitation, and participation to learning. For example, Gates (1917) compared the effectiveness of merely reading passages out of a book to actively reciting the passages. It was found that the active recitation was more effective. Hovland (1951) also found that when more time was spent in active responding or reciting more learning was produced. Based on the research conducted prior to 1960, Lumsdaine concluded that in learning activities experimental evidence favored procedures fostering active, explicitly occasioned responses over passive observation (Lumsdaine, 1961).
In the early 1970s, a number of research studies were conducted on active involvement in noncomputerized simulation activities. According to Stanford and Roark (1974), research has demonstrated that simulation activities caused positive attitude changes and that these attitude changes were related to the amount and intensity of student involvement. The studies also showed that attitude change was not always associated with an increase in factual information in the message. It was found to be more closely associated with active involvement including such elements as social interactions.

Active involvement in the learning process by students has been identified as important in producing attitude change in many studies involving instructional media. This active participation has taken many forms, including subjects taking notes, asking themselves questions, calling out answers, and performing many other types of verbal and visual tasks.

Types of Involvement Strategies
Many types of involvement strategies can be identified in the learning process. Involvement may be behavioral or affective involving physical, emotional, and/or intellectual components. Different levels of involvement may range from the passive pressing
of keys on a computer keyboard to intense intellectual and emotional involvement with an activity. Different involvement strategies may include passive or active participation, emotional involvement or social interaction.

**Active Participation**

Active participation is more effective than passive participation because of the increased likelihood of the subject's attention to and comprehension of the stimuli. When a person is the passive recipient of a persuasive appeal, he may not fully attend to the arguments presented. His mind may wander. ([Rosnow & Robinson, 1967, p. 348])

The idea that active participation is more effective in producing attitude change than passive exposure to a treatment has been investigated by many social psychologists ([Fishbein & Ajzen, 1975]). A number of the theories related to attitude change would support the idea that a person who actively participates in the process of persuasion would be more susceptible to influence than a passive participant. According to Rosnow and Robinson (1967), cognitive dissonance theorists would attribute the effect to the greater amount of energy expended by the active participant. The advocates of reinforcement theory would speculate that active participation is more effective because of the likelihood of the subject's attention to and comprehension of the stimuli. According
to McGuire (1969) however, experimental research in the general area of active participation and attitude change has produced mixed results.

The study of active participation was extremely popular in the 1940s and 1950s in conjunction with the study of film. According to Allen (1957),

the conditions of participation require that some kind of overt activity consciously be engaged in by the learner as he is exposed to the communication and that this activity be systematically evoked either by the communication itself or by some other person or device. (p. 423)

In a review of studies on film and participation, Allen (1957) found that the most popular techniques used in film participation studies included verbalization of response, perceptual-motor responses, knowledge of results, mental practice, and notetaking. In a review of 26 studies, 13 favored participation and only two favored nonparticipation. The remaining studies found participation to be at least as effective as nonparticipation.

According to Bettinghaus (1980), active participation has been found to be more effective than passive participation. The active participation of an individual in the learning process facilitates the response desired. Motor skills are a good example of the need for active participation. It would be very difficult to learn
to ride a bike without actively participating. The same type of active involvement is used in persuasive, political campaigns where supporters are asked to attend rallies and become involved with the campaign.

Bugelski (1977) has found that learning is substantially more likely to occur when a student actively processes the information being learned. Audience participation during a film was found more effective at producing attitude change than passive participation requiring no overt response (Hovland, Lumsdaine, & Sheffield, 1949). According to Kimble and Wulff (1961), this active involvement may only be effective when some guidance toward the correct response is provided, such as hints or cues.

Michael and Maccoby (1961) found that the combination of active participation and knowledge of correct result (KCR) was more effective than active participation alone. Also, limited participation was found to be better than no participation.

In a 1962 study by Salman, subjects who actively participated in a learning activity experienced greater positive attitude change than passive receivers of information. In addition, the passive receivers experienced greater change than those who were observers or who were physically separated from the others. Hovland (1951) found more student learning occurred when an
increased amount of time was spent in active responding.

Watts (1974) found that, initially, both active and passive involvement produced attitude change. However, over time, the active participants, unlike the passive participants, continued to demonstrate a large degree of attitude change. Active participation also lead to greater involvement and superior recall of the topic.

Active participation in a computer lesson is of particular interest in this study. According to Lockard, Abrams and Many (1987),

the computer user must be an active participant in the learning process. The potential for a student to be a mere observer of the learning activity is largely removed in CAI. (p. 144)

The level of involvement with a computer lesson can vary with the level of interaction. The term interactive has been defined with reference to human-computer relationships. Burke (1982) has defined interactive as:

(a) term which describes a learning process in which the student and the system alternate in addressing each other. Typically, each is capable of selecting alternative actions based on the actions of the other. (p. 195)

Human-computer interaction has been described by Heines (1984) as one of the main components of computer-based instruction. The interaction may begin with the display of
information on the screen. The student's eyes, brain, and fingers are used to receive, interpret, and respond to the message. The student input is then processed through a response interpreter, lesson controller, and screen formatter. Finally, a new message is submitted on the screen.

Kiesler et al. (1984) has noted that computer-human communication has a number of distinct social-psychological qualities. For example, although the computer provides feedback to the user, this feedback is nonverbal. As a result, the student does not need to deal with nonverbal cues, such as facial expressions and verbal intonation. In addition, the impersonal, socially anonymous nature of the computer-human communication is unique from other forms of communication. Because the information is not being presented by a human as it might be in a film or audiotape, source variables such as source credibility, attractiveness, and power are less evident. In addition, because the computer is anonymous, the student is less likely to feel inhibited.

A 1980 study examined "interactive" and "passive" forms of computer-based instruction. Avner, Moore and Smith (1980) found that the interactive version of a computer lesson resulted in significantly better performance by students. According to Avner, Moore and Smith (1980),
only instructional sequences that use an active control element such as a human instructor or a computer have a chance to prevent the passive progress through materials that often leads to poor learning. (p. 116)

**Emotional Involvement**

Another important consideration in persuasion is the student's level of emotional involvement. According to Brembeck and Howell (1976, p. 108), "the way in which the learning process affects the expression of emotions is of enormous importance in the study of persuasion". Reardon (1981) found that,

perceptions of personal inconsistency, inappropriateness, and ineffectiveness elicit emotional reactions which facilitate or, as in the case of strong fear appeals, inhibit persuasion... emotional reactions may be used prior to logical appeals to shake the persuadee's confidence in his or her rule structure. (p. 145)

Brembeck and Howell (1976) have stressed that emotions play significant motivational and directive roles in our attitudes and behavior. Emotions were defined as aroused states that can range from mild to extreme in intensity. Watson (1919) found that children expressed three basic emotions: fear, rage, and love. Plutchik (1962), however, identified eight basic emotional expressions including anticipation, anger, joy, acceptance, suprise, fear, sorrow, and disgust. Some researchers contend that emotions only differ in intensity and ignore various expressions of emotion.
Emotional appeals, such as the use of affective language and graphic examples, may set the stage for attitude change. However, emotional appeals alone have not been proven effective at producing attitude change. As discussed in the persuasion section of this chapter, a combination of methods may be the most effective means of producing attitude change.

The affective aspects of the computer must be considered as an element of the emotional level of involvement. In a review of the uses of computers, Milner and Wildberger (1977) noted that students seem to exhibit enhanced self-confidence, curiosity and exploratory behaviors, a strong degree of motivation, and favorable attitudes toward learning in general...It seems as though the computer possesses charismatic qualities that we cannot easily define but we know exist. (p. 121)

In the meta-analysis studies by Kulik and associates it was found that computers generally produced positive attitudes toward computers, in addition to producing positive attitudes about the subject matter taught. Although many studies have been conducted on attitudes toward the computer and specific subject matter areas, few have focused specifically on changing attitudes through the use of the computer. In most cases, the promotion of positive attitudes was only a secondary concern on the part of the researcher. The
primary focus was on learning in a specific subject area. This
distinction between attitude formation in a general area and
attitude change in a specific issue area is important.

**Social Interaction**

When the intent of the persuasive message is to change
behavior, it may be necessary to supplement media with a
secondary channel of communication to assure that audience
commitment or social involvement has occurred (Rosnow &
Robinson, 1967). This secondary channel may take the form of a
social interaction such as a discussion. In a review of the research
on involvement and participation, Karlins and Abelson (1970) found
that active participation in the form of a group discussion was more
effective in changing attitudes than passive participation, such as
hearing lectures or reading appeals.

Participation and interaction in the form of a group
discussion means a heightened degree of learner involvement.
According to Abelson (1959, p. 35), "active participation in the
form of group discussion helps overcome resistance (to change)".
In a study by Lewin (1953), it was found that housewives who
participated in a group discussion regarding the benefits of serving
beef hearts, sweet bread, and kidneys were more likely to later
serve these foods than those who only listened to a lecture on the topic.

According to Maccoby, Michael, and Levine (1961), post-instructional discussions are important in learning. In a study involving student participation procedures using instructional film, it was found that those students who actively responded during the film, and also were involved in post-film questioning scored better than those without this involvement. According to studies conducted by Allison (1966) and Fay (1974), participation in post-instruction discussions was useful at promoting attitude change. Bennett (1955) also found that attitude change could be enhanced by social facilitation through the use of small group discussions.

A number of factors are involved in the use of group discussions for persuasion, including physical elements such as group size and spatial arrangement, and psychological factors such as cohesiveness and group equilibrium (Bettinghaus, 1980). According to Oskamp (1977), the combination of a media presentation with a personal communication can have a stronger impact than either alone. For example, a community action program that incorporated both a media presentation and a group discussion on possible community action was more effective than either the presentation or the discussion independently (UNESCO,
The social communication involved in a post-instructional discussion may be an important aspect of persuasion. According to McGuire (1969), the messages exchanged through this process may contain information that induces the receiver to change attitudes. A number of options are available within a discussion format for the use of persuasive messages. For example, counterattitudinal advocacy is an approach that has been identified by researchers as useful at producing attitude change in a social setting (Insko, 1967; Scott, 1957). Counterattitudinal advocacy occurs when an individual argues for a point of view different from his/her own. This behavior can occur in a debate or a role-playing setting.

Jamieson (1985) has noted that there may be no lasting effects of group persuasion when newly acquired behaviors or attitudes are no longer enforced. Group involvement in a practical way, not just recitation, is more substantial than verbal expression as a means of creating acceptance of the aims and purpose of a group. For example, although recitation of the "Pledge of Allegiance" might be useful in gaining an understanding of the pledge, it may not be effective in promoting acceptance of the key principles within the pledge. A group discussion of the key principles within the document would be more likely to promote
acceptance.

Interdependence and the need for identification provide strong motives for affiliation, that carries with it a persuasive potential.

Of all the various possible sources of influence, perhaps that of the group is the most potent. The desire for affiliation, even at the cost of conformity to group norms, imposes strong pressures upon the individual, and these pressures can be considered as forms of persuasion. It is here, at the face-to-face level, where actions can be monitored and views questioned, that individuals are most prone to suggestion. At the level of 'distant' persuasion through the press and television, the individual is protected by his anonymity; he is not asked to decide and make public his decisions or commitments. In the group, the individual is generally compelled into declaring his position, even silence itself can be expressive of a position. (Jamieson, 1985, p.159)

According to Brembeck and Howell (1976), the influence of the group on the attitudes and behaviors of its members is clearly established. In addition, the smaller the group, the greater the pressure to conform.

Involvement Strategies and Persuasion

Three of the guidelines presented by Simonson (1980) for the development of persuasive messages address the use of involvement strategies. These guidelines include the following:
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 guided post-instruction 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 the mediated message.

Simonson stressed the importance of learner involvement in the planning, production or delivery of instruction. In addition, the instructional procedures and content most likely to produce desired attitudinal outcomes delivered by media incorporate the use of followup activities, such as discussion and open-ended questions after the mediated instruction. Simonson also advocated the creation of an aroused state in the learner through direct participation and dramatic presentations that involved the viewer emotionally and intellectually in the content shown.

Persuasive Computer-based Instruction

This section of the literature review contains a number of subsections. First, the term "persuasive computer-based instruction" will be examined, as will its relationship to persuasion, computers and involvement. Next, an overview of seat belt safety will be provided. Finally, a summary concludes the chapter.
Persuasive Computer-based Instruction

Persuasion involves attempting to change the attitudes and behaviors of others. Computer-based instruction provides a learning environment that allows student-computer interaction. This interactive learning environment provides a unique opportunity for persuasion. Although the elements of the persuasive, computer-based instruction environment are similar to other persuasive situations, the persuader is no longer human. In addition, unlike a film or a slide presentation, the computer controls the interaction. No longer is the message conveyed in a linear fashion, the computer is able to individualize the lesson to meet the needs of the user, as a human would in a one-on-one conversation.

Persuasive, computer-based instruction differs from traditional, computer-based instruction in its basic goal. Rather than providing instruction in an area where an individual holds no position, the persuader must change or modify the persudee's initial stand. Based on Hovland's Reinforcement Theory (Hovland, Janis & Kelley, 1953), the student must not only attend to and comprehend the message, but must also accept the message and yield to the persuader.

The level of student involvement in a persuasive, computer-
based instruction lesson may determine the effectiveness of the lesson. For example, the degree of active participation by the student as discussed in Simonson's Guideline #4 would affect the student's attention to the message. According to Simonson (1982), a learner who is involved in the delivery of instruction would react favorably to the message delivered. For example, a student who actively presses keys on a keyboard in the process of answering questions would be more involved than a person who passively views a computer lesson. The passive viewer could easily be distracted and not attend to the message, while the student who is being requested to enter information would be forced to attend to the message. This attention to the message would address the first stage in Hovland's model.

Hovland's second stage deals with comprehension of a message. The computer provides students with the opportunity to gain immediate feedback, knowledge of results, and be positively reinforced for correct answers. In addition, the computer is able to provide additional examples and remediation for those students who are not yet comprehending the message. As a result, the degree of interaction between the computer and the student may affect the level of comprehension. If learners are passively viewing a computer lesson, or not becoming emotionally involved with the
instruction, it is possible that they are not comprehending the message. When the computer is actively interacting with the learner, the computer is able to monitor the student's comprehension and provide feedback and remediation.

Although a learner may attend to and comprehend a message, they may not accept the message. According to Simonson's Guideline #6, it is important that learners experience a purposeful emotional involvement or arousal during instruction for persuasion to occur. This emotional involvement may affect the final stage in Hovland's model, acceptance. Other elements may also affect the acceptance of the message. Social approval is one of the elements of acceptance discussed by Hovland. Simonson, in Guideline #5, advocated this type of social interaction through a post-instructional discussion and critique to ensure acceptance of the persuasive message. Although the computer is able to provide an interactive environment that can act as a social agent, research has not determined whether computer interaction alone is adequate to produce acceptance and attitude change. It may be that the social pressure exerted in a post-instructional discussion is needed to produce attitude change.

The purpose of this study is to examine three learner involvement strategies in persuasive, computer-based instruction
lessons and to determine whether all, or some combination of these strategies, are needed to produce attitude change. The three involvement strategies may be viewed as progressive levels from passive involvement to active involvement. An instrument was developed for this study that verified the levels of progressive involvement.

The persuasive, computer-based instruction lesson chosen for use in this study promotes the use of seat belts. Seat belts save lives and people need to be persuaded that they are important, lifesaving tools that should be used.

**Seat Belt Safety**

In a collision, the vehicle stops first while its occupants continue moving at the pre-crash rate of speed of the vehicle until they also collide with some object. When occupants are properly restrained, fatalities and injuries can be reduced. (Draper, 1986, p. 10)

In 1983, only about four percent of fatally injured automobile occupants were wearing safety belts (Fatal Accident Reporting System, 1983). Many lives could have been saved through the use of seat belts. According to Trinca (1981), "there is now undisputed worldwide evidence that properly adjusted occupant restraint substantially reduces the severity of injury to vehicle occupants in road crashes" (p. 3). Despite the clear advantages of seat belt use, it
has been found that only 15-18% of front seat occupants wear their seat belts. Additionally, according to a study based on 14,579 observations, persons under the age of 25 are significantly less likely to wear safety belts than those over 25 (Lund, 1986).

Efforts have been made to convince people of the importance of wearing safety belts. Many efforts used to increase seat belt usage have been persuasive. Techniques, including law enforcement, extrinsic rewards, media messages, and various instructional approaches have been used to persuade people to "buckle up". In April 1982, the President announced the development of a major safety campaign to promote the use of safety belts.

Past safety campaigns, however, have been less than successful in increasing the use of seat belts (Fhaner & Hane, 1973; Knapper, Cropley & Moore, 1976; OECD, 1971). In a 1972 review of the literature on seat belt campaigns and seat belt usage, it was noted that

despite the large amounts of time, money, and effort spent on studies related to seat belt use, it must be admitted that knowledge of value for decisions concerning steps to take to increase usage must be regarded as meagre. (Fhaner & Hane, 1973, p. 39)

According to the Insurance Institute for Highway Safety (1986), as of April 1986, twenty-four states had passed laws
requiring seat belt use. Unfortunately, researchers have observed only temporary increases in seat belt usage following the passage of mandatory seat belt usage laws and the enforcement of these seat belt laws. In examining the decline in seat belt use experienced in Canada in the years following a mandatory seat belt use law, it was noted that,

neither existing public information and education strategies, nor extensive systems of punishment have been sufficient to convince individuals to desist from engaging in activities that increase risk of injury. (Simpson & Warren, 1981, p. 80)

Researchers have speculated about the reasons why many people fail to wear seat belts despite the new laws and safety campaigns. According to Knapper, Cropley, and Moore (1976),

observable behavior is mediated by underlying systems of opinions, beliefs and attitudes. Consequently, behavior can only be understood if these intangible and subjective psychological systems are identified. This implies that campaigns aimed at achieving increased use of seat belts will only be successful when they address themselves to the psychological underpinnings of overt behavior. (p. 241)

In examining the relationship between seat belt use, attitudes, and behaviors the OECD (1981) stated,

an attitude involves both intellectual and motivational/emotional components. This may be the reason why safe driving attitudes do not automatically result from the acquisition of knowledge about driving task, the number of accidents, accident causes, etc...Safe driving attitudes appear to be connected with
the perception and the assessment of the potential risks of becoming involved in an accident. (p. 23)

The content and structure of the persuasive message has been found to be extremely important when developing communication for attitude and behavior change. For example in a 1974 study, television "spots" were used to increase the use of seat belts (Robertson et al., 1972). This large, well-controlled study was unable to show evidence for increased seat belt use. The researcher concluded that television campaigns "do not have any effect on use of seat belts". According to Winett (1986), however, it was not the use of television, but the message conveyed through the television that was ineffective. The message emphasized fear rather than other possible approaches such as behavioral modeling and discussion.

Media Alternatives and Seat Belt Safety

Hawkins et al. (1985) identified an alternative to traditional, health education, media campaigns.

...(T)he problem is to find a media or strategies (or both) that allows the economies of scale and expert knowledge traditionally part of mass communication while simultaneously allowing individuals to get information when they want it, translated into individualized responses, and in forms that are easy and convenient to use...we think that interactive computer programs may provide an answer. (p. 244)
Ellis and Raines (1981) identified basic research questions that needed to be addressed in the area of computers and health education. One of the areas cited involved examining the effects of computer-based education on health awareness, attitudes, and behavior. Hawkins et al. (1985) stated that interactive computer programs may be useful both for health communication in general and for the specific problem of adolescent health. According to Hawkins et al. (1985),

although providing health information through a computer program is clearly mass communication from the sender's point of view, a user might find that the tailoring of information, conversational interaction, control of the interaction flow, and responsiveness to feedback all provide a sense of an interaction that is very similar to interpersonal communication, with potential consequences for the results of the computer-user interaction. (p. 230)

The computer may be more accessible to adolescents than other forms of health education media, as well as, of more interest (Hawkins et al., 1985).

BARN (Body Awareness Resource Network), a health education computer program, was developed to provide adolescents with confidential, nonjudgmental health information, behavior change strategies, and sources of referral in making decisions. Although seat belt safety was not included in the program, the related health education areas of alcohol and drugs,
human sexuality, smoking prevention, stress management, and body management were included. A preliminary analysis of the findings in the areas of knowledge and behavior indicated that students using BARN showed more change to the positive or less change to the negative over the two year period than the control group.

Microcomputers have the potential to improve our driver education programs (Opfer, 1985a).

...(E)ducators presenting safety instruction to teenagers most often receive "ho-hum" reactions. And if one wishes to generate true apathy, try lecturing about the merits of automobile seat belt use...the stage is set for a new and innovative approach to this educational dilemma. (Computing Teacher, 1985, p. 40)

According to T.H.E. Journal (1985), unlike the one-way communication of present literature, films and videotapes on seat belt safety, the interactive quality of the microcomputer may be the ideal medium for helping young people make important decisions in high-risk situations.

Summary

This chapter has examined the literature related to persuasion, computer-based instruction, and learner involvement. In addition, it has analyzed how elements from these areas can be
synthesized in the study of learner involvement as an element of persuasive, computer-based instruction. The specific subject chosen for this study was seat belt safety.

The development of proper driver attitudes cannot be achieved through preaching, moralizing, or attempting to force the student to accept the attitudes of the instructor, even if the attitudes of the instructor are above reproach. The only way to develop sound attitudes is to provide types of learning experiences that will enable the student independently to develop positive attitudes based on his own thinking. (Aaron & Strasser, 1977, p. 128)

A persuasive computer-based instruction program dealing with seat belt safety was chosen for use as the basic treatment. The next chapter will examine the methodology used in this study.
METHODOLOGY

The methodology used in this study will be discussed in three parts. First, the selection of the persuasive, computer-based instruction lesson used in this study will be discussed. Second, the identification or development of the instruments used in the study will be examined. Finally, the research design will be discussed.

Selection of the Computer-based Instruction Lesson

The focus of this study was to examine various involvement strategies as they related to a persuasive, computer-based instruction lesson. A specific, persuasive, computer-based instruction (CBI) lesson was needed for use in the study. Although persuasive CBI lessons have been produced in a number of content areas, a well-designed lesson was needed that could be manipulated for use in this study.

This section of the chapter will begin by examining five areas dealing with the selection of the computer-based instruction lesson chosen for this study. The five selection areas include: the content area of the computer-based instruction lesson, the persuasive message design used in the lesson, the design specifications of the computer program itself, the level of student involvement within the lesson, and the technical support system provided by the
publisher for the lesson. A discussion of the specific, computer-based instruction lesson selected will also be provided. Finally, the involvement strategies examined in this study will be discussed as they relate to the CBI lesson selected.

**Content Area**

The search for a content area began with the examination of media catalogs to determine what CBI programs were currently being produced. In addition, computer laboratory collections were examined to locate materials that may have been discontinued and not listed in catalogs. Although many informative and instructional CBI programs could be located, few CBI programs containing persuasive messages could be identified.

It was determined that the majority of persuasive CBI programs were in the content area of health education. In addition, a majority of the persuasive, computer-based instruction lessons were developed by a small number of producers. For example, Sunburst Communications produced persuasive programs on nutrition, smoking, and seat belt safety.

Although this researcher did not have access to all of the programs available, a number of programs were located and examined in detail. Each program was inspected in order to
determine whether the content was accurate, useful, and timely.

**Persuasive Message Design**

In order to select a computer-based instruction program that would be effective at producing attitude change, it was necessary to examine each of the lessons in terms of the inclusion and design of its persuasive messages. The programs were analyzed based on their structure and use of specific appeals. Program elements, such as source variables, message structure, use of fear appeals, use of emotional appeals and involvement strategies were examined. In addition, the lessons were analyzed to determine whether the appropriate type of persuasive message was used. For example, based on the content, a humorous appeal may have been more effective than a fear appeal in a particular instructional situation. The programs were also examined based on Simonson's (1982) guidelines for the design of persuasive messages. These guidelines were discussed in chapter two.

**Computer Program Design**

Each CBI program was examined to determine whether Gagne's Events of Instruction were implemented within the lesson. Each of the areas discussed in the literature review was examined
to determine whether the lesson was well-designed. For example, Burke's (1982) building blocks of computer-based instruction were examined for each lesson. These design elements included the quality of directions, succession, format, questions, branching, and screen design.

**Student Involvement**

Another important aspect of this study dealt with student involvement. Because of this, the involvement strategies used in the lesson were examined. A program was needed that would actively involve the student in the lesson. This active participation could be reflected in the number and types of questioning involved in the CBI lesson. In addition, the emotional involvement could be determined by the method of content presentation and the use of persuasive messages, such as fear appeals or humor.

**Support System**

Because the goal of this study focused on the examination of different involvement strategies, there was a need to manipulate the structure of the program. Thus, it was essential that the software producer be cooperative in the design of at least one of the treatments.
Program Selection

The selection of a program for this study was difficult for a number of reasons. First, few computer-based instruction programs could be located that focused on persuasion. In addition, it was evident that of the persuasive, computer-based instruction programs, few met the criteria for the design of effective persuasive messages or the design of effective computer-based instruction lessons.

The computer program titled "Make It Click!" was selected for use in this study. The CBI lesson met the minimum criteria established in the following five areas: content, persuasive message design, computer program design, student involvement, and support systems.

