Persuasion, hemisphericity, and instructional media: The use of a fear-provoking videotape to change attitude toward smoking in high school students

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A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE

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

Iowa State University
Ames, Iowa

1986

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CHAPTER I. STATEMENT OF THE PROBLEM

Goal of the Chapter

Modern era educational media research may have begun in 1915 (Wagner, 1978). L. A. Averill's study (1915) of D. W. Griffith's film, "The Birth of a Nation," was one of the first efforts to conduct research in educational media (cited in Wagner, 1978). Averill wanted to determine the impact of this film on viewers, so he constructed and administered a survey. The questions Averill raised as a result of his study interested other researchers. Researchers began to examine the relationship between the communication and the means of delivering the message through the use of instructional technology such as films, slides, and radio (Hill, 1978). Consequently, a new field of inquiry evolved, the field described as media research.

Hoban and van Ormer (1951) summarized more than 200 experimental studies dealing with instructional films that were conducted between 1918 and 1950. Their study examined characteristics of films and viewers with the goal of providing instructional film makers theoretical guidance in producing instructional films. This study investigated the use of film to change the attitudes of high school students.

One subcategory of media research investigated the influence of media on attitudes. The concept of attitude has been used by researchers to denote and elucidate a consistency in an individual's behavior across a variety of situations. Specifically, investigators tried to determine why different individuals behaved differently in the same situation and why the same individual responded similarly in different situations. Attitude

research is important because it is, according to Thomas and Znaniecki (1918), impossible to understand social change without an understanding of differences between individuals, including affective differences.

Many teachers, instructional technologists, and instructional developers are concerned with the use of media in the classroom. These educators are interested in how visual media communicate with the viewer. How do people make inferences from mediated messages? Why are not all individuals affected in the same manner? Is there some characteristic inherent in visual media that determines the import of messages?

One branch of media research that attempts to partially answer these questions is Media Attitude (M-A) research. The primary interest of M-A research is how media (films, slides, videotapes, and television) affect a viewer's attitude. As a result of examining over 60 Media-Attitude studies, Simonson (1979b) proposed several guidelines to aid instructional developers in producing persuasive media. Simonson's recommendations were designed to develop a favorable attitude toward instruction or a subject area. Simonson's guidelines can be summarized 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 post-instruction discussions and critiques are likely to develop favorable attitudes toward delivery method and content.

Guideline #6: "Learners who experience purposeful emotional involvement or arousal during instruction are likely to change their attitude in the direction advocated in mediated message" (Simonson, 1979b, p. 18). This study is an in-depth investigation of Simonson's Guideline #6.

Fleming and Levie (1978) cited three reasons why educators have been concerned with attitudes and attitudinal change. Educators have traditionally been interested in influencing student's attitudes toward social and health-related issues. By using instructional media, instructional developers have been able to effectively promote attitudinal positions. A second reason cited by Fleming and Levie was that students remembered and sought additional information when they reacted favorably to an instructional method. This corresponded with Simonson's (1979b) finding that attitude was influenced by an individual's "liking" of a method of presentation. Third, Fleming and Levie indicated that instructional developers should be aware of procedures that influenced attitudes so that unfavorable biases could be eliminated.

Since attitudes have been defined as predispositions to actions, it is imperative that the attitude of the individual is consistent with a

desired action. Examples of this type of behavior are nonsmokers who advocate nonsmoking, and drivers who stress auto safety and wear seat belts.

The remainder of Chapter I of this study will include the following: Discussion of the Problem, Purpose of the Study, Definitions of Terms, and Null Hypotheses to be Tested.

Discussion of the Problem

This study was a Media-Attitude research study. It examined the capability of a fear-arousing videotape to persuade students not to smoke. The students who participated in the study had different methods of processing information.

The effectiveness of videotapes that presented messages with differing degrees of fear-arousing information was examined. Fear was defined as the presentation of the negative consequences of smoking in a way to promote deep concern. The primary goal of this research was to determine whether all viewers were affected by the videotapes in the same manner. A secondary goal of this research was to determine whether the cognitive style of the viewer was related to his/her acceptance of the videotaped persuasive message. The cognitive style of cerebral dominance was examined. The student's attitude toward smoking was the dependent variable of this study.

Purpose of the Study

This study examined whether persuasive films had a differential effect on high school students who demonstrated varying degrees of brain specialization.

Motion media have often been used to change attitudes. Producers have created a whole genre of motion pictures known as persuasive films. These films are often shown in American high schools. Dramatic situations are frequently used to provoke an emotional response in the viewer. It has been suggested (Miller, 1969; Simonson, 1979b) that if the viewers of a persuasive film experienced a purposeful emotional involvement or arousal toward the message of the motion picture, they would most likely change their attitude in the direction advocated by the film.

While emotional involvement produced by fear-provoking messages contributes to persuasion, it has been reported that too much fear may not be more effective than less threatening messages. Janis and Feshbach (1953) conducted experiments in which they varied the amount of fear generated by mediated instruction. Janis and Feshbach stated that although a high threat appeal did generate more worry or fright, it often did not elicit greater acceptance of the content of the communication or greater compliance with the behavior advocated. High anxiety may not change attitude because:

1. it makes it difficult to concentrate on what is being said;
2. well-practiced defenses are stronger than the response advocated by the communication; and

3. negative aspects of the communication generate hostility toward the communication and reduce its credibility.

Janis and Feshbach (1953), along with other researchers (Kiesler, Collins, and Miller, 1969; Insko, Arkoff, and Insko, 1965), have concluded that mediated instruction that provoked fear and then alleviated that fear in some relevant way was the most persuasive for high school students. This study provided additional information on the effectiveness of fear-arousing mediated instruction for changing attitudes of high school students.

In the 1960s, Sperry began "split-brain" research. This work won him the 1981 Nobel prize. Sperry, and other researchers, studied the right/left duality in human information processing that is often referred to as hemisphericity. It has been found that each person has a preferred method of processing information.

> ...people who prefer structured assignments where they can focus on verbal recall to discover specific facts that they can sequence to form an outline as the basis for logical problem solving generally have a dominant left hemisphere. From the other perspective, people who prefer open-ended assignments where they can show relationships through intuitive problem solving utilizing spatial materials generally have a dominant right hemisphere of the brain (Taggart and Torrance, 1984, p. 2).

American education has primarily focused on the development of the left brain hemisphere (Lutz, 1978; Raina, 1979; Sperry, 1975). Educators maintain that learning experience should be designed to enhance both hemispheres of the brain. Some recommendations offered to stimulate right hemispheric development include the use of imagery, pictures, and increased sensory learning (Lutz, 1978; Raina, 1979).

Persuasive films often utilize dramatic portrayals, social orientations, and fear to influence viewers. Recent media research has attempted to identify whether media should be designed differently to meet the needs of different groups of students (Simonson, 1984).

The second reason this study was conducted was that replication research is necessary to build a body of knowledge in any subject (Borg and Gall, 1979). Bauerfeind (cited in Borg and Gall, 1979) stated that the underlying premise of replication research is that if one research finding is found to be statistically significant, a second study should also demonstrate statistically significant findings. Researchers are able to generalize with more certainty after analyzing a large body of knowledge generated by many replications. This study was a modified operational replication of a study conducted by Berry (1983). The sampling and experimental procedures were the same as those used by Berry. However, this study investigated learner hemisphericity rather than the cognitive style of field dependence.

Definitions of Terms

Attitude: 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 (Thomas and Znaniecki, 1918).

Attitude change: Operationally defined as the difference in Smoking Attitude Scale scores for treatment groups as compared to the control group.

Attitude toward smoking: Measured by the Smoking Attitude Scale, it is an indication of an individual's emotional response toward smoking. It was the dependent variable in this study.

Cerebral dominance (CD): Term is used interchangeably with hemisphericity. CD is the cognitive style characterized by the tendency of a person to rely more on one hemisphere of the brain than the other for processing information.

Cognitive style: The stable characteristic that denotes differences in how individuals think, solve problems, learn, and relate to others. Cognitive styles are consistent. An individual's cognitive style is manifest in the person's perceptual and intellectual activities. Cerebral dominance and field dependence are two examples of cognitive styles (Blakemore, McCray, and Coker, 1984).

Fear: A painful feeling of impending danger, evil, or trouble. In this study, fear was defined as the scenes in the videotape treatments designed to arouse stressful feelings for the viewer.

Hemisphericity: Term is used interchangeably with CD throughout this study.

Human Information Processing Survey (HIPS): A 40-question, paper and pencil measure used to assess the cerebral dominance of subjects in this study. The HIPS was developed by Taggart and Torrance in 1984. It was originally Form C of the "Your Style of Learning and Thinking" (SOLAT). The reliability of the HIPS is .84 for the Right Hemisphere Scale, .86 for the Left Hemisphere Scale, and .82 for the Integrated Style Scale. It served as the measure of the independent variable in this study.

Integrated strategy: Term used to describe an individual who uses both the left and right hemisphere and has the ability to see the linkages between the two. An individual with an integrated strategy is the most flexible type of thinker.

Left hemispheristic strategy: Term used to describe an individual who utilizes the left hemisphere of the brain that is specialized for logical, sequential processing of information and deals primarily with verbal, analytical, temporal, and digital materials.

Media-Attitude Interaction (M-A): The phase of media research that is concerned with the interaction between learner characteristics and media to deliver messages when attitude toward some instructional construct is the dependent variable.

Mixed strategy: Term used to describe an individual who processes information utilizing either the left or right hemisphere of the brain. The person with a mixed strategy tends to view left and right dominant elements as separate and isolated from one another.

Operational replication research: A study that duplicates the sampling and experimental procedures of a study that has been conducted previously (Lykken cited in Borg and Gall, 1979). The principle behind replication research is that if research findings represent a true phenomenon, these findings should be obtained each time the study is conducted (Borg and Gall, 1979).

Right hemispheristic strategy: Term used to describe an individual who utilizes the right hemisphere of the brain that is specialized for holistic, intuitive processing of information.

Smoking Attitude Scale (SAS): A measure to determine attitude toward smoking that was developed by Baer (1966) (r=.84). It was used as the measure of the dependent variable in this study. It consisted of a paper and pencil test with 22 items that respondents reacted to using a 5-point Likert scale.

