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STUDENT ATTITUDES TOWARD INSTRUCTIONAL PROCESSES IN SECONDARY PHYSICAL EDUCATION

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STUDENT ATTITUDES TOWARD INSTRUCTIONAL PROCESSES IN SECONDARY PHYSICAL EDUCATION

by

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APPROVAL PAGE

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ABSTRACT

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The purpose of this investigation was to explore student attitudes toward instructional processes in secondary physical education. Germane to the investigation were the following research questions:

(1) Will differences exist in student attitudes according to the class in which the student is enrolled?

(2) Will attitudes differ according to the levels of nonparticipation by students in the physical education class?

(3) Will student gender be a factor in attitudinal differences about instructional processes?

(4) Will attitudinal differences toward instructional processes parallel differences among students according to first semester letter grades?

The Student Attitude Inventory for Instructional Processes in Secondary Physical Education was developed to assess student attitudes. Seventy-six inventory statements were administered to 278 male and female tenth grade physical education students. Criteria for retaining statements in the final inventory were factor loadings and final estimates of communality equal to or greater than 0.50. The final SAI-IPSPE had a test-retest reliability of 0.72.

The SAI-IPSPE was administered to 246 male and female students enrolled in eight randomly selected tenth grade physical education classes in the Cumberland County, North Carolina School System. The data

were factor analyzed with a principal axis, varimax procedure. Factor scores from selected factors were used as dependent measures. The dependent measures were analyzed via the discriminant function approach to MANOVA. Significant main effects were further analyzed utilizing the Tukey procedure to ascertain the location of significant differences in student attitudes toward instructional processes in secondary physical education. The level required for significance was set at the 0.05 level for a two-tailed test.

The data collected revealed that:

(1) The Student Attitudes Inventory for Instructional Processes in Secondary Physical Education was a valid and reliable instrument.

(2) Student attitudes toward instructional processes were significantly different according to the class in which the student was enrolled.

(3) Male and female students demonstrated significantly different attitudes about instructional processes in the secondary physical education environment.

(4) Student attitudes about instructional processes were significantly different paralleling the number of days the student failed to participate in the physical education class.

(5) Attitudes about instructional processes were not significantly different according to first semester letter grade.

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CHAPTER I

INTRODUCTION TO THE INVESTIGATION

Introduction

A major concern of educators has been the quality of the learning environment to which students are exposed. Naturally those learning environments which are conducive to inclusion, participation, and optimal opportunities for learning by students have been highly desired. It has been suggested that elements comprising the learning environment have an effect on students. Collectively, elements of the learning environment have been identified as patterns of classroom activity, organizational structure, the teacher's verbal behavior, and the interaction among the elements. An investigation into the nature of these elements (Bain 1976, 1978) revealed that female physical education teachers were significantly more private than were their male counterparts. Bain did not investigate the impact of these elements on students.

Macdonald (1969) characterized the learning environment as complex and multidimensional. He suggested that schooling has a powerful potential for impact upon students via messages implicit in the schooling medium. A learning environment, carefully constructed, could serve as a filter for undesirable messages that are potentially transmitted in a chance learning environment. That Dewey (1916) some fifty years earlier held this same position is evident in his statement that students learn indirectly through the learning environment. Dewey elaborated on the importance of a quality learning environment by stating that unless a

learning environment has been deliberately regulated, desirable outcomes will be a function of chance. A number of authorities have supported the critical necessity of carefully planning the learning environment (Macdonald, Wolfson, and Zaret, 1973; Anderson, 1971; and Dreeben, 1967). These authorities have suggested that learning is more a product of the processes in the learning environment than the subject matter itself. That is, processes such as the teacher's verbal behavior, patterns of classroom activity, and the rules and regulations governing the learning environment have a greater impact on the learner than does the subject matter content.

Sibergeld, Koenig, and Menderscheid (1975) stated that student perceptions of the classroom have an effect on student behaviors. Research has supported the hypothesis that student perceptions of the learning environment are linked to student behavior and achievement. For example, St. John (1971) noted that black students having pupil-oriented teachers demonstrate significantly improved attendance more than do white students. Moos and Moos (1978) found that classes having high absentee rates were perceived as being high in competitiveness and teacher control. Classes with lower absenteeism rates were perceived as lower in teacher control and higher in involvement.