Content Area

The content of the program was found to be accurate, useful, and timely. The program contained accurate information related to seat belt safety, including facts, statistics, and examples. In addition, the program presented useful information regarding the importance of seat belt use. Because of the current nationwide interest in this area, it could also be viewed as a timely topic.

The "Make It Click" lesson, designed by David Levy and
Andrew McLaren and produced by Sunburst (1985), contained three primary objectives:

1. To provide clear background information and statistics regarding automobile accidents and the use of seat belts.

2. To enable each user to make a genuine commitment to wearing seatbelts consistently.

3. To give students opportunities for independent decision-making and to help them develop confidence in the decisions they make.

"Make It Click" was an interactive program that used active, decision-making situations to help the user form opinions about the use of seat belts. The designers of "Make It Click", Levy and McLaren, stressed:

(It is important to) present health information in a way which genuinely engages the attention of the student and leads him/her to make genuine decisions and commitments based on that knowledge (Sunburst, 1985, p. ii).

According to Sunburst (1986), colorful graphics pique interest and help to reinforce the positive reasons for wearing seat belts. The 10 to 20 minute program presented information and statistics on issues related to seat belt use. The program asked questions regarding the user's name, age, and seat belt use. It explored the reasons for wearing seat belts and interactively presented statistics regarding automobile accidents. These
statistics were "brought to life" for the student through a personalized and relevant simulation called the "Gruesome Game". The "Gruesome Game" graphically illustrated the number of people who would be disabled or die as a result of automobile accidents. The benefits of seat belt use and the reasons some people do not wear seat belts were examined through the use of analogies. Finally, users were asked to make a personal decision. "Are you going to put on your seat belt?"

The computer program contained a number of segments:

1. Introduction and Personalization
2. Discussion of statistics and facts
3. Simulation experience titled "Gruesome Game"
4. Discussion of the benefits of belt use
5. Simulation experience titled "Gruesome Game"
6. Exploration of frequently cited reasons for not wearing seat belts
7. Review and request for a personal decision

**Persuasive Message Design**

In addition to the content of the program, the design of the persuasive messages were also examined. Although a number of different persuasive messages were used within the CBI lesson, it did not appear as if the designers considered careful placement of these messages. Many persuasive techniques were mixed together without consideration for the sequencing of messages.

Credibility was established early in the program through the
use of facts and statistics related to seat belt use and accidents. For example, the lesson included a segment where the student was asked to guess the number of automobile accident deaths per one hundred people. After the correct statistic was identified, a short discussion of the importance of the information followed. Although the student was not interacting with a human, the high level of interactivity provided the student with the feeling of talking one-on-one with a knowledgeable individual. This realistic, relevant, and in most cases, new information about seat belt safety was able to provide an effective, and credible persuasive message.

Because persuasive messages that presented both sides of the issue were used in this program, the student was provided with information that might dispel myths regarding seat belt use. For example, one segment of the program discussed the possibility of being trapped in an automobile with a seat belt on. Although the program conceded that this was possible, it was also stated that an individual was more likely to be struck by lightening than be trapped in an automobile. In addition, the program ended with a segment dealing with the positive reasons for using a seat belts, rather than ending with the negative aspects. This technique involving the use of a two-sided argument, in addition to concluding the lesson with a positive experience has been found to be effective
in producing attitude change. Unfortunately, at the conclusion of
the lesson a student was not forced on comply, but was given the
opportunity to decide not to use seat belts.

Fear appeals were used within the lesson to arouse the user.
For example, in the "Gruesome Game" simulation, students were
shown computer-generated graphics of people who might be
disabled or killed in automobile accidents. These could be
considered mild appeals compared to photographs of actual people.
This type of mild, fear appeal has been found to be more effective
than a strong, fear appeal. Also, the element of humor was
incorporated throughout the program as a relief from the intense
content. For example, at the conclusion of the "Gruesome Game" a
short graphic was used to illustrate the "excitement" the student
might feel about saving the friends in the simulation through the
use of seat belts. Although the sequence was interesting, other
techniques such as naming the graphics, or more realism in the
graphics may have been more effective.

**Computer Program Design**

In addition to containing the elements of effective computer-
based instruction, the "Make It Click" lesson was also found to be
well-constructed in terms of the "Events of Instruction" advocated
Based on Burke's (1982) building blocks of computer-based instruction, the computer lesson was found to be well-designed.

**Directions.** Adequate directions were provided for students, so no additional off-computer documentation or assistance was needed in order to use the program. The lesson also provided teacher support materials.

**Succession.** Although the computer controlled the sequence of the program, the student was made to feel actively involved because of the inclusion of continuous questioning throughout the program. In addition, the student controlled the speed of the program. Unfortunately, in gaining control the student could also choose to speed through the lesson without becoming involved.

**Format.** The format of the program was consistent and well-organized. For example, the directions for continuation of the program were always contained at the bottom of the screen. The format of the program allowed the student control over its pace. The program never progressed without the student either answering a question, or entering a key to proceed.

**Questions.** The questioning style, although consistent, was interesting and easy-to-follow. Most possible responses were considered, and the program provided a utilities section to control
options. For example, if the program were to be used by only high school students, the instructor could modify it to allow only entries of a certain age range.

**Branching.** Although the lesson contained limited branching, the student was able to select a number of segments within the program by using menus. In addition, the student controlled the number of times the simulation was used.

**Screen design.** Finally, the text, graphics, and use of sound added interest and excitement to the program. The graphics, although primitive, were effective in conveying the persuasive message. For example, even though the graphics in the "Gruesome Game" were "cartoon-like" characters, they were useful for the purpose of the simulation.

The lesson was well-constructed and followed Gagne's Events of Instruction closely.

**Gaining attention.** Questions regarding seat belt habits began the program. The personal questions and the interesting "guess the statistics" questions did an adequate job of attracting the user's attention to the program.

**Informing the learner of lesson objectives.** Although not directly stated, the objective of the program was made clear during the presentation of the statistics regarding seat belts and
automobile accidents.

**Stimulating recall of prior learning.** Throughout the lesson, students were asked to recall their own use of seat belts and their involvement in automobile accidents. For example, the program asked whether the student used seat belts on a regular basis. The lesson proceeded, based on the student's response.

**Presenting stimuli with distinctive features.** Throughout the lesson, new and relevant information and activities were presented.

**Guiding learning.** The student learned about the advantages and disadvantages of using seat belts as a result of presentations of statistics, facts, and examples. This learning occurred in a question, response, and feedback-type of environment.

**Eliciting performance.** Students were asked to participate in a simulation during the program. This simulation was used to provide students with an opportunity to apply the statistics regarding seat belts and accidents to a hypothetical situation.

**Providing informative feedback.** Throughout the program, feedback was provided for the student in the form of new information.

**Assessing performance.** Although the actual act of seat belt use was not observed, the student was asked to commit to seat belt use. Students were also provided with feedback regarding their
decision related to seat belt use.

**Enhancing retention and learning transfer.** The program enhanced retention by providing a review near the end of the program. In addition, students were asked to commit themselves. The post-instruction discussion advocated by the program developers promoted retention and transfer.

**Student Involvement**

The "Make It Click" computer lesson provided students with many opportunities for involvement in the areas of active participation, emotional involvement, and social interaction.

**Active participation.** The computer lesson demanded a moderate degree of active participation. Students were continuously asked to respond to questions and make selections. For example, each screen presented the student with some opportunity for active participation, such as a list of choices or options. In addition, this active participation was varied to reduce possible boredom.

Although the student was provided with the opportunity to become involved, the participation was at a low intellectual level. The interaction was limited to constructed answers and the simple pressing of keys.
**Emotional involvement.** Although the program contained a number of emotional appeals, this aspect of the program was most evident in the "Gruesome Game" simulation. This simulation combined the feelings of apprehension, curiosity, fear, and humor. The emotional arousal produced by this simulation was based on a number of factors. First, the student was asked to visualize these people as "friends" prior to knowledge about their fate. Also, the student was asked to select and watch two, best friends. This emotional tie with the graphics produced arousal when the student was informed of the possible fate of the friends. The impact was made more intense by the graphic transformation of some friends graphics into wheelchairs, or skull and crossbones.

**Social interaction.** Although the computer lesson itself did not contain a social interaction element, the "Make It Click" documentation suggested the addition of social interaction in the form of a post-instruction discussion. This discussion was to include a discussion of the program's content and issues related to the content, as well as a critique of the program itself.

**Support System**

The support system for **Sunburst Communications** software was found to be excellent. After contacting the public relations
department, this researcher was given the name of a senior programmer who would cooperate with the development of any feasible modifications that would be needed in the program. In addition, the software company supplied copies of the original software, documentation, and any modified software at no charge.

Additional Selection Criteria

Prior to making a commitment to the "Make It Click" lesson, a number of additional areas were examined. First, professional evaluations and reviews of the program were examined. In addition, a number of professionals in the areas of educational technology and driver education evaluated the program. Also, the computer lesson was examined in relation to Simonson's (1982) guidelines for the planning, production, and use of persuasive media.

The "Make It Click" computer lesson was found to be excellent for use in promoting seat belt safety. A number of independent evaluators and journal editors have published evaluations and reviews of the computer lesson and Sunburst computer software programs have collectively received over 800 awards and recommendations. A vast majority of the commercial reviews of the program were favorable. The few negative comments
involved specific message or program techniques. In addition, a number of reviewers felt that the "Gruesome Game" needed to be more serious to be effective.

Opfer (1985b), an leader in the use of computers in driver education, provided the following review:

"Make it Click: Seatbelt Safety" uses an interactive approach to the process of deciding to use safety belts. Colorful graphics are used to reinforce the positive reasons for safety belt usage. Helps students decide to wear safety belts every time they get into a car.

Excellent! (p. 7)

Booklist (1985), well-known as a selection tool for both print and nonprint materials, stated that "in a serious yet nonthreatening manner, this software drives home some very heady points about wearing seat belts, and in the process conveys useful information" (p. 1413). In a review in Computing Teacher (1985), the program was stated to be well-written and motivating. Also, the reviewer stated that it could be used "to encourage the acceptance of healthy behaviors" (p. 42).

In addition to the standard review format, some reviewers chose to make specific comments regarding the usefulness of the program. A review in Computing Teacher (1985) asked the question,

could a good-quality film be as effective as this software in demonstrating the risks and consequences of not
wearing seat belts? Perhaps, but by focusing on decision making, "Make It Click" clearly does more than transmit information—it is an attempt at behavior modification. (p. 41)

Booklist (1985) stated that,

perhaps the best part of this software is the class discussions stemming from its use. It's easy to watch folks get flipped out of windshields on a computer screen, but to use this program as a motivation to talk about such reality will prove worthwhile. (p. 1413-1414)

Finally, Computing Teacher (1985) emphasized that the computer lesson would be useful for both young children, as well as, adults.

A number of professional educators have reviewed the "Make It Click" program using a nationally published software evaluation tool. They have found it to be an excellent lesson. University faculty members, media specialists, and driver education instructors informally previewed and evaluated the "Make It Click" computer lesson using a software evaluation tool developed at the Northwest Regional Education Laboratory (1983). The standard evaluation form titled "MicroSIFT" included space for a lesson evaluation based on both predefined criteria and open-ended comments (APPENDIX A).

All evaluators agreed that the program would be useful in promoting seat belt use at all age levels from elementary school
through adults. In addition, most evaluators cited the use of a variety of approaches as a major advantage in the program. These approaches included the program's use of the student's name, introduction of statistics, the simulation activity, and the dispelling of myths associated with seat belt use. In addition, reviewers were mixed on whether students would be affected emotionally by the segment called the "Gruesome Game". Although it was agreed that there would be some emotional response, the types of responses ranged from fear to humor.

Based on the guidelines for planning and production of persuasive media by Simonson (1982), the computer lesson was found to contain many of the elements necessary for producing changes in attitude and behavior. In addition, it was found that this computer lesson could be modified to meet the needs of this study in the area of involvement strategies.

Many of the elements highlighted in the guidelines were identified within various segments of the computer lesson. A review of the findings has been outlined below:

Guideline #1: Realism

Segment 2: Statistics - accidents and seat belts
Segments 3-5: The Gruesome Game
Segment 6: Graphic visualizations
Segment 7: Active decision-making
Guideline #2: New Information
Segment 2: Statistics - accidents and seat belts
Segment 6: Statistics in analogies

Guideline #3: Credibility
Segment 2: Statistics - accidents and seat belts
Segment 3-5: The Gruesome Game
Segment 6: Both sides of the issue
Segments 1-7: Organized, easy to follow format

Guideline #4: Active Involvement
Segments 1-7: Interaction by user
Segments 3-5: Involvement in The Gruesome Game

Guideline #5: Post-Instruction Discussion
Not included in computer lesson itself

Guideline #6: Emotional Involvement
Segments 1-7: Vivid Graphics
Segments 1-7: Active and Motivating
Segments 3-5: The Gruesome Game

This study focused on the last three guidelines. Guidelines four through six dealt with the area of active involvement in the persuasion process. Each of these guidelines presented a possible strategy for using involvement in persuasion. Guideline #4 dealt with the passive versus active nature of involvement. Guideline #5 stressed the use of a post-instruction discussion and critique of the lesson with the student. Finally, Guideline #6 addressed the level of emotional involvement or arousal. According to Simonson (1983),

the active learner perceives instruction and information more favorably than does the passive learner, all other things being equal. Involvement is an important
technique for promoting desirable attitudinal outcomes (p. 32).

The "Make It Click" computer program addressed all of the guidelines prescribed by Simonson (1982). However, a novel interpretation was required of Guideline #4. This guideline encompassed the involvement of an individual in the planning, production, and delivery of mediated instruction. The computer was thought to provide a unique environment where the student was an active participant in the delivery of the persuasive message.

Guideline #5 advocates a post-instruction discussion. A post-instruction discussion should involve a group discussion of the content and issues presented in the program, as well as a critique of the program itself. This type of social interaction was not contained in the computer lesson itself. Despite the interactive nature of the computer lesson, it was hypothesized that the post-instruction discussion might still be needed to produce attitude change.

The software package "Make It Click" contained documentation to assist the instructor in conducting a post-instruction discussion as part of the lesson. The following list is contained in the documentation:
1. Poll seat belt use and discuss the results.
2. Review and discuss facts and figures presented in the program, as well as, the reasons for seat belt use and nonuse
3. Which of the reasons for belt use carried the most impact?
4. How easy or hard is it to think about your own injury or death?
5. What is involved in making a decision? Focus on making good decisions.
6. Was the program useful? Did you enjoy using it? Why?

Emotional involvement was the emphasis of Guidelines #6. Although emotional appeals appeared throughout the entire computer lesson, the "Gruesome Game" was the segment of the program that contained the most emotional impact. Students became actively involved in this personal, and purposeful, emotional activity. It was hypothesized that the combination of the personalized aspects of the simulation and the serious results and conclusions drawn in the game might lead to purposeful emotional arousal.

Involvement Strategies and the CBI Lesson

The goal of this study was to examine learner involvement strategies as they were related to the effectiveness of a persuasive, computer-based instruction lesson. A number of involvement strategies were isolated. Elements of the computer lesson were manipulated, activities added, or instructional situations controlled in order to address three involvement strategies, including active
participation (Guideline #4), social interaction (Guideline #5), and emotional involvement (Guideline #6). In this way, it could be determined whether all three guidelines would be needed for producing attitude change or if a particular combination would be optimal.

The level of active participation with the computer lesson was controlled by limiting the amount of computer-learner interaction by placing the student in the role of passive observer. In order to do this, a videotape was produced of what would appear on the computer screen during use of the computer lesson. No additional titles or visuals were added. The lesson was viewed as a student might view a film. The lesson remained the same, however, the student's level of involvement with the lesson changed. The computer lesson was also used in an active participation situation where the student interacted "one-on-one" with the computer.

In order to examine the emotional aspect of involvement, one element of the computer lesson was manipulated. The most emotional segments of the program involved the "Gruesome Game". As a result, this portion of the program was eliminated in one version of the computer lesson. This alternate version of the program, modified by a programmer at Sunburst, removed this emotional aspect of the program without modifying the content of
the program.

The final involvement strategy examined focused on social interaction. A post-instruction discussion was included following the computer lesson's use in some cases. Within this discussion, the learner analyzed and critiqued the instruction and the program's message. General discussion guidelines were included with the "Make It Click" lesson and additional questions and guidelines were developed. This involvement strategy was included to extend the concept of interacting with the computer by including active social interaction.

In review, four different involvement strategies were identified for use in this study with the computer lesson "Make It Click". These included:

A. Individual use of the CBI lesson accompanied by a post-instruction discussion
B. Individual use of the CBI lesson
C. Individual use of the CBI lesson without the "emotional involvement" segment
D. Passive observation of the CBI lesson being used

The Identification or Development of Instruments

This section of the methodology involves the identification and development of instruments. First, the existing testing tools identified and selected for use in this study will be examined. The
process used for the design of the instruments and tools developed specifically for this study will follow. Finally, a pilot study intended to gather data related to the reliability of these measurement tools will be discussed.

**Identification and Selection of Existing Tools**

Two existing tests were used to measure specific student characteristics and student outcomes. The *Computer Anxiety Index* (Maurer, 1983) was used to measure computer anxiety. In order to measure learner outcomes related to seat belt safety, an instrument titled the *Seat Belt Opinion Measure* was chosen.

A measure of computer anxiety was developed by Rohner (1981) and later revised by Maurer (1983). The original measure developed by Rohner was aimed at teachers and not formally validated. Maurer, in a 1983 study, revised and validated the index. In addition to a revision of individual items, normative data was collected from five groups including computer users, computer professionals, junior high school students, public school teachers, and a variety of other individuals. The *Computer Anxiety Index (CAIN)* was found to have reliability estimates of .90 for the test-retest measure of reliability, and .94 and .96 for the internal consistency measure of reliability. In addition, in the area of
criterion referenced validity, correlations between the CAIN, the State-Trait Anxiety Index, and the direct observation of students were shown to be significant.

An instrument titled the Seat Belt Opinion Measure was selected for use in examining attitudes and opinions toward the use of seat belts (Moore, 1975). The measure consisted of 20 Likert-type items measured on a seven-point continuum ranging from "strongly agree" to "strongly disagree". Moore created the measure based on responses to open-ended, free response questions about seat belts. Fifty-five items were identified for use in a pilot study. Of the 55 original items, 20 were selected for the final study. The 20-item measure was found to be highly reliable yielding a .90 alpha coefficient for internal consistency. In addition, it was found that attitudes toward seat belts carried over into respondents' evaluations of regular seat belt use.

Development of Instruments and Tools

Four instruments and tools were developed for use in this study. First, a measure was developed to determine student knowledge about seat belt safety. The second measure was used to identify a student's self-report level of involvement with a computer lesson. In addition, general information questions were developed
for three questionnaires. Guidelines for a post-instruction discussion were also produced.

Knowledge Instrument

A 15-item Seat Belt Knowledge Measure was developed to evaluate a student's knowledge of the information presented in a particular computer program, "Make It Click". Appropriate steps were be taken to assure the validity and reliability of this measure. Guidelines provided by Morris and Fitz-Gibbon (1978) were followed in the development of this instrument. Morris and Fitz-Gibbon developed a set of procedures for the development of an achievement instrument. These procedures have been found to be an effective way of constructing valid and reliable achievement measures.

The purpose of the instrument was to determine student knowledge regarding seat belts and their use. In order to develop objectives to guide in the development of the measure, a number of areas was identified. The objectives were based on information identified as important to seat belt safety in general, and specific information and objectives identified by the program designers. In addition, the content of the lesson and the lesson itself were also examined. The following objectives were developed:
Identify statistics related to the number of automobile accidents.
Identify statistics related to the number of deaths and disabilities resulting from automobile accidents.
Identify statistics related to the reduction of risk related to seat belt use in automobile accidents.
Identify statistics related to current seat belt use.
Identify common reasons for not wearing seat belts.
Provide evidence to dispute common reasons for not wearing seat belts.
Describe what happens to passengers when a car hits an object and stops.
Describe the likelihood of being in an auto accident.

In order to assure content validity of the measure, two areas were examined. First, the construct of seat belt safety was defined. The following definition was developed based on a combination of definitions identified in Webster's dictionary for seat belts, safety belts, and safety. For the purpose of this study, seat belt safety was defined as an understanding of the importance of the proper use of a seat belt device in preventing personal injury in an automobile accident.

Based on this definition of seat belt safety, a panel of judges viewed the preliminary test items and listed the knowledge that would be tested using the instrument. This list closely matched the definition, list of objectives, and the computer lesson contents.

In order to assure content validity, items were matched to specific objectives. All objectives were covered in the instrument. Because the instrument was multiple-choice and scored with the
use of computer forms, there was little chance for subjective
evaluation of items. In addition, since subjects using this
instrument remained anonymous, there was a reduced chance of
test anxiety influencing the results.

The reliability of a test means its consistency. If a test is
reliable, it should consistently measure whatever it is intended to
measure. The reliability coefficient for a set of scores indicated the
coefficient of correlation between a set of scores and another
equivalent set of scores from the same group. Reliability
coefficients may range from -1.00 to +1.00.

The split-half procedure was used to compute the internal
consistency of the test. This procedure involved splitting the test
in half and correlating the two halves. The reliability of the total
test was computed using the Spearman-Brown formula. A number
of factors can affect the reliability of a measure including the length
of the test, the similarity of items, the homogeneity of the group,
and the item difficulty. The Spearman-Brown coefficient of internal
consistency was .86. In addition to the split-half procedure,
Cronbach's alpha procedure was also used yielding a reliability
coefficient of .87. The reliability coefficient of 0.87 indicates that
87 percent of the observed variance was true variance as opposed
to error.
Level of Involvement Instrument

An instrument was also developed to measure a student's perceived level of involvement with a computer lesson. The purpose of this instrument was to assist in determining whether students who were more involved with a persuasive, computer-based instruction lesson would be more likely to have their attitudes changed. In addition, the Level of Involvement Index was also used to classify individuals by level of involvement in order to compare individuals with varied, self-report levels of involvement. Finally, the instrument was used to determine whether the prescribed treatments could be ranked from least to most active.

In order to develop this instrument on self-report level of involvement, guidelines by Henerson, Morris, and Fitz-Gibbon (1978) were followed. The guidelines created by Henerson et al. have been used in the development of a number of valid and reliable measures including the Computer Anxiety Index also used in this study. These guidelines involved a set of procedures that have been found to be effective in producing valid and reliable attitude measures. Although similar in many ways to the development of an achievement measure, the guidelines differ in the development and analysis of measure items. The procedure involved a number of steps. First, the construct and specific aspects of the construct
being measured were defined. Next, measure items were
generated through an interview process. This large pool of items
was then analyzed. Based on this item analysis, some items were
eliminated. Finally, the measure was pilot tested.

The following discussion will examine the development of the
Level of Involvement Index. First, the construct of "involvement"
was defined. According to Webster's (1986) dictionary, the term
involve was defined as "to entangle or include a person in some
situation, to give all of one's attention to".

Specific aspects of the construct were identified for use in
establishing construct validity. Involvement contains three major
elements: physical, intellectual, and emotional. A person reporting
a high level of involvement with a computer lesson would be
physically involved in activities, such as close proximity to the
computer display screen, and active attention to the lesson through
eye contact. Intellectual involvement would be observed through
active response to questions and attendance to the message.
Emotional involvement could be determined through active facial
expressions and engagement in the lesson.

Based on this construct, lesson users were interviewed using
open-ended questions to determine their perceived involvement
with a computer lesson. Based on the responses recorded during
these interviews, 89-items were generated. A prototype instrument was developed in a Likert-type format (APPENDIX B). This prototype was piloted on three groups from one class section of an undergraduate teacher education course. The three groups included people who simply observed a computer lesson, those who used the lesson alone, and those who used and discussed the computer program.

An item analysis was conducted on the data collected. The items of those subjects scoring in the top and bottom 25% were analyzed. Based on this analysis, over 30 items were eliminated. Thirty-nine items were selected to be used in the final form of the instrument. Data were collected on reliability during the second pilot study.

The split-half procedure was used to compute the internal consistency of the Level of Involvement Index. The reliability of the total instrument was computed using the Spearman-Brown formula. The Spearman-Brown coefficient of internal consistency was .97. When the Cronbach alpha procedure was used, a reliability coefficient of .97 was found.

General Information Questions

General information items were developed to be used on
three separate questionnaires. These questions were used to
gather data from the subjects, such as information related to
gender, seat belt use, and self-report levels of seat belt use.
Questions also included a self-report "level of involvement" with the
program, a self-report program effectiveness level, and a self-report
level of seat belt use. The questions were developed based on the
literature on questionnaire development and the analysis of
questionnaires developed for similar studies.