Stimulus-response (S-R) psychology: "A psychological view that all behavior is in response to stimuli that the appropriate tasks of psychological science and those identifying stimuli, the responses correlated with them, and the processes intervening between stimulus and response" (Hilgard and Atkinson, 1967, p. 638).

Treatment groups: The participants in this study were randomly assigned to one of the following three treatments:

1. Control Group: No treatment was administered to this randomly selected group. Each member completed the SAS.
2. Fear Alone: Referred to the randomly assigned treatment group whose members viewed a 15-minute videotape based on the persuasive film, "The Feminine Mistake." Berry (1983) edited the film so that only scenes which evoked fear of smoking in the viewer were shown on the videotape. After viewing, each group member completed the SAS.
3. Fear with Alleviation: Referred to the randomly assigned treatment group whose members viewed a 15-minute videotape based on the persuasive film, "The Feminine Mistake." Berry (1983) edited the film so that fear-provoking scenes and

scenes designed to moderate the fear (e.g., "stop smoking" groups and clinics) were shown on the videotape.

Null Hypotheses to be Tested

1. There will be no statistically significant difference in attitude toward smoking between the treatment groups.
2. There will be no statistically significant difference in attitude toward smoking among groups of students identified as being left brain dominant, right brain dominant, or with integrated brain dominance.
3. There will not be a statistically significant interaction among brain dominance and treatments when attitude toward smoking is compared.
4. There will be no statistically significant difference in attitude toward smoking among students who indicate both parents smoke, one parent smokes, or neither parent smokes.
5. There will not be a statistically significant interaction among groups of students with parents with different smoking patterns and treatments when attitude toward smoking is compared.
6. There will be no statistically significant difference in attitude toward smoking between students who are current smokers, who are former smokers, and who are nonsmokers.
7. There will not be a statistically significant interaction among groups of students with different smoking habits and treatment when attitude toward smoking is compared.

Summary

This chapter discussed the historical antecedents for Media-Attitude research. The ability of film to change attitudes was examined. The societal implications of attitude change research were cited. In this study, two versions of a videotape designed to persuade the viewer of the hazards of smoking were shown to high school students. The purpose of the study was to determine whether the tapes had the same effect on learners who process information utilizing varying amounts of brain specialization (hemisphericity). The null hypotheses of this experiment and definitions of terms were included in this chapter.

CHAPTER II. LITERATURE REVIEW

Goal of the Chapter

This chapter is to provide a summary of the historical development of media research. It will examine the progression from behavioral research to a more holistic method and finally to the need for the integration of the two approaches. The historical development of Media-Attitude (M-A) research will also be discussed.

Since M-A interaction research is concerned with the relationship between learner characteristics and media characteristics, this study investigated the ability of film to persuade individuals characterized by the cognitive style of cerebral dominance. The ability of a film to persuade may be related to other variables; consequently, several factors that influence attitudes were examined.

This study was a modified operational replication of a study conducted by Timothy Berry in 1983. A summary of Berry's procedures and conclusions has been provided.

Development of ATI and M-A Research

"The most fundamental and most important characteristic of a profession is that the skills involved are founded upon a body of intellectual theory and research...the practice of a profession cannot be disjoined from its theoretical understandings, and vice versa..." (Finn, cited in Clark and Angert, 1984). It is important to take a brief look at the historical underpinnings of research in the area of Instructional Technology (IT). This background will provide a perspective that will aid

in understanding the relevance and relationship of this study to current media problems.

According to Martin (1983), psychology, a major contributor to media research, as a science emerged in 1879. By the early 1900s, two major groups of comprehensive learning theories had evolved. One group advocated stimulus-response (S-R) or conditioning theory. The researchers in this group (Thorndike, Pavlov, Skinner) emphasized the analysis of behavior. S-R researchers often studied simple learning processes in order to understand complex ones.

The second group of researchers is often referred to as the cognitive group. Researchers in this category (Piaget, Torrance, Bruner, Ausubel) emphasized internal processes and structures. Thinking as a process is an example of an area of concern of cognitive researchers. The perceptual organization of experiences and situations is of concern to this category of educational psychologist.

Of the prominent instructional techniques, task analysis and behavioral objectives are based upon S-R research, while cognitive construct and humanistic theories are based upon cognitive psychology. One major argument between the two groups has been whether S-R connections were the product, or the result, of learning. Snelbecker stated that "many view the first part of the century as having been the province of S-R psychology and that since mid-century, we have moved into an era that will be dominated by some form of cognitive psychology, most likely under the information-processing orientation" (Snelbecker, cited in Martin, 1983).

Aptitude Treatment Interaction (ATI) is a type of research based upon the development of S-R and cognitive psychology that gained prominence in the 1960s. ATI studies have attempted to identify interactions between learner characteristics (aptitudes) and any manipulable variable (e.g., pace, style of instruction, method of presentation). An interaction was present when a situation had one effect on one person with one characteristic and a different effect on another person with a different level of this characteristic. The purpose of ATI was, according to Cronbach and Snow (1981), to develop enough treatments so that each person would be able to succeed.

Cronbach and Snow (1981) reported that the largest body of ATI research had been conducted on programmed instruction (PI). PI is an instructional technique that leads the learner through a step-by-step program. The learner is required to make an overt response that is corrected before the student is introduced to additional information. It was hypothesized in many studies that PI would have a disordinate effect on low and high ability students.

An example of this type of study was conducted by Porter in 1961 (cited in Cronbach and Snow, 1981). IQs of 74 sixth grade students were obtained. The students were divided into two treatment groups; one group received traditional spelling instruction, while the second group used teaching machines (PI). High IQ students made the same amount of progress regardless of treatment, while the low IQ students did better with PI. An implication of this and other ATI experiments was that students should be

assigned to alternative instructional treatments based on empirical evidence about them.

Media-Attitude (M-A) studies are a subset of ATI research. They investigate the relationships among media, attitude, and learner characteristics. M-A studies began with the inception of media research. Simonson, Thies, and Burch (1979) identified and abstracted over 200 studies conducted over a period of 50 years that utilized media to influence learner's attitudes. In analyzing these studies, they were able to identify four phases of M-A research:

Phase I: Liking - Early research in this area often consisted of a post-treatment lesson survey of what or how much the subject felt or liked about mediated instruction. The "liking" studied was directed toward a specific type of medium or for a lesson delivered by media.

Phase II: Change of Liking - Research included in this category used a pre/post survey of learner attitude toward a form of media or the content of a mediated message. This technique was used to determine whether there was a positive or negative change of attitude.

Phase III: Attitude Comparison - Research in this phase was generally more rigorous in the control of the organization of the research experiment. Two treatments, or one treatment and a control group, were used to compare traditional classroom with mediated instruction. M-A researchers, as a result of this research, began to propose tentative relationships between media, attitude, and achievement.

Phase IV: Media-Attitude Interaction - The research in this area has been concerned with isolating media characteristics and comparing them to

variables in the learning process or characteristics of the learner. Simonson identified few studies at this level of research and stressed the need for additional studies.

Allen (1975) has paralleled this phase of M-A research with the rise of ATI experimentation. Phase IV M-A research is a subcategory of ATI research.

Criticisms of ATI and M-A Research

Cronbach and Snow (1981) pointed out that there have been many inconsistencies in the findings of ATI research. Studies have often attempted to take simplistic views of learning in order to arrive at replicable generalizations and theoretical positions.

Due to the complexity of both learners and learning situations, it is difficult to conduct ATI studies. Researchers continually question whether the variable they are studying has actually caused the observed interaction, or was the effect caused by an unobserved, intervening variable?

Clark and Angert (1984) criticized ATI studies as being overly simplistic and two-dimensional. Clark and Angert stated that ATI has unrealistically delimited the variables of instruction. Researchers tended to interpret studies only from their own perspective and omitted the theoretical basis for research. Allen (1975) has criticized the fragmentary results of ATI that make it difficult to generalize from the results of ATI studies.

Many ATI studies conducted in the 1960s focused on the use of a two-way interaction between aptitude and treatment variables. Snow and

Salomon (1975) have suggested that studies include an interaction analysis of a task variable along with the aptitude and treatment variables. Cronbach and Snow (1981) referred to studies conducted with more than one variable and a treatment as higher order ATI studies. ATI studies must take into account higher order ATIs that combine aptitudes and the many parameters that exist in an instructional setting. In addition to the information-processing habits and abilities of the subject, the message (the signals actually delivered), the subject's perception (e.g., of the rewards and penalties in prospect), emotional state, and finally the effects of the dependent variables of the experience should be considered. Cronbach and Snow (1981) cited several studies to exemplify higher order ATI research. A study conducted by Caron in 1963 (cited in Cronbach and Snow, 1981) demonstrated that Personality and Ability patterns interact with motivational conditions. Silberman's 1962 research (cited in Cronbach and Snow, 1981) showed that conditions that were intended to arouse/reduce anxiety had a disordinal interaction. Stress benefited low anxiety subjects. After analyzing the hypotheses of 20 studies involving anxiety, Cronbach and Snow indicated that there was a need for additional research that examined the complex interactions that exist in a learning situation.

Media research has also been criticized for not examining interactions between various types of instructional media and learning characteristics (Snow and Salomon, 1975). Clark (1975a) stressed the need for additional research on media that is concerned with those relevant attributes of media that interact with individual differences to effect

learning. Clark proposed the construction of a taxonomy of media attributes that would enable the practitioner to select media that would be appropriate for a learner whose cognitive style had been identified. Possible attributes of media to be considered were: pictorial or verbal symbolization, realistic or simplified illustrations, the compression of time of a narration, the organization of the communication, structure of the communication, the use of repetition, and the saliency of cues (Clark, 1975b).

An example of a research study that examined relevant attributes of media was conducted by Miller in 1967. In this study, Miller utilized galvanic skin response (GSR) to measure the emotional involvement of college students and adult subjects. A filmograph was prepared from the motion picture, "Corral." The only discernible difference between treatments was the use of motion. Miller concluded that motion in film was capable of producing an emotional involvement response and must be considered as one factor in an interdependent network.

Cognitive Style

The learner characteristics analyzed in ATI and Phase IV M-A studies are often referred to as the learner's cognitive style. Federico and Landis (1980) defined cognitive styles as stable information-processing habits that characterize a person's mode of perceiving, remembering, thinking, and problem solving.

