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INSTRUCTOR MODELED POSTURAL POSITIONS AND THEIR
INFLUENCE ON INSTRUCTIONAL TEST SCORES OF
TENTH-GRADE STUDENTS.

EAST TENNESSEE STATE UNIVERSITY, ED.D., 1979

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**INSTRUCTOR MODELED POSTURAL POSITIONS AND THEIR INFLUENCE ON
INSTRUCTIONAL TEST SCORES OF TENTH-GRADE STUDENTS**

**A Dissertation
Presented to
the Faculty of the College of Education
East Tennessee State University**

**In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education**

**by
Robert L. Bower**

June 1979

APPROVAL

This is to certify that the Advanced Graduate Committee of

ROBERT L. BOWER

met on the

23rd day of May, 19 79.

The committee read and examined his dissertation, supervised his defense of it in an oral examination, and decided to recommend that his study be submitted to the Graduate Council and the Dean of the School of Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

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INSTRUCTOR MODELED POSTURAL POSITIONS AND THEIR INFLUENCE ON
INSTRUCTIONAL TEST SCORES OF TENTH-GRADE STUDENTS

Purpose. The problem was to determine if instructor modeled postural positions influence instructional test scores of selected tenth-grade students.

Method. Literature was reviewed in order to identify the role of postural behavior as an element of nonverbal communication. Postural communication was reviewed in relation to verbal behavior, facial behavior, deceptive behavior, orientation, relaxation, and educational environments.

An intact group consisting of tenth-grade students comprising the entire sophomore class was selected from one Upper East Tennessee school. Subjects were randomly assigned to one of two subgroups. All subjects were exposed to five instructional videotaped lessons, each of which depicted an instructor modeling one of the following postures: extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed.

Economics was chosen as the instructional content for the series of five lessons. Videotape was selected as the medium for instructional presentation in order to achieve consistency of postural and presentational aspects. The experimenter designed and produced the lesson series for videotape transmission. Each lesson was presented by an instructor modeling one of five postural positions: extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed. All videotaped postures incorporated into the lessons were assessed for reliability of conformance to the established postural criteria. Intratest and intertest similarity were determined in a pilot test situation.

A volunteer monitor administered the videotaped instruction to the intact group of tenth-graders. Duration of each lesson was 7 minutes. The subjects participated in one lesson each week on five successive Tuesdays. Immediately following each lesson, each subject completed a 20-item true-false test on the lesson content.

Differences between mean test scores for the total intact group; males; and females for the five experimental conditions were tested for statistical significance by the t test. The .05 level of significance was adopted in all cases.

Results. Data analysis indicated that instruction presented in an extremely tense posture yielded a mean test score for the total group which was significantly lower than those achieved during the moderately relaxed, extremely relaxed and slightly tense presentations. The slightly relaxed postural treatment phase resulted in a significantly lower mean test score when contrasted with mean scores of the moderately relaxed, extremely relaxed and slightly tense postures. Test scores obtained by females during the extremely tense presentation were significantly depressed when compared to the scores of the moderately relaxed, extremely relaxed, and slightly tense phases. The means for males instructed during the extremely tense and slightly relaxed postural conditions were significantly inferior to those obtained under the conditions of extreme postural relaxation and slight postural tenseness. Throughout all postural treatments, mean test scores of males were higher than those of females, and significantly so in the experimental conditions of extremely relaxed, slightly tense, extremely tense, and slightly relaxed postures.

Summary. The results of the study did not provide absolute guidelines for postures for which instruction should be provided. However, results did reveal that instruction presented in the extremely tense posture was detrimental to learner achievement. Data compiled for the total intact group did indicate that moderately relaxed, and extremely relaxed postural presentations were positively related to learner achievement. Male and female reaction to posture was different. The lowest achievement by females occurred when instruction was presented in the extremely tense posture. Males performed significantly lower during both the extremely tense and the slightly relaxed phases.

Conclusions. The results of the experiment provided evidence that postures which are maintained by an instructor while presenting lesson content influence learner performance in a classroom environment. Lesson content which is presented in a manner which can be characterized as extremely tense is detrimental to learner achievement. A more relaxing classroom environment may be beneficial to learning. The suggestion that the negative effects of an extremely tense postural presentation may generalize to additional learning environments is forwarded. Learner bias, resultant of instruction being presented in an extremely tense manner, may negatively influence future learner achievement under conditions which are not tense. The duration of learner bias may be differential in sexes, being more enduring with males than with females. The possibility that the sex of the instructor may have led to a differential response of males and females is proposed. Of special significance to this study, the ordering of postural presentations, could possibly affect performance of subsequent instructional presentations in differing postural modes.

.

Dissertation prepared under the guidance of Dr. Charles Beseda, Dr. Ted Cobun, Dr. Robert Shepard, Dr. A. Keith Turkett, and Dr. Robert Spangler.

Institutional Review Board

This is to certify that the following study has been filed and approved by the Institutional Review Board of East Tennessee State University.

Title of Grant or Project INSTRUCTOR MODELED POSTURAL POSITIONS AND THEIR INFLUENCE ON INSTRUCTIONAL TEST SCORES OF TENTH-GRADE STUDENTS

Principal Investigator Robert L. Bower

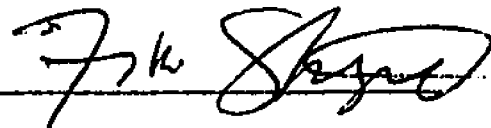
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Date Submitted January 10, 1979

Principal Investigator



Institutional Review Board Approval, Chairman



DEDICATION

This study is dedicated to the aspiration to stimulate the application of a science of human behavior to design and production of instructional media.

ACKNOWLEDGMENTS

Initially, I wish to express my gratitude to Dr. Ted C. Cobun. As a committee member and professor, Dr. Cobun's promotion of academic excellence, exploration of the controversial, and sustained enthusiasm for teaching and learning have significantly contributed to my personal, professional, and academic maturation. I have profited greatly from my association with him, and I am exceedingly grateful for his counsel, encouragement, unwavering support--and most importantly, his friendship.

My sincere appreciation is extended to Dr. Charles G. Beseda, Dr. Robert S. Spangler, Dr. Robert G. Shepard, and Dr. A. Keith Turkett for serving as graduate committee members and for assisting in the formulation and completion of this study.

In addition, I am indebted to my parents, whose provision for a positive and loving home environment ultimately reinforced the pursuance of this goal.

Finally, I wish to thank my wife, Mary, for without whose continual sacrifice, sustenance, and encouragement, the completion of this study would have been illusive.

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Chapter 1

INTRODUCTION

Perception of the image of a communicator by receivers may have a significant effect on how they perceive his messages. First impressions have been said to be lasting impressions, and are modifiable only with difficulty. What a communicator does is important. How he does it is important. "A naughty person, a wicked man, walketh with a froward mouth: he winketh with his eyes, he speaketh with his feet, he teacheth with his fingers" (Proverbs 6:12, 13).

Primitive man employed nonverbal behavior as a means of communication. Biblical sources refer to nonverbal behavior as a reflection of personality. Seventeenth and eighteenth century scientists correlated body positions and movements with emotional states. Throughout history, men of high stature have attempted to adopt various body postures and gestures in order to acquire charisma. Nonverbal behavior has been and remains a dominant influence in the advertising world. The legal profession has realized the persuasive impact of nonverbal behavior, as manifest in the Chicago Seven trial when defense lawyer William Kunstler made a formal objection concerning Judge Hoffman's postural variations during prosecution and defense summations (Davis, 1973). Recently, educators have become aware of nonverbal behavior in the classroom.

Early investigations of John Laxater, Sir Charles Bell, and Cesare Lombroso (Spiegel and Machotka, 1974) attempted to correlate positions, movements, and expressions with particular emotional states. However,

these early works were characterized by subjectivity. Conclusions were drawn from personal experiences and were quite arbitrary. A resurgence in the application of a scientific analysis of body movement as a communicative process has been attributed to Ray L. Birdwhistell, who in 1952 published Introduction to Kinesics: An Annotation System for Analysis of Body Motion and Gestures. This systematic approach to non-verbal behavior paralleled that of linguistics.

Birdwhistell's original research motivated others to study nonverbal behavior as an element of the communication system. As investigation proceeded, communication of the emotional state as expressed in nonverbal behavior became a major concern. Analysis of nonverbal behavior structure and its significance as a communication component has been dominant in psychology. Only recently have educators realized the consequences of the nonverbal communication channel in the classroom.

Bruce Ledford included kinesics in the educational superstructure of learner analysis. Concerning this superstructure he stated that, "the ability to communicate by means of nonlinguistic functions and motions of the body is an integral component" (Ledford, 1974, p. 130).

The importance of nonverbal behavior as manifest in the classroom has been expressed by others. Enthusiasm in the classroom has been attributed to nonverbal behaviors which are emitted by teachers (Kachur and others, 1977). Charles Achilles and Russell French (1974) asserted that: "Youngsters learn to 'like' school, teachers, education, and themselves based upon the interpretations of nonverbal cues . . ." (p. 56).

Of particular emphasis to this study was the focus of an identifiable element of nonverbal behavior. Mark Knapp (1972) includes gestures, movements of the body, limbs, hands, head, feet, and legs,

facial expressions, eye behavior, and posture as typical kinesic components. Specifically, the relaxation dimension of body posture was examined. The effects of a communicator's posture on learner recall of lesson events was analyzed.

Data acquired from the study may be used in an attempt to synthesize answers to questions such as: Is there an optimum body relaxation posture that can be employed by a communicator when addressing subjects? Does the degree of postural relaxation affect male and female subjects differently? Are postural relaxation dimensions relevant variables in educational practice? These are kinesic concepts which have been investigated by other researchers. Contributions from this study may be applicable to current classroom teaching methodology.

The Problem

The problem was to determine if instructor modeled postural positions influence instructional test scores of selected tenth-grade students.

Hypotheses

Given the statement of the problem the following hypotheses were formulated:

H₀₁: There will be no significant difference in the mean scores on tests of subject content after each treatment of extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting postures within the intact group.

H₀₂: There will be no significant difference in the mean scores on tests of subject content between male and female subjects who are

instructed by a communicator exhibiting an extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting posture.

Significance of the Study

An extensive review of the literature revealed that no study has yet investigated five degrees of postural relaxation which may be exhibited by an instructor and the effect on learner recall in a classroom situation. Nonverbal behavioral studies, from both clinical and classroom settings, have isolated elements within the nonverbal behavioral spectrum to manageable components. This study attempted to determine the effects of instructor modeled extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed postures on student recall of presented instruction.

Communication in the classroom emanates from both verbal and non-verbal channels. Recently, there has been concern for teacher nonverbal behavior as it communicates to students. The magnitude of nonverbal behavior as a communicative factor can best be appreciated by the conclusions of Albert Mehrabian (1968c), who suggested that as little as 7 percent of communication can be attributed to the verbal element. The remainder of the message is transmitted by nonverbal attributes.

Psychologists have studied nonverbal behavior and its effects on addressees for a number of years. Nonverbal behavioral characteristics have been correlated with specific emotional states. Stanley Strong, Ronald Taylor, Joseph Bratton, and Rodney Lopez (1971) have determined that a communicator's nonverbal behavior does influence an addressee's description of that communicator. Of further importance, nonverbal

behaviors can be learned and managed. Erving Goffman (1959) contends that these behaviors can be managed to achieve desired effects.

Educators have extrapolated the findings of psychological experiments dealing with nonverbal behavior and are beginning to employ these principles to classroom management. Of recent, workshops have been established to increase the efficiency of teacher nonverbal behavior utilization in the classroom (Ligons, 1974; Borgers and Ward, 1975). Extensive compilations of nonverbal behavior research have aided the further investigation of this phenomenon (Davis, 1972). However, classroom teachers are still not cognizant of the communicative process of nonverbal behavior. Robert Koch further states that "Teachers do unconsciously read a lot of their students' nonverbal messages, and consciously read some, but their use of conscious sending is practically nil" (1972, p. 231).

In a classic statement concerning the scientific method of investigation, Albert Einstein (1933) suggested that in order to learn what physicists do, one must observe them at work rather than ask them what they do. Characteristically, investigations by psychologists, sociologists, and educators into the effects of nonverbal behavior have been concerned with reported emotional perceptions of these behaviors. B. F. Skinner (1953) warns that internal events are difficult to observe, and conclusions derived from such methods may be without justification. He further suggests that a considerable advantage may be gained by confining investigations to observable events. This study restricts itself to conclusions drawn from observable behavior.

The issue of posture in determining the likelihood of achievement of objectives is a critical matter deserving, by supervisors, informed

attention. Educators contend that nonverbal behavior is a component of the communicative process in the classroom. However, only through scientific investigation can we actually determine the effects of nonverbal behavior on learning. Ultimately, compilation of such findings may describe optimum topographies of nonverbal behavior. The assertion that nonverbal behaviors are learned and can be managed is of further significance to supervisors whose mission is to improve classroom instruction. The relevance of nonverbal behaviors to supervisory practice is evident by the definition of supervision as, "the process of helping teachers to improve both instruction and curriculum" (Oliva, 1976).

Assumptions

Assumptions for the study were:

1. Variances between the male and female experimental populations were homogeneous.
2. The general demeanor of the intact group remained constant throughout the experiment.

Delimitations of the Study

The study was limited by the fact that:

1. The effects of five degrees of postural relaxation (extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed) were assessed on the means of post-test scores of an intact group.
2. An intact group of tenth-grade male and female students was selected from one school in Upper East Tennessee.

3. Videotaped instruction was utilized to achieve consistency of postural and presentational aspects.

4. Instructional content which had not been formally taught to the subjects was selected by the experimenter.

5. A single 7-minute exposure of each postural position was administered to all experimental subjects.

Definitions of Terms

Arm-Position Asymmetry

Arm-position asymmetry is one criterion of the postural relaxation dimension. The criteria for each relaxation dimension in the sitting position are:

Extremely Tense - extreme symmetrical position of the arms in the folded position.

Slightly Tense - symmetrical position of the arms while resting in the lap.

Slightly Relaxed - slight asymmetry in the arm position: for example, both hands resting on the lap but one hand from 2 to 5 inches more forward than the other.

Moderately Relaxed - moderate asymmetry in the arm position, where one hand holds the elbow whereas the other hand is free.

Extremely Relaxed - extreme asymmetry in the position of the arms, where one arm is placed in the lap while the other arm is hooked over the back of the chair (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Arms-Akimbo

Arms-akimbo position constitutes placement of hands (palms inward) on the hips.

Decoding

Subjects are presented nonverbal behavioral signals and are instructed to infer feelings and attitudes from those stimuli (Mehrabian, 1972).

Encoding

During encoding experiments subjects are placed in experimental situations which elicit different kinds of attitude related nonverbal behavior. Role playing is typically employed as an encoding method (Mehrabian, 1972).

Extremely Relaxed Posture

An extremely relaxed posture is a degree of the relaxation dimension of body posture. The criteria for an extremely relaxed sitting posture are:

Arm-Position Asymmetry - extreme asymmetry in the position of the arms where one arm is placed in the lap while the other arm is hooked over the back of the chair.

Hand Relaxation - fingers are extended, but not stiffly.

Leg-Position Asymmetry - legs are crossed in an extremely asymmetrical position with one foot, lifted off the floor and the other foot's edge resting on the floor.

Neck Relaxation - the head is hanging so that the line of vision forms more than 20 degrees below the horizontal.

Reclining Angle - the plane from the communicator's shoulders to his hips is 30 degrees back of the vertical plane.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 30 degrees away from the vertical (Mehrabian, 1969a;

Mehrabian and Friar, 1969).

Extremely Tense Posture

An extremely tense posture is one degree of the relaxation dimension of body posture. The criteria for an extremely tense sitting posture are:

Arm-Position Asymmetry - extreme asymmetrical position of arms in a folded position.

Forward Lean - the plane from the communicator's shoulders to his hips is 20 degrees forward of the vertical plane.

Hand Relaxation - the hands are tightly clenched.

Leg-Position Asymmetry - asymmetrical position of the legs with both feet flat on the floor and the insteps touching.

Neck Relaxation - the head is not supported and the line of vision is pointing 20 degrees above the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Forward Lean

Forward lean is the number of degrees that a plane from the communicator's shoulders to his hips is in front of the vertical plane (Mehrabian, 1969a).

Hand Relaxation

Hand relaxation is an element of the postural relaxation dimension. The criteria for degrees of postural relaxation are:

Extremely Tense - the hands are very tightly clenched.

Slightly Tense - the hands are loosely clasped on the lap.

Relaxed (slightly, moderately, and extreme degree) - fingers are extended but not stiffly (Mehrabian, 1969a).

Kinesics

Kinesics deals with the science of bodily communication, and involves the systematic analysis of gestures, movements, and positions of the body (Birdwhistell, 1952).

Leg-Position Asymmetry

Leg-position asymmetry is one criterion of the postural relaxation dimension. The criteria for leg-position asymmetry on each relaxation degree in the sitting position are:

Extremely Tense - legs are in an extremely symmetrical position with both feet flat on the floor and the insteps touching.

Slightly Tense - legs are symmetrically positioned with both feet flat on the floor and insteps not touching.

Slightly Relaxed - legs are in a slightly asymmetrical position with both feet resting flat on the floor and one foot 2 to 5 inches more forward than the other.

Moderately Relaxed Posture - legs are in a moderately asymmetrical position with one leg extended forward and the other bent at the knee.

Extremely Relaxed Posture - legs are crossed in an extremely asymmetrical position with one foot lifted off the floor and the other foot's edge resting on the floor (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Moderately Relaxed Posture

The moderately relaxed posture is one degree of the relaxation dimension of postural behavior. The criteria for a moderately relaxed sitting posture are:

Arm-Position Asymmetry - moderate asymmetry in the position of the arms is exhibited with one hand positioned on the knee 8 to 10 inches more forward than the other, and the elbow of the rear arm resting on the chair's arm.

Hand Relaxation - fingers are extended but not stiffly.

Leg-Position Asymmetry - legs are in a moderately asymmetrical position with one leg extended forward and the other bent at the knee.

Neck Relaxation - the head is hanging so that the line of vision forms between 10 to 20 degrees below the horizontal.