Discussion Guidelines

A set of guidelines and procedures were developed for use in
the discussion aspect of this study. In order to develop these
guidelines, the literature was examined in the area of group
discussion procedures. A list was generated of techniques for
leading effective discussions. Based on this list and additional
literature, discussion guidelines and procedures were developed.
These procedures were then evaluated by a person knowledgeable
in the area of guidance and counseling. Revisions were made and
an outline was created for use in the actual discussion. The
guidelines were evaluated again during the pilot study.
The Pilot Study

A pilot study was conducted as a trial of the instruments and guidelines developed, as well as of the standard measures. Thirty-five students in one section of an undergraduate instructional media course for teachers were used as the sample population. All students completed a general information questionnaire (APPENDIX C). This questionnaire provided demographic information about the subjects. For example, the class was split evenly between males and females. Over 90 percent of the students were between the ages of 20 and 29. Twenty-five percent of the subjects indicated that they sometimes, rarely, or never used their seat belts.

The students were then divided into four groups. One group watched a videotape of a computer lesson being used, two groups used the computer lesson, and one group worked on an unrelated activity. Near the end of the 25 minute treatment, half of the students using the computer program participated in a short discussion. The students then completed the Computer Anxiety Index, the Seat Belt Knowledge Measure, the Level of Involvement Index and the Seat Belt Opinion Measure, in addition to the second general information questionnaire. The data gathered in the pilot study were used to revise procedures related to the organization of
the treatment, obtain reliability data concerning the measures, and
gain insights into additional changes that needed to be made prior
to the final study.

Specific changes were made in two areas prior to the final study. First, minor changes were made in the treatment materials. For example, the additional treatment was included in the final study. The computer-based instruction lesson without the emotional segment was not completed at the time of the pilot study, but it was included in the final study.

In addition to the added treatment, the size of the discussion group was changed slightly. Because of the unusually large class size, the pilot study contained more individuals in the discussion group than was recommended in the literature for a short, small group discussion. The final study dropped the number in the discussion group from nine to four or five. As a result of the smaller discussion groups, it was hoped that each subject would have more opportunities to share ideas with the group in the limited time provided for the discussion.
Finally, the activity of the control group was changed. Rather than a totally unrelated activity, in the final study the control group would use a computer-based instruction lesson on a topic other than seat belt safety. The reason for this change included a number of factors. First, because all other groups were dealing with computers, the control group felt isolated. Also, because they were participating in an unrelated activity, additional supervision was needed for this group.

The second area of revision involved the study procedures. Although the pilot went smoothly, a number of small revisions were made. First, rather than assigning treatment groups verbally, the assignments were placed on cards for the final study. This saved time during the final study, because the instructor could hand out the cards as students came into the room prior to the beginning of class. In addition, little introduction was provided for the students. This led to a number of questions and some confusion. A more detailed description of the purpose of the study was developed without providing too much information. Finally, a minor change was made in the distribution of computer disks. In the final study, the disks were placed in front of the disk drive rather than handed out by the instructor. In addition, they were labeled with the student number for easy identification. This saved time and
reduced confusion.

The Research Questions

The goal of this study was to examine three types of learner involvement strategies when using persuasive, computer-based instruction, and to determine whether all or some combination of these learner involvement strategies were needed to produce changes in knowledge, attitude, and behavior. In order to make this determination, a number of research questions were addressed.

A) Is there a difference in knowledge about seat belts for learners who were exposed to different learner involvement strategies?

B) Is there a difference in attitudes about seat belts for learners who were exposed to different learner involvement strategies?

C) Are there other factors that may have affected the learners who were exposed to different learner involvement strategies?

In order to examine these questions, an experimental study was conducted. This section of the methodology will discuss the experiment in detail, including the research design, the subjects, the materials, the procedure, and the data analysis.
The Research Design

A modified, posttest only-control group design was used for this study (Campbell & Stanley, 1963). This design used four treatment groups and one control group. These groups included:

A. Individual use of the CBI lesson accompanied by a post-instruction discussion
B. Individual use of the CBI lesson
C. Individual use of the CBI lesson without the "emotional involvement" segment
D. Passive observation of the CBI lesson being used
E. Control Group

Two dependent variables were examined. The first dependent variable was the score on the Seat Belt Opinion Measure. This measure identified attitudes and self-report behaviors related to seat belt use. The second dependent variable was the score on the Seat Belt Knowledge Measure. This measure evaluated a subject's knowledge of seat belt use. These measures were discussed in detail in the previous section of this chapter.

Information was gathered from subjects about their gender, opinions regarding seat belts, self-report driving record, and seat belt use. In addition, information was gathered related to self-report effectiveness of the program. Subjects also completed the Computer Anxiety Index and the Level of Involvement Index.

The following null hypotheses were tested:
A) There is no significant difference in Seat Belt Knowledge Measure mean scores between subjects in the four treatments or control group.

B) There is no significant difference in Seat Belt Opinion Measure mean scores between subjects in the four treatments or control group.

C) There is no significant difference between the four treatment groups on other associated variables.

C1) There is no significant difference in Computer Anxiety Index mean scores between subjects in the four treatments or control group.

C2) There is no significant difference in Level of Involvement Index mean scores between subjects in the four treatments or control group.

The Subjects

The subjects chosen for this study were preservice teachers in The College of Education at two universities: The University of Toledo and Iowa State University. The sample from this population of approximately 4000 teacher education majors was approximately 300 students enrolled in 20 sections of a junior level instructional media course. A small number of students were absent from either the treatment procedure or the follow-up study and their data were not used. A variety of backgrounds within the teacher education programs were represented. The experiment took place during the first fifty minutes of the two-hour class sessions.

Each class section was randomly divided into one of five
groups: the four treatment groups or the control group. In order to assure at least four participants in the small group discussion treatment, the first, random assignment was given to the discussion treatment for each class section. Subjects were assigned a four-digit number based on their treatment group, an accession number within the treatment group, and the class section number.

The Materials

The materials used in this study included a variety of hardware and software. Twenty Apple IIe computers were used for three of the treatment groups and the control group. The computer software program "Make it Click" was used for two of the treatment groups.

The third treatment group used a modified version of the "Make it Click" program. This version was developed in conjunction with a programmer at Sunburst Communications. The major modification to the program entailed the elimination of a section of the program dealing with the "Gruesome Game". In addition, all references to the "Gruesome Game" were eliminated.

The control group used a health education computer program on nutrition that was unrelated to seat belt safety. This program was developed by the Minnesota Educational Computer Consortium.
and is a popular educational program. The selection process for this lesson involved examining the content and the design of the computer-based instruction. The length of the program and the content area were also considered.

The remaining treatment group viewed the "Make It Click" computer program through the use of a prerecorded VHS 23-minute videotape. The videotape was strictly a recording of what would appear on the monitor during use of the computer program without the addition of audio or any other special effects. All major segments of the computer program were accessed using the default option at a speed that allowed viewers adequate time to read the screen.

In addition to the computer and video hardware and software, three sets of questionnaires were used. The first set was administered prior to the study to gain general background information (APPENDIX D). The questionnaire for the control group differed slightly from the four treatment group questionnaires. The control group's questionnaire contained the Computer Anxiety Index, the Seat Belt Opinion Measure, and the Seat Belt Knowledge Measure, in addition to the general background information questions (APPENDIX E). The additional data served a pretest comparison function.
Immediately following the treatment, subjects completed the second questionnaire containing the **Computer Anxiety Index**, the **Seat Belt Opinion Measure**, the **Seat Belt Knowledge Measure**, the **Level of Involvement Index**, and general information questions related to the lesson (APPENDIX F). Finally, after two weeks, the follow-up questionnaire was administered. This questionnaire contained the **Computer Anxiety Index**, the **Seat Belt Opinion Measure**, the **Seat Belt Knowledge Measure**, and general information questions related to seat belt safety (APPENDIX G).

**The Procedure**

The procedure for this study involved a number of steps. This study procedure was approved by the "Human Subjects Committee" (APPENDIX H). An overview of the timetable used to implement this procedure is located in APPENDIX I.

An introduction was given to the subjects. They were told that they would be assisting the researcher in examining different types of instructional uses of the computer. In addition, they were told that students would be viewing videotapes, using the computer, or possibly participating in a small group discussion. In order to divide the students into groups, each student was given an identification number that was used to direct students to the
correct group. Students were initially separated into two rooms. The students in the passive observation treatment remained in the classroom with the video player and the regular instructor. After completing the first questionnaire, this group viewed the videotape.

The remaining students proceeded directly to the computer classroom where computers and software were labeled based on identification numbers. At this time, these subjects completed the first questionnaire.

After the completion of the questionnaires, the subjects began using the CBI lesson assigned to them. Approximately 15 minutes into the treatment, those subjects assigned to the post-instruction discussion group proceeded to a small classroom. The researcher led a short discussion dealing with seat belt safety and "Make It Click".

After approximately 25 minutes, all groups met back in the regular classroom. At this time, the second questionnaire was administered. Upon completion of the questionnaire, subjects were thanked for their participation. Two weeks after the initial study, subjects completed the third questionnaire.
Data Processing and Analysis

The data collected were coded, then analyzed. Mean scores for the treatment groups and control group were compared using an F-test. The data obtained from the general information questions were also processed and analyzed.

Summary

This chapter contained three sections. First, the computer-based instruction lesson was selected based on the examination of the content area, persuasive message design, computer program design, student involvement and support systems available.

Second, instruments chosen for use in the study were examined. The process of developing a number of instruments for the study was also discussed. A description of the pilot study ended the section.

Finally, the design of the research study was explained. This discussion included an examination of the research design, the subjects selected for the study, the materials used, and the procedures followed. An discussion of data analysis concluded the chapter. The results of the study and the answers to the research questions are discussed in the fourth chapter.
RESULTS

Introduction

The procedures described in the previous chapter were successfully completed. After the computer-based instruction lesson was selected, materials needed for the study were developed, including the videotape and the modified CBI lesson. In addition, a pilot study was conducted to test the instruments and the experimental procedures to be used in the final study.

In order to examine the research questions, an experimental study was conducted. Data were collected using three questionnaires: a pre-treatment questionnaire, an immediate questionnaire, and a follow-up questionnaire. The pre-treatment questionnaire was administered prior to the treatment procedure. Following the treatment, the "immediate" questionnaire was completed. Finally, the follow-up questionnaire was administered two weeks after the "immediate" questionnaire.

This chapter is separated into five sections. First, an overview of the statistical and treatment procedures used in this study will be given. The results relating to the research question dealing with seat belt knowledge will then be examined. A discussion of the results for the research question involving seat
belt attitudes will follow. Finally, other results related to the study will be explained. A summary will conclude the chapter.

Statistical and Treatment Procedures

The statistics computed for this study produced two categories of results. First, general questions produced demographic data about the study's subjects. Additionally, tests were used to measure subject knowledge and attitudes toward seat belts.

The t-test and the one-way analysis of variance (ANOVA) procedures were used to test hypotheses. The t-test procedure was used to compare the results of the measures completed immediately after the treatment procedure with the measures completed two weeks later. The ANOVA test was used for most other hypotheses testing.

In order to examine the relationship between treatment group scores on measures such as the Seat Belt Opinion Measure, the Seat Belt Knowledge Measure, and the Computer Anxiety Index, a one-way analysis of variance procedure was computed. This technique is used to test for significant differences between mean scores of two or more groups. The Scheffé method was used to identify significant differences between the treatment groups.
When planning the study, a number of questions regarding relationships between the treatment groups was identified. The development of "a priori" contrasts was selected as a statistically powerful method of making comparisons between treatment group mean scores. These "a priori" comparisons are able to detect smaller differences between mean scores than post hoc analysis using the same level of probability.

This "a priori" technique is used when the researcher is interested in comparing a set of specific treatments with other treatments. The t statistic is used for these comparisons. These planned contrasts were used in this study as an "a priori" test of specific relationships between the mean scores of the treatment groups. For example, the three "hands-on" computer treatments groups were compared with the "off-computer" treatment. Another contrast compared the treatment involving the CBI lesson accompanied by the post-instruction discussion with the CBI lessons containing the active participation, but without the social interaction aspect.

The treatment procedure was completed as described in the previous chapter. Data were gathered from four experimental groups and the control group. After all questionnaires were collected, the data were examined. Data from 349 subjects were
collected including 207 subjects from the Iowa State University sample and 142 subjects in The University of Toledo sample. Scores for the Seat Belt Opinion Measure, the Seat Belt Knowledge Measure, the Computer Anxiety Index and the Level of Involvement Index were collected from each subject. Because of missing data, four subjects were dropped from the Iowa State University sample and two subjects were dropped from The University of Toledo sample. Data from 343 subjects were used in analyses.

Although the treatment procedure was completed successfully, several problems arose while conducting the study. First, because of the layout of the computer classroom, treatment groups were unable to be physically separated. Since the subjects were unaware of the purpose of the study and were separated by study carrels, this was not viewed as a major concern.

Three difficulties with the procedure concerning the collection of data occurred. First, the computer data entry sheet may have been confusing to some subjects. The questionnaire contained letters for responses to multiple choice questions, while the computer data entry sheet used numbers. This may have caused students not to answer some questions. In addition, some subjects were confused by inconsistencies between Likert-type scales used on various dependent measures. For example, two had
rating systems with a range of 1-6, and one had a rating system of 1-7. Finally, a few students complained about the length of the questionnaires. Most of the complaints were reported by the control group subjects. This may be explained because the control group completed a pretest prior to the "immediate" questionnaire.

**Question One**

Is there a difference in knowledge about seat belts for learners who were exposed to different involvement strategies?

The following null hypothesis (Hypothesis A) was developed for this question:

There is no significant difference in Seat Belt Knowledge Measure mean scores between subjects in the four treatments or the control group.

A one-way, analysis of variance procedure was used to test whether a significant difference in Seat Belt Knowledge Measure mean scores could be found between the five groups. In addition, "a priori" contrast tests were used to identify specific differences between groups.

A significant difference was found. Tables 1 through 3 gives the results of the one-way, analysis of variance (tables are located at the end of this chapter). A Scheffé procedure was used to identify where the difference occurred. When examining the entire
sample, it was found that all treatment groups produced significantly higher knowledge scores than group 5, the control group.

A number of research questions were established, "a priori". In other words, it was hypothesized that differences existed between sets of treatment groups. A set of contrasts were developed to make these comparisons between groups. The t statistic was used to test these contrasts. The results of the t tests are also reported in Tables 1 through 3. It was found that the CBI accompanied by a post-instruction discussion treatment produced significantly higher mean scores on the Seat Belt Knowledge Measure than what was found for the control group. It was not possible to support the hypothesis that the two treatment groups involving the active participation and/or social interaction involvement strategies produced higher mean scores than the groups without the social interaction, the active participation, and/or the emotional involvement. Also, it was found that no significant difference existed between the group containing both the active participation and the social interaction and the group containing only the active participation. Finally, it was not possible to reject the null hypothesis that there was no significant difference in mean scores between groups containing the "hands-
on" computer use when compared to the "off-computer" group. In other words, no significant difference was found between the "hands-on" treatment groups and the "off-computer" treatment group on the Seat Belt Knowledge Measure.

A t-test was conducted to determine if the mean scores on the Seat Belt Knowledge Measure administered immediately after the experiment were significantly different from the Seat Belt Knowledge Measure mean scores on the follow-up study conducted two weeks later. A significant difference was found (Table 4). In order to examine changes within treatment groups between the immediate and the follow-up questionnaire, a t-test was used to examine the immediate and follow-up mean scores of each treatment group individually. In each case, the mean score dropped significantly between the immediate questionnaire and the follow-up questionnaire completed two weeks later. These results are reported on Table 4.

No significant differences were found between the pretest mean score and the immediate mean score for the control group. A significant drop was found between the immediate mean score and the follow-up mean score of the control group (Table 5).
Question Two

Is there a difference in attitudes about seat belts for learners who were exposed to different involvement strategies?

The following general null hypothesis (Hypothesis B) was posed for this question:

There is no significant difference in Seat Belt Opinion Measure mean scores between subjects in the four treatments or the control group.

A one-way analysis of variance procedure was used to test whether a significant difference in Seat Belt Opinion Measure mean scores could be found between the five groups. In addition, "a priori" contrasts tests were used to pinpoint specific differences between groups.

The F statistic for the analysis of variance was significant (p < .05; Table 6) for the sample as a whole. Next, the Seat Belt Opinion Measure mean scores for students from Iowa State University and The University of Toledo were computed separately. A significant difference was identified in the mean scores of the Iowa State University sample (Table 7), but a significant difference was not found between groups in The University of Toledo sample (Table 8).

The Scheffé procedure was used to identify differences between the groups. When examining the entire sample, it was found that the CBI accompanied by the discussion was significantly
different from the CBI without the emotional aspect. The results of the tests to provide information about the "a priori" questions are reported in Tables 6, 7, and 8. When examining the entire sample, it was found that the CBI 
accompaîiied by the post-instruction discussion produced a significantly higher mean score on the Seat Belt Opinion Measure than the control group. In addition, the data indicated that the two treatments involving the active participation and/or social interaction involvement strategies produced more positive attitudes toward seat belts than the treatments without the social interaction, the active participation, and/or the emotional involvement. It was also found that the treatment group containing both the active participation and the social interaction displayed a significantly higher mean score than the treatment groups containing active participation, but not social interaction. Finally, the researcher found that there was no significant difference in mean scores between the "hands-on" treatment groups 1, 2, and 3 when compared to the "off-computer", passive treatment group.

A t-test was conducted to determine if the mean scores on the Seat Belt Opinion Measure administered immediately after the experiment were significantly different from the Seat Belt Opinion Measure mean scores administered during the follow-up study.
Changes within groups between the immediate and the follow-up questionnaire are illustrated in Table 9. When examining the entire sample, a significant drop was noted for group 1 and group 2 on the Seat Belt Opinion Measure, however, the follow-up scores in these groups remained much higher than the scores of groups 3 and 4. Finally, no significant differences in mean scores on the pretest and the immediate test, or the immediate test and the follow-up test were found in control group (Table 10).

**Question Three**

Are there other factors that may have affected the learners who were exposed to different involvement strategies?

The following general null hypothesis (Hypothesis C) was established for question three:

There is no significant difference between the four treatment groups on other associated variables.

This question will be addressed in five segments. First, computer anxiety will be examined in conjunction with the treatment groups and the dependent variables. Next, involvement strategies and student involvement will be examined. The self-report, seat belt use responses will then be presented. Subject
responses to questions related to the computer-based instruction lesson will follow. Also, data related to other variables, such as age and gender will be given.

**Computer Anxiety**

The following null hypothesis (Hypothesis C1) was posed concerning the relationship of computer anxiety to the treatment groups.

There is no significant difference in Computer Anxiety Index mean scores between subjects in the four treatments or the control group.

A one-way analysis of variance procedure yielded a significant difference in the mean scores of the Computer Anxiety Index among the five groups in the entire sample (Table 11). However, the Iowa State University (Table 12) and The University of Toledo (Table 13) sub-sample testing did not indicate a significant difference in the mean scores. A Scheffé procedure was used to identify specific differences among the groups for the entire sample. It was found that the subjects in the CBI accompanied by the post-instruction discussion had a significantly lower level of computer anxiety than the control group.

A t-test was computed to determine if the mean scores on the Computer Anxiety Index administered immediately after the
experiment were significantly different from the Computer Anxiety Index mean scores on the follow-up study conducted two weeks later. A significant different was found. In order to examine the changes within treatment groups between the immediate and the follow-up questionnaire, a t-test was used to examine the immediate and follow-up scores of each treatment group individually. A significant increase in computer anxiety was noted in groups 1, 2, and 3 between the immediate and the follow-up testing (Table 14). In addition, a significant difference was found in the control group between the pretest and the immediate test. However, a significant difference in mean scores was not noted between the immediate test and the follow-up test (Table 15).

Correlation coefficients were computed to determine whether a relationship existed between scores on the Computer Anxiety Index and the Seat Belt Knowledge Measure or the Seat Belt Opinion Measure. A significant relationship was found between computer anxiety and seat belt opinion (Table 16). In order to determine whether computer anxiety may have affected the results of this study, the analysis of covariance technique was used to statistically control for the variable of computer anxiety. It was found that when the influence of computer anxiety was removed, the resulting differences among the Seat Belt Opinion Measure
mean scores remained significant (Table 17).

**Involvement and Involvement Strategies**

Three types of results were used to examine the level of student involvement with the lesson including group assignment, Level of Involvement Index score, and answers to single-item, involvement questions. First, the involvement strategy was based on group assignment. The researcher hypothesized that the treatment involvement strategies could be considered to require progressively greater amounts of student involvement. While the highest level of student involvement would be the group involved both in the CBI lesson and the post-instruction discussion, the lowest level of student involvement would be the passive observation group. This was confirmed by the Level of Involvement Index mean scores recorded by each student (Table 18).

The following null hypothesis was posed:

There is no significant difference in the Level of Involvement Index mean scores between the subjects in the four treatment or the control group.

A one-way analysis of variance procedure was used to test whether a significant difference in the Level of Involvement Index mean scores could be found between the five groups. A significant difference was identified (Table 18). The Scheffé procedure found
that the mean scores of the CBI accompanied by the discussion were significantly different from the CBI without the emotional segment and the control group. In addition, the CBI accompanied by the discussion, the CBI only, and the CBI without the emotional segment were all significantly different from the passive participation treatment group. The trend of group average scores also supported the intent of this hypothesis.

Comparisons were made "a priori" using contrasts (Tables 18, 19, and 20). It was also found that the group containing both the social interaction and the active participation produced significantly higher levels of involvement than the three treatment groups without this social interaction. The data indicated that the two treatments involving the active participation and/or social interaction involvement strategies produced higher mean levels of involvement than the two treatments groups without the social interaction, the active participation, and/or the emotional involvement. It was also found that the treatment containing both the active participation and the social interaction produced higher level of involvement scores than the two treatment groups containing active participation, but not social interaction. Finally, it was found that there was a significant difference in mean scores between the "hands-on" computer treatment groups 1, 2, and 3.
when compared to the "off-computer" treatment group 4.

The third assessment of student involvement was included in a series of multiple-option questions involving a subject's self-report, level of involvement with the CBI lesson. These single-item measures were intended to gain information about student perceptions of the computer lesson. The six questions are listed below:

1. Rate your attitude toward this type of lesson.
2. Rate the amount of time provided for the lesson.
3. Rate your level of involvement with the lesson as a whole.
4. If you participated in a discussion group, rate your level of involvement within the discussion group.
5. Rate the effectiveness of the lesson in providing you with useful information related to seat belts.
6. Rate to what degree the lesson persuaded you to use your seat belt.

Only those subjects who participated in a treatment involving the persuasive, computer-based instruction lesson were included in the analysis of the questions. Responses to each of the six questions were analyzing in conjunction with an examination of the Level of Involvement Index mean scores. In all six cases, the mean score on the Level of Involvement Index was related to self-report, level of involvement. For example, those indicating a very positive attitude toward computer-based instruction scored significantly higher on the Level of Involvement Index than those reporting neutral, negative, or very negative attitudes toward the lesson. In
addition, those who indicated positive or neutral attitudes expressed significantly higher levels of involvement with the lesson than those who possessed negative or very negative attitudes toward computer-based instruction (Table 21).

When examining subject's responses to the amount of time provided for computer-based instruction, those indicating more than adequate time with the computer-based instruction lesson scored significantly lower on the Level of Involvement Index than those reporting only adequate time with the lesson (Table 22).

Students' self-report, level of involvement, as measured on a single item measure, was found to be significantly related to their mean scores in the Level of Involvement Index. Those indicating that they were involved or very involved with the lesson scored significantly higher on the involvement index than those who expressed that they were uninvolved with the lesson (Table 23).

When subjects were asked to rate the effectiveness of the lesson in terms of the usefulness of the information related to seat belts, it was found that their rating of effectiveness was related to their reported level of involvement with the lesson. Those who indicated that the lesson was excellent or very good had significantly higher scores on the Level of Involvement Index than those who reported that the lesson was good, adequate, or poor
Finally, subjects were asked to rate the ability of the lesson to persuade them to use their seat belts. It was found that those indicating that the lesson was highly persuasive or persuasive scored significantly higher on the Level of Involvement Index than those who perceived the lesson as not being persuasive (Table 25).

**Self-report of seat belt use**

A number of questionnaire items asked students to indicate their use of seat belt use. Only those subjects who participated in a treatment involving the seat belt lesson were included in the analysis. A number of significant results were found when these data were compared to the study's dependent measures, including the Seat Belt Knowledge Measure, the Seat Belt Opinion Measure, and the Computer Anxiety Index.

When asked about future use of seat belts, immediately after the treatment, it was found that those currently using seat belts or planning to use seat belts, scored significantly higher on the Seat Belt Knowledge Measure than those who indicated they did not wear seat belts and would continue not wearing seat belts (Table 26).

Based on self-report seat belt use two week following the treatment, it was found that those individuals that reported always
or almost always wearing seat belts scored significantly higher on the Seat Belt Knowledge Measure than those who reported wearing their seat belt seldom or never (Table 27).

Immediately after the treatment, individuals who indicated that they would use seat belts and would continue to use seat belts tended to give significantly higher scores on the Seat Belt Opinion Measure than those who indicated they currently did not wear seat belts, but would use seat belts in the future. In addition, those who indicated that they would use seat belts in the future scored significantly higher than those who indicated that they would continue not using seat belts (Table 28).

An examination of mean scores on the Seat Belt Opinion Measure and self-report seat belt use, showed that those individuals reporting high use or general use of seat belts scored significantly higher on the attitude measure than those reporting low seat belt use (Table 29).