One important cognitive style is cerebral dominance (CD). Early research (1930s) studies in the field of cerebral dominance or hemisphericity were conducted on patients who suffered from epilepsy and

other brain disorders. According to Sperry (1975), Doctors Bogen and Vogel performed the first operation in 1961 on a human being to determine the purpose of the corpus callosum. The result of this operation confirmed earlier observations. The purpose of the corpus callosum was determined to allow the hemispheres of the brain to share memory and learning. Sperry (1975) determined that the human brain was specialized with two semiautonomous hemispheres that processed information differently.

The left hemisphere of the brain has been compared with a digital computer that processes information in a linear, bit-by-bit manner (Lezak, 1980). The left hemisphere is often associated with verbal, sequential analytic, logical thought where one element is compared to successive elements. An example of a left hemispheristic approach to solving an item on a spatial-visualizations test might be something like this:

> The pattern has a dark portion on the left side and on the bottom. Answer A is also darkened on the bottom and the left so it could be right; but B is wrong because it is darkened at the top. C could be right since the side is darkened and the bottom could be hidden, D might be right since it is just reversed (Sherman, 1980, p. 5).

The right hemisphere of the brain is often compared with an analog computer that processes information in terms of patterns of sound, sight, and touch. Solutions are arrived at intuitively where each element is not considered individually but as a part of a whole. The right hemisphere is often associated with spatial skills, musical skills, and creativity. People who seem to use a more gestalt, holistic mode of problem solving are sometimes referred to as right CD. An example of a right CD approach

to solving an item on a spatial visualization test would be to observe the pattern and compare it as an entity with the figures given as options (Lezak, 1980).

Individuals who habitually utilized strategies processed in the right hemisphere are often referred to as right CD. Conversely, individuals who habitually utilized strategies processed in the left hemisphere are referred to as left CD. Taggart and Torrance (1984) also identified the integrated and mixed styles. Individuals referred to as having an integrated style are able to utilize tactics associated with both the left and right hemispheres simultaneously. These individuals see linkages between the two means of processing information. Individuals with an integrated style are the most flexible thinkers. Individuals with a mixed style utilized either integrated, left or right hemisphere strategies. The mixed style individual views each tactic as isolated and sees no relationship between the elements when solving a problem. In this study, the individuals identified as having a mixed style were characterized by the secondary style that was dominant.

A relationship has been shown between a student's hemisphericity and his/her preference for the learning environment and method of instruction. Students with integrated and left hemispheric styles prefer quiet, warmth, a specific time of day (afternoon), and structure (O'Connor, 1983). Left hemispheric individuals prefer more formal design, more structure, and instruction which favors verbal, sequential processing.

Right dominant students dislike structure, are not motivated by adults, and like sound in the background (O'Connor, 1983). Story plots and pictures appeal to right hemispheristic individuals (Lutz, 1978).

Current research in the field of CD is concerned with the integration of the two hemispheres. Students should be taught complementary approaches to enable them to become flexible thinkers. Taggart (1985) has pointed out that an individual's hemisphericity could possibly be changed as the individual acquired new skills.

Several methods of determining the cerebral dominance of an individual have been developed. In laboratory studies, the brain's electrical activity can be measured by placing electrodes over the temporal lobes. This method is known as an electroencephalogram (E.E.G.). The Sherman-Kulhavy Laterality Assessment Inventory is a 45-item verbal report that assesses both the fine and gross motor activities of the subject. A score is derived by summing the responses (Sherman and Kulhavy, 1976). Dichotic listening tasks and conjugate lateral eye movements have been found to be an effective way to determine the cerebral specialization of children (Harris, 1975). Dichotic listening tasks present different auditory stimuli simultaneously to each ear. The subject must recall what is heard. Conjugate lateral eye movement research is conducted by having researchers observe the direction of the subject's gaze during mental problem solving.

In this study, the Human Information Processing Survey developed by Torrance, Taggart, and Taggart (1984) was used to ascertain the CD of high school students.

Film has several qualities that may have had a differential effect upon the viewer. Characteristics of film (sound, motion, pictures, and story plots) have been considered. An interaction has been predicted between a person's CD and their world view, their ability to perceive meaning from pictures, and their ability to structure the information they receive from film (Karl, 1980; Lutz, 1978; Raina, 1979). This study investigated whether the ability of the film, "The Feminine Mistake," to persuade individuals about the hazards of smoking was related to the subject's hemisphericity.

Merrill (1968) has shown that dramatic situations portrayed in films can change attitudes. It was hypothesized that right CD individuals were more likely to change their attitudes as a result of viewing a fear-arousing film. Right CD were thought to be better able to learn from pictures than left CD individuals who learned best from reading. Right CD individuals were thought to be ones who liked to formulate their own method of organizing information, while left CD individuals seemed to like materials organized in a linear, sequential manner (Gatlin, 1976; Lutz, 1978; Ornstein, 1978).

Right CD have been found to be better able to relate to social situations and the compressed time shown in a film than left CD individuals. Films that stimulated low levels of arousal were processed in a holistic manner by the right hemisphere (Crane, 1977). Other characteristics of film that might have a differential effect on left and right CD individuals include: the rate of presentation, the realistic quality of the pictures, the amount of audience participation required,

and the credibility of the narration (Hoban and van Ormer, 1951; Merrill, 1968).

Research has demonstrated that an individual's perception of a film is directly related to his/her cognitive style (Parkhurst, 1975). In the last ten years, significant research has been conducted on the cognitive style of CD. Educators must consider educational problems and opportunities within the framework of what is known about brain specialization. In order to form a prescriptive theory of instruction, researchers must set forth rules concerning the most effective method of communicating with individuals of varying cognitive styles (Cronbach and Snow, 1981).

Attitude Change

An individual's attitude can be changed through communication (Kiesler, Collins, and Miller, 1969). Hovland, Janis, and Kelley (1963) suggested several factors in communication that might influence an individual's attitude: (1) the communicator, (2) the content of the communication, (3) the audience's predisposition, and (4) an individual's personality. Hovland's persuasive communication model is based upon S-R learning theory. Hovland's theory can be summarized as "who says what to whom with what effect" (Federico and Landis, 1980).

Bochner and Insko (1966) identified an interaction between source credibility and communicator. Aronson, Turner, and Carlsmith (1963) found that conformity to the point of view of a persuasive communication increased and disparagement decreased as the source credibility increased. The most effective persuasive communication occurred when a highly

credible communicator advocated a position that was moderately to extremely discrepant from the position held by the communicatee (Sherif and Hovland cited in Kiesler, Collins, and Miller, 1969).

Bochner and Insko (1966) pointed out that the attentiveness of the individual to the communication may also be a prerequisite for acceptance. An individual's verbal response has been demonstrated to reflect his/her acceptance of a persuasive communication. The overt expression of the new opinion may affect the acceptance of the communication.

Several other factors may influence the effectiveness of a communication at persuading: the order of the communication, the time between communications, and the subject's awareness of the manipulative intent of the communication (Insko, 1967). Two other factors: (1) personality characteristics of the communicatee that influence their acceptance of the mediated message, and (2) the use of emotional appeals provoke fear in members of the audience. These are discussed in the sections of this paper entitled Cognitive Style and Fear-Arousing Appeals.

Fear-Arousing Appeals

Research on fear-arousing appeals was in the behaviorist tradition. Insko, Arkoff, and Insko (1965) and Hovland, Janis, and Kelley (1963) stated that fear generated through a persuasive communication served as a drive to motivate trial and error behavior. If the strength of the fear was reduced, any learning that accompanied it was reinforced. In other words, these researchers found that learning was more efficient when the learner was not overly anxious.

Hovland, Janis, and Kelley (1963) advocated a persuasive communication that aroused fear in the learner and then provided a means of alleviating the fear. Hovland, Janis, and Kelley presented a model of what happens to an individual who is influenced by an effective fear-arousing appeal:

1. The individual is exposed to neutral content cues that define the topic of communication. Threat statements that are interpreted as referring to a genuine danger to the individual accompany the content cues. The individual mentally rehearses the anticipation that "this could happen to me" and emotional tension within the subject is increased.
2. While the individual is in a high state of tension, the communication makes assertions of ways to avert the threat. As the alleviating message is mentally rehearsed, tension subsides. The reduction of emotional tension serves as a reinforcement of the alleviating message.
3. The chain of response can be represented as follows:
   a. content cues (c),
   b. emotional reaction (e), and
   c. reassuring recommendations (r).

If the communication is successful, this habit chain will persist. A fear-alleviating message presented when an individual is in a state of high anxiety will greatly enhance the effectiveness of the recommendations in the appeal, according to this theory.

A study conducted by Janis and Feshbach (1953) illustrated this point. In this study, two versions of a slide and audio tape presentation concerning dental hygiene were prepared. One set was designed to scare the viewer by showing mouths where disease and decay were rampant. The second slide set showed the diseased mouths but also suggested means of curing the diseases. The second version (or fear accompanied by a means of alleviation) was more effective in changing the viewer's attitude.

Cronbach and Snow (1981, p. 439) concluded, "It appears that after two decades of thinking about anxiety and arousal we have not yet brought the phenomena under control so that effects can be predicted and replicated." Several studies reviewed by Cronbach and Snow indicated that arousal had a disordinal effect. Spence and Spence (1966) found that when an organism was already aroused, additional stress or stimulation was likely to impair efficiency. When arousal was low, a treatment that heightened arousal was likely to be beneficial. Silberman's (cited in Cronbach and Snow, 1981) research showed that stress benefited low anxiety subjects more than high anxiety subjects. Hockey's 1979 study (cited in Cronbach and Snow, 1981) found that a high level of arousal increased selectivity of attention and selection of response.

Crane (1977) found that learning and behavior change occur at both a low and high level of arousal. The left hemisphere of the brain functioned at a high level of arousal. If the persuasive communication only mildly aroused the viewer, the message was processed in a holistic fashion by the right hemisphere of the brain.

Researchers have found that the amount of anxiety produced by fear-arousing appeals affect the individual's acceptance of a mediated message. The cognitive style of hemisphericity has been shown to have a differential effect on the acceptance of a persuasive communication (Crane, 1977; Karl, 1980). This study provided additional information on the relationship between levels of arousal and CD.