The traditional outcomes of schooling, such as those outcomes represented by achievement tests, has been suggested as being significantly important because of their relationship to such traditional out-comes as grades received by students. It was demonstrated by Kooker (1976) and Rozelle (1968) that students who earned

lower grades had higher absentee rates. Moos and Moos (1978) indicated that

> the absenteeism rate is a particularly important intermediate out-come variable, since students are less likely to be affected by classrooms they attend less frequently. If students are absent (or for that matter elect not to participate), they cannot avail themselves of relevant learning opportunities and lose the continuity of course content which is crucial for learning. (p. 264)

Although student absenteeism is partly a function of physical symptoms of medical illness, Kiritz and Moos (1974) have demonstrated that perceptions of characteristics of the social environment are related to those symptoms. It has been substantiated (Indik, 1965, and Jenkins, 1973) that absenteeism in work settings is greater where communications between employees and supervisors are poor and where employees have little opportunity to make decisions about their work.

It has been suggested (Dreeben, 1967) that educators have focused a significant amount of research effort on the cognitive aspects of the learning environment. Research about student perceptions, per se, has been voluminous. In contrast, little research has been reported about attitudes of students toward elements comprising the learning environment.

Research has supported the hypothesis that student perceptions of the learning environment are linked to student behavior and student achievement. The manipulation of the learning environment has been suggested as a means of achieving the optimal conditions for student learning (Walberg, 1969). While Anderson (1970) agreed with the idea that classroom characteristics affect student learning, he emphasized that the elements of the learning environment result in learning according to the individual student's characteristics. Therefore, it is believed that a student's

"disposition to feel, perceive, and behave" (Kerlinger, 1973, p. 495) in a certain way toward processes in the learning environment has an impact on that student's behavior and subsequent performance.

Anderson, Walberg, and Welch (1969) stated that a primary goal of educational research has been to establish effective conditions for learning. Yamamoto, Thomas, and Karns (1969) indicated that when the topic of curriculum change arises or when endeavors are made to establish the optimal conditions for learning "children have been rather consistently left out of the recommendation making process" (p. 191). Interests and attitudes of students toward physical activity have been studied. However, according to Loughery (1978), investigations have been of little value to curriculum designers. Loughery went on to say that the "teaching action of the physical educator" is a factor which may tend to inhibit the development of positive student attitudes toward physical education. Loughery (1978) stated that

> professionals in the field who have responsibility for curriculum development and instructional technology need to be concerned with designs that will eliminate negative factors from the total program. (p. 35)

Educators have been concerned with the quality of the learning environment. It has been suggested that learning environments have a potential for teaching students which is just as significant as the subject matter. Research has indicated that instructional processes in the physical education class are value laden. The literature has pointed out that a relationship exists between grades received by students and rates of student absenteeism and student perceptions of the environment. The

importance of the noncognitive results of the schooling processes have been regarded as equally as important as those outcomes represented by traditional achievement tests.

If educators are dedicated to producing the optimum conditions for learning in the physical education class, then it appears that research endeavors must be extended beyond those investigations of student perceptions of the learning environments to investigations of students' attitudes about the learning environment. Therefore, the development of an instrument to assess student attitudes about the instructional processes in the secondary physical education environment is warranted.

The Problem

Statement of the Problem. The purpose of this investigation was to explore student attitudes toward instructional processes. The preliminary phase of the investigation was concerned with the nature of the constructs underlying student attitudes toward instructional processes.

The investigation sought to answer the following questions. (a) Will differences exist in student attitudes according to the class in which the students are enrolled? (b) Will attitudinal differences exist according to the levels of nonparticipation by students in the physical education class? (c) Will student gender be a factor in attitudinal differences about instructional processes? (d) Will attitudinal differences toward instructional processes parallel differences among students according to first semester letter grades?

Scope of the Study. This investigation was restricted to the development and utilization of an instrument to measure attitudes of secondary physical education students about the teacher's verbal behavior, the patterns of class organization, the nature of the class activities, and rules and regulations which govern the physical education environment.

Two independently and randomly drawn samples of coeducational tenth grade physical education classes comprised the sample. The initial sample was comprised of 278 male and female students drawn from nine classes. The second sample was comprised of 246 male and female students drawn from eight classes. The classes participating in the investigation were randomly drawn from a pool of 92 tenth grade physical education classes in the Cumberland County, North Carolina, School System.