A significant difference was found in computer anxiety between individuals who reported using seat belts and those who reported not using seat belts. It was found that those individuals reporting always or almost always wearing their seat belts tended to report significantly lower levels of computer anxiety as measured by the Computer Anxiety Index than those who reported seldom or
never wearing seat belts (Table 30).

In addition to these specific seat belt questions, other related questions were asked. When examining the relationship between these questions and scores on the dependent measures, two significant findings were found. Those who reported that they felt that seat belts prevented serious injury scored significantly higher on the Seat Belt Opinion Measure than those who indicated that wearing a seat belts increased injury in an automobile accident (Table 31).

Another question related to seat belts involved subject's opinions concerning state laws requiring seat belt use. Those who indicated that they were in favor of such laws scored significantly higher on the Seat Belt Opinion Measure than other who had no opinion or opposed these laws. In addition, those who had no opinion scored significantly higher on the attitude measure than those who indicated that they were opposed to the law (Table 32).

Computer-based instruction lesson findings

Only those subjects who participated in a treatment involving the computer-based instruction lesson were included in the analysis of the questions relating to the computer-based instruction lesson.

In examining subject's responses to the effectiveness of the
CBI lesson in providing useful information related to seat belts, it was found that those subjects who felt the lesson was excellent or very good scored significantly higher on the Seat Belt Opinion Measure than those who felt that the program was good, adequate, or poor (Table 33).

The final question given to subjects asked them to report the degree to which they felt the lesson persuaded them to use seat belts. It was found that subjects that considered the lesson persuasive or highly persuasive recorded significantly higher scores on the Seat Belt Opinion Measure than those who felt the lesson was not persuasive (Table 34).

**Additional Variable Findings**

Variables relating to areas, such as age, gender, and location were not shown to be significantly related to the dependent measures.

**Summary**

This chapter presented results obtained from data collected during the experimental study. Results from the Iowa State University and The University of Toledo research sites were reported. In many cases the results were combined. The chapter
began with a discussion of the statistical procedures used in analyzing the data. Next, the research question related to seat belt knowledge and involvement strategies was addressed. The data on seat belt attitudes and involvement strategies followed. Finally, results related to other variables of interest were presented. The next chapter will discuss these results.
TABLES
Table 1: Hypothesis A  
Seat Belt Knowledge Measure Post-test Scores for Five Groups Using Different Involvement Strategies both Universities

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>11.24</td>
<td>11.31</td>
<td>10.35</td>
<td>10.88</td>
<td>8.25</td>
<td>10.48</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.62</td>
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<td>3.74</td>
<td>3.27</td>
<td>2.78</td>
<td>3.26</td>
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<td>Subjects</td>
<td>76</td>
<td>67</td>
<td>72</td>
<td>73</td>
<td>55</td>
<td>343</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>369.37</td>
<td>92.34</td>
<td>9.49</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>338</td>
<td>3335.52</td>
<td>9.72</td>
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</tr>
<tr>
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C. Scheffé Testd

<table>
<thead>
<tr>
<th>Groupsa</th>
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<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
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</table>

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.c</th>
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<tbody>
<tr>
<td>1</td>
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</table>

aThe groups refer to four treatment groups and the control group.
  CBI Dis = CBI lesson along with a post-instruction discussion
  CBI Only = CBI lesson
  CBI No Em = CBI lesson without the "emotional involvement"
  Passive = Passive observation of the CBI lesson
  Control = Control group

bThe higher the score, the higher the knowledge about seat belts.
  Highest possible score is 15.

cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 2: Hypothesis A
Seat Belt Knowledge Measure Post-test Scores for Five Groups Using Different Involvement Strategies at Iowa State University

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
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<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
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<tbody>
<tr>
<td>Mean Scores</td>
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B. Analysis of Variance

<table>
<thead>
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<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
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<th>Prob.c</th>
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C. Scheffé Test

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<th>Groups</th>
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<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
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<tbody>
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<td>CBI Dis</td>
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<td></td>
<td></td>
</tr>
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<td>CBI Only</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>CBI No Em</td>
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<td></td>
</tr>
<tr>
<td>Passive</td>
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<tr>
<td>Control</td>
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D. A Priori Contrasts

<table>
<thead>
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<th>CBI</th>
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<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
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<td>.98</td>
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</table>

aThe groups refer to four treatment groups and the control group.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group

bThe higher the score, the higher the knowledge about seat belts.
Highest possible score is 15.

cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 3: Hypothesis A
Seat Belt Knowledge Measure Post-test Scores for
Five Groups Using Different Involvement Strategies at The University of Toledo

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
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</thead>
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<tr>
<td>Mean Scores</td>
<td>11.19</td>
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<td>10.33</td>
<td>10.96</td>
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<td>Standard Deviation</td>
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B. Analysis of Variance

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<th>Source of Variation</th>
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<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>134.88</td>
<td>33.72</td>
<td>3.72</td>
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<tr>
<td>Within Groups</td>
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<td>9.04</td>
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<tr>
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C. Scheffé Test

<table>
<thead>
<tr>
<th>Groups</th>
<th>CBI Dis</th>
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<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
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<tbody>
<tr>
<td>CBI Dis</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CBI Only</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CBI No Em</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
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<td>.01**</td>
</tr>
<tr>
<td>1</td>
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<td>-1</td>
<td>-1</td>
<td>0</td>
<td>1.10</td>
<td>135</td>
<td>.27</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>-1</td>
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<td>.54</td>
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<td>.58</td>
</tr>
<tr>
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<td>-3</td>
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<td>-.02</td>
<td>135</td>
<td>.97</td>
</tr>
</tbody>
</table>

aThe groups refer to four treatment groups and the control group.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group

bThe higher the score, the higher the knowledge about seat belts.
Highest possible score is 15.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 4
A Comparison of the Immediate and Follow-up Seat Belt Knowledge Measure Scores for the Treatment Group Subjects at both Universities

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measureb</td>
<td>Imm FU</td>
<td>Imm FU</td>
<td>Imm FU</td>
<td>Imm FU</td>
<td>Imm FU</td>
</tr>
<tr>
<td>Subjects</td>
<td>76 76</td>
<td>67 67</td>
<td>72 72</td>
<td>73 73</td>
<td>288 288</td>
</tr>
<tr>
<td>Mean Scoresc</td>
<td>11.11 8.90</td>
<td>11.31 8.50</td>
<td>10.35 7.37</td>
<td>10.88 8.18</td>
<td>10.91 8.29</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.62 4.03</td>
<td>2.97 4.33</td>
<td>3.74 4.59</td>
<td>3.27 4.66</td>
<td>3.18 4.41</td>
</tr>
<tr>
<td>t Value</td>
<td>5.57</td>
<td>4.51</td>
<td>4.06</td>
<td>5.01</td>
<td>9.29</td>
</tr>
<tr>
<td>t Prob.d</td>
<td>.01**</td>
<td>.01**</td>
<td>.01**</td>
<td>.01**</td>
<td>.01**</td>
</tr>
</tbody>
</table>

aThe groups refer to four treatment groups.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson

b"Imm" refers to the measure administered immediately following the treatment procedure.
"FU" refers to the measure administered two weeks following the treatment procedure.

cThe higher the score, the higher the knowledge about seat belts. Highest possible score is 15.

dThe ** indicates significance at the .01 level.
Table 5

A Comparison of the Pretest, Immediate, and Followup Seat Belt Knowledge Measure Scores for the Pretest and Immediate Study in the Control Group at both Universities

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mean Score(^a)</th>
<th>Standard Deviation</th>
<th>t Value</th>
<th>t Prob.(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest(^b)</td>
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<td>8.73</td>
<td>1.76</td>
<td>1.33</td>
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<tr>
<td>Immediate</td>
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<td>8.25</td>
<td>2.78</td>
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</tr>
<tr>
<td>Immediate</td>
<td>55</td>
<td>8.25</td>
<td>2.78</td>
<td>2.04</td>
</tr>
<tr>
<td>Follow-up</td>
<td>55</td>
<td>7.03</td>
<td>3.52</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)The higher the score, the higher the knowledge about seat belts. High score is 15.

\(^b\)The * indicates significance at the .05 level.

\(^c\)"Pretest" refers to the measure administered prior to the treatment procedure. "Immediate" refers to the measure administered immediately following the treatment procedure. "Follow-up" refers to the measure administered two weeks following the treatment procedure.
Table 6: Hypothesis B
Seat Belt Opinion Measure Post-test Scores for Five Groups Using Different Involvement Strategies at both Universities

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>111.35</td>
<td>107.58</td>
<td>100.34</td>
<td>104.45</td>
<td>102.00</td>
<td>105.33</td>
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<tr>
<td>Standard Deviation</td>
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<td>24.82</td>
<td>16.45</td>
<td>18.86</td>
<td>18.43</td>
</tr>
<tr>
<td>Subjects</td>
<td>76</td>
<td>67</td>
<td>72</td>
<td>73</td>
<td>55</td>
<td>343</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>5552.66</td>
<td>1388.16</td>
<td>4.24</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
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<td>110620.10</td>
<td>327.27</td>
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</tr>
<tr>
<td>Total</td>
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</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Groupsa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI Dis</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>CBI Only</td>
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<tr>
<td>CBI No Em</td>
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<tr>
<td>Passive</td>
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<td>Control</td>
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</table>

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>2.92</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>3.31</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>2.86</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>.80</td>
<td>338</td>
<td>.42</td>
</tr>
</tbody>
</table>

---

aThe groups refer to four treatment groups and the control group.  
CBI Dis = CBI lesson along with a post-instruction discussion  
CBI Only = CBI lesson  
CBI No Em = CBI lesson without the "emotional involvement"  
Passive = Passive observation of the CBI lesson  
Control = Control group

bThe higher the score, the more positive the attitudes toward seat belts.
Scores range from 20 to 140.

cThe ** indicates significance at the .01 level.
Table 7: Hypothesis B
Seat Belt Opinion Measure Post-test Scores for Five Groups Using Different Involvement Strategies at Iowa State University

### A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>111.80</td>
<td>108.15</td>
<td>101.19</td>
<td>105.30</td>
<td>102.41</td>
<td>105.95</td>
</tr>
<tr>
<td>Subjects</td>
<td>45</td>
<td>39</td>
<td>42</td>
<td>43</td>
<td>34</td>
<td>203</td>
</tr>
</tbody>
</table>

### B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>3124.54</td>
<td>781.13</td>
<td>2.44</td>
<td>.04*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>198</td>
<td>63334.05</td>
<td>319.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>66458.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### C. Scheffé Test

No two groups were found to be significantly different at the .05 level.

### D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>2.31</td>
<td>198</td>
<td>.02*</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>2.44</td>
<td>198</td>
<td>.01**</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>2.14</td>
<td>198</td>
<td>.03*</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>0.55</td>
<td>198</td>
<td>.58</td>
</tr>
</tbody>
</table>

---

aThe groups refer to four treatment groups and the control group.
- CBI Dis = CBI lesson along with a post-instruction discussion
- CBI Only = CBI lesson
- CBI No Em = CBI lesson without the "emotional involvement"
- Passive = Passive observation of the CBI lesson
- Control = Control group

bThe higher the score, the more positive the attitudes toward seat belts.
Scores range from 20 to 140.

cThe ** indicates significance at the .01 level.
dThe ** indicates significance at the .01 level.
The * indicates significance at the .05 level.
Table 8: Hypothesis B  
Seat Belt Opinion Measure Post-test Scores for Five Groups Using Different Involvement Strategies at The University of Toledo

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>110.70</td>
<td>106.78</td>
<td>99.16</td>
<td>103.23</td>
<td>101.33</td>
<td>104.44</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>11.65</td>
<td>16.60</td>
<td>26.42</td>
<td>16.07</td>
<td>19.76</td>
<td>18.87</td>
</tr>
<tr>
<td>Subjects</td>
<td>31</td>
<td>28</td>
<td>30</td>
<td>30</td>
<td>21</td>
<td>140</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>2453.24</td>
<td>613.31</td>
<td>1.75</td>
<td>.14</td>
</tr>
<tr>
<td>Within Groups</td>
<td>135</td>
<td>47071.30</td>
<td>348.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>139</td>
<td>49524.54</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Schefé Test

No two groups were found to be significantly different at the .05 level.

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>1.77</td>
<td>135</td>
<td>.07</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>2.20</td>
<td>135</td>
<td>.02*</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>1.86</td>
<td>135</td>
<td>.06</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>.58</td>
<td>135</td>
<td>.55</td>
</tr>
</tbody>
</table>

The groups refer to four treatment groups and the control group.  
CBI Dis = CBI lesson along with a post-instruction discussion  
CBI Only = CBI lesson  
CBI No Em = CBI lesson without the "emotional involvement"  
Passive = Passive observation of the CBI lesson  
Control = Control group  

The higher the score, the more positive the attitudes toward seat belts.  
Scores range from 20 to 140.  
The * indicates significance at the .05 level.
Table 9
A Comparison of the Immediate and Follow-up Seat Belt Opinion Measure Scores for the Treatment Group Subjects at both Universities

<table>
<thead>
<tr>
<th>Group&lt;sup&gt;a&lt;/sup&gt;</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Imm</td>
<td>FU</td>
<td>Imm</td>
<td>FU</td>
<td>Imm</td>
</tr>
<tr>
<td>Subjects</td>
<td>76</td>
<td>76</td>
<td>67</td>
<td>67</td>
<td>72</td>
</tr>
<tr>
<td>Mean Scores&lt;sup&gt;c&lt;/sup&gt;</td>
<td>111.35</td>
<td>106.31</td>
<td>107.58</td>
<td>104.05</td>
<td>100.34</td>
</tr>
<tr>
<td>t Value</td>
<td>2.86</td>
<td>2.56</td>
<td>.48</td>
<td>1.49</td>
<td>3.62</td>
</tr>
<tr>
<td>t Prob.&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.01**</td>
<td>.01**</td>
<td>.63</td>
<td>.14</td>
<td>.01**</td>
</tr>
</tbody>
</table>

<sup>a</sup>The groups refer to four treatment groups.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson

<sup>b</sup>"Imm" refers to the measure administered immediately following the treatment procedure.
"FU" refers to the measure administered two weeks following the treatment procedure.

<sup>c</sup>The higher the score, the more positive the attitude toward seat belts. Scores range from 20 to 140.

<sup>d</sup>The ** indicates significance at the .01 level.
Table 10

A Comparison of the Pretest, Immediate, and Followup Seat Belt Opinion Measure Scores for the Pretest and Immediate Study in the Control Group at both Universities

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mean Score(^a)</th>
<th>Standard Deviation</th>
<th>t Value</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest(^b)</td>
<td>55</td>
<td>103.05</td>
<td>19.04</td>
<td>1.15</td>
</tr>
<tr>
<td>Immediate</td>
<td>55</td>
<td>102.00</td>
<td>18.86</td>
<td></td>
</tr>
<tr>
<td>Immediate</td>
<td>55</td>
<td>102.00</td>
<td>18.86</td>
<td>1.07</td>
</tr>
<tr>
<td>Follow-up</td>
<td>55</td>
<td>101.14</td>
<td>17.80</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)The higher the score, the higher the knowledge about seat belts. High score is 15.

\(^b\)"Pretest" refers to the measure administered prior to the treatment procedure.
"Immediate" refers to the measure administered immediately following the treatment procedure.
"Follow-up" refers to the measure administered two weeks following the treatment procedure.
Table 11: Hypothesis C1

Computer Anxiety Index Post-test Scores for
Five Groups Using Different Involvement Strategies at both Universities

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dls</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>62.18</td>
<td>67.46</td>
<td>65.54</td>
<td>68.72</td>
<td>73.56</td>
<td>67.15</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>20.21</td>
<td>19.00</td>
<td>20.91</td>
<td>21.17</td>
<td>21.72</td>
<td>20.79</td>
</tr>
<tr>
<td>Subjects</td>
<td>76</td>
<td>67</td>
<td>72</td>
<td>73</td>
<td>55</td>
<td>343</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>4487.45</td>
<td>1121.86</td>
<td>2.64</td>
<td>.03*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>338</td>
<td>143370.04</td>
<td>424.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>342</td>
<td>147857.49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testc

<table>
<thead>
<tr>
<th>Groupsa</th>
<th>CBI Dls</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI Dls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI No Em</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aThe groups refer to four treatment groups and the control group.
CBI Dls = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group

bThe higher the score, the more computer anxious the individual.
Scores range from 26 to 156.
cThe * indicates significance at the .05 level.
### Table 12: Hypothesis C1

**Computer Anxiety Index Post-test Scores for Five Groups Using Different Involvement Strategies at Iowa State University**

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>62.40</td>
<td>67.86</td>
<td>66.04</td>
<td>67.08</td>
<td>73.66</td>
<td>67.00</td>
</tr>
<tr>
<td>Subjects</td>
<td>45</td>
<td>39</td>
<td>42</td>
<td>43</td>
<td>34</td>
<td>203</td>
</tr>
</tbody>
</table>

#### B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>2229.59</td>
<td>557.39</td>
<td>1.26</td>
<td>.28</td>
</tr>
<tr>
<td>Within Groups</td>
<td>198</td>
<td>87276.38</td>
<td>440.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>89505.98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### C. Scheffé Test

No two groups were found to be significantly different at the .05 level.

---

*a The groups refer to four treatment groups and the control group.

- CBI Dis = CBI lesson along with a post-instruction discussion
- CBI Only = CBI lesson
- CBI No Em = CBI lesson without the "emotional involvement"
- Passive = Passive observation of the CBI lesson
- Control = Control group

*b The higher the score, the more computer anxious the individual. Scores range from 26 to 156.
Table 13: Hypothesis C1
Computer Anxiety Index Post-test Scores for Five Groups Using Different Involvement Strategies at The University of Toledo

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>61.87</td>
<td>66.89</td>
<td>64.80</td>
<td>71.13</td>
<td>73.42</td>
<td>67.37</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>19.50</td>
<td>19.37</td>
<td>20.46</td>
<td>20.64</td>
<td>21.97</td>
<td>20.48</td>
</tr>
<tr>
<td>Subjects</td>
<td>31</td>
<td>28</td>
<td>30</td>
<td>30</td>
<td>21</td>
<td>140</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>2613.11</td>
<td>653.27</td>
<td>1.58</td>
<td>.18</td>
</tr>
<tr>
<td>Within Groups</td>
<td>135</td>
<td>55727.57</td>
<td>412.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>139</td>
<td>58340.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test

No two groups were found to be significantly different at the .05 level.

---

a The groups refer to four treatment groups and the control group.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group

b The higher the score, the more computer anxious the individual.
Scores range from 26 to 156.
Table 14
A Comparison of the Immediate and Follow-up Computer Anxiety Index Scores for the Treatment Group Subjects at both Universities

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dls</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measureb</td>
<td>Imm</td>
<td>FU</td>
<td>Imm</td>
<td>FU</td>
<td>Imm</td>
</tr>
<tr>
<td>Subjects</td>
<td>76</td>
<td>76</td>
<td>67</td>
<td>67</td>
<td>72</td>
</tr>
<tr>
<td>Mean Scoresc</td>
<td>61.18</td>
<td>68.23</td>
<td>67.46</td>
<td>72.64</td>
<td>65.54</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>20.21</td>
<td>17.73</td>
<td>19.00</td>
<td>18.99</td>
<td>20.91</td>
</tr>
<tr>
<td>t Value</td>
<td>-3.35</td>
<td>-2.84</td>
<td>-3.62</td>
<td>-1.85</td>
<td>-5.76</td>
</tr>
<tr>
<td>t Prob.d</td>
<td>.01**</td>
<td>.01**</td>
<td>.01**</td>
<td>.06</td>
<td>.01**</td>
</tr>
</tbody>
</table>

The groups refer to four treatment groups.
- CBI Dls = CBI lesson along with a post-instruction discussion
- CBI Only = CBI lesson
- CBI No Em = CBI lesson without the "emotional involvement"
- Passive = Passive observation of the CBI lesson

b"Imm" refers to the measure administered immediately following the treatment procedure.
"FU" refers to the measure administered two weeks following the treatment procedure.

cThe higher the score, the computer anxious the individual. Scores range from 26 to 156.

dThe ** indicates significance at the .01 level.
Table 15

A Comparison of the Pretest, Immediate, and Followup Computer Anxiety Index Scores for the Pretest and Immediate Study In the Control Group at both Universities

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>t Value</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>70.94</td>
<td>20.44</td>
<td>-2.59</td>
<td>.01**</td>
</tr>
<tr>
<td>Immediate</td>
<td>73.56</td>
<td>21.72</td>
<td>-0.13</td>
<td>.89</td>
</tr>
<tr>
<td>Follow-up</td>
<td>72.00</td>
<td>19.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*aThe higher the score, the higher the knowledge about seat belts. High score is 15.

*bThe ** indicates significance at the .01 level.

*c"Pretest" refers to the measure administered prior to the treatment procedure. "Immediate" refers to the measure administered immediately following the treatment procedure. "Follow-up" refers to the measure administered two weeks following the treatment procedure.
Table 16
Product-Moment Pearson Correlation Data for the Seat Belt Knowledge Measure (SBKM), Seat Belt Opinion Measure (SBOM), and the Computer Anxiety Index (CAIN)

<table>
<thead>
<tr>
<th>Measure</th>
<th>SBKM</th>
<th>SBOM</th>
<th>CAIN&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBKM</td>
<td>1.0</td>
<td>.07</td>
<td>-.08</td>
</tr>
<tr>
<td>SBOM</td>
<td></td>
<td>1.0</td>
<td>-.20&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>CAIN</td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

<sup>a</sup>The <sup>**</sup> indicates significance at the .01 level.

Note. N = 343.
Table 17
Seat Belt Opinion Measure Post-test Scores for Five Groups
Using Different Involvement Strategies at both Universities
with Computer Anxiety Index Post-test Score Held Constant

A. Descriptive Statistics:
Adjusted and Estimated
Mean Score on the Seat Belt Opinion Measure

<table>
<thead>
<tr>
<th>Group</th>
<th>Observed Mean</th>
<th>Adjusted Mean</th>
<th>Estimated Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>111.35</td>
<td>110.80</td>
<td>111.64</td>
</tr>
<tr>
<td>Group 2</td>
<td>107.58</td>
<td>107.64</td>
<td>107.58</td>
</tr>
<tr>
<td>Group 3</td>
<td>100.34</td>
<td>100.07</td>
<td>100.34</td>
</tr>
<tr>
<td>Group 4</td>
<td>104.45</td>
<td>104.69</td>
<td>104.45</td>
</tr>
<tr>
<td>Group 5</td>
<td>102.00</td>
<td>103.09</td>
<td>102.00</td>
</tr>
</tbody>
</table>

B. Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within</td>
<td>336</td>
<td>106018.27</td>
<td>315.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>1</td>
<td>4139.70</td>
<td>4139.70</td>
<td>13.11</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1</td>
<td>391848.62</td>
<td>1848.62</td>
<td>1241.87</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>4</td>
<td>4857.20</td>
<td>1214.30</td>
<td>3.84</td>
<td>.01**</td>
<td></td>
</tr>
</tbody>
</table>

aThe groups refer to four treatment groups and the control group.
Group 1 = CBI lesson along with a post-instruction discussion
Group 2 = CBI lesson
Group 3 = CBI lesson without the “emotional involvement”
Group 4 = Passive observation of the CBI lesson
Group 5 = Control group

bThe higher the score, the more positive the attitudes toward seat belts.
Scores range from 20 to 140.

cThe ** indicates significance at the .01 level.
Table 18: Hypothesis C2
Level of Involvement Index Post-test Scores for Five Groups Using Different Involvement Strategies at both Universities

### A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>4.16</td>
<td>3.69</td>
<td>3.91</td>
<td>2.93</td>
<td>3.52</td>
<td>3.65</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.79</td>
<td>.81</td>
<td>.88</td>
<td>.73</td>
<td>.89</td>
<td>.92</td>
</tr>
<tr>
<td>Subjects</td>
<td>76</td>
<td>67</td>
<td>72</td>
<td>73</td>
<td>55</td>
<td>343</td>
</tr>
</tbody>
</table>

### B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>64.18</td>
<td>16.04</td>
<td>23.52</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>338</td>
<td>229.78</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>342</td>
<td>293.96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### C. Scheffé Test

<table>
<thead>
<tr>
<th>Groups</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI Dis</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI Only</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI No Em</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

### D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>5.89</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>5.20</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>3.04</td>
<td>338</td>
<td>.01**</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>8.89</td>
<td>338</td>
<td>.01**</td>
</tr>
</tbody>
</table>

The groups refer to four treatment groups and the control group.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group
The higher the score, the higher the level of student involvement.
Scores range from 1 to 6.
The ** indicates significance at the .01 level.
The * indicates significance at the .05 level.
Table 19: Hypothesis C2
Level of Involvement Index Post-test Scores for Five Groups Using Different Involvement Strategies at Iowa State University

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>4.16</td>
<td>3.70</td>
<td>3.90</td>
<td>2.92</td>
<td>3.52</td>
<td>3.64</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.79</td>
<td>.77</td>
<td>.91</td>
<td>.74</td>
<td>.86</td>
<td>.92</td>
</tr>
<tr>
<td>Subjects</td>
<td>45</td>
<td>39</td>
<td>42</td>
<td>43</td>
<td>34</td>
<td>203</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>38.43</td>
<td>9.60</td>
<td>14.29</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>198</td>
<td>133.06</td>
<td>.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>171.49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>4.11</td>
<td>198</td>
<td>.01**</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2.33</td>
<td>198</td>
<td>.01**</td>
</tr>
<tr>
<td>3</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>4.455</td>
<td>198</td>
<td>.02*</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>6.96</td>
<td>198</td>
<td>.01**</td>
</tr>
</tbody>
</table>

The groups refer to four treatment groups and the control group.