Berry's Study

In 1983, Timothy Berry conducted a study at Iowa State University to determine the effectiveness of a fear-provoking videotape at changing attitudes toward smoking. Berry prepared two 15-minute videotapes from the persuasive film, "The Feminine Mistake," a motion picture sponsored by the American Cancer Society. The film was narrated by Bonnie Franklin, who the students recognized from the TV program, "One Day at a Time." This film was selected by Berry's panel of experts as an excellent, technically well-done, persuasive film. Berry edited the films into two 15-minute videotapes so that one would elicit great anxiety in the viewer (called the Fear Alone treatment), while the second treatment aroused fear and then provided a means of coping with the anxiety (called the Fear with Alleviation treatment).

The Fear Alone treatment started with a discussion of the physical effects of smoking on women. Women who smoked were shown to have more wrinkles than nonsmokers. An experiment indicated that the toxic gas level in the blood went up and the oxygen level went down as a person smoked. The climax of the videotape was an interview with close-up pictures of a 90-pound woman who was dying of cancer. The woman

attributed her illness to smoking. As the film ended, the narrator reported that the woman died a few days after the film was completed.

The Fear with Alleviation videotape contained the same fear-evoking scenes as the Fear Alone videotape. The scenes were abbreviated so that scenes that provided the viewer a means of dealing with their fear could be included in the 15-minute time frame of the videotape.

The fear-alleviating scenes included: an interview with a doctor who said that the lungs begin to repair themselves as soon as the patient stopped smoking, information about group therapy clinics to aid smokers to quit smoking, and testimonials from former smokers.

Berry randomly placed the 117 subjects into one of three treatments: the Fear Alone, the Fear with Alleviation, and the control group (who did not view any videotape). In order to observe any change in attitude, the Smoking Attitude Scale (SAS) was administered to all three groups. After treatment, the control group was shown to have a more positive attitude toward smoking than either of the other treatments. Results showed that both treatments produced significant attitudinal changes. Tables produced by Berry (1983) are included in this section.

Berry also investigated the interaction between the cognitive style of Field Dependence/Field Independence and the persuasiveness of the videotapes. Field Dependent (FD) individuals are thought to rely on external referents when processing information. They have been shown to be sensitive to social situations and responsive to external reinforcements such as praise. Field Independent (FI) individuals are thought to view concepts in a holistic manner. They seem to be capable of

seeing many components of a message simultaneously, but are not as influenced by social cues.

The Group Embedded Figures Test was administered to each subject in order to determine their level of FD/FI. After examining the relationship between FD/FI and the treatments, Berry concluded that no significant relationship existed. (See Table 1.)

Berry also investigated the relationships between sex, parents' smoking habits, students' smoking habits, and the ability of a persuasive film to alter attitudes. Berry found that nonsmokers had a more negative attitude toward smoking regardless of treatment. (See Table 2.) In Berry's study, the smoking habits of subjects' parents had no bearing on the attitude toward smoking. (See Table 3.) Berry's study also indicated that the sex of the subject did not play a significant role in determining his/her attitude toward smoking. Berry did find that the members of the control group had a more positive attitude toward smoking than their counterpart in either treatment.

Since this study was a modified operational replication of Berry's research, the methods sections is similar. This study differed from Berry's study, because Berry's second independent variable FD/FI was changed to CD.

Summary

This chapter described Aptitude-Treatment Interaction research in terms of historical development as well as current research trends. The relationship between Media-Attitude research and ATI was explained. Research in the areas of cognitive styles, attitude change, and

Table 1. Multiple analysis of variance--attitude change results for treatments and levels of field dependence

A. Descriptive statistics

		Treatments		
		Fear Alone	Fear with Alleviation	Control
Field dependent group	$\bar{X}$	38.93[a]	41.23	47.50
	SD	7.78	11.67	6.76
	N	25	22	14
Field independent group	$\bar{X}$	39.85	40.21	48.32
	SD	10.87	8.95	13.16
	N	20	24	22

B. Multiple analysis of variance--treatment by level

Source	D.F.	SS	MS	F	P
Main effects	3	1,562.56	520.85	4.810	0.003*
Treatment	2	1,554.52	777.26	7.170	0.001*
Level	1	0.35	0.35	0.000	0.960
Interaction	2	24.50	12.25	0.133	0.890
Explained	5	1,587.06	317.41	2.930	0.020
Total	116	13,614.47			

[a]Higher scores indicate a more positive attitude towards smoking.

*Scheffe´ tests indicate that group three (smokers/control) is significantly different from groups seven, eight, and nine (nonsmokers/all treatments).

Table 2. Multiple ANOVA--attitude change for treatments and smoking habits

A. Descriptive statistics

		Treatments			
		Fear Alone	Fear with Alleviation	Control	Totals
Smokers	$\bar{X}$	56.00	52.33	67.25*	60.25
	SD	--	15.26	11.50	11.67
	N	1	3	4	8
Former smokers	$\bar{X}$	46.50	45.00	47.80	47.13
	SD	0.71	--	9.81	6.75
	N	2	1	5	8
Nonsmokers	$\bar{X}$	38.50	39.76	45.19	40.81
	SD	9.33	9.61	8.21	--
	N	32	42	27	101
Totals	$\bar{X}$	39.46	40.70	48.00	42.57
	SD	10.87	8.95	13.15	10.83
	N	35	46	36	117

B. Multiple analysis of variance

Source	D.F.	SS	MS	F	P
Main effects	4	3,933.48	983.37	11.19	0.001[a]
Treatments	2	954.65	477.33	5.43	0.006*
Smoke habits	2	2,371.28	1,185.64	13.49	0.001*
Interaction	4	188.74	47.19	0.537	0.710
Explained	8	4,122.22	515.28	5.86	0.001*
Residual	108	13,614.47	117.37		

[a]Higher scores indicate a more positive attitude towards smoking.

*Scheffe' tests indicate that group three (smokers/control) is significantly different from groups seven, eight, and nine (nonsmokers/all treatments).

Table 3. Multiple ANOVA--for treatments and parents' smoking habits

A. Descriptive statistics

		Treatments		
		Fear Alone	Fear with Alleviation	Control
Both parents smoke	$\bar{X}$	47.50[a]	39.33	42.60
	SD	7.41	6.76	12.76
	N	4	9	5
One parent smokes	$\bar{X}$	39.19	37.79	50.08
	SD	9.33	11.59	11.15
	N	16	14	13
Neither parent smokes	$\bar{X}$	37.60	43.00	48.00
	SD	9.71	10.33	10.54
	N	15	23	18
Totals	$\bar{X}$	39.46	40.70	48.00
	SD	10.87	6.95	13.15
	N	35	46	36

B. Multiple analysis of variance

Source	D.F.	SS	MS	F	P
Main effects	4	1,583.97	395.99	3.79	0.006*
Treatment	2	1,546.81	773.41	7.40	0.001*
Parents' smoking habits	2	21.76	10.88	0.10	0.900
Interactions	4	749.14	187.29	1.79	0.140
Explained	8	2,333.11	291.64	2.79	0.008*
Residual	108	11,281.36	104.46		
Total	116	13,614.47	117.37		

[a]Higher scores indicate a more positive attitude towards smoking.

*Scheffe' tests indicate that group three (smokers/control) is significantly different from groups seven, eight, and nine (nonsmokers/all treatments).

fear-arousing appeals was cited. The cognitive style of hemisphericity was described, since it will be the independent variable in this study. Berry's 1983 study was reviewed, since this study is a modified operational replication of that 1983 study.

CHAPTER III. PROCEDURES

Goal of the Chapter

A study that is a replication of an earlier study utilizes the methods section of the first study. Consistent findings help to develop a body of knowledge that can be more confidently generalized to a larger population. This study is a modified operational replication of a research project conducted by Berry in 1983.

The purpose of this chapter was to explain the procedures used in this study. A description of the experimental design, subjects, measures of the dependent variable, procedures, and limitation is provided. This information should enable other researchers to assess the strengths and weaknesses of this study. This chapter should also provide a basis for experimentation if other researchers would like to replicate this study.

Experimental Design

This study utilized the Randomized, Control Group, Post-Test Only Design. This is a true experimental design as described by Campbell and Stanley (1963). In this design, the subjects are randomly assigned to a treatment group, the treatment is provided, and an observation is made. This design can be symbolically illustrated as:

$$\begin{array}{ccc} R & X & O \\ \hline R & & O \end{array}$$

where R represents the randomized group, X the treatment, and O the observation. The average (mean) of each group's post-test score (observation) are compared. The appropriate test for significance is then applied. For this study, the .05 level was designated as the point where

the differences observed were determined to be a result of the treatment rather than mere chance.

Campbell and Stanley stated that the primary threat to internal validity of this type of study was mortality. In this case, if a subject was not present for any portion of the experience, his/her response to other sections of the study was nullified. In other words, that student's data were not used. No threats to external validity have been identified.

The following steps were taken in order to conduct this experiment:

1. Selection of Berry's videotapes based on the film, "The Feminine Mistake," as treatments.
2. Selection of subject population.
3. Administration of the HIPS (Human Information Processing Survey) that served as the measure of the independent variable, hemisphericity.
4. Random assignment of subjects to treatment groups.
5. Administration of treatments.
6. Administration of the SAS (Smoking Attitude Scale) that consisted of the measure of the dependent variable (attitude toward smoking), the measure of treatment quality, and descriptive questions about the respondents.
7. Testing of hypothesis.

Subjects

The subjects were 178 students enrolled in Personal Health Management classes at Redford High School in Detroit, Michigan. Personal Health Management was offered by the Physical Education Department and was

required for high school graduation in the state of Michigan. The students in this course ranged in age from 14 to 18. One hundred seventy-seven of the subjects were Black; one subject was white. The assignment of subjects to treatments was as follows:

Brain domain	Treatments		
	Fear Alone	Fear/Alleviation	Control
Left	15	24	10
Right	11	10	14
Integrated	20	12	14

N=129

The remaining 49 subjects were not utilized in the study because of the following factors:

18 were absent the day of the treatment

27 were absent the day the HIPS was administered

1 student was 13 years old

2 students' HIPS scores reflected no dominant style

1 student filled out the forms incorrectly

N=49.