Reclining Angle - the plane from the communicator's shoulders to his hips is 15 degrees back of the vertical plane.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 20 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Neck Relaxation

Neck relaxation as a criterion of the postural relaxation dimension refers to the number of degrees in the line of vision above or below the horizontal. The criteria for neck relaxation of the various relaxation degrees in the sitting position are:

Extremely Tense Posture - the head is raised and the line of vision is pointing 20 degrees above the horizontal.

Slightly Tense Posture - the head is raised and the line of vision

is pointing to within 10 degrees above the horizontal.

Slightly Relaxed Posture - the head is positioned so that the line of vision forms within 10 degrees below the horizontal.

Moderately Relaxed Posture - the head is hanging so that the line of vision forms between 10 to 20 degrees below the horizontal.

Extremely Relaxed Posture - the head is hanging so that the line of vision forms more than 20 degrees below the horizontal (Mehrabian, 1969a).

Nonverbal Behavior

Nonverbal behavior includes both signs and communication. Signs may or may not result in communication. The dependence is on the intent of the sign transmitter and the meaning for the sign held by the receiver (Wiener, Devoe, Rubinow, and Geller, 1972).

Nonverbal Communication

Nonverbal communication implies a socially shared signal system of encoder and decoder (Wiener, Devoe, Rubinow, and Geller, 1972).

Postural Relaxation

Postural relaxation is a dimension of behavior with cues that may denote liking and status. The cues are: arm-position asymmetry, hand relaxation, leg-position asymmetry, neck relaxation, reclining angle, and sideways lean (Mehrabian, 1969a).

Posture

Posture is regarded as a frozen phase of total movement which may display expression (James, 1932).

Reclining Angle

Reclining angle is the number of degrees that a plane from the communicator's shoulders to his hips is behind the vertical plane (Mehrabian, 1969a).

Sign

A sign is a motion or gesture used to mean, represent, or point out something.

Slightly Relaxed Posture

A slightly relaxed posture refers to a degree of the relaxation dimension of body posture. A slightly relaxed posture is manifest by the following criteria:

Arm-position Asymmetry - slight asymmetry in the position of the arms where both hands are resting on the lap of the communicator, with one hand from 2 to 5 inches more forward than the other.

Forward Lean - the plane from the communicator's shoulders to his hips is 10 degrees forward from the vertical plane.

Hand Relaxation - fingers are extended but not stiffly.

Leg-Position Asymmetry - legs are in a slightly asymmetrical position with both feet resting flat on the floor and one foot 2 to 5 inches more forward than the other.

Neck Relaxation - the head is positioned so that the line of vision forms to within 10 degrees below the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 10 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Slightly Tense Posture

A slightly tense posture is a degree of the relaxation dimension of body posture. The criteria for a slightly tense sitting posture are:

Arm-Position Asymmetry - symmetrical position of the arms while resting in the lap.

Forward Lean - the plane from the communicator's shoulders to his hips is within 10 degrees forward of the vertical plane.

Hand Relaxation - the hands are slightly tense or loosely clasped.

Leg-Position Asymmetry - legs are symmetrically positioned with both feet flat on the floor and insteps not touching.

Neck Relaxation - the head is not supported and the line of vision is pointing within 10 degrees above the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Subgroup

A subgroup consists of half of a randomly selected number of subjects from the intact group.

Procedures

Procedures utilized during the conduct of the study were:

1. An intact group of tenth-grade students was selected by the experimenter to participate in the experimentation.
2. Lesson content for instructional presentation was selected by the experimenter.
3. Five videotaped instructional presentations were designed and

produced by the experimenter.

4. Five videotaped postures incorporated into the instructional lessons were assessed for reliability of conformance to the established postural criteria.

5. A pilot study was conducted to determine intratest and intertest similarity.

6. The videotaped instruction was administered to the intact group of tenth-graders by a volunteer monitor under the supervision of the experimenter.

7. Experimental data were analyzed and interpreted by the experimenter.

Organization of the Study

The study was organized into five chapters. Chapter 1 contains an introduction to the study, statement of the problem, research hypotheses, significance of the study, assumptions of the study, and delimitations of the study. Definitions of terms, procedures, and organization of the study are also included.

A review of the related literature is presented in Chapter 2.

Procedures by which the study was conducted are contained in Chapter 3.

An analysis of the findings of the study is included in Chapter 4.

Chapter 5 includes the summary, conclusions, and recommendations of the study.

Chapter 2

REVIEW OF RELATED LITERATURE

Introduction

Nonverbal behavior and its relationship to the communicative process has captivated the interest of scientists, artists, theologans, and philosophers for centuries. A resurgence of exploration into human nonverbal behavior has manifest itself in recent years. A disproportionate amount of research has been conducted by psychologists in a clinical environment during the twentieth century. Only recently have those concerned with education, as it occurs in the classroom setting, investigated the environmental effects of nonverbal behavior.

Although researchers agree that some nonverbal behaviors may be potentially communicative, there exists a great disparity in methods of investigation and the subsequent interpretations derived from data as they relate to client communicative behavior (Weitz, 1974). However, there is general agreement in the composition of nonverbal substructures. Knapp (1972) organized the nonverbal domain into the following categories: body motion or kinesic behavior, physical characteristics, touching behavior, paralanguage, proxemics, artifacts, and environmental factors.

The language of nonverbal behavioral research is characterized by diversity and esoterism. However, analysis of the literature is consistent on differentiating between nonverbal behavior and nonverbal communication. Nonverbal behavior includes both signs and communication.

Signs only imply the inference from, or the assignment of some significance to, behavior. Communication is not independent of signs. On the other hand, signs may or may not result in communication. The dependence is on the intent of the sign transmitter and the meaning for the sign held by the receiver. Communication is differentiated from a sign in that the former implies "a socially shared signal system, that is, a code, and encoder who makes something public via that code, and a decoder who responds systematically to that code" (Wiener, Devoe, Rubinow, and Geller, 1972, p. 186).

Posture (a component of kinesics) and its effects as an affect display of behavior has received much attention. Extensive study has been conducted by Mehrabian and his associates into the perceived emotional states associated with postural behavior. Fructification of such studies has been realized in the establishment of postural codes and specified criteria of body posture. The assumption is that body posture communicates.

The purpose of the review of related literature was to isolate and identify body postures and postural components as exhibited in humans and relevant to the communicative process. The following sections of literature provide a theoretical and empirical foundation for this study.

Methodological Approaches

Two broad research strategies typified the study of kinesic behavior (i.e. gestures and other body movements, including facial expression, eye movement, and posture). A systematic study of nonverbal behavior which is somewhat analogous to those of languages characterizes the "structural approach." The "external variable approach" seeks relationships between

specified nonverbal behaviors and other variables (Duncan, 1969).

Birdwhistell's research typified the structural approach to kinesic behavior. Three categories of kinesics have been identified as: pre-kinesics, microkinesics, and social kinesics (Birdwhistell, 1952). Microkinesics, which is concerned with the identification and isolation of body movement, has been divided into structural units. Kinemes, the basic units which have structural meaning, are combined to form kinemorphs, which are further analyzed into kinemorphemic classes (Birdwhistell, 1970). These elements, which are put together into units, are arranged like steps of the spoken language and can therefore express ultimate interest in the emotions (Kendon, 1972).

Birdwhistell's linguistic approach to nonverbal research has been criticized by Allen Dittman (1971) and Paul Machotka (Spiegel and Machotka, 1974). Dittman (1978) concluded that discrete behaviors can be coded into a system of communication, but many behaviors are continuous and cannot be paralleled to the spoken language. Additionally, researchers have suggested that verbal and nonverbal languages do not appeal to the same senses (Ruesch and Kees, 1956). The presumption that information obtained through one approach will help researchers of the other school to maximize findings has been promoted (Duncan, 1969).

Functions of Nonverbal Behavior

Some anthropologists contended that nonverbal behavior originated in primitive man and was shared with animals (Werner and Kaplan, 1963). In light of current complex social interaction this behavior which maintained that primate organization must now be studied in relation to the social processes (Schefflen and Schefflen, 1972).

Nonverbal behavior is relevant in social interaction. Robert Harper, Arthur Wiens, and Joseph Matarazzo (1978) listed the functions of nonverbal behavior as repeating, contradicting, substituting, accenting, relating, and regulating. Because nonverbal communication was an antecedent to verbal communication, people often revert back to nonverbal communication in order to satisfy needs. However, in the present cultural context verbal and nonverbal behavior are interactive and should be studied in the functional relationship (Gladstein, 1974).

Verbal and nonverbal communication in the context of social interaction is further supported by Michael Argyle (1972), as he suggested the functions of nonverbal communication are to: manage the immediate situation, to sustain verbal communication, and to replace verbal communication. Approval nonverbal behaviors are usually reciprocated in free social interaction (Rosenfeld, 1967).

Albert Scheflen (1964) delineated the significance of postural configuration and body positioning. "They demarcate the components of individual behavior that each person contributes to the group activities; they indicate how the individual contributions are related to each other; and they define the steps and order in the interaction--that is, the 'program'" (p. 316).

Postural Psychoanalysis

In his "analytic posturology," Felix Deutsch (1952) made careful observations of body movement in analysis and attempted to correlate the patient's nonverbal behavior with the emerging themes of analysis. Deutsch (1947) noted:

There are definite motivations for the postural behavior of every patient. Postural attitudes reflect or substitute; precede or accompany the verbal expression of unconscious material. Every individual has a characteristic basic posture at rest to which he returns whenever he has altered from it. (p. 211)

Theodore Jacobs (1973), T. F. Braatoy (1954), and Felix Deutsch and William Murphy (1955) indicated that a client's postural behavior was related to his psychological states. John Blazer (1966) observed and identified 10 common leg positions exhibited in women interviewees. These leg positions were then correlated with various personality characteristics. Postural rigidity has been employed (Reich, 1945) as a measure of a client's resistance to change. The downward angling of the head is also considered as an observer clue to depression (Waxer, 1976).

Others concluded that body posture exerts considerable influence on apperception, thinking, and emotions (Beigel, 1952). One psychotherapist even assumed the client's posture in order to get a better idea of what the patient was feeling (Fromm-Reichmann, 1950). The suggestion that a client's temperament could be changed through the manipulation of his nonverbal behavior eventually evolved (Lowen, 1958).

Argyle (1975, p. 281) developed a table representing psychoanalytic interpretations of posture. Refer to Table 1.

Postural and Verbal Behavior

In the course of human interaction the receiver (decoder) is likely to be confronted with both verbal and nonverbal stimuli. Research has been conducted in order to determine the importance of each channel. Dittman (1978) concluded that the reception apparatus gives preference to the channel whose information density is higher and the channel with

Table 1
Psychoanalytic Interpretations of Postures

	Posture	Interpretation
Arms	1. Folded arms, self-wrapping	Self-protection, especially of breasts, withdrawal
	2. Bodice of dress clutched	Fears of bodily damage
	3. Shoulders shrugged, palms out	Passive helplessness
Legs	1. High crossing (females)	Self-protection, withdrawal
	2. Uncrossing	Flirtation
	3. Exhibitionistic leg cross (female)	Flirtation
	4. No movements in pelvis	Sexual inhibition
Trunk	1. Stiff, military bearing (males), prim and upright (females)	Imprisoning anxiety
	2. Vain, affected bearing	Conflict between flirtation and shyness
	3. Drooping, listless, immobile	Helplessness, request for help
	4. Nestling into chair languid, erotic manner	Expresses sexual impulses

Note. From Bodily Communication by M. Argyle. London: Methuen and Co., Ltd., 1975, p. 281.

the greatest intensity. The verbal channel is usually more dense, while greater intensity is reflected in coded body language.

Subjects have been able to discriminate between speaker and message when judging sincerity and intentions. Judgments of nonverbal communication were directly influenced by the quality of the preceiver's cognitive system (McMahan, 1974). However, Allan Korvola (1970) found

no significant relationship existed between the nonverbal communication transmitted and the cognitive level of the verbal communication.

In a previous study Paul Ekman (1967) had professional modern dancers to select the correct body positions from incorrect positions when given 20 speech interview samples. They were able to match the verbal sample when seeing only body position.

Postural and Facial Behavior

Interpretation of facial and postural behavior has been investigated in order to determine the consonance or dissonance of the cues. Information which is communicated by the head may be independent of that communicated by the body. Ekman's (1965) study investigated Harold Schlosberg's (1954) three dimensional theory of emotion--pleasantness-unpleasantness, attention-rejection, and sleep-tension. Ekman found that affective information (pleasantness-unpleasantness) communicated by the head may be independent of the body, while body positions communicating related information on sleep-tension dimension were accompanied by dissimilar facial expressions.

When determining the pleasant-unpleasant dimension of behavior, observers find it easier to use facial cues. However, when facial cues were terminated, the judges were remarkably consistent in appraising feelings expressed in bodily cues. Pleasant body positions consisted of relaxed postures with little movement, while positions involving obvious muscle tension and nervous activity constituted the unpleasant body position. Research was also discovered that professional dancers were more capable of judging body cues than were psychotherapists (Dittman, Parloff, and Boomer, 1965).

Paul Ekman and Wallace Friesen (1967) found that specific emotions can frequently be perceived from both facial expressions and body acts, although facial expressions are considered more useful. They indicated that body posture and movement which follows facial affect displays can be interpreted as "coping with the facially display effect" (Ekman and Friesen, 1969, p. 76). Data which conflicts with the above study has been gathered by Jeffery Shapiro (1972). He found that judges who rated still photographs reached a greater consensus when rating body positions alone as opposed to rating faces alone. However, when given the opportunity to rate the whole person, they did not use body cues.

Postural Cues and Deception

Posture has provided cues to deceptive behavior. "He that has eyes to see and ears to hear may convince himself that no mortal can keep a secret. If his lips are silent, he chatters with his finger-tips; betrayal oozes out of him at every pore" (Freud, 1905, p. 94).

Researchers consistently indicate that nonverbal behavior reveals deception. However, this leakage can occur from numerous body sources. Ekman and Friesen (1969) indicated that the face is the best sender of nonverbal behavior, whereas the legs and feet are the worst sender. However, because the face is the best sender, it is the most carefully monitored and is therefore not a major source of leakage and deception cues. Conversely, the legs and feet are least responded to and consequently a good source of leakage and deception cues.

Facial and bodily cues have been observed when a subject has engaged in deceptive behavior. Supportive of the previous hypothesis, subjects who were engaged in deceptive behavior indicated that attempts were made

to disguise the face rather than the body. When given a sample of the subject's behavior from an honest interview and identified as nondeceptive, observers significantly made more accurate judgments of deceptive behavior from body rather than facial cues (Ekman and Friesen, 1974). However, Sandor Feldman (1959) found that ratings by naive judges, as opposed to trained judges, revealed an inability to detect lying and truthful subjects by observing body cues. Judges viewing the face were able to detect more displeasure in lying subjects than in truthful subjects.

Fixed Postural Analysis

Various techniques have been utilized in the analysis of body position and posture. Still photographs have been employed as the interpretative process of position. An early study was conducted by William James (1932) who employed photographs of 347 postures. Four postural categories were developed in his study as follows: approach, withdrawal, expansion, and contradiction. For each of these categories head and trunk positions were found to be the most important indicators. A forward lean of the trunk was interpreted as positive, while a backward tilt was negative. Postural interpretations were similar whether the subject viewed the posture and interpreted it or if viewed, imitated, and then interpreted.

Stick figures have been used in an attempt to interpret the interaction of numerous pairs of postures (Argyle, 1975). Machotka (Spiegel and Machotka, 1974) utilized line drawings of nude female figures which exhibited varying degrees of arm openness. Closed-arm positions were interpreted as cold, rejecting, shy, and passive. Moderate or extreme open-arm positions were regarded as warm and accepting. A curvilinear

relationship existed in degrees of arm-positions, as subjects preferred moderate open-arm positions to extreme closed-arm or extreme open-arm positions.

Two profiles of human figures were presented in 27 postural variations to subjects for decoding (Knapp, 1965). The models were rotated to backward, upright, and forward positions. A significantly low rate of positive responses were found when the most elevated figure was rotated backwards.

Postural Orientation

Degree of postural orientation related to forward or backward lean has been found to be the index of positive or negative attitudes as portrayed by communicators (Fretz, 1966). Ratings have been conducted on counselors who exhibited affiliative and unaffiliative nonverbal behavior. In this study Michael LaCrosse (1975) employed a 20 percent forward body lean as a criterion for affiliative behavior. In an attempt to determine the relationship between the amount of verbalization in free association contingent upon expressive movements and verbal reinforcement, (Reece and Whitman, 1962) forward postural lean was used as a variable. Forward lean and backward tilt have also been used as indexes in rating therapist types (Smith, 1972).

The early study of James (1932) discovered that a forward lean of the trunk was positively interpreted while a backward tilt was perceived as negative. Richard Katz (1964) studied postural configurations which composed what he called an "understanding posture." The result of his findings indicated that a central cue of the "understanding posture" was a forward tilt of the body. Similarly, Mehrabian's (1968a) experiments

determined that the communicator's angle or degree of backward lean of the torso decreased for increasing positive attitudes toward addressees. In an interview situation, those who tend to communicate less positive feelings by reclining more also perceive themselves as assuming greater distances from addressees in general (Gottheil, Coney, and Paredes, 1968).

Postural Relaxation

Relaxation indexes of posture play a critical role in the evaluation and interpretation of nonverbal behavior. Nonverbal behavior may be considered as multidimensional (Schlosberg, 1954; Williams and Sundene, 1965; and Osgood, 1966). More recently, Mehrabian (1972) developed a three dimensional framework to describe referents of nonverbal behavior. The framework included evaluation, potency or status, and responsiveness. He and others have determined that postural relaxation is significant to the formulation of perceived interpretations of nonverbal behavior. Subsequently, he has developed the subdimension of postural relaxation to be incorporated into the aforementioned conceptual three dimensional scheme of nonverbal analysis.

After extensive experimental analysis, Mehrabian (1969a) established the reliability and validity of criteria for rating the relaxation dimension of standing or seated postures. The relaxation dimension includes the following components: arm-position asymmetry, sideways lean, leg-position asymmetry, hand relaxation, neck relaxation, and reclining angle. See Table 2.