- CBI Dis = CBI lesson along with a post-instruction discussion
- CBI Only = CBI lesson
- CBI No Em = CBI lesson without the "emotional involvement"
- Passive = Passive observation of the CBI lesson
- Control = Control group

The higher the score, the higher the level of student involvement. Scores range from 1 to 6.

The * indicates significance at the .05 level.

The ** indicates significance at the .01 level.
Table 20: Hypothesis C2
Level of Involvement Index Post-test Scores for
Five Groups Using Different Involvement Strategies at The University of Toledo

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Groupa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>4.17</td>
<td>3.68</td>
<td>3.92</td>
<td>2.95</td>
<td>3.52</td>
<td>3.64</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.81</td>
<td>.88</td>
<td>.85</td>
<td>.74</td>
<td>.97</td>
<td>.94</td>
</tr>
<tr>
<td>Subjects</td>
<td>31</td>
<td>28</td>
<td>30</td>
<td>30</td>
<td>21</td>
<td>140</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>25.76</td>
<td>6.44</td>
<td>8.92</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>135</td>
<td>96.68</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>139</td>
<td>122.45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testc

<table>
<thead>
<tr>
<th>Groupsa</th>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI Dis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBI No Em</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D. A Priori Contrasts

<table>
<thead>
<tr>
<th>CBI Dis</th>
<th>CBI Only</th>
<th>CBI No Em</th>
<th>Passive</th>
<th>Control</th>
<th>t Value</th>
<th>D.F.</th>
<th>t Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>3.66</td>
<td>135</td>
<td>.01**</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
<td>3.14</td>
<td>135</td>
<td>.01**</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1.93</td>
<td>135</td>
<td>.05*</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-3</td>
<td>0</td>
<td>5.44</td>
<td>135</td>
<td>.01**</td>
</tr>
</tbody>
</table>

aThe groups refer to four treatment groups and the control group.
CBI Dis = CBI lesson along with a post-instruction discussion
CBI Only = CBI lesson
CBI No Em = CBI lesson without the "emotional involvement"
Passive = Passive observation of the CBI lesson
Control = Control group

bThe higher the score, the higher the level of student involvement.
Scores range from 1 to 6.

cThe * indicates significance at the .01 level.
The ** indicates significance at the .05 level.
Table 21
Level of Involvement Index Post-test Scores by Subjects' Self-Report Attitude Toward the Lesson at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Attitude&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Very Positive</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>Very Negative</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.54</td>
<td>4.10</td>
<td>3.28</td>
<td>2.70</td>
<td>2.33</td>
<td>3.69</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.87</td>
<td>.58</td>
<td>.69</td>
<td>.71</td>
<td>.53</td>
<td>.92</td>
</tr>
<tr>
<td>Subjects</td>
<td>31</td>
<td>141</td>
<td>60</td>
<td>41</td>
<td>15</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>120.55</td>
<td>30.13</td>
<td>69.23</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>283</td>
<td>120.58</td>
<td>.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>241.13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test<sup>d</sup>

<table>
<thead>
<tr>
<th>Lesson Attitude&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Very Positive</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>Very Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Negative</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>"Lesson Attitude" refers to a subject's self-report attitude toward the lesson.

<sup>b</sup>The higher the score, the higher the level of student involvement. Scores range from 1 to 6.

<sup>c</sup>The ** indicates significance at the .01 level.

<sup>d</sup>The * indicates significance at the .05 level.
Table 22
Level of Involvement Index Post-test Scores by Subjects' Self-Report Amount of Time for the Lesson at both Universities Using only Subjects in the Four Treatment Groups.

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Timea</th>
<th>More than Adequate</th>
<th>Adequate</th>
<th>Inadequate</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>3.48</td>
<td>3.89</td>
<td>3.71</td>
<td>3.67</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.95</td>
<td>.86</td>
<td>.97</td>
<td>.93</td>
</tr>
<tr>
<td>Subjects</td>
<td>139</td>
<td>125</td>
<td>24</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>10.86</td>
<td>5.43</td>
<td>6.45</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>236.51</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>247.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Lesson Timea</th>
<th>More than Adequate</th>
<th>Adequate</th>
<th>Inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than Adequate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate</td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

a"Lesson Time" refers to subject's self-report reaction to the amount of time provided to complete the assigned lesson.
bThe higher the score, the higher the level of student involvement. Scores range from 1 to 6.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 23
Level of Involvement Index Post-test Scores by Subjects' Self-Report Amount of Lesson Involvement with the Lesson at both Universities Using only Subjects in the Four Treatment Groups.

<table>
<thead>
<tr>
<th>Lesson Involvementa</th>
<th>Very Involved</th>
<th>Involved</th>
<th>Uninvolved</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>4.38</td>
<td>3.94</td>
<td>2.67</td>
<td>3.68</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.93</td>
<td>.68</td>
<td>.92</td>
<td>.93</td>
</tr>
<tr>
<td>Subjects</td>
<td>36</td>
<td>175</td>
<td>77</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree ofFreedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>84.07</td>
<td>28.02</td>
<td>47.72</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>163.23</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>247.31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Lesson Involvementa</th>
<th>Very Involved</th>
<th>Involved</th>
<th>Uninvolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Involved</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involved</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninvolved</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

a"Lesson Involvement" refers to a subject's self-report level of involvement with the lesson.
bThe higher the score, the higher the level of student involvement.
Scores range from 1 to 6.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 24
Level of Involvement Index Post-test Scores by Subjects' Self-Report Lesson Effectiveness at both Universities Using only Subjects in the Four Treatment Groups.

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Effectiveness</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>4.32</td>
<td>4.09</td>
<td>3.32</td>
<td>2.85</td>
<td>2.50</td>
<td>3.68</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.78</td>
<td>.73</td>
<td>.68</td>
<td>.88</td>
<td>.77</td>
<td>.93</td>
</tr>
<tr>
<td>Subjects</td>
<td>45</td>
<td>114</td>
<td>80</td>
<td>38</td>
<td>11</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>88.43</td>
<td>22.10</td>
<td>39.20</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>283</td>
<td>157.31</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>245.74</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test

<table>
<thead>
<tr>
<th>Lesson Effectiveness</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Excellent
- Very Good
- Good
- Adequate
- Poor

- * indicates significance at the .05 level.
- ** indicates significance at the .01 level.

Note:
- "Lesson Effectiveness" refers to a subject's self-report rating of the effectiveness of the lesson in providing useful information about seat belt safety attitude toward the lesson.
- The higher the score, the higher the level of student involvement.
- Scores range from 1 to 6.
- * indicates significance at the .05 level.
Table 25
Level of Involvement Index Post-test Scores by Subjects' Self-Report Lesson Persuasiveness at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Persuasiveness</th>
<th>Highly Persuasive</th>
<th>Persuasive</th>
<th>Not Persuasive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores(b)</td>
<td>4.31</td>
<td>3.75</td>
<td>3.10</td>
<td>3.68</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.81</td>
<td>.84</td>
<td>.91</td>
<td>.92</td>
</tr>
<tr>
<td>Subjects</td>
<td>40</td>
<td>180</td>
<td>68</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>37.40</td>
<td>18.70</td>
<td>25.46</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>202.70</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>240.11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test\(d\)

<table>
<thead>
<tr>
<th>Lesson Persuasiveness</th>
<th>Highly Persuasive</th>
<th>Persuasive</th>
<th>Not Persuasive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Persuasive</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persuasive</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Persuasive</td>
<td>•</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a"Lesson Effectiveness" refers to a subject's self-report rating of the effectiveness of the lesson in providing useful information about seat belt safety attitude toward the lesson.
bThe higher the score, the higher the level of student involvement.
Scores range from 1 to 6.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 26
Seat Belt Knowledge Measure Post-test Scores by Subjects' Self-Report Future Seat Belt Use at both Universities Using only Subjects in the Four Treatment Groups

<table>
<thead>
<tr>
<th>Future Seat Belt Use&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Use/Will Use</th>
<th>Don't Use/Will Use</th>
<th>Don't Use/Won't Use</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores&lt;sup&gt;b&lt;/sup&gt;</td>
<td>11.70</td>
<td>10.57</td>
<td>8.45</td>
<td>10.91</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.89</td>
<td>3.28</td>
<td>2.82</td>
<td>3.18</td>
</tr>
<tr>
<td>Subjects</td>
<td>187</td>
<td>78</td>
<td>23</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>227.02</td>
<td>113.51</td>
<td>15.70</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>283</td>
<td>1987.36</td>
<td>7.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>2214.38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test<sup>d</sup>

<table>
<thead>
<tr>
<th>Future Seat Belt Use&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Use/Will Use</th>
<th>Don't Use/Will Use</th>
<th>Don't Use/Won't Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use/Will Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Use/Will Use</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Use/Won't Use</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

<sup>a</sup>"Future Seat Belt Use" refers to a subject's self-report predicted future use of seat belts.

<sup>b</sup>The higher the score, the higher the knowledge about seat belts. Highest possible score is 15.

<sup>c</sup>The ** indicates significance at the .01 level.

<sup>d</sup>The * indicates significance at the .05 level.
Table 27
Seat Belt Knowledge Measure Post-test Scores by Subjects' Self-Report Follow-up Seat Belt Use at both Universities Using only Subjects in the Four Treatment Groups

### A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Seat Belt Use</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>11.48</td>
<td>10.35</td>
<td>9.34</td>
<td>10.91</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.66</td>
<td>3.57</td>
<td>4.63</td>
<td>3.18</td>
</tr>
<tr>
<td>Subjects</td>
<td>186</td>
<td>59</td>
<td>43</td>
<td>288</td>
</tr>
</tbody>
</table>

### B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>148.12</td>
<td>74.06</td>
<td>7.45</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>2501.87</td>
<td>9.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>2650.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### C. Scheffé Test

<table>
<thead>
<tr>
<th>Seat Belt Use</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always/Almost Always</td>
<td>11.48</td>
<td>10.35</td>
<td>9.34</td>
</tr>
<tr>
<td>Generally</td>
<td>2.66</td>
<td>3.57</td>
<td>4.63</td>
</tr>
<tr>
<td>Seldom/Never</td>
<td>186</td>
<td>59</td>
<td>43</td>
</tr>
</tbody>
</table>

*a"Seat Belt Use" refers to subject's self-report seat belt use.
*bThe higher the score, the higher the knowledge of seat belts. Highest possible score is 15.
*cThe ** indicates significance at the .01 level.
*dThe * indicates significance at the .05 level. 
Table 28
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Future Seat Belt Use at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Future Seat Belt Use</th>
<th>Use/Will Use</th>
<th>Don't Use/Will Use</th>
<th>Don't Use/Won't Use</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>111.57</td>
<td>101.44</td>
<td>81.50</td>
<td>105.97</td>
</tr>
<tr>
<td>Subjects</td>
<td>186</td>
<td>59</td>
<td>43</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>20568.40</td>
<td>10284.20</td>
<td>48.11</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>51507.95</td>
<td>213.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>72076.36</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test

<table>
<thead>
<tr>
<th>Future Seat Belt Use</th>
<th>Use/Will Use</th>
<th>Don't Use/Will Use</th>
<th>Don't Use/Won't Use</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use/Will Use</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Use/Will Use</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Use/Won't Use</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Future Seat Belt Use" refers to a subject's self-report predicted future use of seat belts.

bThe higher the score, the more positive the attitude toward seat belts. Scores range from 7 to 140.

cThe ** indicates significance at the .01 level.

dThe * indicates significance at the .05 level.
Table 29
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Follow-up Seat Belt Use at both Universities
Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Seat Belt Usea</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>109.95</td>
<td>102.76</td>
<td>85.03</td>
<td>105.97</td>
</tr>
<tr>
<td>Subjects</td>
<td>186</td>
<td>59</td>
<td>43</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob. c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>17203.88</td>
<td>8601.94</td>
<td>32.80</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>65296.97</td>
<td>262.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>82500.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Seat Belt Usea</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always/Almost Always</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Seldom/Never</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

a"Seat Belt Use" refers to subject's self-report seat belt use.
bThe higher the score, the more positive the attitude toward seat belts. Scores range from 7 to 140.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 30
Computer Anxiety Index Post-test Scores by Subjects' Self-Report Follow-up Seat Belt Use at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Seat Belt Use(^a)</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores(^b)</td>
<td>64.28</td>
<td>66.11</td>
<td>80.12</td>
<td>66.52</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>18.85</td>
<td>17.83</td>
<td>22.15</td>
<td>20.54</td>
</tr>
<tr>
<td>Subjects</td>
<td>186</td>
<td>59</td>
<td>43</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>3468.01</td>
<td>1734.00</td>
<td>4.83</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>55942.82</td>
<td>358.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>59410.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test\(^d\)

<table>
<thead>
<tr>
<th>Seat Belt Use(^a)</th>
<th>Always/Almost Always</th>
<th>Generally</th>
<th>Seldom/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always/Almost Always</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seldom/Never</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) "Seat Belt Use" refers to subject's self-report seat belt use.
\(^b\) The higher the score, the more computer anxious the individual. Scores range from 26 to 156.
\(^c\) The ** indicates significance at the .01 level.
\(^d\) The * indicates significance at the .05 level.
Table 31
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Accident Experience at both Universities Using only Subjects in the Four Treatment Groups

<table>
<thead>
<tr>
<th>Accident Experiencea</th>
<th>Seat Belts Saved A Life</th>
<th>Seat Belts More Injuries</th>
<th>Seat Belts No Different</th>
<th>No Accident Experience</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>110.17</td>
<td>85.66</td>
<td>103.15</td>
<td>105.80</td>
<td>105.97</td>
</tr>
<tr>
<td>Subjects</td>
<td>65</td>
<td>11</td>
<td>41</td>
<td>171</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3</td>
<td>5136.68</td>
<td>1712.22</td>
<td>5.25</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>284</td>
<td>90258.75</td>
<td>325.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>95395.43</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Accident Experiencea</th>
<th>Seat Belts Saved A Life</th>
<th>Seat Belts More Injuries</th>
<th>Seat Belts No Different</th>
<th>No Accident Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saved A Life</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Injuries</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Made No Different</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>No Experience</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

a "Accident Experience" refers to a subject's self-report experiences with seat belts and automobile accidents.
b The higher the score, the more positive the attitude toward seat belts. Scores range from 7 to 140.
c The ** indicates significance at the .01 level.
d The * indicates significance at the .05 level.
Table 32
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Opinion of Seat Belt Law at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Opinion of Seat Belt Lawa</th>
<th>In Favor</th>
<th>No Opinion</th>
<th>Opposed</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>112.46</td>
<td>101.10</td>
<td>85.83</td>
<td>105.97</td>
</tr>
<tr>
<td>Subjects</td>
<td>195</td>
<td>38</td>
<td>55</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F Prob. c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>30951.78</td>
<td>15475.89</td>
<td>66.98</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>65149.32</td>
<td>231.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>96101.10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Opinion of Seat Belt Lawa</th>
<th>In Favor</th>
<th>No Opinion</th>
<th>Opposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Favor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opposed</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

a"Opinion of Seat Belt Law" refers to subject's self-report opinion of the state seat belt law.
bThe higher the score, the more positive the attitude toward seat belts. Scores range from 7 to 140.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 33
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Lesson Effectiveness at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Effectivenessa</th>
<th>Excellent/Very Good</th>
<th>Good</th>
<th>Adequate/Poor</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scoresb</td>
<td>110.74</td>
<td>100.36</td>
<td>102.27</td>
<td>105.97</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>16.54</td>
<td>19.74</td>
<td>102.27</td>
<td>18.12</td>
</tr>
<tr>
<td>Subjects</td>
<td>159</td>
<td>80</td>
<td>49</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>6669.98</td>
<td>3334.99</td>
<td>11.24</td>
<td>.01**</td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>83668.19</td>
<td>296.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>90338.17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Scheffé Testd

<table>
<thead>
<tr>
<th>Lesson Effectivenessa</th>
<th>Excellent/Very Good</th>
<th>Good</th>
<th>Adequate/Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent/Very Good</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate/Poor</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a"Lesson Effectiveness" refers to a subject's self-report rating of the effectiveness of the lesson in providing useful information about seat belt safety attitude toward the lesson.
bThe higher the score, the more positive the attitude toward seat belts.
Scores range from 7 to 140.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
Table 34
Seat Belt Opinion Measure Post-test Scores by Subjects' Self-Report Lesson Persuasiveness at both Universities Using only Subjects in the Four Treatment Groups

A. Descriptive Statistics

<table>
<thead>
<tr>
<th>Lesson Persuasiveness</th>
<th>Highly Persuasive</th>
<th>Persuasive</th>
<th>Not Persuasive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Scores</td>
<td>119.32</td>
<td>107.94</td>
<td>96.17</td>
<td>105.97</td>
</tr>
<tr>
<td>Subjects</td>
<td>40</td>
<td>180</td>
<td>68</td>
<td>288</td>
</tr>
</tbody>
</table>

B. Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>F</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>13585.58</td>
<td>6792.79</td>
<td>25.96</td>
<td>.01**</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>285</td>
<td>72715.39</td>
<td>261.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>86300.97</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

C. Scheffé Test

<table>
<thead>
<tr>
<th>Lesson Persuasiveness</th>
<th>Highly Persuasive</th>
<th>Persuasive</th>
<th>Not Persuasive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Persuasive</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Persuasive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Persuasive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a"Lesson Effectiveness" refers to a subject's self-report rating of the effectiveness of the lesson in providing useful information about seat belt safety attitude toward the lesson.
bThe higher the score, the more positive the attitude toward seat belts. Scores range from 7 to 140.
cThe ** indicates significance at the .01 level.
dThe * indicates significance at the .05 level.
DISCUSSION OF RESULTS

This discussion of the results will be presented in four sections. First, a summary of the study will be provided. An interpretation of the findings outlined in chapter four will follow. This will include an examination of the results related to seat belt knowledge and learner involvement strategies. In addition, the results dealing with seat belt attitudes and learner involvement strategies will be discussed. A discussion of other results will also be included. Implications and recommendations will follow. Finally, a summary of conclusions will be provided.

Summary

Persuasive messages play an important role in our daily lives. We are constantly being bombarded with persuasive messages intended to change knowledge, attitudes, and/or behaviors toward people, places, or things. These persuasive messages are delivered via a variety of media, such as television, radio, and newspapers. Considerable research has examined the use of traditional forms of media as vehicles for the delivery of persuasive messages, however very little research could be located on the delivery of persuasive
messages via a computer.

As the computer increasingly becomes an increasingly integrated part of our lives, it is essential that researchers examine how this tool can best be used for the delivery of all messages, including persuasive ones. The computer possesses some distinct characteristics that are difficult to duplicate using other forms of media. For example, the computer is an interactive medium that allows a high degree of computer-human interaction. This one-on-one, active student involvement with the computer may be important in promoting attitude change.

Many researchers have emphasized the importance of active student involvement in learning. For example, Simonson (1982) proposed a set of guidelines for the planning, production, or use of persuasive media that stressed the importance of student involvement in learning. Three of the guidelines presented by Simonson served as a foundation for this study.

The purpose of this study was to examine three learner involvement strategies that were incorporated into a persuasive, computer-based instruction lesson, and to determine whether all, or some combination of these strategies, were needed to produce changes in knowledge, attitude, and behavior.

A number of phases were constituted in this study. First,
based on a set of criteria, a persuasive, computer-based instruction lesson was selected for use in the study. The learner involvement strategies were then incorporated into a series of treatment materials based on the CBI lesson. Next, instruments and procedures for the study were identified or developed. A pilot study was conducted as a test of these instruments and procedures. Finally, the experimental study was carried out and the data were analyzed.

Interpretation of Findings

An interpretation of the findings will be provided in three sections. First, the results related to seat belt knowledge and learner involvement strategies will be discussed. A discussion of the results dealing with seat belt attitudes and learner involvement strategies will follow. Findings related to other data will conclude this section.

Question One:

Is there a difference in knowledge about seat belts for learners who were exposed to different involvement strategies?

The findings described in the previous chapter support the idea that the persuasive, computer-based instruction program was
effective in promoting increased knowledge about seat belts. In each treatment the average score of the treatment group was higher than the control group. In other words, each group that completed the computer-based instruction lesson learned something about the use of seat belts.

Three of the statements made prior to the study regarding possible relationships between the treatment groups were not supported. The higher than anticipated average knowledge score by passive participation group may have been responsible for this. One possible reason for their higher than expected score may have been related to the composition of the treatment. In the videotaped computer-based instruction lesson, all decisions were made for the student. Unlike the individualized CBI lesson where students could quickly read over or skip sections, the videotape controlled the pace of the instruction. In addition, although the active participation aspect was removed from the treatment, the emotional involvement condition, the "Gruesome Game" was included. This may explain why the passive participation mean score was lower than two of the active participation groups, but higher than the group without the "emotional aspect" of the lesson in the "Gruesome Game."

It was found that the treatment group containing only the CBI
lesson scored higher than the group that contained the CBI lesson accompanied by the post-instruction discussion. Although this finding was not significant, this difference might be explained by the fact the group containing only the CBI lesson worked on the computer portions of the lesson longer than the group who participated in a discussion following the CBI lesson.

When comparing the results of the immediate and follow-up study for the entire sample, it was found that retention was lower than expected. A significant drop in seat belt knowledge occurred for all groups after the two week period following the initial study. It is interesting to note that the average scores fell more in line with the degree of student involvement. For example, while the group who used only the CBI lesson scored the highest on the immediate measure, the group who also were involved in the post-instruction discussion scored highest on the follow-up. A possible explanation of this trend may be that although the extended time with the computer lesson was important for short-term retention, the post-instruction discussion group was of more value for long-term retention. Overall, student scores regressed toward the mean during the two week period following the initial study.

In conclusion, a difference in knowledge about seat belts was found for learners who were exposed to different involvement
strategies. Each treatment group performed significantly better than the control group on the knowledge measure. It was also reported that the involvement strategies involving active participation and social interaction produced higher scores than those involvement strategies without the active participation, the social interaction, and/or the emotional involvement aspects. This trend would indicate the importance of social interaction, active participation, and emotional involvement as critical aspects of effective cognitive instruction.

**Question Two:**

Is there a difference in attitudes about seat belts for learners who were exposed to different involvement strategies?

The findings reported in the previous chapter support the idea that learner involvement strategies were important in promoting attitude change. A significant difference was noted between the five groups.

A key distinction could be made between the learner involvement strategies and the average scores on the Seat Belt Opinion Measure. The two treatments involving the social interaction and/or active participation involvement strategies (CBI accompanied by a discussion and CBI lesson only) produced more
positive attitudes toward seat belts than the treatments without the social interaction, the active participation, and/or the emotional involvement (CBI without the "emotional aspect" and passive observation of the CBI lesson). It was also found that the treatment involving the social interaction was significantly more effective than simply the active participation alone. It was concluded that the social interaction component of the lesson was important in promoting attitude change. In addition, the removal of the emotional involvement from the persuasive situation was found to be detrimental. Finally, the importance of the "hands-on" active participation was not supported. This lack of significance may be due to the low average score of the group that contained the active participation, but did not contain the emotional component of the CBI lesson.

An unanticipated finding dealt with the extremely low average group score of the treatment group that lacked the emotional aspect of the CBI lesson. This group scored lower than each of the other treatment groups and the control group. A number of possible reasons exist to explain why this group scored lower than the other groups. One explanation stems from the work by Simonson (1979) in the area of emotional involvement and persuasion. Although subjects in the lowest scoring group were
presented with the same, basic information the other groups received, they did not participate at an emotional level with the content. As a result, they did not have the same purposeful experience with the statistics and facts related to seat belt safety as did the subjects in the other treatment groups. Providing a great deal of information about a topic, without including a context or personal significance for the information may be detrimental to attitude change. Evidence of this can be found in many classroom learning environments where students "turn-off" from topics that are boring or not personally stimulating. The same probably hold true of persuasive situations.

A finding noted during the comparison of the immediate and the follow-up scores involved the changes within each treatment group. It was reported that the seat belt opinion mean scores of groups 1 (CBI lesson accompanied by a discussion) and 2 (CBI lesson only) fell during the two weeks following the initial study. Because these two groups possessed the highest scores on the immediate test, it was expected that they might fall slightly toward the overall average. Extreme scores often regress toward the mean during a follow-up study.