There were many possible explanations for the high mortality rate found in this study. When the students were randomly assigned to a treatment in another room, some of the students may have continued walking past the treatment room. Some students in the fourth hour group may not have come to class after they heard that there was a test during the period. Due to administrative constraints, it was impossible to test additional students or to provide make-up tests to students who were

absent. Consequently, the number of students who completed the study was much smaller than the number anticipated by the researcher.

Measure of the Dependent Variable

The Smoking Attitude Scale (SAS) developed by Baer (1966) was the standardized test of the dependent variable utilized in this study. The reliability of the SAS was reported as .80, .75, and .80 for the three treatment groups used in the 1966 study. Using the Cronbach Alpha test of internal consistency, Berry determined the reliability of the SAS as .84 (1983).

Measure of the Independent Variable

The independent variables in this study were the method of presentation and the learner characteristic of hemisphericity. Berry edited two 15-minute videotapes using scenes from the film, "The Feminine Mistake." The film, produced by David Bell, was sponsored by the American Cancer Society. The film was narrated by Bonnie Franklin. The purpose of the film was to alert women to the increased danger to their health caused by smoking.

One videotape produced by Berry was designated the Fear Alone videotape. This tape contained fear-evoking scenes about smoking and the detrimental effects of smoking on women. A summary of the content by Berry is as follows:

> The fear alone treatment started with cosmetic reports on how women who smoke have more skin wrinkles, then presented a report on how the oxygen level goes down and the toxic gas level goes up in the blood of women who smoke. Next, a report was shown on how the respiratory systems of unborn

> babies are affected when pregnant mothers smoke. The fear alone treatment videotape ended with an interview with a woman who had lung cancer caused by smoking, and who was obviously, at 90 pounds, in an emaciated state. The interview faded out with the narrator commenting that a few days after the interview, the cancer patient had died (Berry, 1983, p. 28).

The second videotape was referred to as the Fear with Alleviation tape. This tape had the same scenes as the Fear Alone tape. The time of the fear-producing scenes that were viewed was shortened so that additional scenes that provided a means of dealing with the fear could be included in the 15-minute videotape. Scenes designed to alleviate the fear included: hints on how an individual could cut down and quit smoking, pictures from group therapy smoking clinics, testimonies from former smokers and nonsmokers on the improved quality of their life, and a doctor's report that the human lung begins to repair itself as soon as an individual quits smoking.

The learner characteristics that were analyzed as independent variables in this study included the subject's level of hemisphericity, smoking habits, and parents' smoking habits. The information concerning smoking habits and parents' smoking habits was identified by each subject.

The level of hemisphericity was obtained by analyzing the HIPS. This test was designed by Torrance with Taggart and Taggart (1984). The reliability of the test was determined by the authors as .84.

The test consisted of 40 statements, each with three alternatives. The student was to select the statement that described him/herself most accurately. The student's score was tallied and assigned a standard score using a Conversion Table (see Appendix C) developed by Taggart and

Torrance (1984). Those scores that indicated a Mixed Strategy were given a secondary analysis. The preferred strategy was ascertained by the highest standard score. The distribution of subjects into each category was as follows:

Left dominant	49
Right dominant	35
Integrated	46

Procedure

The students who participated in this study were enrolled in Personal Health Management (PHM) classes at Redford High School in Detroit, Michigan. The PHM classes that participated in this study met during the third and fourth periods of the day with different instructors. The class was required of all students for high school graduation.

The first meeting with the students took place in the Spring of 1985. Prior to this time, the subject was given a consent form that acknowledged participating in the experiment. This form gave only a basic indication as to the nature of the study so as not to influence subjects. (See Appendix A.) The HIPS test was administered. The students were allowed 45 minutes to answer the 40 questions as specified in the standardized instructions to the test.

At the second meeting, the students were randomly assigned to one of the three treatments. Treatment 1 subjects viewed the Fear Alone videotape and then were given 10 minutes to complete the SAS and questions regarding smoking habits and the technical quality of the presentation. Treatment 2 subjects viewed the Fear with Alleviation videotape and then

were given 10 minutes to fill out a questionnaire identical to the one presented in Treatment 1 (and found in Appendix B). Treatment 3 served as the control group. These subjects were given 10 minutes to fill out the SAS questionnaire and then were dismissed. The subjects in the control group did not view any videotape.

The data were analyzed using t-tests, analysis of variance tests, and multiple analysis of variance tests. Descriptive statistics were obtained and examined in order to test hypotheses.

Limitations

Efforts have been made to reduce the influence of intervening variables that might affect this study. Several problems that could not be alleviated were based on the fact that the treatments were not given to all subjects at once because several sections of the course were used in this study. The students in later sections may have been preconditioned by students who had previously received the treatment. Absenteeism was also a problem. In order to ensure the validity of this research, if a subject was absent from any part of the experiment, his/her participation was nullified.

Summary

This is a modified operational replication of Berry's study. The major differences between this and Berry's study were the subjects, and the learning characteristic of the subjects used as an independent variable. In this study, 178 students enrolled in Personal Health Management at Redford High School, Detroit, Michigan were the subjects.

Also, hemisphericity was the independent variable rather than field dependence.

The procedures followed were similar to those used in the Berry study. The 178 students were given the HIPS to determine their level of hemispheric dominance. Of these 178, 129 completed the entire study. The students were assigned to one of three treatment groups: Control (no treatment), Fear Alone, and Fear with Alleviation. The experimental treatments were two videotapes designed to arouse fear about smoking. Immediately after viewing the tapes, the students filled out the SAS. The SAS was the measure of the dependent variable, the subject's attitude toward smoking. The SAS scores were used to test hypotheses.

CHAPTER IV. RESULTS OF STATISTICAL ANALYSES

Goal of the Chapter

The 129 subjects in this study were identified by the Human Information Processing Survey (HIPS) as having a tendency to be either right cerebral dominant, left cerebral dominant, or as having an integrated cerebral style.

Each subject participated in one of three treatments:

1. A 15-minute videotape that contained scenes designed to evoke fear in the viewers.
2. A 15-minute videotape that contained scenes designed to evoke fear in the viewers and then provided a means to alleviate that fear.
3. The control group that viewed no videotape.

The Smoking Attitude Scale (SAS) was administered after the treatment. The score derived from this post-test was utilized as the test of the dependent variable, attitude toward smoking.

This chapter contains the results of the statistical tests that were used to analyze hypotheses. The tests utilized in this study were the multiple analysis of variance (MANOVA) and the Duncan Procedure. A t-test was used to evaluate the quality of the treatments.

Tests of Main Hypotheses

Hypotheses 1: There will be no statistically significant difference in attitude toward smoking between the treatment groups.

Hypothesis 1 was examined by using a multiple analysis of variance. The students in the Fear Alone treatment had the least favorable attitude toward smoking, but this difference was not statistically significant (see Table 4).

Hypothesis 2: There will be no statistically significant difference in attitude toward smoking among groups of students identified as being left brain dominant, right brain dominant, or with integrated brain dominance.

Hypothesis 2 was examined by using multiple analysis of variance. The individuals characterized as being right CD had a less favorable view of smoking than either the individuals with a left or integrated CD style. This finding was not statistically significant (see Table 4).

Hypothesis 3: There will not be a statistically significant interaction among brain dominance and treatments when attitude toward smoking is compared.

Hypothesis 3 was examined by using multiple analysis of variance. The MANOVA reported that the level of the interaction was not statistically significant (see Table 4).

Hypothesis 4: There will be no statistically significant difference in attitude toward smoking among students who indicate both parents smoke, one parent smokes, or neither parent smokes.

Hypothesis 4 was analyzed by using multiple analysis of variance. The students who reported two parents smoked had a more positive attitude toward smoking than students who had one parent that smoked. The students who reported that neither parent smoked had the least favorable attitude

Table 4. Attitude toward smoking for treatments and brain dominance groupings

A. Descriptive statistics

Brain dominance		Treatments: Fear with Alleviation	Fear	Control	Totals
Right brain	$\bar{X}$	58.50[a]	58.45	58.21	58.37
	SD	11.482	11.370	9.040	10.206
	N	10	11	14	35
Integrated brain	$\bar{X}$	58.08	60.11	59.21	59.29
	SD	4.944	10.397	8.451	10.713
	N	12	19	14	45
Left brain	$\bar{X}$	60.13	59.76	60.13	60.00
	SD	10.498	10.267	8.854	9.883
	N	46	45	38	129

B. Multiple analysis of variance

	D.F.	Sum of squares	Mean square	F
Main effects	4	292.480	73.120	0.725
Treatment	2	15.242	7.621	0.076
Brain dominance	2	288.350	144.175	1.429
Interactions				
Treatment by brain dominance	4	103.706	25.927	0.257
Explained	8	396.186	49.523	
Residual	120	12,105.814	100.882	
Total	128	12,502.000	97.672	

[a]Higher scores indicate a more positive attitude toward smoking.

toward smoking. This difference was not statistically significant (see Table 5).

Hypothesis 5: There will not be a statistically significant interaction among groups of students with parents with different smoking patterns and treatments when attitude toward smoking is compared.

Hypothesis 5 was examined using multiple analysis of variance. The level of the two-way interaction between parents' smoking habits and treatment was not significant at the .05 level. There was an indication that the control group had a more positive attitude toward smoking than the other treatments (see Table 5).

Hypothesis 6: There will be no statistically significant difference in attitude toward smoking among students who are current smokers, who are former smokers, and who are nonsmokers.

Hypothesis 6 was also evaluated by using multiple analysis of variance. The MANOVA revealed that students' smoking habits were related to attitude toward smoking, and this relationship was statistically significant at the .05 level. The Duncan procedure was used to examine this finding. Current smokers had the most positive attitude toward smoking and former smokers had the most negative attitude toward smoking, as indicated by the SAS (see Table 6).

Hypothesis 7: There will not be a statistically significant interaction among groups of students with different smoking habits and treatments when attitude toward smoking is compared.