Postural relaxation relates to both attitude and status. Mehrabian (1968) found that male communicators displayed a lack of relaxation when

Table 2

Relaxation Cues

A. Arm Position Asymmetry

1. Symmetrical position of the arms: for example, hands clasped at the midsection, arms folded symmetrically, or both hanging down or akimbo while standing.
2. Slight asymmetry in the position of the arms: for example, both hands resting on the lap of the communicator, but one is from 2 to 5 inches more forward than the other, or one hand clasps the other at the wrist.
3. Moderate asymmetry in the position of the arms: for example, one hand holds an elbow or the upper arm whereas the other hand is free, one arm hanging loosely and the other hanging by a finger which is stuck in a pocket.
4. Extreme asymmetry in the position of the arms: for example, one arm in lap and the other hooked over the back of the chair, one hand stuck in a pocket and the other resting on knee or hanging loosely, or only one arm akimbo.

B. Sideways Lean: the number of degrees that a plane cutting the communicator's torso bilaterally in half is away from a plane cutting his chair bilaterally in half. This angle is estimated to the nearest 10 degree and cannot exceed 90 degrees.

C. Leg Position Asymmetry

1. Symmetrical position of the legs with both feet flat on the floor and the insteps touching.
2. Symmetrical position of the legs with both feet flat on the floor and the insteps not touching.
3. Asymmetrical stance of the legs with both feet resting flat on the floor, such as when one foot is moved to a more forward position.
4. Asymmetrical stance of the legs with one or both feet partially lifted off the floor, as when there is a bend at the ankle and only an edge of the foot is resting on the floor, or when the legs are crossed while seated.

D. Hand Relaxation

1. Very tense; hands or fists are tightly clenched, or hands are clasping anything tightly, or hands are in motion, such as drumming fingers.

Table 2 (continued)

-
2. Moderately tense; loosely clasped or in loose fists or clasping any object or part of the body loosely.
 3. Relaxed; fingers are extended but not stiffly.
- E. Neck Relaxation
1. The head is not supported and the line of vision is pointing 10 degrees or more above the horizontal.
 2. The head is not supported and the line of vision is within 10 degrees of the horizontal.
 3. The head is supported as when resting on the back of a couch or is hanging so that the line of vision forms 10 or more degrees below the horizontal.
- F. Reclining Angle: The number of degrees that a plane defined by a line from the communicator's shoulders to his hips is away from the vertical plane. Angles are measured in units of 10 degrees and whereas reclining angles are scored as positive, forward leaning angles are scored as negative.
-

Note. Increasing degrees of each of the preceding criteria indicate more relaxation. With the exception of the sideways lean and reclining angles which are not scored for standing positions, all the criteria above are scored for both seated and standing positions. From "Some Referents and Measures of Nonverbal Behavior" by A. Mehrabian, Behavior Research Methods and Instrumentation, 1969a, 1, 204.

confronted with intensely disliked male addressees. Encoding and decoding methods were employed during experimentation. Another encoding experiment (Mehrabian, 1968a) required subjects to imagine themselves in situations involving addressees who were either intensely liked, moderately liked, neither liked or disliked, moderately disliked and intensely disliked. Subjects were then asked to sit as if they were interacting with these hypothetical addressees. Arm and leg asymmetry were not used as a

variable of arm relaxation. Findings indicated that there was no significant difference in the relationship between openness of arrangement of arms or legs of seated communicators and attitude toward the addressees. An explanation relative to this finding was offered by the experimenter. "It is possible that the heretofore neglected variable of symmetry in the positioning of the arms and legs can yield a more fruitful indicator of attitudes and particularly of status relations" (Mehrabian, 1968a, p. 29).

In another 1968 study, Mehrabian (1968a) found that a tense posture relative to a moderately relaxed posture communicated a more negative attitude. Also, a communicator in the standing position tended to use arms-akimbo positions more with disliked addressees than with liked addressees. In a group sketch of six figures the arms-akimbo position was rated as haughty, inflexible, and defiant (Spiegel and Machotka, 1974).

Postural relaxation also provides measures of the status dimension of nonverbal behavior. Observations in psychiatric staff meetings revealed that lower status participants (interns) were less relaxed than higher status participants (psychiatrists) (Goffman, 1961). Status was also implied from a relaxation factor in another experiment conducted by Albert Mehrabian and Sheldon Ksionzky (1972). The relaxation factor had a significant but negative correlation with affiliative, integration, and distress behavior factors as well as reported affiliation with strangers and confederates. The arm asymmetry position contributed to the behavioral index of distress--a by-product of object manipulation which usually involved the use of only one hand.

Albert Mehrabian and John Friar (1969) concluded that the relationship between the attitude of a communicator toward his addressee and the

degree of relaxation exhibited by the communicator is curvilinear. With a disliked addressee, the degree of postural relaxation is either extremely high or low. Moderate postural relaxation is manifest for a liked addressee. However, a linear relationship exists between relaxation and status. A high degree of relaxation is present with a low-status addressee and moderate degree of relaxation was observed with peers. An excellent review of experimental findings dealing with the posture and position of a communicator relative to his attitude and status to addressee is provided by Mehrabian (1969b).

Degrees of persuasiveness can also be indexed by varying degrees of postural relaxation. A decoding experiment required college undergraduates to interpret 10 seconds of videotaped recordings with four degrees of postural relaxation as they related to communication persuasiveness (Mehrabian and Williams, 1969). Male communicators who exhibited slightly tense postures were perceived as significantly less persuasive than those who displayed slightly relaxed postures. Female communicators were perceived as more persuasive when exhibiting slightly tense postures. Moderately and extremely relaxed postures were detrimental to the communicator's perceived persuasiveness in both sexes.

An experiment by Hugh McGinley, Richard LeFevre, and Pat McGinley (1975) investigated open, neutral, and closed postural positions on persuasion. More addressee opinion change was elicited by the communicator with the open body posture. This person was also rated by the addressee as being more positive and more potent.

Varying degrees of anxiety have been correlated with postural relaxation. In a unique study, Anthony Jurich and Julie Jurich (1974) interviewed 40 female college students concerning their sexual attitudes.

Questions were ordered to elicit increasing levels of anxiety. Prior to and after the interview, finger sweat prints were taken to measure the degree of anxiety. A global assessment of anxiety was conducted along with postural relaxation ratings. In every instance, correlations of global assessment, sweat print, and relaxation indicators were positive to a significant degree.

Mehrabian (1971) used a shock factor in investigating postural relaxation. Under one experimental condition subjects were rewarded for lying successfully. However, the subjects were threatened with and given a mild shock if the judge detected deceit in the shock condition. There was less relaxation under the threatening condition than under the reward condition.

Posture and Sex Differences

Experimental studies have identified sexual differences relative to posture and body position. Forestene London (1975) supplied evidence that perceptions of nonverbal behavior differ among sex and race. In an interview situation John Sterrett (1976) found that men react more positively to excess body language than females. An open posture of female encoders communicates a more positive attitude than a closed posture, whereas no differences in attitudes of men are communicated by open and closed positions (Mehrabian, 1968b). Similarly, Susan Beekman (1975) found that females tend to exhibit more affiliative nonverbal behavior during dyadic conversation. However, sex of the conversation partner did not have an effect on displayed nonverbal behavior.

Relative to the relaxation dimension, male communicators exhibit less body relaxation and a greater degree of vigilance toward intensely

disliked males. In the presence of disliked females, males tend to display a more relaxed position, as indicated by sideways lean in a chair (Mehrabian, 1968a). The same study found that greater dislike of both male and female addressees resulted in greater relaxation in female communicators.

Nonverbal Behavior Research in Education

Relatively speaking, educators have only recently become involved in the formal investigation of nonverbal behavior and how it affects the classroom. According to Charles Galloway (1972), there are several explanations for this phenomenon. Although there was little or no support for the following assumption from behavioral scientists, educators believed that nonverbal behaviors were consistent with verbal behaviors. Reliable observations of nonverbal influence are difficult to obtain. Identification of precise referents is also an arduous task.

Many of the studies in education have been concerned with the quantity and kinds of nonverbal interactions as they occur in the classroom (French, 1974). These nonverbal phenomena have been studied in situ, as no attempt was made to manipulate or control variables (Achilles, 1974). Quantitative and qualitative variations of teacher communicated behavior have been found in relation to student I.Q. (Chaiken, Sigler, and Derlega, 1974), sex (Cospers, 1970), social class (Shepard, 1971), age (Fowler, 1972), and race (Crump, 1974).

Some experimentation which attempts to assess the effects of nonverbal behavior on subjects has occurred in the classroom. Robert Woolfolk and Anita Woolfolk (1974) investigated the conditions of positive verbal-positive nonverbal, positive verbal-negative nonverbal,

negative verbal-positive nonverbal, and negative verbal-negative nonverbal upon students' perceptions of teachers. All positive teacher behavior resulted in the most positive and attractive ratings, while all negative teacher behavior resulted in the least positive and attractive ratings. Cartoon drawings of teacher gestures, positions, and stances have also been used to examine the feeling of students toward the elementary classroom teacher (Schusler, 1972).

A limited number of educational studies have analyzed the effects of teacher nonverbal behavior on student task performance. Anita Woolfolk (1977) discovered that student performance rate of spelling was significantly higher when teachers were nonverbally negative. Independent nonverbal variables concentrated in facial expressions, which provide little indication of posture effects. A similar finding by Ruth Middleman (1972) indicated that black lower socioeconomic children were more productive on a drawing task when teacher nonverbal behavior was negative. There was no significant difference in task performance of white and other black socioeconomic groups as a result of nonverbal cues. Posture was included as a component of the composite nonverbal behavior.

Summary

Research in the area of nonverbal behavior and its relationship to academic and social performance in the educational classroom was scant. A few studies did attempt to assess the effects of some nonverbal behavior emanating from an instructor on academic achievement. Yet, educators proclaim that nonverbal behavior is operative and interactive and of sufficient consequence to advocate the implementation of nonverbal communicative principles. In essence, the assertion that nonverbal

behavior plays a vital role in the classroom environment is commonly accepted, with little or no research evidence to support this claim.

A vast majority of the nonverbal behavioral research reviewed has been conducted by psychologists in clinical settings. Relevant to this study were the experiments which involved postural assessment. Documentation of postural states as correlates to the emotions abounds in the literature.

Postural studies have emphasized inferential conclusions rather than conclusions drawn from continuous direct measurement techniques (overt). No studies have analyzed an extensive array of teacher modeled postures on the effects of student learning. The study described herein was designed to attain this goal.

Chapter 3

METHOD

Design

The intent of the study was to determine the effects, if any, on teaching effectiveness of variations of instructor modeled postural positions. The design accommodated the testing of the two experimental hypotheses:

H₀₁: There will be no significant difference in the mean scores on tests of subject content after each treatment of extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting postures within the intact group.

Intact Group X₁ O₁ X₂ O₂ X₃ O₃ X₄ O₄ X₅ O₅

H₀₂: There will be no significant difference in the mean scores on tests of subject content between male and female students who are instructed by a communicator exhibiting an extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting posture.

Female X₁ O₁ X₂ O₂ X₃ O₃ X₄ O₄ X₅ O₅

Male X₁ O₁ X₂ O₂ X₃ O₃ X₄ O₄ X₅ O₅

An intact group, consisting of male and female tenth-grade students, was exposed to five experimental treatments. The manipulative independent variable for the intact group was the introduction of varying instructor

modeled postures into the instructional situation. Postures were defined in terms of the relaxation dimension as: extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed.

The chronological order of postural treatment presentation follows:

1. X_1 -- Instruction was presented to the experimental group by a teacher modeling a moderately relaxed posture.
2. X_2 -- Instruction was presented to the experimental group by a teacher modeling an extremely relaxed posture.
3. X_3 -- Instruction was presented to the experimental group by a teacher modeling a slightly tense posture.
4. X_4 -- Instruction was presented to the experimental group by a teacher modeling an extremely tense posture.
5. X_5 -- Instruction was presented to the experimental group by a teacher modeling a slightly relaxed posture.

Treatment of the Data

The t test was employed to analyze the data collected in the study. Since the design strategy involved both between-subjects and within-subjects, data analysis was undertaken by use of the independent sample t test and the repeated measures t test. The hypotheses were tested for the $p < .05$ level of significance.

Subjects

Tenth-grade students from one Upper East Tennessee school comprised the population sample for the study. Authorization was initially obtained from the East Tennessee State University Institutional Review Board to employ human subjects for the purpose of the study. With the approval

of the principal, teachers, subjects, and parents, the entire sophomore class, consisting of 69 students, served as an intact experimental group. The Informed Consent Form is displayed in Appendix A.

In order to efficiently manage and administer the experiment, the intact group was subdivided into two equal groups. Each subgroup received the same experimental conditions. Utilizing the random table of numbers, subjects were randomly assigned to one of two subgroups. Data obtained from each subgroup were pooled collectively.

Instrumentation

Instructional content which had not been formally taught to the subjects was selected by the experimenter. The subjects do not enroll in Economics until the junior or senior year in school. Economics was selected as lesson content based on the above assumption. A U.S. News and World Report (May 1, 1978) article entitled, "ABC's of How Our Economy Works," provided the information contained in the instruction. The unit was subdivided into five instructional segments. Instructional content in all lessons was independent of each other. The sequence of presentation follows:

1. Lesson 1 -- The Business Cycle
2. Lesson 2 -- The Business Enterprise
3. Lesson 3 -- Money
4. Lesson 4 -- The Stock Market
5. Lesson 5 -- Labor Unions

Appendix B contains duplicates of the five lesson scripts (including instructions to subjects) which were utilized in the production and subsequent presentation of instruction. Test items were formulated from

the lesson scripts and are contained in Appendix C. The order by which test items were presented was determined by random assignment. For each of the five tests, 10 true and 10 false test items were randomly sequenced. All test items were derived from the appropriate lesson scripts to insure content validity of each test. Appendix D includes a representation of test item content validity.

Production of Videotaped Instruction for Presentation

A unit lesson was designed and subdivided into five equal segments. The duration of each segment was 7 minutes. Each of the five experimental conditions was represented by one 7-minute segment of instruction. Experimental conditions were randomly assigned to lessons. Postures modeled by the instructor were assigned to the instructional lessons as follows:

1. Lesson 1 -- moderately relaxed posture
2. Lesson 2 -- extremely relaxed posture
3. Lesson 3 -- slightly tense posture
4. Lesson 4 -- extremely tense posture
5. Lesson 5 -- slightly relaxed posture

The criteria for each degree of postural relaxation (sitting position) contained in the videotaped instruction are listed as:

1. Extremely Tense Posture -- the instructor's arms are extremely symmetrical and in a folded position. The plane from the communicator's shoulders to his hips is 20 degrees forward of the vertical plane. The hands are tightly clenched. Positioning of the legs is extremely symmetrical with both feet flat on the floor and insteps touching. The head is not supported and the line of vision is pointing 20 degrees above

the horizontal. No sideways lean is present as the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical.

2. Slightly Tense Posture -- the instructor's arms are in a symmetrical position and resting in the lap. The plane from the communicator's shoulders to his hips is 10 degrees forward of the vertical plane. Hands are loosely clasped. Legs are symmetrically positioned with both feet flat on the floor and insteps not touching. The head is positioned so that the line of vision is pointing to within 10 degrees above the horizontal. No sideways lean is observable as the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical.

3. Slightly Relaxed Posture -- the instructor's arms are slightly asymmetrical where both hands are resting in the lap, and one hand is 2 to 5 inches more forward than the other. The plane from the model's shoulders to his hips is within 10 degrees forward of the vertical plane. Fingers of the model's hands are extended but not stiffly. The legs are slightly asymmetrical with both feet resting flat on the floor, and one foot is 2 to 5 inches more forward than the other. The head is positioned so that the line of vision forms to within 10 degrees below the horizontal. A slight sideways lean is exhibited by the communicator, as the plane cutting his torso bilaterally in half is 10 degrees away from the vertical.

4. Moderately Relaxed Posture -- the instructor's arms are moderately asymmetrical with one hand positioned on the knee 8 to 10 inches more forward than the other and the elbow of the rear arm resting on the chair's arm. Fingers are extended but not stiffly. The plane from the

instructor's shoulders to his hips is 15 degrees back of the vertical plane. The legs are in a moderately asymmetrical position with one leg extended forward and the other bent at the knee. The head hangs so that the line of vision forms between 10 to 20 degrees below the horizontal. A moderate sideways lean is present as the plane cutting the communicator's torso bilaterally in half is 20 degrees away from the vertical.

5. Extremely Relaxed Posture -- the instructor's arms are in an extreme asymmetrical position with one arm placed in the lap while the other arm is hooked over the back of the chair. Fingers are extended but not stiffly. The plane from the model's hips to his shoulders is 30 degrees back of the vertical plane. Legs are crossed in an extremely asymmetrical position with one foot lifted off the floor and the other foot's edge resting on the floor. The head hangs so that the line of vision forms more than 20 degrees below the horizontal. Extreme sideways lean is evidenced as the plane cutting the communicator's torso bilaterally in half is 30 degrees away from the vertical.

To insure constancy of video and audio quality, the same videotape recording and playback hardware was used throughout all experimental treatments. All videotapes were recorded and played back in color. Listed below are the hardware employed in this study.

1. Sony Trinicon Camera -- Model DXC-1600
2. Sony Reel-to-Reel Videotape Recorder (Master) -- Model AV-8650
3. Sony Cassette Videotape Recorder (Slave) -- Model VO-2850
4. Sony Trinitron Receiver (19 inch) -- Model CUM-1750
5. Colortran Lights (five) -- Model mini-light 10 (three)
Model multi-10 (two)
6. Shure Lavalier Mike -- Model 570

Lens, lens setting, lighting, props, and backdrop remained constant during the recording of all lessons. Standardization of hardware and software was maintained during all experimental conditions in the pilot study and experimental study.

Reliability Assessment of Videotaped Postures

Reliability of all postural positions displayed by the instructor in the five videotaped lessons was tested. Five volunteers from the advanced graduate seminar at East Tennessee State University were trained by the experimenter to identify extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting postures in accordance with the established criteria for these degrees of postural relaxation.