In conclusion, a difference in attitudes toward seat belts between learners who were exposed to different involvement
strategies was reported. It was found that three of the four treatment groups showed more positive attitudes toward the use of seat belts than the control group. Overall, the computer-based instruction lesson was effective in producing positive attitude change toward the use of seat belts. The social interaction aspect was found to be important in promoting these positive attitudes. In addition, the removal of the emotional component of the lesson was a hindrance to positive attitude change. Although active participation in the form of "hands-on" computer interaction was not found to be significantly different from passive participation in all cases, it was considered a contributing factor to the success of groups 1 (CBI lesson accompanied by a discussion) and 2 (CBI lesson only).

Question Three:
Are there other factors that may have affected the learners who were exposed to different involvement strategies?

The discussion of this question is divided into three parts. First, data related to computer anxiety and the involvement strategies will be discussed. Then, student involvement and the learner involvement strategies will be examined. Finally, a discussion of other data related to the study will conclude this
A significant difference was found between treatment groups on the Computer Anxiety Index (CAIN) which was first given immediately after the treatments. The group containing the CBI lesson accompanied by the post-instruction discussion exhibited significantly lower computer anxiety than the control group. It is hypothesized that the group participating in the post-instruction discussion reported the lowest level of computer anxiety because they had an opportunity to critique the computer lesson.

When the scores from the follow-up testing obtained two weeks later were examined, some interesting trends emerged. It was found that computer anxiety increased in three active participation groups (CBI accompanied by a discussion, CBI lesson only, and CBI without the "emotional involvement") during the two week period following the initial study. One explanation for this increase in anxiety could be because of the direct computer experience these groups received. Because they completed the questionnaire immediately after computer use, their anxiety could have been momentarily reduced. This would explain the lack of a significant increase in computer anxiety in the group that did not use the computer directly. Another explanation for the lower follow-up scores of the active participation groups could be because
of the regression toward the mean that often occurs during a second testing situation.

Based on the findings reported in the previous chapter, the fundamental concepts related to involvement strategies were supported. It was noted that the active participation group who participated in the post-instruction discussion indicated they had the highest level of involvement, while the passive involvement group stated that they had the lowest level of involvement. This difference supports the notion that active participation in the form of computer-student interaction, and social interaction in the form of a post-instruction discussion, were involvement strategies that students perceived as highly involving. In addition, passive instruction with little participation in the form of a videotaped computer lesson was rated low indicating that it was perceived as low in the area of student involvement. Additionally, the active participation and/or social interaction involvement strategies produced higher levels of student involvement than the treatments without social interaction, emotional involvement, and/or active involvement. The students assigned to the active participation treatment strategies all reported much higher levels of involvement than those in the passive participation low involvement strategy. The treatment group combining social interaction and active
participation was found to produce much higher levels of involvement than those treatments without the social interaction. In other words, when developing strategies to increase student involvement in learning, instructional developers should consider strategies that include both active student participation and social interaction such as a post-instruction discussion.

Next, a series of questions were asked. Because they were single items, generalizations based on them should be made cautiously. A number of useful observations can be made, however. For example, those subjects who felt involved with the lesson also scored high on the involvement measure. Although this may appear logical, it provides important support for the validity of the Level of Involvement Index.

When asked to rate their attitude toward the use of computer-based instruction, those subjects with positive attitudes toward the lesson tended to score high on the involvement measure. An important relationship existed between attitude toward CBI and involvement with CBI.

The question dealing the time provided for the computer-based instruction also yielded interesting results. Those individuals who indicated that they had more than adequate time with the lesson felt less involved than those who only expressed having only
adequate time with the lesson. Based on this observation, can be concluded that when too much time was provided for students to use the lesson some students felt less involved in the lesson. Apparently, timing is a critical consideration if student involvement in a lesson is considered important.

Those students who indicated that the CBI lesson was excellent or highly persuasive scored higher on the Level of Involvement Index than those who responded that the lesson was poor or not persuasive. Based on these results, it can be concluded that effectiveness, persuasiveness, and high student involvement are related.

In summary, it was found that students' perceptions of involvement were strongly related to the learner involvement strategies used within the treatment groups. The social interaction and/or active participation groups (CBI accompanied by a discussion and CBI lesson only) were found to produce the highest levels of student involvement, while the passive participation group produced low perceived levels of involvement. Finally, computer attitude, time using the program, and the perceived effectiveness and persuasiveness of the computer program were related to a student's level of involvement with the program.

Data related to other factors were also reported in chapter
four. It was found that those currently using seat belts or planning to use seat belts after the treatment scored higher on the Seat Belt Knowledge Measure than those who chose not to wear seat belts. This seemed to indicate that knowledge about seat belts was related to seat belt use. This was particularly important because the reason some individuals decide to change their mind and wear seat belts may be related to their increased knowledge about seat belts. This relationship was also evident in an examination of the Seat Belt Opinion Measure and current or planned use of seat belts. It was found that scores on the Seat Belt Opinion Measure were related to reported seat belt use. Specifically, those scoring high on the attitude measure reported high levels of seat belt use. These findings lend support to the link between knowledge, attitudes, and behaviors. It seemed that high seat belt use, high levels of seat belt knowledge, and positive attitudes toward seat belts were all related.

A link between self-report seat belt use on the follow-up testing and computer anxiety was also identified. Those individuals reporting they always or almost always wore their seat belts possessed much lower levels of computer anxiety than those who rarely or never used seat belts. The average score of those who reported not using seat belts was near what Maurer (1983)
considered to be a highly computer anxious score.

Although a cause and effect relationship between seat belt use and computer anxiety is unlikely, it may be that both relate to some type of "tool or technology anxiety". For example, the Computer Anxiety Index (CAIN) asked a number of questions that would relate generally to fears and attitudes people have toward tools or "high tech" gadgets, such as seat belts. Statements on the CAIN related to general areas, such as the complexity of computer use, the doubt about whether a computer would be used, the avoidance of computer use, and the comment that computers were more trouble than they are worth. Similar statements might be made about seat belts being uncomfortable gadgets and a nuisance to wear. The idea that tools such as computers are useless and that people are being controlled by these tools may relate to the broader area of "tool or technology anxiety". If this were the case, people who possessed this anxiety may have felt they would encounter increased problems as more and more technical devices became a part of their lives.

The idea that the use of technology and computer anxiety are related was reinforced in a 1984 study involving computer anxiety. Lamb (1984) found that individuals indicating that they did not use new technologies such as videocassette recorders, microwave ovens, and automatic bank tellers were more likely to have higher
Computer Anxiety Index scores than those who used these items. Computer anxiety was of concern in this study because it was felt it may have hindered the acceptance of the persuasive messages presented in a message delivered by the computer. It was noted that when examining computer anxiety levels immediately after the experiment, the treatments using the highest levels of student involvement produced the lowest levels of computer anxiety. As a result, the level of student involvement with a computer lesson may be particularly important in changing the attitudes and anxieties related to both seat belts and computers.

Although data were gathered relating to a number of demographics, such as age and gender, no important findings emerged. This may be related to the "generic" nature of the CBI program used in the study. For example, because it was not aimed at a particular age or gender, it was no more likely to influence one of these specific subsets of the sample.

Implications and Recommendations

A number of implications and recommendations were developed based on the results of this study. These will be discussed next.

The results of this study suggest that the computer can serve
as an effective method for the delivery of persuasive messages. Currently, few persuasive, computer-based instruction programs are commercially available. Producers should be encouraged by these findings to make use of the computer as a tool for promoting desirable attitude change.

Various learner involvement strategies were found to be important in promoting attitude change. These strategies should be considered when designing persuasive, computer-based instructional materials. The data suggested the importance of a combination of involvement strategies such as social interaction, active participation, and emotional involvement. For example, the combination of the post-instruction discussion aspect of the lesson along with the computer-based instruction program was found to be the most effective strategy. In the same way, the absence of an emotional involvement aspect in a lesson was shown to be detrimental to attitude change.

The study findings should not be used alone as a basis for a lesson design decision, but should be used in conjunction with other instructional design methods, computer program design techniques, and persuasive message techniques. Specifically, the student involvement strategies addressed three of Simonson's (1982) guidelines related to the planning and production of
persuasive instructional media. These and other guidelines should also be considered in producing the most effective, persuasive message.

Producers should be encouraged to place emphasis on the careful design of the involvement strategies used within their persuasive, computer-based instruction lessons. For example, specific directions should be provided with persuasive lessons to guide teachers who will lead a post-instruction discussion. In addition to "traditional" discussion questions, designers should place emphasis on guidelines for leading effective discussions and techniques for encouraging retention and attitude change through techniques such as lesson critique and verbal commitment.

Student's self-report attitudes toward the lesson, in addition to their feelings about the effectiveness and persuasiveness of the lesson, were found to be related to their knowledge and attitudes toward the lesson's content. Attitudes toward the medium and lesson used for the delivery of the persuasive messages are important in determining message impact. This study only examined this area in a general way. A study is needed that would examine in greater depth student's attitudes toward the lesson and toward the delivery system.

Based on the results of this study, a number of suggestions
will be presented for further research in the area of involvement strategies and persuasive, computer-based instruction. A study should be conducted that would examine additional combinations of involvement strategies related to the specific areas of social interaction, active participation, and emotional involvement. In addition to the combinations examined in this study, other combinations of involvement strategies could be explored. For example, a more in-depth examination of passive participation might include studying passive participation with or without a post-instruction discussion or with or without emotional involvement. By examining specific learner involvement strategies, researchers will be able to continue the process of validating the guidelines developed by Simonson for the development of persuasive instructional media.

A study should be conducted that would examine active participation more in-depth. This could be accomplished by examining the various levels of active participation within a persuasive, computer-based instruction lesson. For example, lesson segments could be designed that would allow students control of the program sequence through the use of various menus, or the computer could be given total control of the presentation. Within each of these design techniques different levels of active
participation could be identified.

The involvement strategies involving social interaction were found to be particularly important for promoting attitude change. Additional research should be conducted in order to examine specific aspects of social interaction. For example, the post-instruction discussion could be examined to determine what features of the discussion were most influential at promoting attitude change. This study included a variety of post-instruction techniques including critique of the lesson, verbal commitment to behavior change, recitation for retention, and the nature of social interaction. In addition to a study of post-instruction discussion, an examination of social interactions could include the use of cooperative learning with persuasive, computer-based instruction.

Finally, the emotional involvement strategies should be examined in more depth. The emotional involvement aspect of the persuasive, computer-based instruction program combined aspects of fear and humor appeals. These two aspects should be examined separately in new studies.

In addition to the study of seat belts, other topics areas, such as nutrition, drugs, or smoking could be studied. Although the involvement strategies and persuasive techniques examined within this study were general and should apply to all types of situations,
some specific questions arose during an examination of the data that should be addressed with a second content area. For example, the relationship of the seat belt as a technology to computer anxiety could have played a role in attitude change for some individuals. A "nontechnology" topic such as smoking should be chosen for study in a similar experiment.

Also, the construct of computer anxiety should be studied in more depth. The link between computer anxiety and technology should be studied as well as how these constructs affect the effectiveness of the computer as a tool for the delivery of persuasive messages. This could be partially accomplished by comparing the results of two lessons involving technology and "nontechnology" related topics.

A final recommendation for further research involves an exploration of the erosion of results that occurred over the two week period following the treatment. There is a concern relating to the short term effects of the treatment. Although regression toward the mean may explain some of the decline, other factors such as the content, the length of treatment, the persuasive message used, or the design of the computer-based instruction lesson may also have played a role.

Finally, a set of guidelines should be developed that specify
different aspects of involvement strategies that make them important in persuasion. The present study would serve as a foundation for the development of these guidelines.

Summary of Conclusions

Persuasive, computer-based instruction is useful at promoting changes in student knowledge and attitude. Student involvement in the form of strategies such as social interaction, active participation, and emotional involvement in computer-based instruction are important in promoting these changes in knowledge, attitude, and behavior. It was found that a persuasive, computer-based instruction lesson was effective at promoting changes in knowledge and attitudes toward the use of seat belts. Specifically, the inclusion of social interaction in the form of a post-instruction discussion was shown to be an effective involvement strategy in promoting attitude change. In the same way, removal of emotional involvement from the lesson was found to be detrimental.

Producers should be encouraged by the findings of this study. The computer was found to be a tool for delivery of messages that promote desirable attitude change. Emphasis should be placed on the careful design of the involvement strategies used within persuasive, computer-based instruction. A set of guidelines should
be developed to specify important aspects of these involvement strategies.

Further research is needed to better understand persuasive, computer-based instruction. Specific aspects of learner involvement strategies used within persuasive, computer-based instruction lessons could be examined. Studies could be conducted that would examine additional combinations of involvement strategies related to the specific areas of active participation, emotional involvement, and social interaction. In addition, other topic areas, such as nutrition, drugs, or smoking could be studied. Finally, the construct of computer anxiety should be studied more closely as it relates to attitudes toward the computer and the use of persuasive, computer-based instruction.
REFERENCES


Rogers, R. W. (1973). An analysis of fear appeals and attitude change. Final report, Grant No. 1 Row MH22157-01 MSM, National Institute of Mental Health, University of South Carolina, Chapel Hill, South Carolina.


ACKNOWLEDGMENTS

Many people should be thanked for their unending support during this study. First, I wish to thank Michael Simonson for his encouragement, guidance, and steadfast interest in my project. His constant support kept my enthusiasm high not only through this dissertation, but throughout my six years of graduate school.

I wish to thank all of the faculty and graduate students at both Iowa State University and The University of Toledo who assisted in the study treatments. In addition, I would like to thank the faculty at both universities who pressured me to finish this dissertation. Although I got tired of hearing the words "get to work" and "aren't you done yet," I am thankful for their persistence and encouragement along the way. In particular, I wish to thank Mary Jo Henning, Les Elsie, and Dennis Myers who provided the strong support and enduring advice necessary to handle the pressures of a full-time faculty position and a dissertation. The support and understanding of my program committee is also greatly appreciated. They tolerated poorly timed meetings and months without contact in order to assist me in completing this study.

Finally, I thank my family and friends. The long distance
phone calls of encouragement from my parents and my sisters were greatly appreciated. I am extremely grateful to Gayle and Gary Giles for their guest room, car, and words of encouragement during my trips back to Iowa. I wish to deeply thank my friend Denise Ludtke who put up with my swinging moods and "less-than-neat" office. Most of all, I thank my husband, Jerry, for that extra love and encouragement that got me through the day. Jerry's confidence in my abilities gave me the courage to enter graduate school and the enthusiasm to complete this dissertation.

Thank you all for your strength and support.
APPENDIX A.

MICROSFIT EVALUATION FORM
Title ___________________________________________________________________ Version Evaluated ____________________________

Producer ___________________________________________________________________ Cost __________________________________________

Subject/Topics ___________________________________________________________________ 

Grade Level(s) (circle) pre-1 1 2 3 4 5 6 7 8 9 10 11 12 post-secondary

Required Hardware ___________________________________________________________

Available for Hard Disk? □ Yes □ No □ Unknown

Required Software ___________________________________________________________

Software protected? □ Yes □ No

Medium of Transfer: □ Tape Cassette □ ROM Cartridge □ 5½” Flexible Disk □ 8” Flexible Disk

Back Up Policy ___________________________________________________________

Producer’s field test data is available □ On Request □ With Package □ Not Available

INSTRUCTIONAL PURPOSES & TECHNIQUES
(Please check all applicable):

☐ Remediation □ Drill and Practice
☐ Standard Instruction □ Tutorial
☐ Enrichment □ Information Retrieval
☐ Assessment □ Game
☐ Instructional Management □ Simulation
☐ Authoring □ Problem Solving
☐ Other __________________________

DOCUMENTATION AVAILABLE:
Circle P-(Program) or S-(Supplementary Material)

P S Suggested grade/ability level(s)

P S Instructional objectives

P S Prerequisite skills or activities

P S Sample program output

P S Program operating instructions

P S Pre-test

P S Post-test

P S Teacher’s information

P S Resource/reference information

P S Student’s instructions

P S Student worksheets

P S Textbook correlation

P S Follow-up activities

P S Other

OBJECTIVES: □ Stated □ Inferred

PREREQUISITES: □ Stated □ Inferred

Describe package CONTENT AND STRUCTURE, including record keeping and reporting functions:

(Use back if additional space needed)
<table>
<thead>
<tr>
<th>CONTENT CHARACTERISTICS</th>
<th>1. SA A D SD NA The content is accurate. (p. 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. SA A D SD NA The content has educational value. (p. 16)</td>
</tr>
<tr>
<td></td>
<td>3. SA A D SD NA The content is free of race, ethnic, sex and other stereotypes. (p. 16)</td>
</tr>
<tr>
<td>INSTRUCTIONAL CHARACTERISTICS</td>
<td>4. SA A D SD NA The purpose of the package is well defined. (p. 17)</td>
</tr>
<tr>
<td></td>
<td>5. SA A D SD NA The package achieves its defined purpose. (p. 17)</td>
</tr>
<tr>
<td></td>
<td>6. SA A D SD NA Presentation of content is clear and logical. (p. 17)</td>
</tr>
<tr>
<td></td>
<td>7. SA A D SD NA The level of difficulty is appropriate for the target audience. (p. 18)</td>
</tr>
<tr>
<td></td>
<td>8. SA A D SD NA Graphics/color/sound are used for appropriate instructional reasons. (p. 18)</td>
</tr>
<tr>
<td></td>
<td>9. SA A D SD NA Use of the package is motivational. (p. 19)</td>
</tr>
<tr>
<td></td>
<td>10. SA A D SD NA The package effectively stimulates student creativity. (p. 19)</td>
</tr>
<tr>
<td></td>
<td>11. SA A D SD NA Feedback on student responses is effectively employed. (p. 20)</td>
</tr>
<tr>
<td></td>
<td>12. SA A D SD NA The learner controls the rate and sequence of presentation and review. (p. 20)</td>
</tr>
<tr>
<td></td>
<td>13. SA A D SD NA Instruction is integrated with previous student experience. (p. 29)</td>
</tr>
<tr>
<td></td>
<td>14. SA A D SD NA Learning can be generalized to an appropriate range of situations. (p. 29)</td>
</tr>
<tr>
<td>TECHNICAL CHARACTERISTICS</td>
<td>15. SA A D SD NA The user support materials are comprehensive. (p. 30)</td>
</tr>
<tr>
<td></td>
<td>16. SA A D SD NA The user support materials are effective. (p. 31)</td>
</tr>
<tr>
<td></td>
<td>17. SA A D SD NA Information displays are effective. (p. 31)</td>
</tr>
<tr>
<td></td>
<td>18. SA A D SD NA Intended users can easily and independently operate the program. (p. 32)</td>
</tr>
<tr>
<td></td>
<td>19. SA A D SD NA Teachers can easily employ the package. (p. 34)</td>
</tr>
<tr>
<td></td>
<td>20. SA A D SD NA The program appropriately uses relevant computer capabilities. (p. 34)</td>
</tr>
<tr>
<td></td>
<td>21. SA A D SD NA The program is reliable in normal use. (p. 35)</td>
</tr>
</tbody>
</table>

Describe the potential use of the package in classroom settings:
Estimate the amount of time a student would need to work with the (Can be total time, time per day, time range or other indicator.)

Strengths:

Weaknesses:

Other Comments:
APPENDIX B.

PRELIMINARY LEVEL OF INVOLVEMENT ITEMS
<table>
<thead>
<tr>
<th>Statement</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I really got into the lesson.</td>
<td></td>
</tr>
<tr>
<td>2. I wasn't really paying much attention to the lesson.</td>
<td></td>
</tr>
<tr>
<td>3. The lesson made me feel uncomfortable.</td>
<td></td>
</tr>
<tr>
<td>4. I was interested in the lesson.</td>
<td></td>
</tr>
<tr>
<td>5. I was excited by the lesson.</td>
<td></td>
</tr>
<tr>
<td>6. I felt like the computer was talking to me.</td>
<td></td>
</tr>
<tr>
<td>7. I was distracted during the lesson.</td>
<td></td>
</tr>
<tr>
<td>8. I felt motivated during the lesson.</td>
<td></td>
</tr>
<tr>
<td>9. During the lesson, I recalled past experiences.</td>
<td></td>
</tr>
<tr>
<td>10. I felt like I really experienced the lesson.</td>
<td></td>
</tr>
<tr>
<td>11. My eyes were really focused on the lesson.</td>
<td></td>
</tr>
<tr>
<td>12. I felt like I really participated in the lesson.</td>
<td></td>
</tr>
<tr>
<td>13. My attention was focused on the lesson.</td>
<td></td>
</tr>
<tr>
<td>14. I was really aroused during the lesson.</td>
<td></td>
</tr>
<tr>
<td>15. I felt separated from the lesson.</td>
<td></td>
</tr>
<tr>
<td>16. I felt like I was actively participating in the lesson.</td>
<td></td>
</tr>
<tr>
<td>17. I examined the program thoroughly.</td>
<td></td>
</tr>
<tr>
<td>18. I felt like I shared in the lesson.</td>
<td></td>
</tr>
<tr>
<td>19. I ignored most of the lesson.</td>
<td></td>
</tr>
<tr>
<td>20. I felt like I asserted myself during the lesson.</td>
<td></td>
</tr>
<tr>
<td>21. I felt a cohesive part of the lesson.</td>
<td></td>
</tr>
<tr>
<td>22. I felt like an active member of the lesson.</td>
<td></td>
</tr>
<tr>
<td>23. I felt like I had the chance to react during the lesson.</td>
<td></td>
</tr>
<tr>
<td>24. I was totally engrossed in the lesson.</td>
<td></td>
</tr>
<tr>
<td>25. I really explored the lesson.</td>
<td></td>
</tr>
<tr>
<td>26. I felt that the lesson involved me in decision making.</td>
<td></td>
</tr>
<tr>
<td>27. I felt detached from the lesson.</td>
<td></td>
</tr>
<tr>
<td>28. I was paying close attention to the lesson.</td>
<td></td>
</tr>
<tr>
<td>29. I felt the lesson involved me emotionally.</td>
<td></td>
</tr>
<tr>
<td>30. I felt the lesson involved me intellectually.</td>
<td></td>
</tr>
<tr>
<td>31. I felt the lesson involved me physically.</td>
<td></td>
</tr>
<tr>
<td>32. I felt I could associate this lesson with &quot;real life situations&quot;.</td>
<td></td>
</tr>
</tbody>
</table>

**Level of Involvement**

**Instructions:**
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings.

1 = Strongly Agree  
2 = Agree  
3 = Slightly Agree  
4 = Slightly Disagree  
5 = Disagree  
6 = Strongly Disagree
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>33. I felt a high energy level during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34. I was indifferent to the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35. I felt involved in the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36. I felt that the lesson was directed to me personally.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37. I felt really involved with the lesson topic.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>38. I continued to think about the lesson even after it was over.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39. I felt like the lesson was flexible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>40. I eagerly moved through the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41. I responded emotionally during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>42. I really concentrated on the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>43. I felt indifferent during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>44. I felt isolated during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>45. I felt unconcerned about the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>46. I felt in control during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>47. I felt the lesson made me think.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>48. I felt withdrawn from the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>49. I waited in anticipation for each part of the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>50. I felt that I contributed to the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>51. My feelings were aroused during parts of the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>52. I felt motivated during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>53. I felt intellectually involved with the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>54. I felt engaged in the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>55. I felt very closely involved with the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>56. I blocked out the lesson and was thinking about other things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>57. I felt physically distant from the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>58. I felt emotionally distant from the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>59. I felt mentally challenged by the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>60. I was inattentive during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>61. I was unresponsive during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>62. I felt like I was communicating during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>63. I was really thinking during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>64. I felt alert during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>65. I felt bored and inactive the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>66. I felt like the lesson was hard to follow.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>67. I felt like I played as passive role in the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>68. I felt rather apathetic toward the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>69. I felt aroused or agitated at times during the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>70. I felt that the lesson considered my ideas and attitudes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>71. The lesson considered my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>72. I felt more like an outsider than a participant in the lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
73. I felt distant from the lesson.  
74. I was upset by the program.  
75. I felt the lesson wasn't very exciting.  
76. I didn't really feel involved.  
77. I was "on the edge of my seat" waiting to see what would come next.  
78. I felt excluded in the lesson.  
79. I examined nearly all the alternatives and options within the program.  
80. I carefully analyzed the lesson.  
81. I felt committed at the end of the lesson.  
82. I felt like I was sharing my inner feelings in the lesson.  
83. I got so involved with the lesson that I almost lost track of time.  
84. I really learned alot.  
85. I felt really involved with the lesson.  
86. I felt like the computer was interacting with me.  
87. I felt physically involved with the program.  
88. It seemed like the lesson was focused directly at me.  
89. I felt emotionally involved with the program.  

90. Create five of your own statements about how you feel regarding this program.
APPENDIX C.

PILOT STUDY QUESTIONNAIRE
Seat Belt Safety Questionnaire

Section 1

General Information Questions

Instructions:
Please answer the following questions on the computer form provided.