Table 5. Attitude toward smoking for treatments and groups of students with parents with different smoking patterns

A. Descriptive statistics

Parents' smoking pattern		Treatments: Fear with Alleviation	Fear	Control	Totals
Both parents smoke	$\bar{X}$	66.29[a]	59.08	56.75	60.26
	SD	11.456	13.201	8.172	11.670
	N	7	12	8	27
One parent smokes	$\bar{X}$	58.19	61.26	60.65	59.98
	SD	11.048	8.659	10.022	9.921
	N	21	19	20	60
Neither parent smokes	$\bar{X}$	57.47	57.42	61.80	58.62
	SD	7.279	10.570	6.663	8.348
	N	15	12	10	37
Totals	$\bar{X}$	59.26	59.58	60.13	59.64
	SD	10.222	10.475	8.854	9.841
	N	43	43	38	124

B. Multiple analysis of variance

	D.F.	Sum of squares	Mean square	F
Main effects	4	67.719	16.930	0.173
Treatment	2	11.921	5.960	0.061
Parents' smoking patterns	2	52.043	26.022	0.266
Two-way interactions				
Treatment by parents' smoking patterns	4	603.383	150.846	1.543
Explained	8	671.102	83.888	0.858
Residual	115	11,241.568	97.753	
Total	123	11,912.669	96.851	

[a]Higher scores indicate a more positive attitude toward smoking.

Table 6. Attitude toward smoking for treatment groups and groups of students with different smoking habits

A. Descriptive statistics

Students' smoking habits		Treatments: Fear with Alleviation	Fear	Control	Totals
Current smoker	$\bar{X}$	71.11[a]	56.67	61.20	65.65
	SD	7.769	14.012	7.463	10.332
	N	9	3	5	17
Nonsmoker	$\bar{X}$	58.41	59.45	59.93	59.25
	SD	8.818	10.342	9.296	9.476
	N	34	38	30	102
Former smoker	$\bar{X}$	46.67	74.00	60.33	56.43
	SD	9.504	--	9.074	12.817
	N	3	1	3	7
Totals	$\bar{X}$	60.13	59.60	60.13	59.95
	SD	10.498	10.574	8.854	9.981
	N	46	42	38	126

B. Multiple analysis of variance

	D.F.	Sum of squares	Mean square	F
Main effects	4	693.579	173.395	1.937
Treatment	2	4.334	2.167	0.024
Students' smoking habits	2	685.543	342.771	3.829*
Two-way interactions Treatment by students' smoking habits	2	1,284.950	321.238	3.589**
Explained	8	1,978.529	247.316	2.763
Residual	117	10,473.186	89.514	
Total	125	12,451.714	99.614	

[a]Higher scores indicate a more positive attitude toward smoking.
*Results are significant at the .05 level.
**Results are significant at the .01 level.

Hypothesis 7 was evaluated by using a multiple analysis of variance. The F of 3.589 was found to be statistically significant at the .01 level (see Table 6).

Test of Treatment Quality

A check of the technical quality of the videotapes was made to ensure that there was no quality variation resulting from the editing of the videotapes. The students were asked to evaluate the quality of the videotape by answering a question added to the SAS. The answers to this question were compared. The average of all students' ratings suggests that the students thought the quality of the videotapes was very good. The ratings of the technical quality of the two videotapes were not statistically different (see Table 7).

Table 7. Comparison of the quality of the treatments

Treatment	Average rating
Fear with Alleviation	$\bar{X}$ = 4.16 SD = 1.10 N = 44
Fear Alone	$\bar{X}$ = 4.13 SD = 1.67 N = 38

Summary

In summary, there did not seem to be any difference in attitudes toward smoking that were related to treatment or cerebral dominance. There was a relationship found between attitude toward smoking and the

smoking habits of students. It was felt that these results were confounded. A puzzling aspect of this research is why the treatments did not have a statistically significant impact on the subjects utilized in this study. It had been pointed out that the same videotape had had a statistically significant effect on the attitude toward smoking on the subjects in the Berry study (1983). A second puzzling aspect of this research was that the cognitive style of hemisphericity did not interact with the treatments. Two reasons for the confounded results may have been the high mortality rate of this study and the small number of subjects utilized in the study. Implications of these results will be reported in Chapter V.

CHAPTER V. CONCLUSIONS

Goal of the Chapter

Since 1915, research has indicated that media can be used to change the attitudes of the message receiver. Educators have tried to identify specific aspects of media that have a consistent effect on certain types of learners in order to develop prescriptive teaching techniques that will change attitudes. The problem of this study was to investigate whether various persuasive treatments could be used to change attitudes. In this study, an attempt was made to examine the effectiveness of fear-provoking messages on the attitude toward smoking of students with different ways of processing information (hemisphericity).

This study was a modified operational replication of a study conducted by Berry (1983). The cognitive style of field dependence/field independence was used as an independent variable in Berry's study. The two studies were consistent in the finding that the acceptance of a persuasive message delivered by a fear-evoking videotape was not related to the viewer's cognitive style.

Other factors considered important enough to be examined by this and Berry's study were the smoking behavior of the subject and the smoking pattern of the parents. In both studies, there was a significant relationship between the students' smoking behavior and their attitude toward smoking. The smoking pattern of parents appeared to influence the student's attitude toward smoking. However, this finding was not found to be statistically significant in either study.

There was no measure of smoking behavior change, or post-treatment follow-up check on the persistence of attitude change in either this or Berry's study.

Summary of Results

There were seven hypotheses that were tested during this study. They were:

Hypothesis 1: There will be no statistically significant difference in attitude toward smoking between the treatment groups.

The analysis run using the Smoking Attitude Scale (SAS) as the dependent variable did not yield any significant results. Hypothesis 1 was accepted. There was no statistically significant difference between either of the videotape treatments or the control group.

Table 4 gives the results obtained from the SAS that was administered immediately after the treatments. In this study, there was no difference in attitude between the control group and the group that viewed the fear with alleviation videotapes. These two groups were slightly more positive than the fear alone treatment group.

This finding is not consistent with Berry's research. Table 1 indicated that the persuasive treatment significantly influenced the subjects' attitude against smoking.

Hypothesis 2: There will be no statistically significant difference in attitude toward smoking among groups of students identified as being left brain dominant, right brain dominant, or with integrated brain dominance.

An examination of Table 4, a summary of a 3x3 multiple analysis of variance, demonstrated no statistically significant results. Hypothesis 2 was accepted.

The individuals classified as having right cerebral dominance had the least favorable attitude toward smoking. This result may support the observation (O'Connor, 1983) that right CD individuals are not motivated by adults.

Table 1 indicated that the cognitive style of field dependence did not result in an interaction with the treatment in Berry's study (1983). The cognitive styles of hemisphericity and field dependence have not been shown to be statistically relevant variables in determining the effectiveness of fear-provoking videotapes in changing attitudes.

Hypothesis 3: There will not be a statistically significant interaction among brain dominance and treatments when attitude toward smoking is compared.

An examination of Table 4, a summary of a 3x3 multiple analysis of variance, indicated no statistically significant results. Hypothesis 3 was accepted.

This finding is consistent with many criticisms of ATI research. Clark and Angert (1984) pointed out the difficulty in isolating variables when conducting ATI studies. Many unobserved variables inherent in the treatments, the subjects, or the testing situation may have had a more significant effect on the subjects' attitude toward smoking than the variables examined in this study. For example, in this study, the credibility of the communicator, Bonnie Franklin, may have reduced the

amount of attention the subjects paid to the treatments. The reading level of the student may have distorted the classification of subjects who responded to the HIPS survey. The anxiety level of students who were randomly assigned to a different teacher may have altered their acceptance of the message.

Table 1 also showed no significant relationship between cognitive style and treatment in Berry's study (1983). Cronbach and Snow (1981) pointed out that well-substantiated findings regarding ATI were rare. Cronbach and Snow suggested using ATI findings as guides for future research.

Hypothesis 4: There will be no statistically significant difference in attitude toward smoking among students who indicate both parents smoke, one parent smokes, or neither parent smokes.

An examination of Table 5, a summary of a 3x3 multiple analysis of variance, indicated that parents' smoking habits had an influence on the student's smoking attitude. The level of the interaction was not statistically significant, so Hypothesis 4 was accepted.

Berry also noted that parents' smoking behavior exerted a nonstatistically significant impact on students (see Table 2). More in-depth questioning of parents' smoking patterns may have yielded statistically significant interaction. If the student no longer lives with the smoking parent, the impact of his/her smoking behavior may change.

Hypothesis 5: There will not be a statistically significant interaction among groups of students with parents with different smoking patterns and treatments when attitude toward smoking is compared.

A multiple analysis of variance was used to determine the significance of the interaction between parents' smoking behavior and the student's attitude toward smoking. No statistical significance was identified, and Hypothesis 5 was accepted.

Hypothesis 6: There will be no statistically significant difference in attitude toward smoking among students who are current smokers, who are former smokers, and who are nonsmokers.

An examination of Table 6, the 3x3 multiple analysis of variance, revealed that there was a statistically significant interaction at the .05 level. Hypothesis 6 was rejected.

Berry's study also indicated that there was a statistically significant relationship between a person's smoking habits and their attitude toward smoking. This finding confirmed the logical assumption that if one smokes, he/she has a positive attitude toward smoking (see Table 3). There were not enough former smokers in either study to allow one to generalize about the attitudes of former smokers toward smoking, however.

Hypothesis 7: There will not be a statistically significant interaction among groups of students with different smoking habits and treatments when attitude toward smoking is compared.

Hypothesis 7 was found to be statistically significant at the .01 level (see Table 6). Hypothesis 7 was rejected.

This interaction was confirmed by Berry's findings (see Table 3). The treatments were shown to be somewhat related to students' attitude toward smoking. Because of the small numbers of subjects in each cell, researchers are cautioned against generalizing these results.

Recommendations for Further Study

This study should provide ideas and insights to other researchers who wish to conduct Phase IV, Media-Attitude Interaction studies. Due to the difficulties inherent in conducting ATI research, it is difficult to arrive at statistically significant conclusions that can be generalized to a large population. Rather than providing a prescriptive technique for influencing the attitudes of high school students, this study provides a basis for further investigation.

In this study, the treatments were two 15-minute videotapes. One of the tapes was designed to produce fear in the viewer. The second tape was edited so that the fear produced could be alleviated within the 15-minute duration of the film. The viewers of the treatment seemed to change their attitudes toward smoking only slightly as a result of the treatments. The change was not significant and seemed less convincing than the results Berry found using the same videotapes.