Upon mastery of this skill, the evaluators were presented 25 10-second segments of the five videotaped lessons which were ultimately presented to the experimental group of tenth-graders. The five original videotapes were partitioned into 10-second segments and assigned a number. Five 10-second segments were randomly selected from each experimental condition. The order of presentation for the 25 segments was in addition randomly determined.

Each 10-second segment of videotaped instruction was edited onto one videotape. A 10-second section, containing a black screen and an audio recording of the segment number, separated each of the 25 sample segments. These videotaped segments of instruction were presented to the evaluators without audio. Appendix E contains a copy of the criteria for each degree of postural relaxation given to the evaluators and the checksheet for rating the 25 10-second videotaped segments.

Reliability for each videotaped experimental condition was determined by totaling the number of evaluator agreements and dividing that sum by the number of agreements plus the number of disagreements.

$$\text{Reliability} = \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}}$$

For the purpose of the study, an acceptable reliability coefficient of .80 was established. A reliability coefficient of 1.00 was obtained for each of the five videotaped postures. Appendix F presents the reliability data of the videotaped postures.

Pilot Test for Intratest and Intertest Similarity

A pilot study was conducted by the researcher using the content of the five lessons and the accompanying posttests described previously. The investigator chose to use subjects from a different population than the proposed study. This was done in order to avoid any contamination of the results of the present study. The volunteer pilot group of tenth-grade subjects was comprised of five males and five females. Subjects were randomly selected from a study hall at a second local high school. The pilot test was designed to determine intratest and intertest similarity of the five posttests.

The pilot group was presented the same instructions, lesson content, and tests as were later employed in the final experiment. The same hardware and software were utilized for the pilot group. However, the videotaped instruction did not include a display of the five degrees of postural relaxation. The video track of the presented instruction included only a bust shot of the instructor throughout the five lessons. Appendix G contains a table of the pilot group's raw scores.

Chi square was utilized in presenting, analyzing, and interpreting the pilot data for test similarity. A five-by-two chi square analysis was concluded at the $p < .05$ level of significance. The obtained chi square factor of 1.3 was not significant. Intratest and intertest similarity data obtained in the pilot study appear in Appendix H.

Procedures

In order to facilitate the administration of the study, the intact group of subjects was subdivided into two groups. All subjects were randomly assigned to a subgroup. Each subject participated in the study during one half of the first school period. The subjects in each of the two subgroups were instructed via the intercommunications system of the high school to report to the classroom in which the experiment was to take place.

As the subjects entered the room, they were invited by an adult male volunteer monitor to select a seat. When all subjects were seated, the monitor moved to the front and center of the experimental group and provided the initial instructions. Appendix I contains the monitor's instructions to the students. The monitor then distributed one copy of the test (face down) and one pencil per subject.

Following the monitor's instructions, the videotape recorder was started. Additional instructions were presented to the subjects via the audio track of the videotape. Concurrently, the video track of the tape displayed the graphic "Instructions." The instructions were followed by a black screen and no audio for 10 seconds. One lesson was then presented. Upon termination of the lesson, instructions necessary for test administration were delivered by the videotape recording. Instructions were

presented according to the procedure previously described. At this time, the subjects completed the test. Appendix C contains duplicates of the tests which were administered at the conclusion of each videotaped instructional unit.

During the experiment, the task of the subjects was to react to the stimuli of the videotaped instruction. The response task of the subjects was to complete a true-false test consisting of 20 items contained in the lesson following each of five lessons. All lessons were 7 minutes in length, and subjects were allotted a maximum of 15 minutes to complete each test. Subjects participated in one session per week for five weeks. The data for the study were gathered during each Tuesday of five successive weeks, beginning in March, 1979.

Chapter 4

RESULTS AND DISCUSSION

Results

A selected group of tenth-graders from an Upper East Tennessee school were tested in order to determine the influence of instructor modeled postural positions on task performance. Each subject was presented instruction by a lecturer modeling each of the postures identified as: extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed.

Post-instructional test scores on economics provided the basic data for the present study. The raw scores consisting of the number of correct responses to five twenty-item true-false tests for the five experimental treatments are arrayed in Appendix J.

These data were keypunched into IBM 80-column cards and read into the IBM 370/135 memory bank operating under the DOS/VS system at the East Tennessee State University Computer Center. They were analyzed by an SPSS (Statistical Package for the Social Sciences) which computed t test and breakdown procedures of the data.

The mean test scores for five instructor modeled postural positions are shown in Table 3. Variance profile scores for males, females, and the total group are displayed in Appendix K. Data collected from the study were analyzed by an application of repeated measures and independent samples t tests to all possible combinations of postural treatments.

Table 3

Comparison of Mean Scores of Five Instructor Modeled Postural Positions for Males, Females, and Total Group

Subjects	Treatments				
	Moderately Relaxed X_1	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
Males	15.38	15.63	15.63	14.38	14.21
Females	14.24	13.90	13.81	12.05	12.67
Total	14.84	14.82	14.78	13.29	13.49

Two null hypotheses were tested in the study. The first null hypothesis was tested for significant difference at the .05 level:

H_{01} : There will be no significant differences in the mean scores on tests of subject content after each treatment of extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting postures within the intact group.

Intact Group $X_1 O_1 X_2 O_2 X_3 O_3 X_4 O_4 X_5 O_5$

The total group's test variances, means, and t values for all possible postural pair combinations are contained in Table 4. As an example, comparisons are made between conditions X_1 and X_2 , X_1 and X_3 , X_1 and X_4 , X_1 and X_5 . Table 5 presents a summary matrix of t values for the total group.

An examination of the test scores revealed that the mean score for the total group in the moderately relaxed postural presentation was 14.84 and 13.29 (Table 4) in the extremely tense postural presentation. The t value of 3.91 was significant at the .001 level. Mean scores for the

Table 4

Total Group Test Variances, Means, and t Values for
Five Instructor Modeled Postural Positions

Treatment	N	Variance	Mean	t Value
Moderately Relaxed X ₁	45	6.907	14.84	0.05
Extremely Relaxed X ₂	45	7.513	14.82	
Moderately Relaxed X ₁	45	6.907	14.84	0.18
Slightly Tense X ₃	45	6.404	14.78	
Moderately Relaxed X ₁	45	6.907	14.84	3.91**
Extremely Tense X ₄	45	5.437	13.29	
Moderately Relaxed X ₁	45	6.907	14.84	2.93*
Slightly Relaxed X ₅	45	6.847	13.49	
Extremely Relaxed X ₂	45	7.513	14.82	0.13
Slightly Tense X ₃	45	6.404	14.78	
Extremely Relaxed X ₂	45	7.513	14.82	3.93**
Extremely Tense X ₄	45	5.437	13.29	
Extremely Relaxed X ₂	45	7.513	14.82	3.14*
Slightly Relaxed X ₅	45	6.847	13.49	
Slightly Tense X ₃	45	6.404	14.78	4.41**
Extremely Tense X ₄	45	5.437	13.29	
Slightly Tense X ₃	45	6.404	14.78	3.38*
Slightly Relaxed X ₅	45	6.847	13.49	
Extremely Tense X ₄	45	5.437	13.29	0.50
Slightly Relaxed X ₅	45	6.847	13.29	

* P < .01

** P < .001

df=44

total group also indicated that test performance following the instructional presentation by an instructor modeling a moderately relaxed posture was significantly superior to the slightly relaxed presentation. The mean scores were 14.84 and 13.49 respectively, and the t value of 2.93 was significant at the .01 level.

Table 5
Summary Matrix of t Values for Five Instructor
Modeled Postural Positions for Total Group

	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
Moderately Relaxed X_1	0.05	0.18	3.91**	2.93*
Extremely Relaxed X_2		0.13	3.93**	3.14*
Slightly Tense X_3			4.41**	3.38*
Extremely Tense X_4				0.50

* $P < .01$

** $P < .001$

df=44

Examination of the test scores disclosed that the mean score for the total group in the extremely relaxed postural presentation was 14.82 and 13.29 (Table 4) in the extremely tense postural presentation. The t value of 3.93 was different at the .001 level of significance. Mean scores for the total group also revealed that test performance on lesson content presented by an instructor modeling an extremely relaxed posture was significantly superior than in the slightly relaxed posture. The mean scores were 14.82 and 13.49 respectively, and the t value of 3.14 at the .01 level was significantly different.

The mean test score for the total group in the slightly tense

postural presentation was 14.78 and 13.29 (Table 4) in the extremely tense postural presentation. The t value of 4.41 was significant at the .001 level. Total group mean scores also indicated that test performance following the instructional presentation by an instructor modeling a slightly tense posture was significantly higher than in the slightly relaxed posture. The mean score for the slightly tense posture treatment phase was 14.78, while 13.49 was the mean score for the slightly relaxed posture. A t value of 3.38 was significant at the .01 level.

The first null hypothesis was rejected. However, data indicated that total intact group mean scores were significantly lower when presented lesson content by an instructor modeling an extremely tense posture as compared with instruction presented in a moderately relaxed, extremely relaxed, and slightly tense posture. Learner achievement was also significantly less in the slightly relaxed posture when contrasted with achievement during the moderately relaxed, extremely relaxed, and slightly tense treatment phases. Mean test scores reached their apex during the moderately relaxed postural phase and declined to the lowest level during the extremely tense experimental phase.

The second null hypothesis was tested for statistical difference at the .05 level of significance:

H_{02} : There will be no significant difference in the mean scores on tests of subject content between male and female students who are instructed by a communicator exhibiting an extremely tense, slightly tense, slightly relaxed, moderately relaxed, and extremely relaxed sitting posture.

Female $X_1 O_1 X_2 O_2 X_3 O_3 X_4 O_4 X_5 O_5$

Male $X_1 O_1 X_2 O_2 X_3 O_3 X_4 O_4 X_5 O_5$

Female test variances, means, and t values for all possible postural pair comparisons are contained in Table 6. A summary matrix of female t values is presented in Table 7.

An examination of test scores disclosed that the mean score for females in the moderately relaxed postural presentation was 14.24 and 12.05 (Table 6) in the extremely tense postural presentation. The t value of 4.18 was significantly different beyond the .001 level. A significant difference was also detected between treatment conditions two and four. On this occasion, females scored significantly better on the test following the extremely relaxed postural presentation (mean of 13.90) as opposed to the extremely tense presentation (mean 12.67). The t value of 3.12 was significant at the .01 level. Test scores of females on instructional content were significantly superior in the slightly tense condition when compared with scores obtained during the extremely tense postural treatment. The t value of 3.41 was significantly different at the .01 level.

Male test variances, means, and t values for all possible postural pair comparisons are contained in Table 8. A summary matrix of male t values is presented in Table 9.

The mean scores for males in the extremely relaxed postural presentation was 15.63 and 14.38 (Table 8) in the extremely tense postural presentation. The t value of 2.41 was significant at the .05 level. Mean scores for the male subjects also indicated that test performance on lesson content presented by an instructor modeling an extremely relaxed posture was significantly superior than in the slightly relaxed posture. The mean scores were 15.63 and 14.21 respectively. The t value of 2.76 at the .05 level was significantly different.

Table 6

Female Test Variances, Means, and t Values for
Five Instructor Modeled Postural Positions

Treatment	N	Variance	Mean	t Value
Moderately Relaxed X_1	21	8.891	14.24	0.48
Extremely Relaxed X_2	21	5.891	13.90	
Moderately Relaxed X_1	21	8.891	14.24	0.86
Slightly Tense X_3	21	4.862	13.81	
Moderately Relaxed X_1	21	8.891	14.24	4.18**
Extremely Tense X_4	21	3.848	12.05	
Moderately Relaxed X_1	21	8.891	14.24	2.06
Slightly Relaxed X_5	21	6.933	12.67	
Extremely Relaxed X_2	21	5.891	13.90	0.16
Slightly Tense X_3	21	4.862	13.81	
Extremely Relaxed X_2	21	5.891	13.90	3.12*
Extremely Tense X_4	21	3.848	12.05	
Extremely Relaxed X_2	21	5.891	13.90	1.74
Slightly Relaxed X_5	21	6.933	12.67	
Slightly Tense X_3	21	4.862	13.81	3.41*
Extremely Tense X_4	21	3.848	12.05	
Slightly Tense X_3	21	4.862	13.81	1.74
Slightly Relaxed X_5	21	6.933	12.67	
Extremely Tense X_4	21	3.838	12.05	1.01
Slightly Relaxed X_5	21	6.933	12.67	

* $P < .01$ ** $P < .001$

df=20

Table 7

Summary Matrix of \underline{t} Values for Five Instructor
Modeled Postural Positions for Females

	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
Moderately Relaxed X_1	0.48	0.86	4.18**	2.06
Extremely Relaxed X_2		0.16	3.12*	1.74
Slightly Tense X_3			3.41*	1.74
Extremely Tense X_4				1.01

* P < .01

** P < .001

df=20

Examination of the test scores revealed that the mean score for males in the slightly tense postural presentation was 15.63 and 14.38 (Table 8) in the extremely tense postural presentation. The \underline{t} value of 2.79 was significant at the .01 level. Mean scores for males also disclosed that test performance following the instructional presentation by an instructor modeling a slightly tense posture was significantly superior to that in the slightly relaxed posture. The mean score for the slightly tense posture was 15.63, while 14.21 was the mean score for the slightly relaxed posture. A \underline{t} value of 3.24 was significant at the .01 level.

An independent sample \underline{t} test procedure was employed to determine the statistical significance of male and female test performance in the five experimental treatments. The between-subjects analysis was conducted at the .05 level of statistical significance. Table 10 contains the test variances, means, and \underline{t} values for males and females for the five instructor modeled postural positions.

Table 8

Male Test Variances, Means, and t Values for Five
Instructor Modeled Postural Positions

Treatment	N	Variance	Mean	t Value
Moderately Relaxed X_1	24	4.853	15.38	0.45
Extremely Relaxed X_2	24	7.810	15.63	
Moderately Relaxed X_1	24	4.853	15.38	0.47
Slightly Tense X_3	24	6.419	15.63	
Moderately Relaxed X_1	24	4.853	15.38	1.74
Extremely Tense X_4	24	4.419	14.38	
Moderately Relaxed X_1	24	4.853	15.38	2.06
Slightly Relaxed X_5	24	5.911	14.21	
Extremely Relaxed X_2	24	7.810	15.63	0.0
Slightly Tense X_3	24	6.419	15.63	
Extremely Relaxed X_2	24	7.810	15.38	2.41*
Extremely Tense X_4	24	4.419	14.38	
Extremely Relaxed X_2	24	7.810	15.63	2.76*
Slightly Relaxed X_5	24	5.911	14.21	
Slightly Tense X_3	24	6.419	15.63	2.79**
Extremely Tense X_4	24	4.419	14.38	
Slightly Tense X_3	24	6.419	15.53	3.24**
Slightly Relaxed X_5	24	5.911	14.21	
Extremely Tense X_4	24	4.419	14.38	0.32
Slightly Relaxed X_5	24	5.911	14.21	

* $P < .05$ ** $P < .01$

df=23

Table 9
Summary Matrix of \underline{t} Values for Five Instructor
Modeled Postural Positions for Males

	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
Moderately Relaxed X_1	0.45	0.47	1.74	2.06
Extremely Relaxed X_2		0.0	2.41*	2.76*
Slightly Tense X_3			2.79**	3.24**
Extremely Tense X_4				0.32

* P < .05

** P < .01

df=23

Test mean scores for the males were significantly superior to test mean scores for females in the extremely relaxed, slightly relaxed, extremely tense, and slightly relaxed experimental conditions. An examination of the data indicated that males achieved a mean score of 15.63 (Table 10) for the extremely relaxed presentation, while the female mean score was 13.90. The calculated \underline{t} value of 2.19 was significant at the .05 level. The slightly tense treatment yielded a mean score for males of 15.63 and a mean score for females of 13.81. At the .05 level of significance, the \underline{t} value of 2.55 significantly different. The mean score for males in the extremely tense treatment was 14.38, and the mean score for females was 12.05. The obtained \underline{t} value of 3.82 was significant at the .001 level. Again, the mean test score for males (14.21) was significantly higher than that of females (12.67) during the slightly relaxed treatment phase. The corresponding \underline{t} value of 2.04 was significant at the .05 level.

Table 10

Test Variances, Means, and t Values for Males and
Females for Five Instructor Modeled
Postural Positions

Male and Female Subjects	Treatment	N	Variance	Mean	t Value
Moderately Relaxed					
Male	X_1	24	4.853	15.38	1.47
Female	X_1	21	8.891	14.24	
Extremely Relaxed					
Male	X_2	24	7.810	15.63	2.19*
Female	X_2	21	5.891	13.90	
Slightly Tense					
Male	X_3	24	6.419	15.63	2.55*
Female	X_3	21	4.862	13.81	
Extremely Tense					
Male	X_4	24	4.419	14.38	3.82**
Female	X_4	21	3.848	12.05	
Slightly Relaxed					
Male	X_5	24	5.911	14.21	2.04*
Female	X_5	21	6.933	12.67	

* $P < .05$ ** $P < .001$

df=43

The second null hypothesis was rejected. However, data analysis indicated that the mean score for females in the extremely tense condition was significantly lower than those in the moderately relaxed, extremely relaxed, and slightly tense treatment phases. The mean test score for males presented instruction in an extremely tense posture was significantly less than those obtained in the extremely relaxed and slightly tense postural presentations. Males also scored significantly lower in the slightly relaxed condition when compared with test performances during the extremely relaxed and slightly tense phases of experimental intervention. Females did not exhibit significant differences of mean test scores in the slightly relaxed condition.

Mean test scores for males reached the highest level when instruction was presented in an extremely relaxed and slightly tense posture, while females were highest in the moderately relaxed phase. Task performance of males was lowest during the slightly relaxed condition, and female achievement was most depressed when instruction was presented in the extremely tense mode. In every instance, mean test scores of males were superior to mean test scores of females, and significantly so during the extremely relaxed, slightly tense, extremely tense, and slightly relaxed postural presentations.