1. What is your age?
   A. 14-19
   B. 20-29
   C. 30-39
   D. Over 40

2. What is your gender?
   A. Female
   B. Male

3. Where have you spent most of your life?
   A. On a farm
   B. In a small town (up to 10,000)
   C. In a large town (10,000-50,000)
   D. In a small city (50,000-100,000)
   E. In a medium-sized city (100,000-500,000)
   F. In a larger city (over 500,000)
   G. I've never lived in one place more than five years

4. What is the size of the car you most frequently drive or ride in?
   A. Subcompact
   B. Midsize
   C. Large or full size
   D. Van or pickup

5. What is your opinion of the law making seat belt use compulsory?
   A. In Favor
   B. No Opinion
   C. Opposed

6. What importance do you place on following the seat belt law?
   A. Very important
   B. Important
   C. Somewhat important
   D. Of little importance
   E. Not important
7. How would you rate your driving record
   A. Excellent
   B. Very Good
   C. Average
   D. Not Good
   E. Poor

8. Generally, based on your personal experiences with automobile accidents,
   A. wearing a seat belt prevents serious injury.
   B. wearing or not wearing a seat belt doesn't seem to matter.
   C. wearing a seat belt causes serious injury.

9. How often do you wear your seat belt?
   A. Always
   B. Almost Always
   C. Generally
   D. Sometimes or Seldom
   E. Never or Almost Never

10. How often do you wear your seat belt in the city?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

11. How often do you wear your seat belt on the highway?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

12. How would you compare the amount of time you spend riding in or driving a car with the average American?
    A. Much more time in the car
    B. More time in the car
    C. Same time in the car
    D. Less time in the car
    E. Much less time in the car
13. Have you, or has someone close to you, ever been in an accident that involved a fatality or serious injury?
   A. Yes. A seat belt may have saved the person's life.
   B. Yes. A seat belt may have increased the injury.
   C. Yes, but the seat belt did not make a difference.
   D. No. I've never been in that situation.

14. How would you rate your chances of being in a life-threatening accident?
   A. Very High
   B. High
   C. Somewhere in the middle
   D. Low
   E. Very low
Instructions:
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings.

1 = Strongly agree
2 = Agree
3 = Slightly agree
4 = Slightly disagree
5 = Disagree
6 = Strongly disagree

15. Having a computer available to me would improve my productivity. 1 2 3 4 5 6

16. If I had to use a computer for some reason, it would probably save me some time and work. 1 2 3 4 5 6

17. If I use a computer, I could get a better picture of the facts and figures. 1 2 3 4 5 6

18. Having a computer available to me would improve my general satisfaction. 1 2 3 4 5 6

19. Having to use a computer could make my life less enjoyable. 1 2 3 4 5 6

20. Having a computer available to me could make things easier for me. 1 2 3 4 5 6

21. I feel very negative about computers in general. 1 2 3 4 5 6

22. Having a computer available to me could make things more fun for me. 1 2 3 4 5 6

23. If I had a computer at my disposal, I would try to get rid of it. 1 2 3 4 5 6

24. I look forward to a time when computers are more widely used. 1 2 3 4 5 6

25. I doubt if I would ever use computers very much. 1 2 3 4 5 6

26. I avoid using computers whenever I can. 1 2 3 4 5 6

27. I enjoy using computers. 1 2 3 4 5 6

28. I feel that there are too many computers. 1 2 3 4 5 6
29. Computers are probably going to be an important part of my life. 1 2 3 4 5 6
30. A computer could make learning fun. 1 2 3 4 5 6
31. If I were to use a computer, I could get a lot of satisfaction from it. 1 2 3 4 5 6
32. If I were to use a computer, it would probably be more trouble than it was worth. 1 2 3 4 5 6
33. I am usually uncomfortable when I have to use computers. 1 2 3 4 5 6
34. I sometimes get nervous just thinking about computers. 1 2 3 4 5 6
35. I will probably never learn to use a computer. 1 2 3 4 5 6
36. Computers are too complicated to be of much use to me. 1 2 3 4 5 6
37. If I had to use a computer all the time, I would probably be very unhappy. 1 2 3 4 5 6
38. I sometimes feel intimidated when I have to use a computer. 1 2 3 4 5 6
39. I sometimes feel that computers are smarter than I am. 1 2 3 4 5 6
40. I can think of many ways that I could use a computer. 1 2 3 4 5 6
Seat Belt Opinion Measure

Instructions:

Please indicate how you feel regarding the following statements. Use the following scale to indicate your attitudes.

1 = Strongly agree  
2 = Agree  
3 = Slightly agree  
4 = Neutral  
5 = Slightly disagree  
6 = Disagree  
7 = Strongly disagree

41. Seat belts make you feel secure and safe.  
42. I feel I don't need a seat belt.  
43. I'm not sold on the safety value of seat belts.  
44. I don't feel any safer with a seat belt on.  
45. Seat belts are a must for high speed travel on the highway.  
46. Since seat belts are in the car, I feel I should wear them.  
47. What we need are more laws requiring people to wear seat belts in cars.  
48. I would rather not think about seat belts.  
49. Seat belts are the best protection you have in a car.  
50. We need more education programs to convince people to wear seat belts.  
51. Publicity on T.V., radio, and in the newspaper is not going to get me to wear a seat belt.  
52. Lower insurance premiums for drivers who wear seat belts would be a good idea.  
53. I don't see why I have to pay for seat belts just because the government insists on their installation.  
54. When the traffic is heavy or the roads are bad, I put my seat belt on.  
55. Whenever I feel uneasy about driving, I put my seat belt on.
1 = Strongly agree 5 = Slightly disagree
2 = Agree 6 = Disagree
3 = Slightly agree 7 = Strongly disagree
4 = Neutral

56. Seat belts are a nuisance to put on and adjust. 1 2 3 4 5 6 7
57. Seat belts give you support and lessen fatigue. 1 2 3 4 5 6 7
58. An important advantage of seat belts is that they keep you from being banged around inside the car in event of an accident. 1 2 3 4 5 6 7
59. There is no effort involved in using a seat belt. 1 2 3 4 5 6 7
60. If someone insisted, I would put my seat belt on. 1 2 3 4 5 6 7
Seat Belt Quiz

Instructions:
This survey will quiz your knowledge of seat belt safety and use. Choose the best letter and enter it on your computer sheet.

61. During the next twelve months, how many people in the United States will be in an automobile accident?
   A. One out of every three people
   B. One out of every ten people
   C. One out of every fifty people
   D. One out of every one hundred people

62. Seatbelts reduce the risk of serious injury or death in auto accidents by
   A. 10%.
   B. 25%.
   C. 50%.
   D. 75%.

63. One out of every three people will
   A. be disabled in an automobile accident during their lifetime.
   B. be killed in an automobile accident.
   C. be struck by lightening during their lifetime.
   D. be in an automobile accident in the next twelve months.

64. Choose a common reason(s) for not wearing seat belts:
   A. I just don't think about it.
   B. Putting them on is a pain.
   C. I might get trapped in the car.
   D. All of the above are common reasons.

65. Choose the TRUE statement:
   A. When a car hits something and stops, everything stops at the same time.
   B. When a car hits something and stops, a passenger with a seat belt continues moving.
   C. When a car hits something and stops, a passenger without a seat belt continues moving.
   D. In an accident, the use of a seat belt makes no difference.

66. What percentage of people in the United States do not wear seat belts?
   A. 5%
   B. 10%
   C. 50%
   D. 90%
67. In the last twelve months, 50,000 people were killed in auto accidents. Choose the **TRUE** statement(s):

A. Half of the deaths could have been prevented if the people had NOT worn seat belts.
B. Half of these deaths could have been prevented if the people had worn seat belts.
C. Three to four of the 50,000 would have been saved by not wearing their seat belts.
D. Both (B) and (C) are correct.

68. How many people in the United States are killed in automobile accidents?

A. One out of three.
B. One out of ten.
C. One out of one hundred.
D. One out of one thousand.

69. Choose the **TRUE** statement:

A. I am more likely to be killed by lightning than in an automobile accident.
B. I am just as likely as anyone else to get killed in automobile accident.
C. Seat belts make it more likely that I will be disabled in an automobile accident.
D. All of the above are correct.

70. Choose the **TRUE** statement:

A. In the United States, one of seven people under 25 will be in an automobile accident in the next twelve months.
B. Seatbelts increase the risk of being injured in an automobile accident by 50%.
C. It is not necessary to wear a seat belt for traveling short distances in town.
D. All of the above are correct.

71. Complete the following sentence. If I wear a seat belt...

A. I reduce my chances of being injured in an accident.
B. I risk being trapped in a car during an accident.
C. Both of the above are incorrect.
D. Both of the above are correct.

72. Wearing a seat belt will cut your chances of being killed in an accident by

A. 1/4
B. 1/3
C. 1/2
D. 3/4
73. Choose the most likely result. If your car hit a telephone pole,
A. all passengers would be thrown forward and killed instantly.
B. all passengers would be thrown forward, however, those
   wearing seat belts would be less likely to be injured than those not
   wearing seat belts.
C. all passengers wearing seat belts would be uninjured, however
   those not wearing seat belts would probably be killed.
D. the passengers are not likely to be injured, so wearing a seat
   belt will make no difference.

74. Complete the following sentence. Wearing a seat belt...
A. eliminates your chances of being injured or killed in an
   automobile accident.
B. reduces your chances of being trapped in an automobile.
C. reduces your chance of being in an accident.
D. None of the above.

75. Is it likely that someone you know will be killed in an automobile accident?
A. No.
B. Yes.
C. There is no way to predict.
Lesson Involvement Survey

Instructions:

Please indicate how you feel about the following statements. Use the following scale to indicate your feelings on the computer sheet provided.

1 = Strongly Agree
2 = Agree
3 = Slightly Agree
4 = Slightly Disagree
5 = Disagree
6 = Strongly Disagree

76. I really got into the lesson.
77. I was distracted during the lesson.
78. I felt motivated during the lesson.
79. During the lesson, I recalled past experiences.
80. I felt like I really experienced the lesson.
81. My eyes were really focused on the lesson.
82. I felt like I was actively participating in the lesson.
83. I felt like I shared in the lesson.
84. I was totally engrossed in the lesson.
85. I really explored the lesson.
86. I felt that the lesson involved me in decision making.
87. I felt detached from the lesson.
88. I felt that the lesson was directed to me personally.
89. I felt really involved with the lesson topic.
90. I continued to think about the lesson even after it was over.
91. I eagerly moved through the lesson.
92. I really concentrated on the lesson.
93. I felt indifferent during the lesson.
1. I felt uninterested about the lesson. 1 2 3 4 5 6
2. My feelings were aroused during parts of the lesson. 1 2 3 4 5 6
3. I felt intellectually involved with the lesson. 1 2 3 4 5 6
4. I felt engaged in the lesson. 1 2 3 4 5 6
5. I felt very closely involved with the lesson. 1 2 3 4 5 6
6. I blocked out the lesson and was thinking about other things. 1 2 3 4 5 6
7. I felt physically distant from the lesson. 1 2 3 4 5 6
8. I felt emotionally distant from the lesson. 1 2 3 4 5 6
9. I felt inattentive during the lesson. 1 2 3 4 5 6
10. I felt like I was communicating during the lesson. 1 2 3 4 5 6
11. I was really thinking during the lesson. 1 2 3 4 5 6
12. I felt alert during the lesson. 1 2 3 4 5 6
13. I felt more like an outsider than a participant in the lesson. 1 2 3 4 5 6
14. I felt the lesson wasn’t very exciting. 1 2 3 4 5 6
15. I felt excluded in the lesson. 1 2 3 4 5 6
16. I felt like I was sharing my inner feelings in the lesson. 1 2 3 4 5 6
17. I got so involved with the lesson that I almost lost track of time. 1 2 3 4 5 6
18. I really learned a lot. 1 2 3 4 5 6
19. I felt like the computer was interacting with me. 1 2 3 4 5 6
20. I felt physically involved with the program. 1 2 3 4 5 6
21. It seemed like the lesson was focused directly at me.
Instructions:

Please answer the following questions on the computer sheet provided.

115. Rate your attitude toward this type of lesson.

A. Very Positive
B. Positive
C. Neutral
D. Negative
E. Very Negative

116. Rate the amount of time provided for the lesson.

A. More Than Adequate
B. Adequate
C. Inadequate

117. Rate to what degree the lesson persuaded you to use your seat belt.

A. Highly Persuasive
B. Persuasive
C. Not Persuasive

118. Choose one of the following statements.

A. If I were driving, I would ask my passengers to wear their seat belts.
B. If I were driving, I would not ask my passengers to wear their seat belts.
APPENDIX D.

QUESTIONNAIRE 1A
General Questionnaire 1
PART I

Instructions:
Please answer the following questions on the computer sheet provided.

1. What is your age?
   A. 14-19
   B. 20-29
   C. 30-39
   D. Over 40

2. What is your gender?
   A. Female
   B. Male

3. Where have you spent most of your life?
   A. On a farm
   B. In a small town (up to 10,000)
   C. In a large town (10,000-50,000)
   D. In a small city (50,000-100,000)
   E. In a medium-sized city (100,000 - 500,000)
   F. In a larger city (over 500,000)
   G. I've never lived in one place more than five years

4. What is the size of the car you most frequently drive or ride in?
   A. Subcompact
   B. Midsize
   C. Large or full size
   D. Van or pickup

5. What is your opinion of the law making seat belt use compulsory?
   A. In Favor
   B. No Opinion
   C. Opposed

6. What importance do you place on following the seat belt law?
   A. Very important
   B. Important
   C. Somewhat important
   D. Of little importance
   E. Not important
7. How would you rate your driving record
   A. Excellent
   B. Very Good
   C. Average
   D. Not Good
   E. Poor

8. Generally, based on your personal experiences with automobile accidents,
   A. wearing a seat belt prevents serious injury.
   B. wearing or not wearing a seat belt doesn't seem to matter.
   C. wearing a seat belt causes serious injury.

9. How often do you wear your seat belt?
   A. Always
   B. Almost Always
   C. Generally
   D. Sometimes or Seldom
   E. Never or Almost Never

10. How often do you wear your seat belt in the city?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

11. How often do you wear your seat belt on the highway?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

12. How would you compare the amount of time you spend riding in or driving a car with the average American?
    A. Much more time in the car
    B. More time in the car
    C. Same time in the car
    D. Less time in the car
    E. Much less time in the car
13. Have you, or has someone close to you, ever been in an accident that involved a fatality or serious injury?
   A. Yes. A seat belt may have saved the person's life.
   B. Yes. A seat belt may have increased the injury.
   C. Yes, but the seat belt did not make a difference.
   D. No. I've never been in that situation.

14. How would you rate your chances of being in a life-threatening accident?
   A. Very High
   B. High
   C. Somewhere in the middle
   D. Low
   E. Very low
APPENDIX E.

QUESTIONNAIRE 1B
Instructions:
Please answer the following questions on the computer sheet provided.

1. What is your age?
   A. 14-19
   B. 20-29
   C. 30-39
   D. Over 40

2. What is your gender?
   A. Female
   B. Male

3. Where have you spent most of your life?
   A. On a farm
   B. In a small town (up to 10,000)
   C. In a large town (10,000-50,000)
   D. In a small city (50,000-100,000)
   E. In a medium-sized city (100,000 - 500,000)
   F. In a larger city (over 500,000)
   G. I've never lived in one place more than five years

4. What is the size of the car you most frequently drive or ride in?
   A. Subcompact
   B. Midsize
   C. Large or full size
   D. Van or pickup

5. What is your opinion of the law making seat belt use compulsory?
   A. In Favor
   B. No Opinion
   C. Opposed

6. What importance do you place on following the seat belt law?
   A. Very important
   B. Important
   C. Somewhat important
   D. Of little importance
   E. Not important
7. How would you rate your driving record
   A. Excellent
   B. Very Good
   C. Average
   D. Not Good
   E. Poor

8. Generally, based on your personal experiences with automobile accidents,
   A. wearing a seat belt prevents serious injury.
   B. wearing or not wearing a seat belt doesn't seem to matter.
   C. wearing a seat belt causes serious injury.

9. How often do you wear your seat belt?
   A. Always
   B. Almost Always
   C. Generally
   D. Sometimes or Seldom
   E. Never or Almost Never

10. How often do you wear your seat belt in the city?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

11. How often do you wear your seat belt on the highway?
    A. Always
    B. Almost Always
    C. Generally
    D. Sometimes or Seldom
    E. Never or Almost Never

12. How would you compare the amount of time you spend riding in or driving a car with the average American?
    A. Much more time in the car
    B. More time in the car
    C. Same time in the car
    D. Less time in the car
    E. Much less time in the car
13. Have you, or has someone close to you, ever been in an accident that involved a fatality or serious injury?

A. Yes. A seat belt may have saved the person's life.
B. Yes. A seat belt may have increased the injury.
C. Yes, but the seat belt did not make a difference.
D. No. I've never been in that situation.

14. How would you rate your chances of being in a life-threatening accident?

A. Very High
B. High
C. Somewhere in the middle
D. Low
E. Very low

PART II
Computer Attitude Survey

Instructions:
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings.

1 = Strongly agree
2 = Agree
3 = Slightly agree
4 = Slightly disagree
5 = Disagree
6 = Strongly disagree

15. Having a computer available to me would improve my productivity. 1 2 3 4 5 6

16. If I had to use a computer for some reason, it would probably save me some time and work. 1 2 3 4 5 6

17. If I use a computer, I could get a better picture of the facts and figures. 1 2 3 4 5 6

18. Having a computer available to me would improve my general satisfaction. 1 2 3 4 5 6

19. Having to use a computer could make my life less enjoyable. 1 2 3 4 5 6

20. Having a computer available to me could make things easier for me. 1 2 3 4 5 6

21. I feel very negative about computers in general. 1 2 3 4 5 6

22. Having a computer available to me could make things more fun for me. 1 2 3 4 5 6
1 = Strongly agree  
2 = Agree  
3 = Slightly agree  
4 = Slightly disagree  
5 = Disagree  
6 = Strongly disagree

23. If I had a computer at my disposal, I would try to get rid of it. 1 2 3 4 5 6
24. I look forward to a time when computers are more widely used. 1 2 3 4 5 6
25. I doubt if I would ever use computers very much. 1 2 3 4 5 6
26. I avoid using computers whenever I can. 1 2 3 4 5 6
27. I enjoy using computers. 1 2 3 4 5 6
28. I feel that there are too many computers. 1 2 3 4 5 6
29. Computers are probably going to be an important part of my life. 1 2 3 4 5 6
30. A computer could make learning fun. 1 2 3 4 5 6
31. If I were to use a computer, I could get a lot of satisfaction from it. 1 2 3 4 5 6
32. If I were to use a computer, it would probably be more trouble than it was worth. 1 2 3 4 5 6
33. I am usually uncomfortable when I have to use computers. 1 2 3 4 5 6
34. I sometimes get nervous just thinking about computers. 1 2 3 4 5 6
35. I will probably never learn to use a computer. 1 2 3 4 5 6
36. Computers are too complicated to be of much use to me. 1 2 3 4 5 6
37. If I had to use a computer all the time, I would probably be very unhappy. 1 2 3 4 5 6
38. I sometimes feel intimidated when I have to use a computer. 1 2 3 4 5 6
39. I sometimes feel that computers are smarter than I am. 1 2 3 4 5 6
40. I can think of many ways that I could use a computer. 1 2 3 4 5 6
PART III
Seat Belt Opinion Measure

Instructions:

Please indicate how you feel regarding the following statements. Use the following scale to indicate your attitudes.

1 = Strongly agree 5 = Slightly disagree
2 = Agree 6 = Disagree
3 = Slightly agree 7 = Strongly disagree
4 = Neutral

41. Seat belts make you feel secure and safe. 1 2 3 4 5 6 7
42. I feel I don't need a seat belt. 1 2 3 4 5 6 7
43. I'm not sold on the safety value of seat belts. 1 2 3 4 5 6 7
44. I don't feel any safer with a seat belt on. 1 2 3 4 5 6 7
45. Seat belts are a must for high speed travel on the highway. 1 2 3 4 5 6 7
46. Since seat belts are in the car, I feel I should wear them. 1 2 3 4 5 6 7
47. What we need are more laws requiring people to wear seat belts in cars. 1 2 3 4 5 6 7
48. I would rather not think about seat belts. 1 2 3 4 5 6 7
49. Seat belts are the best protection you have in a car. 1 2 3 4 5 6 7
50. We need more education programs to convince people to wear seat belts. 1 2 3 4 5 6 7
51. Publicity on T.V., radio, and in the newspaper is not going to get me to wear a seat belt. 1 2 3 4 5 6 7
52. Lower insurance premiums for drivers who wear seat belts would be a good idea. 1 2 3 4 5 6 7
53. I don't see why I have to pay for seat belts just because the government insists on their installation. 1 2 3 4 5 6 7
54. When the traffic is heavy or the roads are bad, I put my seat belt on. 1 2 3 4 5 6 7
55. Whenever I feel uneasy about driving, I put my seat belt on. 1 2 3 4 5 6 7
1 = Strongly agree                  5 = Slightly disagree
2 = Agree                           6 = Disagree
3 = Slightly agree                  7 = Strongly disagree
4 = Neutral

56. Seat belts are a nuisance to put on and adjust.  1 2 3 4 5 6 7
57. Seat belts give you support and lessen fatigue.  1 2 3 4 5 6 7
58. An important advantage of seat belts is that they keep you from being banged around inside the car in event of an accident.  1 2 3 4 5 6 7
59. There is no effort involved in using a seat belt.  1 2 3 4 5 6 7
60. If someone insisted, I would put my seat belt on.  1 2 3 4 5 6 7

PART IV
Seat Belt Survey

Instructions
This survey will quiz your knowledge of seat belt safety and use. Choose the best letter and enter it on your computer sheet.

61. During the next twelve months, how many people in the United States will be in an automobile accident?
   A. One out of every three people
   B. One out of every ten people
   C. One out of every fifty people
   D. One out of every one hundred people

62. Seatbelts reduce the risk of serious injury or death in auto accidents by
   A. 10%.
   B. 25%.
   C. 50%.
   D. 75%.

63. One out of every three people will
   A. be disabled in an automobile accident during their lifetime.
   B. be killed in an automobile accident.
   C. be struck by lightning during their lifetime.
   D. be in an automobile accident in the next twelve months.
Choose a common reason(s) for not wearing seat belts:

A. I just don't think about it.
B. Putting them on is a pain.
C. I might get trapped in the car.
D. All of the above are common reasons.

Choose the TRUE statement:

A. When a car hits something and stops, everything stops at the same time.
B. When a car hits something and stops, a passenger with a seat belt continues moving.
C. When a car hits something and stops, a passenger without a seat belt continues moving.
D. In an accident, the use of a seat belt makes no difference.

What percentage of people in the United States do not wear seat belts?

A. 5%
B. 10%
C. 50%
D. 90%

In the last twelve months, 50,000 people were killed in auto accidents. Choose the TRUE statement(s):

A. Half of the deaths could have been prevented if the people had NOT worn seat belts.
B. Half of these deaths could have been prevented if the people had worn seat belts.
C. Three to four of the 50,000 would have been saved by not wearing their seat belts.
D. Both (B) and (C) are correct.

How many people in the United States are killed in automobile accidents?

A. One out of three.
B. One out of ten.
C. One out of one hundred.
D. One out of one thousand.

Choose the TRUE statement:

A. I am more likely to be killed by lightning than in an automobile accident.
B. I am just as likely as anyone else to get killed in automobile accident.
C. Seat belts make it more likely that I will be disabled in an automobile accident.
D. All of the above are correct.
70. Choose the **TRUE** statement:

A. In the United States, one of seven people under 25 will be in an automobile accident in the next twelve months.
B. Seatbelts **increase** the risk of being injured in an automobile accident by 50%.
C. It is not necessary to wear a seat belt for traveling short distances in town.
D. All of the above are correct.

71. Complete the following sentence. If I wear a seat belt...

A. I reduce my chances of being injured in an accident.
B. I risk being trapped in a car during an accident.
C. Both of the above are incorrect.
D. Both of the above are correct.

72. Wearing a seat belt will cut your chances of being killed in an accident by

A. $\frac{1}{4}$
B. $\frac{1}{3}$
C. $\frac{1}{2}$
D. $\frac{3}{4}$

73. Choose the most likely result. If your car hit a telephone pole,

A. all passengers would be thrown forward and killed instantly.
B. all passengers would be thrown forward, however, those wearing seat belts would be less likely to be injured than those not wearing seat belts.
C. all passengers wearing seat belts would be uninjured, however those not wearing seat belts would probably be killed.
D. the passengers are not likely to be injured, so wearing a seat belt will make no difference.

74. Complete the following sentence. Wearing a seat belt...

A. eliminates your chances of being injured or killed in an automobile accident.
B. reduces your chances of being trapped in an automobile.
C. reduces your chance of being in an accident.
D. None of the above.

75. Is it likely that someone you know will be killed in an automobile accident?

A. No.
B. Yes.
C. There is no way to predict.
APPENDIX F.

QUESTIONNAIRE 2
General Questionnaire 2
PART I
Computer Attitude Survey

Instructions:
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings.