After the experiment was completed, the subjects informally discussed their reactions to the videotapes. Statements made by the students implied that they found the videotapes very convincing and that they would never smoke. However, the results of the SAS did not support these statements.

ATI studies have been criticized for not examining all the variables that may influence a subject's attitude. If the subjects had been taken from an English class rather than a Personal Health Management class, the results may have differed. A number of other unanswered questions are also produced by these results. Did the selection of subjects affect the results of this study? Why did not the treatments have a differential effect on individuals with varying cognitive styles? Was the implication that individuals who exhibited right CD viewed smoking as less positive than individuals with left CD or an integrated style found in any other study? Did attitude change result in a change of behavior? Were there other factors in the presentation or situation that could account for the trends noted? Unfortunately, this research cannot answer these questions.

ATI research is in its infancy. Many replications need to be conducted to build a reliable foundation to explain the phenomenon researchers observe. Only after these and other questions are substantiated can researchers hope to develop a taxonomy of media attributes that can be used to select effective methods of solving specific problems.

Summary

The purpose of this study was to examine a possible relationship between attitude change, the learner characteristic of cerebral dominance, and a fear-provoking message. Subjects were identified as being right cerebral dominant, left cerebral dominant, or to have an integrated cerebral style by scores obtained on the Human Information Processing Survey (HIPS). They were then given either a fear-provoking treatment, a

fear with alleviation treatment, or assigned to the control group that received no treatment. The experimental treatments were designed to change the viewer's attitude toward smoking. The subjects took a post-test called the Smoking Attitude Scale (SAS). The SAS served as the measure of the dependent variable.

Data from the SAS were analyzed by multiple analysis of variance (MANOVA), and the Duncan Procedure was run to try to explain significant interactions. The only results that were statistically significant indicated that individuals who smoked had a more positive attitude toward smoking than individuals who did not smoke.

This study was a modified operational replication of a study conducted by Berry. The results of this study and the significant finding in Berry's study are not in accord. The cognitive style (hemisphericity in this study and field dependence in Berry's research) of the subject did not demonstrate a statistically significant interaction with the attitude toward smoking. No conclusion can be drawn regarding the effectiveness of a fear-provoking videotape as compared to a fear with alleviation videotape in changing attitudes toward smoking in high school students.

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ACKNOWLEDGMENTS

Firstly, I would like to thank George Ginger, Head of the Health and Physical Education Department, Redford High School, Detroit, Michigan. Mr. Ginger assisted in obtaining the cooperation of the school administration, teachers, and students so that this study could be conducted.

Secondly, I would like to thank Mrs. Barbara Taggart. She was never further away than my telephone. Mrs. Taggart was always encouraging as she explained questions I had concerning the HIPS Survey and hemisphericity. She was very generous in supplying additional references to aid me in my study.

Finally, I would like to thank my Program of Study committee, Dr. Ross Klein, Dr. Michael Simonson, and Dr. Roger Volker. Their suggestions have been invaluable in helping me complete this thesis. Dr. Simonson, Chairman of my Program of Study committee, was extremely cooperative in coordinating this long-distance research. I would like to thank Dr. Simonson for his help with this research.

APPENDIX A.
INFORMATION ON THE USE OF HUMAN SUBJECTS

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Permission to Participate	68

INFORMATION ON THE USE OF HUMAN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY
(Please follow the accompanying instructions for completing this form.

66

1. Title of project (please type): THE RELATIONSHIP BETWEEN CEREBRAL DOMINANCE AND ATTITUDE CHANGE AS PRODUCED BY A FEAR EVOKING FILM ON SMOKING

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 pro[illegible] been approved will be submitted to the committee for review.

HOPE S. WEISSMAN — 4-1-85 — Signature of Principal Investigator
Typed Named of Principal Investigator — Date

INSTRUCTIONAL RESOURCES CENTER — 294-6840
Campus Address — Campus Telephone

3. Signatures of others (if any) — Date — Relationship to Principal Investigator

4-1-85 Dept. Head – Health & P.E.

4/5 Major Prof.

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 4 Day 18 Year 85

Anticipated date for last contact with subjects: Month 4 Day 23 Year 85

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 ____

8. Signature of Head or Chairperson — Date — Department or Administrative Unit

4/8/85 Professional Studies

9. Decision of the University Committee on the Use of Human Subjects in Research:

☐ Project Approved ☐ Project not approved ☐ No action required

George G. Karas — Date — Signature of Committee Chairperson
Name of Committee Chairperson

Description of the Project

The purpose of this study is to determine whether a film that arouses fear in a viewer and then provides a means of alleviating the fear is more effective than a film which just generates fear in the viewer. It has been hypothesized that the ability of a film to persuade an individual is related to that person's learning style. This is a modified replication of a study conducted at ISU in 1983 by Timothy Berry. The learning style of cerebral dominance will be examined rather than field dependence.

Films are frequently showed in high school to influence students' attitudes to a variety of topics such as sex, drugs, and smoking. Personal Health Management (PHM) classes in Detroit Public Schools often utilize these films. The 175 subjects of this study are currently enrolled in a PHM course at Redford High School in Detroit, Michigan. The students, male and female, range in age from 14 to 18. PHM is a required course for high school graduation.

There are no physical or psychological risks or discomforts associated with this research. Each subject will be given a modified consent form.

Dear Redford Parents,

I am currently working on my master's degree at Iowa State University and have only my thesis to complete. I have received permission from the school administration to conduct my study in the Personal Health Management classes.

The students will be tested to determine if they are right or left brain dominant, a particular learning style. They will answer a short test called the HIPS and then most will view a videotape about the effects of smoking. Less than an hour of time is needed to conduct the study. The students will in no way be subjected to any physical or mental stress.

All data on individual students will be kept strictly confidential with only group data reported. If for any reason you would not like your son/daughter to participate, please contact me with a note.

Thank you for your anticipated cooperation.

Yours truly,

Hope S. Weissman

APPENDIX B.
SMOKING ATTITUDE SURVEY

SECTION ONE: (answer on this sheet)

PLEASE CHECK THE FOLLOWING INFORMATION ABOUT YOURSELF:

YOUR NAME _____

TEACHER'S NAME _____

GENDER: MALE ____ FEMALE ____

AGE _____

SMOKING HABITS (circle one)
a. Current smoker
b. Former smoker
c. Non-smoker

PARENTS SMOKING HABITS (circle one)
a. Both Parents Smoked
b. One Parent Smoked
c. Neither Parent Smoked

SECTION TWO:(answer on score sheet)	DISAGREE				AGREE
1. SMOKING GIVES ONE POISE	1	2	3	4	5
2. SMOKING IS A DISGUSTING HABIT	1	2	3	4	5
3. SMOKING SOOTHES ONES NERVES	1	2	3	4	5
4. SMOKING GIVES LITTLE ENJOYMENT	1	2	3	4	5
5. PEOPLE SMOKE BECAUSE OF OTHERS	1	2	3	4	5
6. SMOKING ALLOWS A SENSE OF SECURITY	1	2	3	4	5
7. SMOKING IS ONE OF THE MOST PLEASURE-ABLE EXPERIENCES IN LIFE	1	2	3	4	5
8. SMOKING IS A FILTHY HABIT	1	2	3	4	5
9. SMOKING PROVIDES A SENSE OF WELL BEING	1	2	3	4	5
10. SMOKING IS ONE OF LIFE'S BASIC PLEASURES	1	2	3	4	5
11. SMOKING IS OCCASIONALLY PLEASURABLE	1	2	3	4	5
12. SMOKING HELPS A PERSON RELAX	1	2	3	4	5
13. NO ONE SHOULD BE ALLOWED TO SMOKE	1	2	3	4	5
14. SMOKING IS AN AESTHETIC EXPERIENCE	1	2	3	4	5
15. SMOKING DULLS YOUR MIND	1	2	3	4	5
16. SMOKING IS A HARMLESS ACTIVITY	1	2	3	4	5
17. ONE WHO SMOKE IS INSECURE	1	2	3	4	5
18. SMOKING IS A RELATIVELY HARMLESS ACTIVITY	1	2	3	4	5
19. SMOKING IS ONE OF THE GREATEST EVILS IN THE WORLD	1	2	3	4	5
20. SMOKING IS A PLEASANT MEANS OF RELAXATION	1	2	3	4	5
21. SMOKING MAKES ONE NERVOUS	1	2	3	4	5
22. SMOKING IS A WASTE OF TIME	1	2	3	4	5

SECTION THREE:(answer on score sheet)

WHAT DID YOU THINK OF THE TECHNICAL QUALITY OF THIS PRESENTATION?	1	2	3	4	5

APPENDIX C.
HUMAN INFORMATION PROCESSING SURVEY

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Conversion Table	80

human information processing™ survey

RESEARCH EDITION

Response Sheet

Name _____ Date _____

For each item of the Survey, select the one alternative that best describes you. Indicate your choice by *circling* the letter "A," "B," or "C" next to the number of that item in the list below.

When you have completed all forty items, follow the instructions of your Survey administrator for completion of this sheet.

1.	A	B	C	_____	21.	A	B	C	_____
2.	A	B	C	_____	22.	A	B	C	_____
3.	A	B	C	_____	23.	A	B	C	_____
4.	A	B	C	_____	24.	A	B	C	_____
5.	A	B	C	_____	25.	A	B	C	_____
6.	A	B	C	_____	26.	A	B	C	_____
7.	A	B	C	_____	27.	A	B	C	_____
8.	A	B	C	_____	28.	A	B	C	_____
9.	A	B	C	_____	29.	A	B	C	_____
10.	A	B	C	_____	30.	A	B	C	_____
11.	A	B	C	_____	31.	A	B	C	_____
12.	A	B	C	_____	32.	A	B	C	_____
13.	A	B	C	_____	33.	A	B	C	_____
14.	A	B	C	_____	34.	A	B	C	_____
15.	A	B	C	_____	35.	A	B	C	_____
16.	A	B	C	_____	36.	A	B	C	_____
17.	A	B	C	_____	37.	A	B	C	_____
18.	A	B	C	_____	38.	A	B	C	_____
19.	A	B	C	_____	39.	A	B	C	_____
20.	A	B	C	_____	40.	A	B	C	_____

Your Raw Scores → ☐ + ☐ + ☐ = 40

Ls Is Rs

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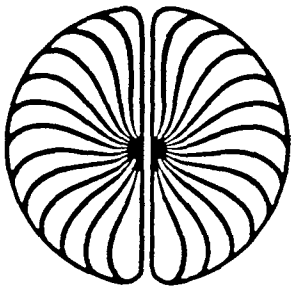
RESEARCH EDITION



human information processing™ survey

Developed By
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Published by:
SCHOLASTIC TESTING SERVICE, INC.
Bensenville, Illinois 60106

Instructions for Completing the Human Information Processing Survey Research Edition

For each item, select the one alternative that you feel is most descriptive of you. Even in cases where you think none of the three choices is really descriptive, select the one that is best for you. You need to respond to all forty items for your feedback to be compared to other people who have completed this Survey.