Discussion

An entire sophomore class from one Upper East Tennessee school was selected in order to determine the effects of teaching effectiveness of variations of instructor modeled postural positions. Each subject was exposed to instruction presented by a lecturer modeling each of five postures identified as: extremely tense, slightly tense, slightly relaxed,

moderately relaxed, and extremely relaxed. The order of assignment of instructor modeled postural positions to the five lessons was random. Immediately following the viewing of each of these videotaped lessons, 7 minutes in duration, each subject was administered a true-false test composed of 20 items. All test items were restricted to only instructional content presented in the specified videotaped lesson. Test score means were statistically analyzed utilizing the t test for repeated measures and independent samples. Test scores for those not participating in all five experimental treatments were discarded from the study. Experimental mortality over the five-week session reduced the original population of 69 students to 45 upon termination of the study.

The intent of the study was to determine if instructor modeled postural positions influence instructional test scores of selected tenth-grade students. Two null hypotheses were constructed in order to determine these effects on the total intact group and on males and females. The comparisons made in analyzing the two null hypotheses resulted in a partial rejection of those hypotheses.

Findings of significant differences of test score means for the total group, due to presenting instruction from various postural positions, lend credence to the effectiveness of posture as a form of nonverbal communication. Analysis of the data for the total intact group clearly demonstrated that when compared to a moderately relaxed, extremely relaxed, and slightly tense posture, instruction presented in an extremely tense posture was significantly less effective. Total group test scores on subject content presented in a slightly relaxed posture were significantly inferior to test scores resultant of instruction presented in the moderately relaxed, extremely relaxed, and slightly

tense postures.

Suggestions referred to in the review of related literature indicated that a curvilinear relationship exists between a receiver's perception of a communicator and the modeled posture. Therefore, positive or approach responses may be correlated with less extreme postures, and negative or nonreceptive responses may be correlated with the extreme postures. Total group results in this study only partially substantiated this proposition.

Of particular interest was the chronological order of postural exposures. The initial significant differences occurred with combinations of the extremely tense posture (fourth treatment) and previous treatments of moderately relaxed, extremely relaxed, and slightly tense postures. The fifth treatment, consisting of a slightly relaxed posture, revealed test scores which were significantly less than those of the first three treatment phases. Conjecture into the sequential order of postural presentation is not inappropriate in order to explain the apparent discrepancies in test performance of the slightly relaxed presentation with the moderately relaxed, extremely relaxed, and slightly tense postures. In effect, post-extremely tense postural biasing may have negatively influenced attending to a slightly relaxed postural presentation.

Organismic variables revealed differences in test scores of males and females for various degrees of postural relaxation. Test mean scores of females disclosed a significantly inferior performance to instruction presented in the extremely tense posture when contrasted with moderately relaxed, extremely relaxed, and slightly tense postures. No significant difference was evidenced between test scores of instruction presented in an extremely tense posture and a slightly relaxed posture. Evidence of

a significant difference between the fifth treatment of a slightly relaxed posture and moderately relaxed, extremely relaxed, and slightly tense postures was not found. Mean test scores of females were greatest in the moderately relaxed condition and lowest in the extremely tense experimental treatment phase.

Test scores of males, similar to those of females, reflected task performance for the extremely tense postural presentation as significantly poorer than in the extremely relaxed and slightly tense postures. No significant difference was observed between extremely tense and moderately relaxed postural test scores. Contrasted with test scores of females, the mean test score for males during the slightly relaxed postural instruction was significantly less than those achieved in the treatments of extremely relaxed and slightly tense posture. Test mean scores of males reached their apex in both the extremely relaxed and slightly tense conditions. The lowest mean score was recorded in the slightly relaxed postural treatment. Chronologically, the extremely tense condition preceded the slightly relaxed treatment phase.

Throughout all experimental conditions, test mean scores for males were higher than those of females in the corresponding postures. Mean test scores for males were significantly higher at the .05 level in the extremely relaxed, slightly tense, extremely tense, and slightly relaxed postural conditions.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Nonverbal behavior and its relationship to communication has captivated the attention of social scientists in recent years. A disproportionate amount of the research into this phenomenon has been conducted by clinical psychologists. Only recently have educators attended to the possible influence of nonverbal behavior on learning in the classroom environment.

An accompanying phenomenon of nonverbal research has been the organization and specialization of nonverbal substructures, of which kinesic behavior is a component. Posture analysis, has been incorporated into kinesic research. Although there exists a great disparity in methods of investigation and subsequent interpretations derived from data, researchers do agree that kinesic behavior may be potentially communicative.

Psychoanalytic interpretations of nonverbal behavior attempted to correlate postural behavior with psychological states. Postural behavior has been manipulated to alter an individual's temperament. The interaction of verbal behavior and postural behavior was determined to be real. Evidence was provided to suggest the bodily posture may be independent of facial cues and interrelated with deception cues. More specific to this study, the extent of postural relaxation or its absence thereof was identified as a significant factor in the formulation of perceived

interpretations of nonverbal behavior. Posture has been related to both attitude and status. The preponderance of research suggested that a curvilinear relationship existed between attitude and postural degrees of relaxation, with postural extremes eliciting negative responses and slight or moderate postures eliciting more positive attitudes. Perceptions of postural behavior differed among sex as males tended to react more favorably to excessive nonverbal behavior.

Only recently have educators become involved in the investigation of nonverbal behavior relative to the classroom environment. Many educational studies were concerned with the quantity and kinds of nonverbal interactions as they occurred in the classroom, without experimental manipulation of variables. Quantitative and qualitative variations of teacher communicated nonverbal behavior were related to student IQ, sex, social class, age, and race. In general, a paucity of research dealing with the effects of nonverbal behavior in the classroom was extant.

The intent of this study was to determine if instructor modeled postural positions influence instructional test scores of selected tenth-grade students.

An intact group consisting of tenth-grade students comprising the entire sophomore class was selected from one Upper East Tennessee school. As a result of experimental mortality the original group of 69 tenth-graders was reduced in number by 24, with a resultant experimental group of 45 students at the termination of the study. Subjects were randomly assigned to one of two subgroups to facilitate administration of experimental treatment. All subjects were exposed to five instructional videotaped lessons, each of which depicted an instructor modeling one of the following postures: extremely tense, slightly tense, slightly

relaxed, moderately relaxed, and extremely relaxed.

Economics was chosen as the instructional content for the series of five lessons. Videotape was selected as the medium for instructional presentation in order to achieve consistency of postural and presentational aspects. The experimenter designed and produced the lesson series for videotape transmission. Each lesson was presented by an instructor modeling one of the five postural positions. All videotaped postures incorporated into the lessons were assessed for reliability of conformance to the established postural criteria. Intratest and intertest similarity were determined in a pilot test situation.

A volunteer monitor administered the videotaped instruction to the intact group of tenth-graders. Duration of each lesson was 7 minutes. The subjects participated in one lesson each week on five successive Tuesdays. Immediately following each lesson, each subject completed a 20-item true-false test on the lesson content.

Differences between the total intact group, female, and male means of five test scores for the five experimental conditions were tested for statistical significance by the t test. The .05 level of significance was adopted in all cases.

Results

Results of the data analysis indicated that total group mean scores for subjects presented instruction in the extremely tense and slightly relaxed postural positions were significantly lower than mean scores of the moderately relaxed, extremely relaxed, and slightly tense conditions. The greatest mean test score for the total group occurred in the moderately relaxed treatment phase, while the lowest mean test score was manifest

during the extremely tense phase.

A breakdown of mean test scores by sex disclosed many significant differences within and between the male and female population. Mean test scores of females revealed that test performance during the extremely tense postural treatment was significantly lower than during the moderately relaxed, extremely relaxed, and slightly tense experimental conditions. There was no significant difference of mean test scores during the extremely tense and slightly relaxed postural treatment phases. Mean test scores of females were greatest in the moderately relaxed condition and lowest in the extremely tense experimental treatment phase.

Analysis of mean scores of males revealed significantly lower performance during the extremely tense postural presentation when compared with test scores in the extremely relaxed and slightly tense phases of treatment. No significant difference was indicated between extremely tense and moderately relaxed treatment conditions. Unlike females, males achieved a significantly lower mean test score during instructional presentation in the slightly relaxed postural position when compared with mean scores of the extremely relaxed and slightly tense postural conditions. Test means for males were largest in both the extremely relaxed and slightly tense experimental conditions, and lowest in the slightly relaxed postural phase.

Throughout all experimental conditions, mean test scores for males were higher than mean scores for females in the corresponding treatment phase. Mean test scores for males were significantly higher when presented instruction modeled by the lecturer in extremely relaxed, slightly tense, extremely tense and slightly relaxed postural positions.

Conclusions

The results of the experiment provided evidence that postures which are maintained by an instructor while presenting lesson content influence learner performance in a classroom environment. Lesson content which is presented in a manner which can be characterized as extremely tense is detrimental to learner achievement. A more relaxing classroom environment may be beneficial to learning. The suggestion that the negative effects of an extremely tense postural presentation may generalize to additional learning environments is proposed. Learner bias, resultant of instruction being presented in an extremely tense manner, may negatively influence future learner achievement under conditions which are not tense. The duration of learner bias may be differential in sexes, being more enduring with males than with females. The possibility that the sex of the instructor may have led to a differential response of males and females is proposed. Of special significance to this study is the ordering of postural presentations which could possibly affect performance of subsequent instructional presentations in differing postural modes.

Recommendations

As a result of the study it was recommended that:

1. additional studies be made varying the order of postural presentation to determine the effects of presentational order on performance of male and female students.
2. research be engaged in to determine the influence of the sex of the instructor in modeling various postures on the performance of male and female students.
3. additional studies be made using postural relaxation concepts

with students at age levels different from those of this study.

4. research be conducted to determine the prolonged effects of presenting instructional material in various postural positions.

5. exploration be made to assess the effects of a "live" instructor modeling various postural positions on student performance in classroom situations.

6. research be conducted to determine the effects of various instructor modeled postures on performance of differing socioeconomic, racial, and ethnic groups.

7. professionals, charged with the responsibility of training teachers, be cognizant of and apply the principles of nonverbal behavior within the domain of teacher training institutions and in-service education.

8. the same study be replicated to determine the validity of the findings described in the present study.

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APPENDIXES

APPENDIX A

INFORMED CONSENT FORM

East Tennessee State University
Institutional Review Board

Informed Consent Form

PRINCIPAL INVESTIGATOR: Robert L. Bower

TITLE OF PROJECT: INSTRUCTOR MODELED POSTURAL POSITIONS AND THEIR
INFLUENCE ON INSTRUCTIONAL TEST SCORES OF TENTH-GRADE STUDENTS

- 1) Indicated below are the (a) purpose of this study, (b) the procedure to be followed and (c) the approximate duration of this study.

The problem of the study is to determine the effectiveness of various teaching styles incorporating videotaped instruction. A series of five seven-minute lessons reflecting these teaching styles will be presented to the students. Following the instruction, the students will complete a written true-false test on the lesson content. Students will participate 30 minutes per day, 1 day per week, for 5 weeks.

- 2) Discomforts, inconveniences and/or risks that can be reasonably expected are:

None

- 3) I understand the procedures to be used in this study and the possible risks involved. All my questions have been answered. I also understand that while my rights and privacy will be maintained, the Secretary of the Department of Health, Education and Welfare does have free access to any information obtained in this study should it become necessary and I freely and voluntarily choose to participate. I understand that I may withdraw at any time without prejudice to me.

Date

Signature of Volunteer

Date

Signature of Parents or Guardian
(when applicable)

January 10, 1979
Date

Robert L. Bower
Signature of Investigator

Date

Signature of Witness (if applicable)

APPENDIX B

INSTRUCTIONAL TELEVISION SCRIPTS

Script: Lesson 1

Visual	Narration
"Instructions"	<p>Good day students, thank you for volunteering your time to help us. You are participating in a series of instructional lessons. One lesson will be presented each week for five weeks. We are developing a series of lessons and tests. Your cooperation in assisting us is greatly appreciated. In order for us to have accurate results, it is important that you be present each week for each lesson. Immediately following each lesson you will be given a short quiz. Please leave the quizzes face down until you are instructed to turn them over.</p> <p>I would like you to do as well on each quiz as possible. I would also ask you that you do not take notes during the lesson. If you would like to know your quiz scores, I will be happy to provide them after all five quizzes have been taken.</p>
Instructor modeled moderately relaxed posture	<p>Today we will look at the cycle that occurs in our economy. Our economy is continually changing. Sometimes it is improving, and other times it is getting worse. Economic improvement is called</p>

Visual**Narration**

growth, and economic worsening is called decline. Historically, the growth of the economy has been lengthy and gradual, where the declines have been sharper and shorter. The results of this growth have been more jobs and better living conditions.

Before the industrial era, hard times could be traced to obvious causes such as wars, revolutions, plagues and famine. Things have become more complicated in the last 200 years. In the U.S. the establishment of national banks, and more recently the Federal Reserve System, were designed to eliminate the causes of financial panics--and they have helped. Still we have periods of ups and downs or growth and decline.

Since World War I, there have been 13 periods of growth. These periods of excessive growth have set the stage for major downturns in the economy. The most notable downturn was the Great Depression of 1929, where corrections for excessive economic growth were made at great economic costs. We have experienced a severe slump as recently as 1973. After recovery has been made, economists begin to

Visual**Narration**

project the next decline. You see, there is no sure cure for business declines.

There are five main stages which make up the modern business cycle. They are recovery, gathering speed, restraining the boom, downturn, and fighting the recession.

The recovery stage begins when the economic decline or recession ends. Businesses have many plants and machines which are not being used. It is easy to find skilled workers, because they have not been employed. Costs have been cut and inventories are at a bare minimum. Credit is easy to get. Federal taxes have probably been cut. The government has increased spending programs trying to get more money back into the economy. At this time investors are buying into the stock market and stock prices are beginning to go up.

The second stage is called "gathering speed." During this stage business begins to expand. Consumers, or buyers, and companies are more confident and will spend and borrow more money. They

Visual**Narration**

make purchases which they could not afford to make during the recession. The companies are now getting more orders, which means that they are producing more products. In order to make more goods, they must hire more workers. Companies must also buy more raw materials. Raw materials are those ingredients which are required to make the final products. Stores or retailers find that they must have bigger inventories.

Builders are building more houses because home loans are cheaper and easier to get. Government spending is still growing from programs that were started during the downturn. There is little worry about the large amount of government spending, because people will be earning more money. This means they will be paying more taxes. Taxes are used to pay for government spending.

Facilities which remained unused during the decline are now put to use. Businesses begin to invest in new equipment and buy new plants. People no longer look back at the economic decline, but look ahead to economic growth.

Visual**Narration**

Let's now move to stage three in the economic cycle. It is called "restraining the boom." A boom refers to rapid economic growth. This is where things start to go wrong. During this time, some companies can't keep up with the demand for their products. Shortages develop. Because of the shortages, items become more valuable and prices go up. The President will try to reduce the government debt and Congress tries to keep the popular spending programs.

The demand for credit grows and as it does, interest rates, which are costs for borrowing money, increase. The Federal government is caught in the bind of encouraging economic growth, but trying to make sure the economy does not grow too fast. The Federal Reserve System tries to hold credit back in an effort to prevent a runaway boom. This results in higher interest rates.

As interest rates increase, money is pulled out of the mortgage market. Now speculative builders find it increasingly more difficult to sell houses. This situation leaves many of the houses unsold.

Visual**Narration**

Consumers are beginning to spend less rapidly, and this leaves merchants with more goods than they can sell. Because of this situation merchants order less goods from the producers.

This leads us into the fourth stage of the economic cycle which is called the "downturn." Because merchants order less, producers are forced to reduce production and lay off employees. These layed off workers must tighten their budget and spend less money, because they have no income. New capital investments of producers become less attractive. As consumer demand falters, production decreases and unemployment spreads. More people suffer a drop in income. Investors lose confidence and demand shrinks further. A recession or economic decline is underway.

Fighting the recession, which is the fifth stage in the economic cycle, begins. Businesses who have accumulated large and excessive inventories begin to reduce them. Costs are cutback and debts are paid off. During this stage, it is not unusual for many companies to go bankrupt. More

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cooperation between the White House and Congress is seen as they try to increase demand and make money more plentiful. Here lies the controversy concerning government involvement in the economy. Many experts say that the government must correct the situation, while others say that the government should not interfere with business. Some say that government regulation of the economy has caused more problems than it has solved.

As of yet no one has found a way to keep the economy of going through these stages of growth and decline.

"Instructions"

You will have 15 minutes to complete the quiz. You will not be permitted to ask the monitor any questions concerning the quiz. When you have completed the quiz, write the time which is shown on the clock located beside the television. A space is provided for time below your name. After writing the time on the quiz sheet, give the quiz to the monitor and return to your classroom.

The grade you make on this quiz will in no way affect your grades at this school. However, I

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would like you to do your best. At this time turn your quiz over and print your first and last name in the space provided at the top of your paper. You may now begin.

Script: Lesson 2

Visual	Narration
"Instructions"	<p>Good day students, thank you for volunteering your time to help us. You are participating in a series of instructional lessons. One lesson will be presented each week for five weeks. We are developing a series of lessons and tests. Your cooperation in assisting us is greatly appreciated. In order for us to have accurate results, it is important that you be present each week for each lesson. Immediately following each lesson you will be given a short quiz. Please leave the quizzes face down until you are instructed to turn them over.</p> <p>I would like you to do as well on each quiz as possible. I would also ask you that you do not take notes during the lesson. If you would like to know your quiz scores, I will be happy to provide them after all five quizzes have been taken.</p>
Instructor modeled extremely relaxed posture	<p>Today we are going to talk about business corporations and how they fit into the economy. Generations ago, a family could produce most of the food, equipment, and clothing that they needed. This is</p>

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no longer true. Today each person plays a specialized role in the network of producers and consumers. Business bring together raw materials, workers, machinery, and money to make a product or sell a service. Presently, there are about 14 million American firms making all kinds of products and providing many services. A business enterprise can be as simple as one person or as complex as a giant corporation. If these businesses want to succeed, they must provide goods or services that consumers want, at prices they will pay, and product them efficiently enough to make a product.

A business begins with an entrepreneur. An entrepreneur is a person who sees a need, figures a way to meet it, and is willing to take a risk to make money. The business can be in with the development or invention of a new product. Or it can be a matter of seeing new ways to combine existing products and methods. This second way is similar to the Henry Ford story. Henry Ford did not invent the car, but he developed the assembly line method of production in order to produce more and cheaper cars.