1 = Strongly agree        4 = Slightly disagree
2 = Agree                 5 = Disagree
3 = Slightly agree        6 = Strongly disagree

1. Having a computer available to me would improve my productivity.  1 2 3 4 5 6
2. If I had to use a computer for some reason, it would probably save me some time and work. 1 2 3 4 5 6
3. If I use a computer, I could get a better picture of the facts and figures. 1 2 3 4 5 6
4. Having a computer available to me would improve my general satisfaction. 1 2 3 4 5 6
5. Having to use a computer could make my life less enjoyable. 1 2 3 4 5 6
6. Having a computer available to me could make things easier for me. 1 2 3 4 5 6
7. I feel very negative about computers in general. 1 2 3 4 5 6
8. Having a computer available to me could make things more fun for me. 1 2 3 4 5 6
9. If I had a computer at my disposal, I would try to get rid of it. 1 2 3 4 5 6
10. I look forward to a time when computers are more widely used. 1 2 3 4 5 6
11. I doubt if I would ever use computers very much. 1 2 3 4 5 6
12. I avoid using computers whenever I can. 1 2 3 4 5 6
13. I enjoy using computers. 1 2 3 4 5 6
14. I feel that there are too many computers. 1 2 3 4 5 6
1 = Strongly agree  
2 = Agree  
3 = Slightly agree  
4 = Slightly disagree  
5 = Disagree  
6 = Strongly disagree

15. Computers are probably going to be an important part of my life.  
16. A computer could make learning fun.  
17. If I were to use a computer, I could get a lot of satisfaction from it.  
18. If I were to use a computer, it would probably be more trouble than it was worth.  
19. I am usually uncomfortable when I have to use computers.  
20. I sometimes get nervous just thinking about computers.  
21. I will probably never learn to use a computer.  
22. Computers are too complicated to be of much use to me.  
23. If I had to use a computer all the time, I would probably be very unhappy.  
24. I sometimes feel intimidated when I have to use a computer.  
25. I sometimes feel that computers are smarter than I am.  
26. I can think of many ways that I could use a computer.
PART II
Seat Belt Opinion Measure

Instructions:

Please indicate how you feel regarding the following statements. Use the following scale to indicate your attitudes.

1 = Strongly agree  5 = Slightly disagree
2 = Agree 6 = Disagree
3 = Slightly agree 7 = Strongly disagree
4 = Neutral

27. Seat belts make you feel secure and safe. 1 2 3 4 5 6 7
28. I feel I don't need a seat belt. 1 2 3 4 5 6 7
29. I'm not sold on the safety value of seat belts. 1 2 3 4 5 6 7
30. I don't feel any safer with a seat belt on. 1 2 3 4 5 6 7
31. Seat belts are a must for high speed travel on the highway. 1 2 3 4 5 6 7
32. Since seat belts are in the car, I feel I should wear them. 1 2 3 4 5 6 7
33. What we need are more laws requiring people to wear seat belts in cars. 1 2 3 4 5 6 7
34. I would rather not think about seat belts. 1 2 3 4 5 6 7
35. Seat belts are the best protection you have in a car. 1 2 3 4 5 6 7
36. We need more education programs to convince people to wear seat belts. 1 2 3 4 5 6 7
37. Publicity on T.V., radio, and in the newspaper is not going to get me to wear a seat belt. 1 2 3 4 5 6 7
38. Lower insurance premiums for drivers who wear seat belts would be a good idea. 1 2 3 4 5 6 7
39. I don't see why I have to pay for seat belts just because the government insists on their installation. 1 2 3 4 5 6 7
40. When the traffic is heavy or the roads are bad, I put my seat belt on. 1 2 3 4 5 6 7
41. Whenever I feel uneasy about driving, I put my seat belt on. 1 2 3 4 5 6 7
1 = Strongly agree
2 = Agree
3 = Slightly agree
4 = Neutral
5 = Slightly disagree
6 = Disagree
7 = Strongly disagree

42. Seat belts are a nuisance to put on and adjust.
43. Seat belts give you support and lessen fatigue.
44. An important advantage of seat belts is that they keep you from being banged around inside the car in event of an accident.
45. There is no effort involved in using a seat belt.
46. If someone insisted, I would put my seat belt on.

PART III
Seat Belt Survey

Instructions

This survey will quiz your knowledge of seat belt safety and use. Choose the best letter and enter it on your computer sheet.

47. During the next twelve months, how many people in the United States will be in an automobile accident?
   A. One out of every three people
   B. One out of every ten people
   C. One out of every fifty people
   D. One out of every one hundred people

48. Seatbelts reduce the risk of serious injury or death in auto accidents by
   A. 10%.
   B. 25%.
   C. 50%.
   D. 75%.

49. One out of every three people will
   A. be disabled in an automobile accident during their lifetime.
   B. be killed in an automobile accident.
   C. be struck by lightening during their lifetime.
   D. be in an automobile accident in the next twelve months.
50. Choose a common reason(s) for not wearing seat belts:
   A. I just don't think about it.
   B. Putting them on is a pain.
   C. I might get trapped in the car.
   D. All of the above are common reasons.

51. Choose the TRUE statement:
   A. When a car hits something and stops, everything stops at the same time.
   B. When a car hits something and stops, a passenger with a seat belt continues moving.
   C. When a car hits something and stops, a passenger without a seat belt continues moving.
   D. In an accident, the use of a seat belt makes no difference.

52. What percentage of people in the United States do not wear seat belts?
   A. 5%
   B. 10%
   C. 50%
   D. 90%

53. In the last twelve months, 50,000 people were killed in auto accidents. Choose the TRUE statement(s):
   A. Half of the deaths could have been prevented if the people had NOT worn seat belts.
   B. Half of these deaths could have been prevented if the people had worn seat belts.
   C. Three to four of the 50,000 would have been saved by not wearing their seat belts.
   D. Both (B) and (C) are correct.

54. How many people in the United States are killed in automobile accidents?
   A. One out of three.
   B. One out of ten.
   C. One out of one hundred.
   D. One out of one thousand.

55. Choose the TRUE statement:
   A. I am more likely to be killed by lightening than in an automobile accident.
   B. I am just as likely as anyone else to get killed in automobile accident.
   C. Seat belts make it more likely that I will be disabled in an automobile accident.
   D. All of the above are correct.
56. Choose the TRUE statement:
A. In the United States, one of seven people under 25 will be in an automobile accident in the next twelve months.
B. Seatbelts increase the risk of being injured in an automobile accident by 50%.
C. It is not necessary to wear a seat belt for traveling short distances in town.
D. All of the above are correct.

57. Complete the following sentence. If I wear a seat belt...
A. I reduce my chances of being injured in an accident.
B. I risk being trapped in a car during an accident.
C. Both of the above are incorrect.
D. Both of the above are correct.

58. Wearing a seat belt will cut your chances of being killed in an accident by
A. 1/4
B. 1/3
C. 1/2
D. 3/4

59. Choose the most likely result. If your car hit a telephone pole,
A. all passengers would be thrown forward and killed instantly.
B. all passengers would be thrown forward, however, those wearing seat belts would be less likely to be injured than those not wearing seat belts.
C. all passengers wearing seat belts would be uninjured, however those not wearing seat belts would probably be killed.
D. the passengers are not likely to be injured, so wearing a seat belt will make no difference.

60. Complete the following sentence. Wearing a seat belt...
A. eliminates your chances of being injured or killed in an automobile accident.
B. reduces your chances of being trapped in an automobile.
C. reduces your chance of being in an accident.
D. None of the above.

61. Is it likely that someone you know will be killed in an automobile accident?
A. No.
B. Yes.
C. There is no way to predict.
PART IV
Lesson Involvement Survey

Instructions:
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings on the computer sheet provided.

1 = Strongly Agree
2 = Agree
3 = Slightly Agree
4 = Slightly Disagree
5 = Disagree
6 = Strongly Disagree

62. I really got into the lesson. 
63. I was distracted during the lesson. 
64. I felt motivated during the lesson. 
65. During the lesson, I recalled past experiences. 
66. I felt like I really experienced the lesson. 
67. My eyes were really focused on the lesson. 
68. I felt like I was actively participating in the lesson. 
69. I felt like I shared in the lesson. 
70. I was totally engrossed in the lesson. 
71. I really explored the lesson. 
72. I felt that the lesson involved me in decision making. 
73. I felt detached from the lesson. 
74. I felt that the lesson was directed to me personally. 
75. I felt really involved with the lesson topic. 
76. I continued to think about the lesson even after it was over. 
77. I eagerly moved through the lesson. 
78. I really concentrated on the lesson. 
79. I felt indifferent during the lesson.
1 = Strongly Agree  
2 = Agree  
3 = Slightly Agree  
4 = Slightly Disagree  
5 = Disagree  
6 = Strongly Disagree  

80. I felt unconcerned about the lesson.  
81. My feelings were aroused during parts of the lesson.  
82. I felt intellectually involved with the lesson.  
83. I felt engaged in the lesson.  
84. I felt very closely involved with the lesson.  
85. I blocked out the lesson and was thinking about other things.  
86. I felt physically distant from the lesson.  
87. I felt emotionally distant from the lesson.  
88. I felt inattentive during the lesson.  
89. I felt like I was communicating during the lesson.  
90. I was really thinking during the lesson.  
91. I felt alert during the lesson.  
92. I felt more like an outsider than a participant in the lesson.  
93. I felt the lesson wasn't very exciting.  
94. I felt excluded in the lesson.  
95. I felt like I was sharing my inner feelings in the lesson.  
96. I got so involved with the lesson that I almost lost track of time.  
97. I really learned a lot.  
98. I felt like the computer was interacting with me.  
99. I felt physically involved with the program.  
100. It seemed like the lesson was focused directly at me.
PART V

Instructions:

Please answer the following questions on the computer sheet provided.

101. Rate your attitude toward this type of lesson.

   A. Very Positive
   B. Positive
   C. Neutral
   D. Negative
   E. Very Negative

102. Rate the amount of time provided for the lesson.

   A. More Than Adequate
   B. Adequate
   C. Inadequate

103. Rate your level of involvement with the lesson as a whole.

   A. Very Involved
   B. Involved
   C. Uninvolved

104. If you participated in a discussion group, rate your level of involvement within the discussion group.

   A. Very Involved
   B. Involved
   C. Uninvolved
   D. I did not participate in a discussion group.

105. Rate the effectiveness of the lesson in providing you with useful information related to seat belts.

   A. Excellent
   B. Very Good
   C. Good
   D. Adequate
   E. Poor

106. Rate to what degree the lesson persuaded you to use your seat belt.

   A. Highly Persuasive
   B. Persuasive
   C. Not Persuasive
107. Choose one of the following statements.

A. I use seat belts and will continue to use seat belts.
B. I don't always use seat belts, but plan to use them from now on.
C. I don't use seat belts and will continue not to use seat belts.

108. Choose one of the following statements.

A. If I were driving, I would ask my passengers to wear their seat belts.
B. If I were driving, I would not ask my passengers to wear their seat belts.
General Questionnaire 3
PART I
Computer Attitude Survey

Instructions:
Please indicate how you feel about the following statements. Use the following scale to indicate your feelings.

1 = Strongly agree  
2 = Agree  
3 = Slightly agree  
4 = Slightly disagree  
5 = Disagree  
6 = Strongly disagree

1. Having a computer available to me would improve my productivity. 1 2 3 4 5 6
2. If I had to use a computer for some reason, it would probably save me some time and work. 1 2 3 4 5 6
3. If I use a computer, I could get a better picture of the facts and figures. 1 2 3 4 5 6
4. Having a computer available to me would improve my general satisfaction. 1 2 3 4 5 6
5. Having to use a computer could make my life less enjoyable. 1 2 3 4 5 6
6. Having a computer available to me could make things easier for me. 1 2 3 4 5 6
7. I feel very negative about computers in general. 1 2 3 4 5 6
8. Having a computer available to me could make things more fun for me. 1 2 3 4 5 6
9. If I had a computer at my disposal, I would try to get rid of it. 1 2 3 4 5 6
10. I look forward to a time when computers are more widely used. 1 2 3 4 5 6
11. I doubt if I would ever use computers very much. 1 2 3 4 5 6
12. I avoid using computers whenever I can. 1 2 3 4 5 6
13. I enjoy using computers. 1 2 3 4 5 6
14. I feel that there are too many computers. 1 2 3 4 5 6
15. Computers are probably going to be an important part of my life. 1 2 3 4 5 6
16. A computer could make learning fun. 1 2 3 4 5 6
17. If I were to use a computer, I could get a lot of satisfaction from it. 1 2 3 4 5 6
18. If I were to use a computer, it would probably be more trouble than it was worth. 1 2 3 4 5 6
19. I am usually uncomfortable when I have to use computers. 1 2 3 4 5 6
20. I sometimes get nervous just thinking about computers. 1 2 3 4 5 6
21. I will probably never learn to use a computer. 1 2 3 4 5 6
22. Computers are too complicated to be of much use to me. 1 2 3 4 5 6
23. If I had to use a computer all the time, I would probably be very unhappy. 1 2 3 4 5 6
24. I sometimes feel intimidated when I have to use a computer. 1 2 3 4 5 6
25. I sometimes feel that computers are smarter than I am. 1 2 3 4 5 6
26. I can think of many ways that I could use a computer. 1 2 3 4 5 6
PART II
Seat Belt Opinion Measure

Instructions:

Please indicate how you feel regarding the following statements. Use the following scale to indicate your attitudes.

1 = Strongly agree 2 = Agree 3 = Slightly agree 4 = Neutral
5 = Slightly disagree 6 = Disagree 7 = Strongly disagree

27. Seat belts make you feel secure and safe. 1 2 3 4 5 6 7
28. I feel I don't need a seat belt. 1 2 3 4 5 6 7
29. I'm not sold on the safety value of seat belts. 1 2 3 4 5 6 7
30. I don't feel any safer with a seat belt on. 1 2 3 4 5 6 7
31. Seat belts are a must for high speed travel on the highway. 1 2 3 4 5 6 7
32. Since seat belts are in the car, I feel I should wear them. 1 2 3 4 5 6 7
33. What we need are more laws requiring people to wear seat belts in cars. 1 2 3 4 5 6 7
34. I would rather not think about seat belts. 1 2 3 4 5 6 7
35. Seat belts are the best protection you have in a car. 1 2 3 4 5 6 7
36. We need more education programs to convince people to wear seat belts. 1 2 3 4 5 6 7
37. Publicity on T.V., radio, and in the newspaper is not going to get me to wear a seat belt. 1 2 3 4 5 6 7
38. Lower insurance premiums for drivers who wear seat belts would be a good idea. 1 2 3 4 5 6 7
39. I don't see why I have to pay for seat belts just because the government insists on their installation. 1 2 3 4 5 6 7
40. When the traffic is heavy or the roads are bad, I put my seat belt on. 1 2 3 4 5 6 7
41. Whenever I feel uneasy about driving, I put my seat belt on. 1 2 3 4 5 6 7
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1 = Strongly agree  5 = Slightly disagree
2 = Agree         6 = Disagree
3 = Slightly agree 7 = Strongly disagree
4 = Neutral

42. Seat belts are a nuisance to put on and adjust.  1 2 3 4 5 6 7
43. Seat belts give you support and lessen fatigue.  1 2 3 4 5 6 7
44. An important advantage of seat belts is that they keep you from being banged around inside the car in event of an accident.  1 2 3 4 5 6 7
45. There is no effort involved in using a seat belt.  1 2 3 4 5 6 7
46. If someone insisted, I would put my seat belt on.  1 2 3 4 5 6 7

PART III
Seat Belt Survey

Instructions
This survey will quiz your knowledge of seat belt safety and use. Choose the best letter and enter it on your computer sheet.

47. During the next twelve months, how many people in the United States will be in an automobile accident?
   A. One out of every three people
   B. One out of every ten people
   C. One out of every fifty people
   D. One out of every one hundred people

48. Seatbelts reduce the risk of serious injury or death in auto accidents by
   A. 10%.
   B. 25%.
   C. 50%.
   D. 75%.

49. One out of every three people will
   A. be disabled in an automobile accident during their lifetime.
   B. be killed in an automobile accident.
   C. be struck by lightening during their lifetime.
   D. be in an automobile accident in the next twelve months.
50. Choose a common reason(s) for not wearing seat belts:
   A. I just don't think about it.
   B. Putting them on is a pain.
   C. I might get trapped in the car.
   D. All of the above are common reasons.

51. Choose the TRUE statement:
   A. When a car hits something and stops, everything stops at the same time.
   B. When a car hits something and stops, a passenger with a seat belt continues moving.
   C. When a car hits something and stops, a passenger without a seat belt continues moving.
   D. In an accident, the use of a seat belt makes no difference.

52. What percentage of people in the United States do not wear seat belts?
   A. 5%
   B. 10%
   C. 50%
   D. 90%

53. In the last twelve months, 50,000 people were killed in auto accidents. Choose the TRUE statement(s):
   A. Half of the deaths could have been prevented if the people had NOT worn seat belts.
   B. Half of these deaths could have been prevented if the people had worn seat belts.
   C. Three to four of the 50,000 would have been saved by not wearing their seat belts.
   D. Both (B) and (C) are correct.

54. How many people in the United States are killed in automobile accidents?
   A. One out of three.
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   D. One out of one thousand.

55. Choose the TRUE statement:
   A. I am more likely to be killed by lightening than in an automobile accident.
   B. I am just as likely as anyone else to get killed in automobile accident.
   C. Seat belts make it more likely that I will be disabled in an automobile accident.
   D. All of the above are correct.
56. Choose the **TRUE** statement:

A. In the United States, one of seven people under 25 will be in an automobile accident in the next twelve months.
B. Seatbelts **increase** the risk of being injured in an automobile accident by 50%.
C. It is not necessary to wear a seat belt for traveling short distances in town.
D. All of the above are correct.

57. Complete the following sentence. If I wear a seat belt...

A. I reduce my chances of being injured in an accident.
B. I risk being trapped in a car during an accident.
C. Both of the above are incorrect.
D. Both of the above are correct.

58. Wearing a seat belt will cut your chances of being killed in an accident by

A. 1/4
B. 1/3
C. 1/2
D. 3/4

59. Choose the most likely result. If your car hit a telephone pole,

A. all passengers would be thrown forward and killed instantly.
B. all passengers would be thrown forward, however, those wearing seat belts would be less likely to be injured than those not wearing seat belts.
C. all passengers wearing seat belts would be uninjured, however those not wearing seat belts would probably be killed.
D. the passengers are not likely to be injured, so wearing a seat belt will make no difference.

60. Complete the following sentence. Wearing a seat belt...

A. eliminates your chances of being injured or killed in an automobile accident.
B. reduces your chances of being trapped in an automobile.
C. reduces your chance of being in an accident.
D. None of the above.

61. Is it likely that someone you know will be killed in an automobile accident?

A. No.
B. Yes.
C. There is no way to predict.
Instructions:

Please answer the following questions on the computer sheet provided.

62. Choose one of the following statements.
   A. I use seat belts and will continue to use seat belts.
   B. I don't always use seat belts, but plan to use them from now on.
   C. I don't use seat belts and will continue not to use seat belts.

63. Choose one of the following statements.
   A. If I were driving, I would ask my passengers to wear their seat belts.
   B. If I were driving, I would not ask my passengers to wear their seat belts.

64. How often do you wear your seat belt?
   A. Always
   B. Almost Always
   C. Generally
   D. Sometimes or Seldom
   E. Never or Almost Never

65. During the past few weeks, I drove or rode in a car...
   A. Many times
   B. A few times
   C. Only a couple of times
   D. Not at all

66. During the past few weeks, how often did you wear your seat belt when driving or riding on a car?
   A. Always
   B. Almost Always
   C. Generally
   D. Sometimes or Seldom
   E. Never or Almost Never
APPENDIX H.

HUMAN SUBJECTS COMMITTEE APPROVAL
INFORMATION ON THE USE IN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY

(Please follow the accompanying instructions for completing this form.)

1. Title of project (please type): Active Involvement as An Element of Persuasive Computer-Based Instruction

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

   Annette Lamb
   Typewritten Name of Principal Investigator
   3/17/87
   Signature of Principal Investigator

   No31 Lagomarcino Hall
   Campus Address
   294-6640
   Campus Telephone

3. Signatures of others (if any) Date Relationship to Principal Investigator

4. ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomforts to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

   □ Medical clearance necessary before subjects can participate
   □ Samples (blood, tissue, etc.) from subjects
   □ Administration of substances (foods, drugs, etc.) to subjects
   □ Physical exercise or conditioning for subjects
   □ Deception of subjects
   □ Subjects under 14 years of age and/or Subjects 14-17 years of age
   □ Subjects In Institutions
   □ Research must be approved by another institution or agency

5. ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.
   □ Signed Informed consent will be obtained.
   □ Modified informed consent will be obtained.

6. Anticipated date on which subjects will be first contacted: Month Day Year
   Anticipated date for last contact with subjects:
   05 22 87

7. If Applicable: Anticipated date on which audio or visual tapes will be erased and/or Identifiers will be removed from completed survey instruments: Month Day Year
   05 22 87

8. Signature of Head or Chairperson Date Department or Administrative Unit
   3/19/87

5. Decision of the University Committee on the Use of Human Subjects in Research:
   □ Project Approved □ Project not approved □ No action required
   George G. Karas
   3/20/87
STUDY PROCEDURES

Materials and Equipment Needed:
Pencils
Score Sheets
Questionnaires 1A, 1B, and 2
Computer Disks (Marked with Subject Assignment Numbers)
Videotape
Subject Assignment Cards
Discussion Outline

Facilities Needed:
Classroom with VHS player and monitor
Discussion Classroom
Computer Laboratory

Preparation Needed:
In Media Classroom:
  ____ Prepare ID cards to hand out
  ____ Lay out Video Group Questionnaires, Sheets and Pencils
  ____ Lay out Folder to Collect Questionnaires
  ____ Prepare Videotape
  ____ Lay out Questionnaire 2, Sheets and Pencils

In Computer Laboratory:
  ____ Lay out questionnaires, sheets and pencils at stations
  ____ Lay out computer disk at stations
  ____ Attach ID card to the computer disk sleeve
  ____ Lay out folder to collect questionnaires

In Discussion Classroom:
  ____ Check the set-up of chairs
  ____ Lay out discussion folder

Specific Experiment Timeline

CLASSTIME

CLASSROOM with INSTRUCTOR and Annette Lamb
0:00-0:12
  Attendance
  Introduction to basic computer operation - 301 instructor
  Introduction of Annette Lamb
ANNETTE WILL TAKE OVER
0:12-0:15
Annette's Introductory Comments
Distribute and explain "Subject Assignment Cards"
1. Used to identify the piece of software you are using.
Direct students based on their card numbers:
   4000-4999 Stay in the Classroom
   All others Follow Annette to the Computer Lab

CLASSROOM with INSTRUCTOR
0:15-0:20
Distribute QUESTIONNAIRE 1A, computer sheets, and pencils.
1. Instruct students to use pencils only.
2. Instruct students NOT to write on the questionnaire itself.
3. Instruct students to use their card number for an ID number.
4. Instruct student NOT to fill in other sections such as name.
5. When students are done, collect questionnaires and place in the folder provided.

0:20-0:42
Prepare and start videotape.
1. Describe how the 24 minute videotape is a recording of a person using a computer program called "Make It Click".
2. Start and videotape and proceed to the computer lab.

COMPUTER LAB with Annette Lamb
0:15-0:20
Instruct students to sit at the computer containing a number matching that on their card.
Distribute QUESTIONNAIRE 1A or 1B, computer sheets, and pencils.
1. Instruct students to use pencils only and not to write on the questionnaire.
2. Instruct students to use their card number for an ID number.
3. Those with numbers 5000-5999 may take a more time.
4. When students are done, collect questionnaires.
0:20-0:43
Instruct students to use the computer program at their computer.
Inform students that they will have 15-25 minutes and will probably have time to go through the program more than once.
Assist students as needed with using the computer hardware.

0:33
Direct students based on their cards:
1000-1999 Go with Annette to Microteaching
All others Stay in homework lab and continue working

0:43
Direct all remaining students to return to the media classroom.

DISCUSSION CLASSROOM with Annette Lamb
0:33-0:43
Students will participate in a discussion.

0:43
Return to media classroom.

CLASSROOM with INSTRUCTOR and Annette Lamb
0:43-0:47
All students should return to their seats.
Distribute QUESTIONNAIRE 2, computer sheets, and pencils.
   1. Instruct students to use pencils only.
   2. Instruct students NOT to write on the questionnaire itself.
   3. Instruct students to use their card number for an ID number.
   4. Instruct student NOT to fill in other sections such as name.
   5. When students are done, collect questionnaires and ID cards and place in the folder provided.

0:47
Thank students for their participation.
Followup Study Guidelines
For Annette Lamb’s Study

Instructor Directions

Preparation:
A box containing the following items will be placed in the Classroom:
1. Copies of QUESTIONNAIRE 3
2. A stack of precounted computer sheets
   (if more are needed an extra stack has been provided)
3. Pencils

Inform students that Annette Lamb requests some additional information.

Distribute QUESTIONNAIRE 3, computer sheets, and pencils.
1. Instruct student NOT to write on the questionnaire itself.
2. Instruct students to use pencils only.
3. Distribute "subject identification cards" provided in the box.
4. Instruct students to use their card number for an ID number.
5. Instruct students NOT to fill in other sections such as name.
6. When students are done, collect questionnaires and ID numbers.
7. Place questionnaires in the MASTER FOLDER.

Thank students again for their participation.