For example, consider these three choices:

A. prefer to use logical analysis in making a decision	A
B. no preference for logical or intuitive decision making	B
C. prefer to use my intuition in arriving at a decision	C

Choose the letter of the choice that is most descriptive of you. If choice "B" is more like you than either "A" or "C," mark "B" in the manner described by your Survey administrator. Follow the instructions of the Survey administrator in marking your choice for each of the forty items on this Survey. If for any reason you change your mind, erase your original choice and then indicate your new preference.

Begin with the first set and make your choice for each successive set of three. You have as much time as you need to complete this Survey, but generally the best response is the first strong impression you have after carefully reading the three alternatives. Detailed analysis of the response choices will probably not provide a more accurate description of your preferences.

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In the right-hand column, select the one choice which is most descriptive of you. Do this for *each* item on the Survey. Follow the instructions of the Survey administrator for marking your choices.

1.	A	usually learn or remember only those things specifically studied	A
	B	good memory for details and facts in the environment not specifically studied	B
	C	have noticed no difference in my abilities in these areas	C
2.	A	like to read fantasy stories	A
	B	like to read realistic stories	B
	C	no preference between fantasy and realistic stories	C
3.	A	equally as much fun to dream as to plan realistically	A
	B	more fun to dream	B
	C	more fun to plan realistically	C
4.	A	listen to music or radio while reading or studying	A
	B	must have total quiet in order to read or study	B
	C	listen to music or radio only if reading for enjoyment, not if studying	C
5.	A	would like to write fiction books	A
	B	would like to write non-fiction books	B
	C	no preference between writing fiction and non-fiction	C
6.	A	if seeking mental health counseling, would prefer group counseling and sharing feelings with others	A
	B	if seeking mental health counseling, would prefer the confidentiality of individual counseling	B
	C	have no preference for group over individual counseling	C
7.	A	enjoy drawing my own images and ideas	A
	B	enjoy copying and filling in details	B
	C	enjoy drawing my own images and copying and filling in equally	C
8.	A	believe I could be easily hypnotized	A
	B	could probably be hypnotized but it would be difficult	B
	C	do not believe I could be hypnotized	C
9.	A	no preference between mystery stories and action stories	A
	B	prefer action stories	B
	C	prefer mystery stories	C
10.	A	no preference between algebra and geometry	A
	B	prefer algebra	B
	C	prefer geometry	C

Go on to the next page.

11.	A	like to organize things sequentially	A
	B	like to organize things to show relationships	B
	C	no preference for sequential over relational organization	C
12.	A	good at remembering verbal materials	A
	B	good at tonal (musical sound) memory	B
	C	equally good at verbal and tonal memory	C
13.	A	pace personal activity to time limits with ease	A
	B	use time to organize self and personal activities	B
	C	have difficulty in pacing personal activities to time limits	C
14.	A	have frequent mood changes	A
	B	have few mood changes	B
	C	stable, almost no mood changes	C
15.	A	skilled in communicating with animals	A
	B	moderately good in communicating with animals	B
	C	cannot communicate very well with animals	C
16.	A	no preference for cats over dogs or vice versa	A
	B	preference for cats	B
	C	preference for dogs	C
17.	A	enjoy clowning around	A
	B	can clown or be serious depending upon the occasion	B
	C	do not enjoy clowning around	C
18.	A	frequently somewhat absent-minded	A
	B	occasionally absent-minded	B
	C	almost never absent-minded	C
19.	A	when viewing advertisements, am most often influenced by attractive signs, pleasant scenes, and sensual overtones	A
	B	when viewing advertisements, am most often influenced by the information comparing several products and demonstrating which works the best	B
	C	primarily influenced by the advertising medium only when accompanied by information on the quality of the product	C
20.	A	no preference for demonstration over verbal instructions	A
	B	prefer demonstration	B
	C	prefer verbal instructions	C

Go on to the next page.

21.	A	equally valuable to discuss stories and illustrate them	A
	B	more valuable to discuss stories read	B
	C	more valuable to illustrate stories read	C
22.	A	equally valuable to tell stories and to act out stories	A
	B	more valuable to tell stories	B
	C	more valuable to act out stories	C
23.	A	moving rhythmically and rhyming are equally enjoyable	A
	B	moving rhythmically is more fun	B
	C	rhyming is more fun	C
24.	A	would like to do impromptu interpretive dancing	A
	B	would like to do ballet dancing	B
	C	no preference for ballet over impromptu interpretive dancing	C
25.	A	enjoy interacting affectively with others	A
	B	enjoy interpreting the affective interaction of others	B
	C	equal preference for affective interaction and interpretation of the affective interaction of others	C
26.	A	can think better while lying down	A
	B	can think better while sitting up straight	B
	C	equal preference for thinking while lying down or sitting up straight	C
27.	A	would like to be a music critic	A
	B	would like to be a music composer	B
	C	would enjoy equally music criticism and composition	C
28.	A	skilled in the intuitive prediction of outcomes	A
	B	skilled in the statistical, scientific prediction of outcomes	B
	C	equally skilled in intuitive and statistical/scientific prediction	C
29.	A	generally attentive to verbal explanations	A
	B	generally restless during verbal explanations	B
	C	can control attention during verbal explanations	C
30.	A	enjoy analyzing stories	A
	B	enjoy creative storytelling	B
	C	enjoy equally analyzing stories and creative storytelling	C

Go on to the next page.

31.	A	conforming or nonconforming depending upon the situation	A
	B	generally conforming	B
	C	generally nonconforming	C
32.	A	no preference for well-structured over open-ended assignments	A
	B	preference for open-ended assignments	B
	C	preference for well-structured assignments	C
33.	A	prefer to learn through free exploration	A
	B	prefer to learn systematically through ordering and planning	B
	C	no preference between learning through free exploration and learning through more systematic ways	C
34.	A	strong in recalling verbal materials (names, dates, etc.)	A
	B	strong in recalling spatial imagery	B
	C	equally strong in recalling verbal and spatial imagery	C
35.	A	read for main ideas	A
	B	read for specific details and facts	B
	C	read for main ideas and for details and facts equally	C
36.	A	skilled in sequencing ideas	A
	B	skilled in showing relationships among ideas	B
	C	equally skilled in sequencing and showing relationships	C
37.	A	no preference between outlining and summarizing readings	A
	B	preference for outlining over summarizing	B
	C	preference for summarizing over outlining	C
38.	A	producing ideas and drawing conclusions are equally enjoyable	A
	B	drawing conclusions is more fun	B
	C	producing ideas is more fun	C
39.	A	solve problems logically, rationally	A
	B	solve problems intuitively	B
	C	equally skilled in solving problems intuitively and logically	C
40.	A	just as exciting to me to improve something as to invent something new	A
	B	more exciting to improve something	B
	C	more exciting to invent something new	C

When you have completed all forty items, follow the instructions of your Survey administrator.

Figure 14 – Scoring Key for the Research Edition

1. A – L B – R C – I	11. A – L B – R C – I	21. A – I B – L C – R	31. A – I B – L C – R
2. A – R B – L C – I	12. A – L B – R C – I	22. A – I B – L C – R	32. A – I B – R C – L
3. A – I B – R C – L	13. A – I B – L C – R	23. A – I B – R C – L	33. A – R B – L C – I
4. A – R B – L C – I	14. A – R B – I C – L	24. A – R B – L C – I	34. A – L B – R C – I
5. A – R B – L C – I	15. A – R B – I C – L	25. A – R B – L C – I	35. A – R B – L C – I
6. A – R B – L C – I	16. A – I B – R C – L	26. A – R B – L C – I	36. A – L B – R C – I
7. A – R B – L C – I	17. A – R B – I C – L	27. A – L B – R C – I	37. A – I B – L C – R
8. A – R B – I C – L	18. A – R B – I C – L	28. A – R B – L C – I	38. A – I B – L C – R
9. A – I B – L C – R	19. A – R B – L C – I	29. A – L B – R C – I	39. A – L B – R C – I
10. A – I B – L C – R	20. A – I B – R C – L	30. A – L B – R C – I	40. A – I B – L C – R

Figure 3 – Conversion Table for Standard Scores and Percentiles

Raw Score	Left		Integrated		Right	
	Standard Score	Percentile	Standard Score	Percentile	Standard Score	Percentile
0	50	1	39	0	51	1
1	55	1	43	0	55	1
2	59	2	46	0	59	2
3	63	3	50	1	63	3
4	67	5	54	2	68	5
5	71	8	58	2	72	8
6	76	11	61	3	76	11
7	80	16	65	4	80	16
8	84	21	69	6	84	21
9	88	28	73	9	88	27
10	92	35	76	12	92	35
11	97	43	80	16	96	43
12	101	52	84	21	100	51
13	105	60	88	27	105	59
14	109	68	91	33	109	67
15	113	75	95	41	113	74
16	118	81	99	48	117	80
17	122	86	103	55	121	85
18	126	90	106	63	125	89
19	130	93	110	70	129	93
20	134	96	114	76	133	95
21	139	97	118	81	137	97
22	143	98	121	86	141	98
23	147	99	125	89	146	99
24	151	99	129	93	150	99
25	155	100	133	95	154	100
26	160		136	97	158	
27	164		140	98	162	
28	168		144	99	166	
29	172		148	99	170	
30	176		151	99	174	
31	181		155	100	178	