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The reason for developing business is profit. A profit is the motivating factor which causes people to take an investment risk. There are two ways for determining profit. The first method of determining profit is called profit margin. Profit margin refers to the amount the business clears on each dollar of sales. The second method of determining profit is called return on investment. Return on investment relates the profit to the amount of money that is invested in the business.

In our society, the large corporation dominates the business side of our economy. About 54 percent of all sales and three-fourths of all products are accounted for by 500 of America's largest companies. The largest of these in terms of sales is General Motors.

The corporation is preferred by investors when dealing in large amounts of money. There is a very good reason for this. The law says that if a corporation goes bankrupt, the owners may lose all their money invested, but they cannot be made to pay any unpaid debts. A corporation's ownership

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is divided into shares of stock that are sold to investors. Investors buy stock in hopes of receiving profit that the corporation will make. This profit is paid to stock shareholders in the form called dividends. Shareholders hope to make money in another way, that is the value of each share of stock will increase beyond the price they paid.

When investors purchase shares of a corporation's stock, the business gets this money. The company uses the money received from the sale of stock for buying new plants and equipment, and paying off loans and bills. As long as the company makes profits on their products or services, investors will purchase stock.

Competition among companies determines the kinds and prices of marketed products. Even in large corporations like Ford Motor or IBM, competition causes them to cut prices, develop new and improved products and stage sales to keep their share of the market.

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At times companies have made agreements in order to reduce competition. This led to fixing prices at a high level and driving out newer and weaker competitors. Federal antitrust laws have been passed to prevent these kinds of unfair practices. The old Standard Oil Company was broken up to end its monopoly over the oil industry. Monopoly refers to a business which has control over a particular product or service.

Today the average American family buys more goods and services than ever before. This is because the productivity of the American worker has increased over the years. The number of goods or services produced by the worker in an hour on the job has gone up at a rate of almost 3 percent a year over the long run. There are several reasons for the increase in productivity. First, workers are more educated today. Another reason is that inventions have led to more efficient methods of production. Each year new ideas are put into action in businesses all over America. Thirdly, sometimes new and cheaper resources of raw materials are found and used.

Visual**Narration**

In order to get these new ideas put into use large amounts of money must be available to the company. How does the corporation get the money needed? We've already mentioned one method and that is people buying stocks directly. Investors can buy stocks knowingly through a stockbroker. Other times people are involved in stocks without really knowing it. Premiums which we pay when we buy life insurance are invested by the life insurance company into corporate stocks. Money which is set aside for worker pension plans is also invested in stock.

Today there is a growing gap between ownership and control of corporations. Corporations have become so large that no one owns more than a small fraction of it. Therefore, the investors who own just a few shares of stock have little voting control over the corporation when it comes to electing boards of directors or influencing policy. This means that management usually controls the company. If management can control from 20 to 30 percent of the shares, it will usually be able to do what it wants.

Visual**Narration**

The board of directors is the group which determines the policies of a corporation. The power of individual shareholders to change management, if it is going a poor job, is not very great. One thing they can do is to sell their stock in the company, but if the company is not doing a good job the investor may take a loss. Another way out is called the "takeover offer." Some other company may want to buy the business for its own use. If this happens, a very good offer will be made to the stockholder for selling his stock and the owner of the stock stands to make a large profit. This has happened many times in recent years, and it has caused many corporations to "clean house" and make sure that they look after the stockholder's interests.

"Instructions"

You will have 15 minutes to complete the quiz. You will not be permitted to ask the monitor any questions concerning the quiz. When you have completed the quiz, write the time which is shown on the clock located beside the television. A space is provided for time below your name. After writing the time on the quiz sheet, give the quiz to the monitor and return to your classroom.

Visual**Narration**

The grade you make on this quiz will in no way affect your grades at this school. However, I would like you to do your best. At this time turn your quiz over and print your first and last name in the space provided at the top of your paper. You may now begin.

Script: Lesson 3

Visual	Narration
"Instructions"	<p>Good day students, thank you for volunteering your time to help us. You are participating in a series of instructional lessons. One lesson will be presented each week for five weeks. We are developing a series of lessons and tests. Your cooperation in assisting us is greatly appreciated. In order for us to have accurate results, it is important that you be present each week for each lesson. Immediately following each lesson you will be given a short quiz. Please leave the quizzes face down until you are instructed to turn them over.</p> <p>I would like you to do as well on each quiz as possible. I would also ask you that you do not take notes during the lesson. If you would like to know your quiz scores, I will be happy to provide them after all five quizzes have been taken.</p>
Instructor modeled slightly tense posture	<p>Today we are going to talk about money--what it is and where it comes from. Money is anything that performs these three functions:</p> <ol style="list-style-type: none"> <li data-bbox="662 1838 1438 1936">1. It is generally acceptable in exchange for goods and services.

Visual**Narration**

2. It is the yardstick by which the value of other things are measured.
3. It is a convenient form for saving purchasing power.

Money may take on many forms. Beads, furs, and tobacco have been used as money in the past. Gold and silver have commonly served as money because of their scarcity and durability. Today money mainly consists of currency, coins, and checking accounts. Checkbook money makes up three-fourths of the active money supply. At the beginning of 1978 there was about 335 billion dollars in U.S. money, with over 247 billion in checkbook money. The money supply continues to grow as the economy grows. Where does this money come from? According to our Constitution, the federal government has the sole authority to mint coins and to determine their value. The Federal Reserve System was set up by Congress to create a flexible money supply. This was done to end financial panics which were caused by money supply shortages.

The Federal Reserve System determines the amount of money created. These decisions are based on trends

Visual**Narration**

in industrial production, employment, inflation, trade, and the money supply. There are many steps which are involved in the process of creating money. Many banks belong to the Federal Reserve System. These banks must keep deposits at the Federal Reserve Banks. Right now, banks belonging to the Federal Reserve System must deposit 15 percent of the new funds in a district Federal Reserve Bank. There are 12 Federal Reserve Banks in the United States.

If the Federal Reserve decides to expand the money supply, it sends instructions to the open market desk at the Federal Reserve Bank of New York. The New York Federal Reserve Bank buys \$100 million in Treasury bills from a securities dealer and pays with a check. The dealer deposits the check into bank A. \$100 million have been added to the supply. Bank A puts 15 percent or \$15 million into reserve (remember, a bank which belong to the Federal Reserve System must deposit 15 percent of new funds into the Federal Reserve Bank). After the \$15 million has been put into reserve, it loans the remaining \$85 million. Again 15 percent of the \$85

Visual**Narration**

million must be put in reserve and the remainder is again loaned creating still more money. By the time the process is complete (when all \$100 million has been deposited in reserve) \$600 million has been added to the supply.

The production of coins and bills is carried out at specified locations. Coins are produced by U.S. mints in Philadelphia, Denver, and San Francisco. Bills are printed by the Bureau of Engraving in Washington.

Interest rates also affect the money supply. Interest rates are prices charged by lenders to those who borrow money. The Federal Reserve System influences interest rates which you would pay for a loan. This is done by changing the discount rate. The discount rate is the interest that commercial banks must pay to borrow from the Federal Reserve System. If interest rates are high it may become less attractive for commercial banks to borrow. In turn this influences the ability of the bank to add to its deposits and make loans. Interest rates have risen drastically

Visual**Narration**

during the 1970's. This is because of inflation. In order to make the same percentage of loans in real terms, the bank must increase the cost for borrowed money.

The dollar does not have real backing (like gold or silver). Before 1971, foreign held dollars could be exchanged for gold. The result was a steady decrease in the gold supply, as foreign countries exchanged their dollars for gold. The dollar can no longer be exchanged for gold by foreign countries. American citizens lost the exchange right long before.

The dollar value around the world largely depends on the extent to which people are willing to accept it in exchange for goods and services. Recently, the value of the dollar has steadily declined throughout the world. While the value of the dollar has declined, the price of gold continues to increase. Many countries would much rather own gold than currency, including U.S. dollars. In an emergency, no matter what happens to the value of any currency, gold will still be valuable. The

Visual**Narration**

U.S.'s policy is to reduce the importance of gold in the world's monetary system. Although the dollar is not backed by gold, it is backed by the assets of the Reserve System. The real backing is the taxing authority of the federal government. The government can increase the flow or decrease the flow of money coming into the treasury by increasing taxes.

The job of the Federal Reserve System is to manage the monetary system. This is easier said than done. The Reserve System must be sure to maintain a delicate balance of money supply. If it does not create enough money, it becomes difficult and expensive to borrow money. Consumer and industrial spending and investing are reduced. If reductions become too great, the economy will go into a recession. On the other hand, if the money supply increases too quickly, borrowing becomes easier. People will bid for more goods and services than industry can supply. Shortages occur and prices increase. Economists call it "too much money chasing too few goods." We call it inflation.

Visual**Narration**

Some economists have blamed the Federal Reserve for causing inflation and recession with their manipulating of the money supply. As a result, these economists say that the government should keep the money supply growing at a steady rate and not keep shifting between tight and easy money policies.

"Instructions"

You will have 15 minutes to complete the quiz. You will not be permitted to ask the monitor any questions concerning the quiz. When you have completed the quiz, write the time which is shown on the clock located beside the television. A space is provided for time below your name. After writing the time on the quiz sheet, give the quiz to the monitor and return to your classroom.

The grade you make on this quiz will in no way affect your grades at this school. However, I would like you to do your best. At this time turn your quiz over and print your first and last name in the space provided at the top of your paper. You may now begin.

Script: Lesson 4

Visual	Narration
"Instructions"	<p>Good day students, thank you for volunteering your time to help us. You are participating in a series of instructional lessons. One lesson will be presented each week for five weeks. We are developing a series of lessons and tests. Your cooperation in assisting us is greatly appreciated. In order for us to have accurate results, it is important that you be present each week for each lesson. Immediately following each lesson you will be given a short quiz. Please leave the quizzes face down until you are instructed to turn them over.</p> <p>I would like you to do as well on each quiz as possible. I would also ask you that you do not take notes during the lesson. If you would like to know your quiz scores, I will be happy to provide them after all five quizzes have been taken.</p>
Instructor modeled extremely tense posture	<p>Today we will look at the stock market and see how it effects the economy. The stock market is very important to the economy as it tells us how business is faring. It serves as a gauge of the</p>

Visual**Narration**

nation's economic health. Not only does the stock market reflect the ups and downs of business, but it also influences how well or poorly business will do.

One reason the stock market is so important, is that it represents a huge amount of wealth. Over 25 million people and institutions invest in the stock market. Institutions such as pension funds, insurance companies, and bank trust departments hold stock for many more millions of people.

The New York Stock Exchange lists 26.2 billion shares of stock for trading. If each share of stock would increase just \$1, investors would be richer by 26.2 billion dollars.

Even people who do not own stocks look at the stock market to see how business is doing. If the stock market is increasing, they feel more confident and may spend more money. When the market is declining, the public becomes cautious and will not spend.

Visual**Narration**

There is another effect of the stock market's influence. If a company's stock is rising, it is more likely to issue more shares to raise money for expansion and modernization of plants. This will increase business and the number of jobs in the economy.

What determines the price at which a stock will sell? First of all, we need to look at the reason people buy stock. It is very simple. People buy stock to make a profit. The typical buyer of stock looks for two types of profit. One type of profit an individual can receive is called a dividend. This is a fraction of the corporation's profit that is paid to all stockholders for each share of stock they own. Secondly, the investor hopes to make a profit by selling his stock at a higher price than he paid for it.

When we buy stock in hopes of selling it at a higher price, we are saying that we have faith that the company will make even more profits than it did in the past. An indication of the strength

Visual**Narration**

of a company is seen in the company's price-earnings ratio. By looking at the price-earnings ratio we can in part determine the potential price of the stock. The price-earnings ratio is determined by dividing the market price of the stock by the earnings per share for the previous twelve months. As an example, a stock selling at twenty dollars and earning two dollars per share has a price-earnings ratio of 10. If the ratio is too high, the stock may be overvalued. If the ratio is lower, it may indicate that the stock is underpriced and would make a good investment. In terms of price-earnings ratio, stocks are now cheaper than they have been since World War II.

Almost any unexpected event which may change the business outlook will cause the price of stock to change. If corporate earnings were expected to go up and they go down, or if a new product turns out to be a dud, the price of that stock will go down. On the other hand, if profits unexpectedly go up or if a major invention has been announced, the price of the stock will go up. The Securities

Visual**Narration**

and Exchange Commission polices the stock market to make sure that companies do not lie in their reports or to prevent other illegal or unfair practices.

How do you go about buying stock? First, you go to a local broker and place an order. You must tell him how many shares to buy, what stock to buy, and at what price to pay for the stock. The local broker phones the order through the main office to the brokerage's member on the floor of the exchange. The exchange is a common location where stocks are bought and sold. He must find someone who is selling the stock and agree on the price. In order for stock to exchange hands there must be a buyer and a seller. If there are more people who want to buy than sell, the stock price will go up. The reverse happens if there are more sellers than buyers, and the price will go down. When a deal is made, the buyer has five days to pay for the stock, and the seller has five days to deliver the stock to the broker. The transaction is then completed.

Visual**Narration**

Not everyone makes money in the stock market. In fact there are more people who lose money than make money in the market. In order for someone to make a profit on stock, someone else has to take a loss.

What makes investing even more difficult is that many things influence the price of stock that the company has no control over. Broad economic trends influence the market. If the economy as a whole is going poorly, the stock of a company may fall-- even if it is making a good profit. When the economic outlook is uncertain, investors hold back from buying stocks.

Most money that corporations get from investors comes through borrowing. This borrowing is done by selling bonds. A bond is a note to repay a loan with interest within a specified period of time. The price of bonds is affected most by interest rates. As interest rates increase, investors are more attracted to buying bonds.

Individual investors can buy bonds, but the majority of bonds are purchased by large pension

Visual	Narration
	<p>funds, banks and insurance firms. There is a very good reason for this. Most bonds are sold in denominations of \$1,000. Few individual investors have large amounts of money to invest. The average price of stock on the New York Stock Exchange is \$29. There are more people who can afford this smaller kind of investment. Bonds are an attractive investment because they are a safe investment. A corporation must pay interest and principle due on bonds before it can pay dividends on its stock. If the corporation goes broke, bond-holders are among the first to be paid,--stockholders are among the last. If there is no money left, stockholders are not paid and they lose their investment.</p>
"Instructions"	<p>You will have 15 minutes to complete the quiz. You will not be permitted to ask the monitor any questions concerning the quiz. When you have completed the quiz, write the time which is shown on the clock located beside the television. A space is provided for time below your name. After writing the time on the quiz sheet, give the quiz to the monitor and return to your classroom.</p>

Visual**Narration**

The grade you make on this quiz will in no way affect your grades at this school. However, I would like you to do your best. At this time turn your quiz over and print your first and last name in the space provided at the top of your paper. You may now begin.

Script: Lesson 5

Visual	Narration
"Instructions"	<p>Good day students, thank you for volunteering your time to help us. You are participating in a series of instructional lessons. One lesson will be presented each week for five weeks. We are developing a series of lessons and tests. Your cooperation in assisting us is greatly appreciated. In order for us to have accurate results, it is important that you be present each week for each lesson. Immediately following each lesson you will be given a short quiz. Please leave the quizzes face down until you are instructed to turn them over.</p> <p>I would like you to do as well on each quiz as possible. I would also ask you that you do not take notes during the lesson. If you would like to know your quiz scores, I will be happy to provide them after all five quizzes have been taken.</p>
<p>Instructor modeled slightly relaxed posture</p>	<p>Today we are going to look at the role of labor unions and how they effect the economy. Nearly one out of every four workers belongs to a union. In recent years the rate of workers belonging to</p>

Visual**Narration**

unions has decreased from 26.3 percent to 23.72 percent. Still the unions continue to have a major impact on the U.S. economy.

In fact, when unionized workers sign a contract with a company, identical benefits are given to the nonunion workers. Some economists estimate that the pay of as many as 20 million nonunion workers is tied directly to union wage levels. Income of still more workers is affected by union contracts. Sometimes a nonunion company often raises the wages its workers in line with union wages. This is done to keep the workers from wanting to join a union.

The main role of organized labor is collective bargaining. Collective bargaining is a process where workers, through a union, negotiate with employers about wages and working conditions. At the latest count, 194,726 agreements were in force between managements and unions. Bargaining can be conducted with individual companies, individual plants, or throughout an industry on a regional or national basis. The coal and steel industry

Visual**Narration**

negotiates as a whole. But usually bargaining is done with a single company.

Union leaders are elected by the union membership. The leader will remain in that position only as long as the membership is satisfied with the job he is doing. If he is doing a poor job, chances are he will not remain as leader. Members have the right to decide whether an agreement is satisfactory or not. This is done by a democratic vote. If they decide not to ratify the contract, more negotiations will be necessary until an agreement is accepted by the union membership.

The ultimate weapon of the union is the strike. A strike is a work stoppage. Negotiations is a cat-and-mouse game. If the union is weak, management bargains from a position of strength. The union will take what it can get. Even when the union is strong and most workers belong, the union is limited. For example a strike may occur in one plant of which the company has thirty strikers. If this happens, production can be increased at the other plants to make up for the strike in the single plant.

Visual**Narration**

Ironically, the union leader can be too successful in bargaining. This happened in the construction industry in the early 1970s. Wages and working conditions were so expensive that nonunion building firms became cheaper. Because the non-union building firms could build the same structure for less, they received more construction contracts. Craftsmen belonging to unions became unemployed. After this happened, unions began agreeing to much smaller pay raises.

In the past, labor contracts were primarily concerned with increasing hourly or weekly wages. This is no longer the case. Fringe benefits have become a major concern. In fact, fringe benefits amount to about one-third of the wages in the private sector. During the last ten years, fringes increased about twice as much as total pay. This has made the contract negotiating process more difficult.

When agreements cannot be reached a strike usually occurs. Strikes can sometimes be good for the employer and the union. The strike will force

Visual**Narration**

each side (union and management) to consider the issues. As a strike continues both sides may reconsider and become a little more agreeable. This may help both sides to agree on the contract.

Do workers really gain from collective bargaining agreements? Figures show that normally, union workers receive higher wages than nonunion workers. But the union worker is also more likely to become unemployed longer than the nonunion worker.

Unions have been criticized for causing inflation. Inflation is the continual rise in prices. This criticism is particularly strong in the coal and steel unions where contracts are negotiated on an industry wide basis. Sometimes, union work rules protect jobs--this is especially true in the railroads. Management claims these rules keep workers on the job when there is no longer need for them, which in turn lowers productivity and increases prices. Another strong criticism of unions has been the corruption of the union leadership. Some union leaders use gangster tactics and terrorize employers and even their own employees during the period of

Visual**Narration**

contract negotiation. Other union leaders have been investigated for stealing millions of dollars from the union pension fund--which is paid for by union members. Some leaders have also increased their own salaries tremendously. For these reasons, unions like corporations have come under federal regulation.

Many economists say that unions are not the major source of inflation in the U.S. today. During the 1950s and early 1960s, inflation was small. At that time unions accounted for a larger part of the labor force, and they were more militant. These economists say that the government's management of the budget and money supply is the chief cause of inflation. The government plays an influential role in collective bargaining. The National Labor Relations Act of 1935 is the corner-structure on which the unions rest. Workers have the right to organize. Employers must also bargain in good faith. Limits have been placed on companies in regard to what they can do to discourage union membership. Limits have also been placed on the powers of union officials.

Visual**Narration**

The AFL-CIO is a national federation of over 114 trade unions. The largest union is the Teamsters. The AFL-CIO's major role is to foster a healthy political climate for unions. It favors federal spending and job training programs that will lower unemployment. It is currently pushing for a national health insurance. This would mean the unions could quit bargaining for these fringe benefits and concentrate on other gains.

"Instructions"

You will have 15 minutes to complete the quiz. You will not be permitted to ask the monitor any questions concerning the quiz. When you have completed the quiz, write the time which is shown on the clock located beside the television. A space is provided for time below your name. After writing the time on the quiz sheet, give the quiz to the monitor and return to your classroom.

The grade you make on this quiz will in no way affect your grades at this school. However, I would like you to do your best. At this time turn your quiz over and print your first and last name in the space provided at the top of your paper. You may now begin.

APPENDIX C

TEST ITEMS

Name: _____, _____
 last first

Time: _____

Directions: Label true statements with a "T" and false statements with a "F"

Test 1

- _____ 1. It is difficult to find skilled workers during the recovery phase of the economy.
- _____ 2. During the stage that the recession is being fought, businesses tend to reduce their inventories.
- _____ 3. When the downturn phase of the cycle begins, producers become more interested in making new investments in order to produce more.
- _____ 4. Credit is hard to get during the recovery stage of the cycle.
- _____ 5. Top economists have designed a system which has eliminated business declines.
- _____ 6. The recovery stage begins when the recession has ended.
- _____ 7. When the economy is gathering speed, stores usually reduce their inventories.
- _____ 8. As the demand for credit grows, interest rates decrease.
- _____ 9. Since World War I, the U.S. has experienced more than 10 periods of growth.
- _____ 10. As the economy gather speed, people still tend to look back at the decline rather than to look ahead to future growth.
- _____ 11. As the economy begins to gather speed, consumers tend to borrow more money than before.
- _____ 12. Americans will pay more federal taxes to pay for more government spending as the economy is in the gathering speed stage.
- _____ 13. When the boom is being restrained, merchants have more goods than they can sell.
- _____ 14. When the economy is gathering speed, product shortages develop.
- _____ 15. Historically, business declines have been shorter and more gradual than growth stages.
- _____ 16. The purpose of the Federal Reserve System was to reduce financial panics.
- _____ 17. The President will try to reduce government debt and Congress will try to keep spending programs during the restraining the boom phase.
- _____ 18. Our economy continually changes from periods of growth to decline.
- _____ 19. We call those materials used by manufacturers to make final products "consumed materials."
- _____ 20. Wars were listed as a cause of hard times before the industrial era.

Name: _____, _____
 last first

Time: _____

Directions: Label true statements with a "T" and false statements with a "F"

Test 2

- _____ 1. When a corporation goes bankrupt, individual owners cannot be made to pay unpaid debts.
- _____ 2. During the "takeover offer" the stock owner stands to lose most of his investment.
- _____ 3. The board of directors is the group which determines the policies of a corporation.
- _____ 4. The profit which the corporation pays to its stockholders is called "sharing interest."
- _____ 5. Although many large corporations exist in the U.S., most of the business is conducted by the smaller local businesses.
- _____ 6. In terms of sales, General Motors is the largest corporation in the U.S.
- _____ 7. American businesses do not and have not made secret agreements in order to reduce competition.
- _____ 8. Individual investors have little voting control when it comes to electing boards of directors.
- _____ 9. Return on investment relates the amount of profit to the amount of money that is invested.
- _____ 10. Even with the advantages of technology, the average productivity of today's worker has decreased.
- _____ 11. One way a company can get money is to sell stock.
- _____ 12. The Standard Oil Company once had a monopoly on the oil industry, until the federal government broke it up.
- _____ 13. Management can usually get its way if it controls as little as 20% to 30% of the votes.
- _____ 14. It is illegal to invest funds, which have been set aside for pension plans, into the stock market.
- _____ 15. A business begins with an entrepreneur who takes a risk to make money.
- _____ 16. Profit margin refers to the total annual profits on each individual item sold.
- _____ 17. Today there is a growing gap between ownership and control of corporations.
- _____ 18. A business enterprise must be comprised of at least two people.
- _____ 19. Competition affects the prices and products of smaller companies, but it does not affect a company as large as IBM or Kodak.
- _____ 20. Henry Ford invented the car and then developed the assembly line in order to produce more and cheaper cars.

Name: _____
 last first

Time: _____

Directions: Label true statements with a "T" and false statements with a "F"

Test 3

- _____ 1. There are 12 Federal Reserve Banks in the U.S.
- _____ 2. Many economists say that the Federal Reserve should not manipulate the money system, but instead let it grow at a steady rate.
- _____ 3. When the money supply becomes tight, people will bid for more goods and services than industry can supply.
- _____ 4. About \$300 million will actually be added to the money supply when the Federal Reserve adds an initial \$100 million.
- _____ 5. Decisions made by the Federal Reserve concerning the amount of money created are based on industrial production.
- _____ 6. Banks belonging to the Federal Reserve System must deposit at least 20% of new funds in a Federal Reserve Bank.
- _____ 7. The discount rate is the rate that a borrower must pay a commercial bank for borrowed money.
- _____ 8. Gold is the real backing for the U.S. dollar.
- _____ 9. The Federal Reserve System determines the amount of money created.
- _____ 10. The dollar does not have real backing.
- _____ 11. Coins are produced at U.S. mints in Philadelphia, Denver, and San Francisco.
- _____ 12. Interest rates have risen drastically during the 1970s in the U.S.
- _____ 13. It becomes difficult to borrow money when the money supply is low.
- _____ 14. Foreign countries who hold U.S. dollars can exchange the dollars for gold.
- _____ 15. Money can take on many forms.
- _____ 16. Even though the economy grows, the money supply is kept the same.
- _____ 17. Countries would rather hold gold than currencies.
- _____ 18. Currency is a convenient form for saving purchasing power.
- _____ 19. The Federal Reserve does not try to influence the interest rates which you would pay for a loan.
- _____ 20. Checkbook money makes up approximately one fourth of the active money system.

Name: _____, _____
 last first

Time: _____

Directions: Label true statements with a "T" and false statements with a "F"

Test 4

- _____ 1. In terms of price-earnings ratio, stocks are slightly more expensive than they have been since World War II.
- _____ 2. If the corporation goes broke, stockholders are among the first to be paid.
- _____ 3. Unlike stocks, the majority of bonds are purchased by the individual investor.
- _____ 4. Almost any unexpected event which may change business outlook will cause the price of stock to change.
- _____ 5. The price-earnings ratio is determined by dividing the market price of the stock by the earnings per share for the past 12 months.
- _____ 6. If the ratio is high, the stock may be overvalued, if it is low, it may be undervalued.
- _____ 7. The "exchange" is a common location where stocks are bought and sold.
- _____ 8. Most of the corporation's borrowing is done by selling stock.
- _____ 9. When we buy stock in hopes of selling it at a profit, we have faith that the corporation will make more profits than in the past.
- _____ 10. The buyer has 10 days to pay for the stock, and the seller has 10 days to deliver the stock.
- _____ 11. The New York Exchange Commission polices the stock market to make sure corporations do not use illegal or unfair practices.
- _____ 12. If there are more buyers than sellers, the price of the stock will go up.
- _____ 13. As interest rates increase, bonds become a more attractive buy.
- _____ 14. The reason people invest in the stock market is that there are more investors who make money than lose money.
- _____ 15. There are about 15 million people and institutions who invest in the stock market.
- _____ 16. The fact that a company may issue more shares of stock does not affect the actual number of jobs in the economy.
- _____ 17. When the general economy is doing poorly, the price of stock will go down even if the corporation is making a good profit.
- _____ 18. The stock market does reflect the ups and downs of the economy, but it has little influence on how business will do in the future.

- _____ 19. When ordering stock from a broker, all you really need to tell him is: how many shares to buy, what stock to buy, and the price to pay.
- _____ 20. The New York Stock Exchange lists over 25 billion shares of stock for trading.

Name: _____
 last first

Time: _____

Directions: Label true statements with a "T" and false statements with a "F"

Test 5

- _____ 1. Union leaders can be too successful in bargaining a contract.
- _____ 2. The largest union in the U.S. is the Teamsters.
- _____ 3. According to federal law, employers may not be required to bargain in good faith.
- _____ 4. Unions have always tried to get contracts with the largest pay raises possible for their members.
- _____ 5. When union leaders negotiate a contract agreement, it becomes binding for the membership.
- _____ 6. The ultimate weapon of the union is the strike.
- _____ 7. Normally, nonunion workers receive higher wages than union workers.
- _____ 8. Many economists say that unions are not the major cause of inflation.
- _____ 9. Bargaining can be done with individual companies or on an industrial or nationwide basis.
- _____ 10. Coal and steel unions usually negotiate contracts with individual companies or plants.
- _____ 11. Unions emphasize fringe benefits more than pay raises when negotiating new contracts.
- _____ 12. The nonunion worker is likely to become unemployed more often than the union worker.
- _____ 13. Unions are less militant today than they were in the 1960s.
- _____ 14. Because of union rules, there are fewer jobs in the railroad industry than there were in the 1950s.
- _____ 15. In recent years, the rate of workers belonging to unions has increased dramatically.
- _____ 16. Collective bargaining is the secondary role of organized labor.
- _____ 17. Unions and corporations are both under federal regulation.
- _____ 18. Nearly 1 out of every 4 workers belongs to a union today.
- _____ 19. A strike can be good for both an employer and a union.
- _____ 20. Nonunion workers of a company seldom receive benefits from a union contract.

APPENDIX D

CONTENT VALIDITY OF TEST ITEMS

Content Validity of Test Items: Lesson 1

Test Item	Script Narration
1. It is difficult to find skilled workers during the recovery phase of the economy.	It is easy to find skilled workers, because they have not been employed.
2. During the stage that the recession is being fought, businesses tend to reduce their inventories.	Businesses who have accumulated large and excessive inventories begin to reduce them.
3. When the downturn phase of the cycle begins, producers become more interested in making new capital investments in order to produce more.	New capital investments of producers become less attractive.
4. Credit is hard to get during the recovery stage of the cycle.	Credit is easy to get.
5. Top economists have designed a system which has eliminated business declines.	After recovery has been made, economists begin to project the next decline. You see, there is no sure cure for business declines.
6. The recovery stage begins when the recession has ended.	The recovery stage begins when the economic decline or recession ends.
7. When the economy is gathering speed, stores usually reduce their inventories.	Stores and retailers find that they must have bigger inventories.
8. As the demand for credit grows, interest rates decrease.	The demand for credit grows and as it does interest rates which, are costs for borrowing money, increase.
9. Since World War I, the U.S. has experienced more than 10 periods of growth.	Since World War I, there have been 13 periods of growth.

Content Validity for Test Items: Lesson 1--continued

Test Item	Script Narration
10. As the economy gathers speed, people still tend to look back at the decline rather than look ahead to future growth.	People no longer look back at the economic decline, but look ahead to economic growth.
11. As the economy begins to gather speed, consumers tend to borrow more money than before.	Consumers, or buyers, and companies are more confident and will spend and borrow more money.
12. Americans will pay more federal taxes to pay for more government spending as the economy is gathering speed.	There is little worry about the large amount of government spending, because people will be earning more money. This means they will be paying more taxes. Taxes are used to pay for government spending.
13. When the boom is being restrained, merchants have more goods than they can sell.	Consumers are beginning to spend less rapidly, and this leaves merchants with more goods than they can sell.
14. When the economy is gathering speed, product shortages develop.	During this time, some companies can't keep up with the demand for their products. Shortages develop.
15. Historically, business declines have been shorter but more gradual than growth stages.	Historically, the economic growth of the economy has been lengthy and gradual, where the declines have been sharper and shorter.
16. The purpose of the Federal Reserve System was to reduce financial panics.	In the U.S. the establishment of national banks and more recently, the Federal Reserve System were designed to eliminate the causes of financial panic—and they have helped.

Content Validity of Test Items: Lesson 1--continued

Test Item	Script Narration
17. The President will try to reduce government debt, and Congress will try to keep spending programs during the restraining the boom phase.	The President will try to reduce the government debt, and Congress tries to keep the popular spending programs.
18. Our economy continually changes from periods of growth to decline.	Our economy is continually changing. Sometimes it is improving and other times it is getting worse. Improvement is called growth, and economic worsening is called decline.
19. We call those materials used by manufacturers to make final products "consummed materials."	Raw materials are those ingredients which are required to make the final products.
20. Wars were listed as a cause of hard times before the industrial era.	Before the industrial era, hard times could be traced to obvious causes such as wars, revolutions, plagues, and famine.

Content Validity of Test Items: Lesson 2

Test Item	Script Narration
1. When a corporation goes bankrupt, individual owners cannot be made to pay unpaid debts.	The law says that if a corporation goes bankrupt, the owners may lose all their money invested, but they cannot be made to pay any unpaid debts.
2. During the "takeover offer," the stock owner stands to lose most of his investment.	If this happens, a very good offer will be made to the stockholder for selling his stock, and the owner of the stock stands to make a large profit.
3. The board of directors is the group which determines the policies of a corporation.	The board of directors is the group which determines the policies for a corporation.
4. The profit which the corporation pays to its stockholders is called "sharing interest."	The profit is paid to stock shareholders in the form called dividends.
5. Although many large corporations exist in the U.S., most of the business is conducted by the smaller local businesses.	In our society, the large corporation dominates the business side of our economy. About 54 percent of all sales and three-fourths of all products are accounted for by 500 of America's largest companies.
6. In terms of sales, General Motors is the largest corporation in the U.S.	The largest of these in terms of sales is General Motors.
7. American businesses do not and have not made secret agreements in order to reduce competition.	At times companies have made agreements in order to reduce competition.
8. Individual investors have little voting control when it comes to electing boards of directors.	Therefore, the investors who own just a few shares of stock have little voting control over the corporation when it comes to electing board of directors or influencing policy.

Content Validity of Test Items: Lesson 2--continued

Test Item	Script Narration
9. Return on investment relates the amount of profit to the amount of money that is invested.	Return on investment relates the profit to the amount of money that is invested in the business.
10. Even with the advantages of technology, the average productivity of today's worker has decreased.	This is because the productivity of the American worker has increased over the years. The number of goods or services produced by the worker in an hour on the job has gone up at a rate of almost 3 percent a year over the long run.
11. One way a company can get money is to sell stock.	The company used the money received from the sale of stock for buying new plants and equipment, and paying off loans and bills.
12. The Standard Oil Company once had a monopoly on the oil industry until the federal government broke it up.	The old Standard Oil Company was broken up to end its monopoly over the oil industry.
13. Management can usually get its way if it controls as little as 20 to 30 percent of the votes.	If management can control from 20 to 30 percent of the shares, it will usually be able to do what it wants.
14. It is illegal to invest funds, which have been set aside for pension plans, into the stock market.	Money which is set aside for worker pension plans is also invested in stock.
15. A business begins with an entrepreneur who takes a risk to make money.	A business begins with an entrepreneur. An entrepreneur is a person who sees a need, figures a way to meet it, and is willing to take a risk to make money.

Content Validity of Test Items: Lesson 2—continued

Test Item	Script Narration
16. Profit margin refers to the total annual profits on each individual item sold.	Profit margin refers to the amount the business clears on each dollar of sales.
17. Today there is a growing gap between ownership and control of corporations.	Today there is a growing gap between ownership and control of corporations.
18. A business enterprise must be comprised of at least two people.	A business enterprise can be as simple as one person or as complex as a giant corporation.
19. Competition affects the prices and products of smaller companies, but it does not affect a company as large as IBM or Kodak.	Even in large corporations like Ford Motor or IBM, competition causes them to cut prices, develop new and improved products and stage sales to keep their share of the market.
20. Henry Ford invented the car and then developed the assembly line in order to produce more and cheaper cars.	Henry Ford did not invent the car, but he developed the assembly line method of production in order to produce more and cheaper cars.

Content Validity of Test Items: Lesson 3

Test Item	Script Narration
1. There are 12 Federal Reserve banks in the U.S.	There are 12 Federal Reserve banks in the U.S.
2. Many economists say that the Federal Reserve should manipulate the money system, but instead let it grow at a steady rate.	Some economists have blamed the Federal Reserve for causing inflation and recession with their manipulating of the money supply. As a result, these economists say that the government should keep the money supply growing at a steady rate and not keep shifting between tight and easy money policies.
3. When the money supply becomes tight, people will bid for more goods and services than industry can supply.	On the other hand, if the money supply increases too quickly, borrowing becomes easier. People will bid for more goods and services than industry can supply.
4. About \$300 million will actually be added to the money supply when the Federal Reserve adds an initial \$100 million.	By the time the process is complete (when all \$100 million have been deposited in reserve) \$600 million has been added to the supply.
5. Decisions made by the Federal Reserve System concerning the amount of money created are based on industrial production.	These decisions are based on trends in industrial production, employment, inflation, trade, and the money supply.
6. Banks belonging to the Federal Reserve System must deposit at least 20 percent of new funds in a Federal Reserve Bank.	Right now, banks belonging to the Federal Reserve System must deposit 15 percent of the new funds in a district Federal Reserve Bank.
7. Gold is the real backing for the U.S. dollar.	Although the dollar is not backed by gold, it is backed by assets of the Reserve System.

Content Validity of Test Items: Lesson 3--continued

Test Item	Script Narration
8. The discount rate is the rate that a borrower must pay a commercial bank for borrowed money.	The discount rate is the interest that commercial banks must pay to borrow from the Federal Reserve System.
9. The Federal Reserve System determines the amount of money created.	The Federal Reserve System determines the amount of money created.
10. The dollar does not have real backing.	The dollar does not have real backing--like gold or silver.
11. Coins are produced at U.S. mints in Philadelphia, Denver, and San Francisco.	Coins are produced by U.S. mints in Philadelphia, Denver, and San Francisco.
12. Interest rates have risen drastically during the 1970s in the U.S.	Interest rates have risen drastically during the 1970s.
13. It becomes difficult to borrow money when the supply is low.	If it does not create enough money, it becomes difficult and expensive to borrow money.
14. Foreign countries who hold U.S. dollars can exchange the dollars for gold.	The dollar can no longer be exchanged for gold by foreign countries.
15. Money can take on many forms.	Money may take on many forms. Beads, furs, and tobacco have been used as money in the past.
16. Even though the economy grows, the money supply is kept the same.	The money supply continues to grow as the economy grows.
17. Countries would rather hold gold than currencies.	Countries would much rather own gold than currency, including U.S. dollars.

Content Validity of Test Items: Lesson 3--continued

Test Item	Script Narration
18. Currency (money) is a convenient form of saving purchasing power.	It is a convenient form for saving purchasing power.
19. The Federal Reserve does not try to influence the interest rates which you would pay for a loan.	The Federal Reserve System influences interest rates which you would pay for a loan.
20. Checkbook money makes up approximately one-fourth of the active money system.	Checkbook money makes up three-fourths of the active money supply.

Content Validity of Test Items: Lesson 4

Test Item	Script Narration
1. In terms of price-earnings ratio, stocks are slightly more expensive than they have been since World War II.	In terms of price-earnings ratio, stocks are now cheaper than they have been since World War II.
2. If a corporation goes broke, stockholders are among the first to be paid.	If the corporation goes broke, bondholders are among the first to be paid,--stockholders are paid last.
3. Unlike stocks, the majority of bonds are purchased by the individual investors.	Individual investors can buy bonds, but the vast majority of bonds are purchased by large pension funds, banks, and insurance firms.
4. Almost any unexpected event which may change business outlook will cause the price of stock to change.	Almost any unexpected event which may change the business outlook will cause the price of stock to change.
5. The price-earnings ratio is determined by dividing the market price of the stock by the earnings per share for the past 12 months.	The price-earnings ratio is determined by dividing the market price of the stock by the earnings per share for the previous 12 months.
6. If the ratio is high the stock may be overvalued, if it is low it may be undervalued.	If the ratio is too high the stock may be overvalued. If the ratio is lower, it may indicate that the stock is underpriced and would make a good investment.
7. The "exchange" is a common location where stocks are bought and sold.	The exchange is a common location where stocks are bought and sold.
8. Most of the corporation's borrowing is done by selling stock.	Most money that corporations get from investors comes through borrowing. This borrowing is done by selling bonds.

Content Validity of Test Items: Lesson 4--continued

Test Item	Script Narration
9. When we buy stock in hopes of selling it at a profit, we have faith that the corporation will make more profits than in the past.	When we buy stock in hopes of selling it at a higher price, we are saying that we have faith that the company will make even more profits than it did in the past.
10. The buyer has 10 days to pay for the stock, and the seller has 10 days to deliver the stock.	When a deal is made, the buyer has 5 days to pay for the stock, and the seller has 5 days to deliver the stock to the broker.
11. The New York Exchange Commission polices the stock market to make sure corporations do not use illegal or unfair practices.	The Securities and Exchange Commission polices the stock market to make sure that companies do not lie in their reports or to prevent other illegal or unfair practices.
12. If there are more buyers than sellers, the price of the stock will go up.	If there are more people who want to buy than sell the stock price will go up.
13. As interest rates increase, bonds become a more attractive buy.	As interest rates increase, investors are more attracted to buying bonds.
14. The reason people invest in the stock market is that there are more investors who make money than lose money.	Not everyone makes money in the stock market. In fact there are more people who lose money than make money in the market.
15. There are about 15 million people and institutions who invest in the stock market.	Over 25 million people and institutions invest in the stock market.
16. The fact that a company may issue more shares of stock does not affect the actual number of jobs in the economy.	If a company's stock is rising, it is more likely to issue more shares to raise money for expansion and modernization of plants. This will increase business and the number of jobs in the economy.

Content Validity of Test Items: Lesson 4--continued

Test Item	Script Narration
17. When the general economy is doing poorly, the price of stock will go down even if the corporation is making a profit.	If the economy as a whole is going poorly, the stock of a company may fall--even if it is making a good profit.
18. The stock market does reflect the ups and downs of the economy, but it has little influence on how business will do in the future.	Not only does the stock market reflect the ups and downs of business, but it also influences how well or poorly business will do.
19. When ordering stock from a broker, all you really need to tell him is: how many shares to buy, what stock to buy, and the price to pay.	First you must go to a local broker and place an order. You must tell him how many shares to buy, what stock to buy, and at what price to pay for the stock.
20. The New York Stock Exchange lists over 25 billion shares of stock for trading.	The New York Stock Exchange lists 26.2 billion shares of stock for trading.

Content Validity of Test Items: Lesson 5

Test Item	Script Narration
1. Union leaders can be too successful in bargaining a contract.	Ironically, the union leader can be too successful in bargaining.
2. The largest union in the U.S. is the Teamsters.	The largest union is the Teamsters.
3. According to federal law, employers may not be required to bargain in good faith.	Employers must also bargain in good faith.
4. Unions have always tried to get contracts with the largest pay raises possible for their members.	After this had happened, unions began agreeing too much to smaller pay raises.
5. When union leaders negotiate a contract agreement, it becomes binding for the membership.	Members have the right to decide whether an agreement is satisfactory or not. This is done by a democratic vote.
6. The ultimate weapon of the union is the strike.	The ultimate weapon of the union is the strike.
7. Normally, nonunion workers receive higher wages than union members.	Figures show that normally, union workers receive higher wages than nonunion workers.
8. Many economists say that unions are not the major cause of inflation.	Many economists say that unions are not the major source of inflation in the U.S. today.
9. Bargaining can be done with individual companies or on an industrial nationwide basis.	Bargaining can be conducted with individual companies, individual plants or throughout an industry on a regional or national basis.

Content Validity of Test Items: Lesson 5--continued

Test Item	Script Narration
10. Coal and steel unions usually negotiate contracts with individual companies or plants.	This criticism is particularly strong in the coal and steel unions where contracts are negotiated on an industry wide basis.
11. Unions emphasize fringe benefits more than pay raises when negotiating new contracts.	Fringe benefits have become a major concern. In fact, fringe benefits amount to about one-third of the wages in the private sector.
12. The nonunion worker is likely to become employed more often than the union worker.	But the union worker is also more likely to become unemployed longer than the nonunion worker.
13. Unions are less militant today than they were in the 1960s.	During the 50s and 60s, inflation was small. At that time unions accounted for a larger part of the labor force and they were more militant.
14. Because of union rule, there are fewer jobs in the railroad industry.	Sometimes, union work rules protect jobs--that is especially true in the railroads.
15. In recent years, the rate of workers belonging to unions has increased dramatically.	In recent years, the rate of workers belonging to unions has decreased from 26.3 to 23.7 percent.
16. Collective bargaining is the secondary role of organized labor.	The main role of organized labor is collective bargaining.
17. Unions and corporations are both under federal regulation.	For these reasons, unions like corporations have come under federal regulations.
18. Nearly 1 out of every 4 workers belongs to a union today.	Nearly 1 out of every 4 workers belongs to a union.

Content Validity of Test Items: Lesson 5--continued

Test Item	Script Narration
19. A strike can be good for both an employer and a union.	Strikes can sometimes be good for the employer and the union.
20. Nonunion workers of a company seldom receive benefits from a union contract.	In fact, when unionized workers sign a contract with a company, identical benefits are given to the nonunion workers.

APPENDIX E

**EVALUATOR CRITERIA AND CHECKLIST FOR FIVE DEGREES
OF POSTURAL RELAXATION**

Evaluator Criteria for Five Degrees
of Postural Relaxation

Extremely Tense Posture

An extremely tense posture is one degree of the relaxation dimension of body posture. The criteria for an extremely tense sitting posture are:

Arm-Position Asymmetry - extreme symmetrical position of arms in a folded position.

Forward Lean - the plane from the communicator's shoulders to his hips is 20 degrees forward of the vertical plane.

Hand Relaxation - the hands are tightly clenched.

Leg-Position Asymmetry - symmetrical position of the legs with both feet flat on the floor and the insteps touching.

Neck Relaxation - the head is not supported and the line of vision is pointing 20 degrees above the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Slightly Tense Posture

A slightly tense posture is a degree of the relaxation dimension of body posture. The criteria for an extremely relaxed sitting posture are:

Arm-Position Asymmetry - symmetrical position of the arms while resting in the lap.

Forward Lean - the plane from the communicator's shoulders to his hips is 10 degrees forward of the vertical plane.

Hand Relaxation - the hands are loosely clasped.

Leg-Position Asymmetry - legs are symmetrically positioned with both

feet flat on the floor and insteps not touching.

Neck Relaxation - the head is not supported and the line of vision is pointing within 10 degrees above the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 0 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Slightly Relaxed Posture

A slightly relaxed posture refers to a degree of the relaxation dimension of body posture. A slightly relaxed posture is manifest by the following criteria:

Arm-Position Asymmetry - slight asymmetry in the position of the arms where both hands are resting on the lap of the communicator, with one hand from 2 to 5 inches more forward than the other.

Forward Lean - the plane from the communicator's shoulders to his hips is within 10 degrees forward from the vertical plane.

Hand Relaxation - fingers are extended but not stiffly.

Leg-Position Asymmetry - legs are in a slightly asymmetrical position with both feet resting flat on the floor and one foot 2 to 5 inches more forward than the other.

Neck Relaxation - the head is positioned so that the line of vision forms to within 10 degrees below the horizontal.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 10 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Moderately Relaxed Posture

The moderately relaxed posture is one degree of the relaxation

dimension of postural behavior. The criteria for a moderately relaxed sitting posture are:

Arm-Position Asymmetry - moderate asymmetry in the position of the arms is exhibited with one hand positioned on the knee 8 to 10 inches more forward than the other, and the elbow of the rear arm resting on the chair's arm.

Hand Relaxation - fingers are extended but not stiffly.

Leg-Position Asymmetry - legs are in a moderately asymmetrical position with one leg extended forward and the other bent at the knee.

Neck Relaxation - the head is hanging so that the line of vision forms between 10 to 20 degrees below the horizontal.

Reclining Angle - the plane from the communicator's shoulders to his hips is 15 degrees back of the vertical plane.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 20 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Extremely Relaxed Posture

An extremely relaxed posture is a degree of the relaxation dimension of body posture. The criteria for an extremely relaxed sitting posture are:

Arm-Position Asymmetry - extreme asymmetry in the position of the arms where one arm is placed in the lap while the other arm is hooked over the back of the chair.

Hand Relaxation - fingers are extended, but not stiffly.

Leg-Position Asymmetry - legs are crossed in an extremely asymmetrical position with one foot, lifted off the floor and the other foot's edge resting on the floor.

Neck Relaxation - the head is hanging so that the line of vision forms more than 20 degrees below the horizontal.

Reclining Angle - the plane from the communicator's shoulders to his hips is 30 degrees back of the vertical plane.

Sideways Lean - the plane cutting the communicator's torso bilaterally in half is 30 degrees away from the vertical (Mehrabian, 1969a; Mehrabian and Friar, 1969).

Evaluator Checklist of Five Sitting Posture Types

Directions. Based on the preceding criteria for five degrees of sitting postural relaxation, check the posture type which best corresponds to that displayed in each videotape segment. You will evaluate 25 videotape segments, each 10 seconds in length.

	Posture Type				
	Extremely tense	Slightly tense	Slightly relaxed	Moderately relaxed	Extremely relaxed
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

APPENDIX F

RELIABILITY OF VIDEOTAPED POSTURES

Table 11
Reliability of Videotaped Postures

Postural Relaxation Factor	Number of Agreement	Sum of Agreement and Disagreement	Reliability Coefficient
Extremely tense	25	25	1.0*
Slightly tense	25	25	1.0*
Slightly relaxed	25	25	1.0*
Moderately relaxed	25	25	1.0*
Extremely relaxed	25	25	1.0*

* Acceptable reliability coefficient of .80

APPENDIX G

RAW SCORES OF PILOT GROUP

Table 12

Raw Scores of Pilot Group on Five Tests of Instructional Content

Subjects	Tests										
	1		2		3		4		5		
	Test Items	Even	Odd	Even	Odd	Even	Odd	Even	Odd	Even	Odd
1		5	7	5	6	4	7	6	6	8	3
2		9	7	3	6	8	7	7	7	7	8
3		8	3	9	6	7	5	5	7	6	7
4		9	8	6	8	7	9	7	7	7	7
5		4	4	4	5	6	7	6	4	7	6
6		7	4	7	8	7	8	8	5	6	7
7		7	9	8	9	7	8	8	8	8	8
8		8	9	6	9	8	8	8	6	7	8
9		6	7	7	7	5	4	5	7	6	7
10		8	9	7	10	8	8	7	7	8	7

APPENDIX H

ANALYSIS OF INTRATEST AND INTERTEST SIMILARITY

Table 13

Chi Square Analysis of Pilot Group Data of
Intratest and Intertest Similarity^a

Test Items	Tests					Row Subtotal
	1	2	3	4	5	
Even	(68.39)	(67.4)	(68.89)	(64.92)	(68.39)	
	71	62	68	67	70	338
Odd	(69.6)	(68.6)	(70.1)	(66.08)	(69.6)	
	67	74	71	64	68	344
Column Subtotal	138	136	139	131	138	Total 682

^aExpected frequencies in parentheses.

$$\chi^2 = 1.3$$

$$df. = 4$$

$$P. < .05 = 9.488$$

APPENDIX I

MONITOR'S INSTRUCTIONS TO STUDENTS

Monitor's Instructions to Students

"Good morning. You will view a videotaped program in just a few minutes. Before the program starts, I will give each of you one pencil and one worksheet. The worksheet will be placed face down on your desk, please leave it in that position. You will receive further instructions when I start the videotape recorder. Thank you."

APPENDIX J

**TABLE OF RAW SCORES FOR FIVE INSTRUCTOR
MODELED POSTURAL POSITIONS**

Table 14

Raw Scores of Subjects for Five Instructor
Modeled Postural Positions

Subject	Sex	Treatment				
		Moderately Relaxed X_1	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
1	F	15	17	12	10	12
2	M	16	19	15	13	16
3	F	14	15	13	14	13
4	M	15	15	14	15	12
5	F	16	14	18	11	10
6	M	14	12	14	14	17
7	M	16	18	19	17	16
8	F	18	14	16	12	15
9	F	10	14	13	8	10
10	M	14	17	15	15	15
11	M	14	11	11	13	12
12	F	17	11	15	14	18
13	F	14	11	13	10	10
14	M	17	16	16	12	14
15	M	11	16	16	17	15
16	F	18	19	18	13	16
17	M	16	18	17	14	17
18	F	16	16	14	12	13
19	F	17	17	16	16	17
20	M	18	20	20	15	16
21	M	14	10	14	14	10
22	M	18	16	20	16	16
23	F	14	14	14	14	12
24	F	14	11	12	12	9
25	M	18	19	19	17	18
26	M	16	15	13	12	15
27	F	15	16	13	14	11

Table 14 (continued)

Subject	Sex	Treatment				
		Moderately Relaxed X_1	Extremely Relaxed X_2	Slightly Tense X_3	Extremely Tense X_4	Slightly Relaxed X_5
28	F	16	12	13	12	13
29	F	10	12	8	10	15
30	F	7	13	12	11	13
31	M	17	18	15	16	15
32	F	17	10	15	14	11
33	M	13	13	12	12	12
34	M	17	11	14	10	14
35	M	17	14	15	15	14
36	F	13	14	13	13	9
37	M	12	16	16	15	14
38	F	16	17	14	13	11
39	F	10	12	13	10	12
40	M	19	17	15	17	10
41	M	16	18	18	18	17
42	M	16	18	19	13	15
43	M	14	15	12	11	9
44	M	11	13	16	14	12
45	F	12	13	15	10	16

APPENDIX K

**VARIANCE PROFILE SCORES FOR FIVE INSTRUCTOR
MODELED POSTURAL POSITIONS**

Table 15

Variance Profile Scores for Five Instructor Modeled Postural Positions
for Males, Females, and Total Group

Subjects	Treatments									
	Moderately Relaxed X_1		Extremely Relaxed X_2		Slightly Tense X_3		Extremely Tense X_4		Slightly Relaxed X_5	
	VAR	SD	VAR	SD	VAR	SD	VAR	SD	VAR	SD
Males	4.853	2.203	7.810	2.795	6.419	2.534	4.419	2.102	5.911	2.431
Females	8.891	2.982	5.891	2.427	4.862	2.205	3.838	1.962	6.933	2.633
Total	6.907	2.628	7.513	2.741	6.404	2.531	5.437	2.332	6.847	2.617

VITA

VITA

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Special Instructor, College of Education, East Tennessee State University, 1977-1979.
- Publications:** Bower, R. L. A comprehensive learning event design using a communication framework. International Journal of Instructional Media, 1975-76, 3(4).
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- Bower, R. L. Hawthorne effect: To be or not to be. International Journal of Instructional Media, 1978-79, 6(2).

Professional
Memberships:

Association for Educational Communications and
Technology
Tennessee Educational Communication and Technology
Association (President 1977-1978)
Association for Behavior Analysis
Phi Delta Kappa
Kappa Delta Pi