The first sample was utilized to assess the factor patterns and the internal consistency of a pool of 75 inventory items. The 75 items were statements relative to instructional processes in the secondary physical education environment. In addition, the first sample was utilized to assess the reliability of the Student Attitudes Inventory for Instructional Processes in Secondary Physical Education. The second sample was used to (a) assess the stability and invariance of the underlying constructs of student attitudes toward instructional processes, (b) produce factor scores from interpretable constructs, and (c) assess multivariate differences in student attitudes toward instructional processes due to days not participating, first semester letter grade, student gender, and the students' physical education classes.

Definition of Terms

SAI-IPSPE. The acronym, SAI-IPSPE, referred to the Student Attitudes Inventory for Instructional Processes in Secondary Physical Education.

Instructional Processes. The term which referred to the teacher's verbal behavior, patterns of class organization, and rules and regulations governing the physical education environment was instructional processes.

Stability. The term "stability" of factor patterns was synomous with the replication of factors. Gorsuch (1974) defined factorial replication as the reproducing of the same factors across random samples.

Secondary Physical Education. In this investigation, secondary physical education referred to tenth grade physical education.

Days Not Participating (DNP). Days not participating and its acronym, DNP, referred to the number of days that a student did not participate in the physical education class. The term was defined in such a way as to be inclusive of students present in the class but not participating and students absent from the class.

First Semester Letter Grade (FSLG). The first semester letter grade and its acronym, FSLG, referred to the letter symbolic of the grade received by the student at the conclusion of the first two nine-week grading periods. The range of FSLG was A, B, C, D, and F.

Assumptions Underlying The Research

The following assumptions were acknowledged to underlie the research:

1. Student attitudes about instructional processes in the secondary physical education environment were sufficiently salient to be a phenomenon strong enough to be detected by a summated rating instrument.

2. Attitudes about the teacher's verbal behavior, patterns of class organization, and rules and regulations governing the physical education environment were a function of the student's perceptions of previous and present physical education experiences.

3. Outcomes, i.e., participation, nonparticipation, and grades received were influenced by one's degree of attitudinal congruence with the instructional processes in the secondary physical education environment.

4. A guarantee of anonymity would facilitate student responses to the SAI-IPSPE according to attitudes rather than what one believes to be socially acceptable.

5. All limitations and assumptions of Bain's (1976a) Implicit Values Instrument for Physical Education content items, from which the SAI-IPSPE items were framed, were valid.

6. A random cluster sample of tenth grade physical education classes would be representative of the population of tenth grade physical education students in the Cumberland County, North Carolina, School System.

Limitations of the Research

The following were acknowledged as limitations affecting the interpretation of the results of the investigation:

1. The inability of one to respond to the SAI-IPSPE in a "normal" manner due to certain temporary changes in one's emotional and/or physical characteristics were not controlled.

2. Factors such as race, intelligence, and socioeconomic status were acknowledged as contributing sources of test variance. However, those factors were not controlled in this investigation.

3. Because of the computer time cost involved, it was not feasible to study interaction effects in the analysis for differences in student attitudes.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The review of literature was concerned with (a) the nature of attitudes, (b) the hidden curriculum, and (c) the learning environment. Definitions of attitudes, dimensions of attitudes, and attitude development were reviewed. The literature about the hidden curriculum was concerned with definitions of the hidden curriculum and descriptive research about the hidden curriculum. Literature regarding the learning environment was concerned with student perceptions of the learning environment and the learning environment's impact on intermediate outcomes of the schooling processes.

The Nature of Attitudes

Definitions of Attitude. The term "attitude" has had considerable usage in the literature. Irrespective of this phenomenon, the term has not been defined uniformly in the literature reviewed. Allport (1935) alluded to the difficulty in defining attitudes by suggesting that the term is more easily measured, a point with which Dawes (1972) concurred. DeFleur and Westie (1963) stated that despite its wide usage, the concept of attitude is not uniformly defined.

The seventeenth-century literature, according to DeFleur and Westie (1963), referred to attitude as the relative position of an artist's subject to a background. Historically, the same notion has

been generalized to indicate one's mental position toward a particular referent. Examples cited by DeFleur and Westie were "one's mental position on an issue, modes of thought which characterize groups, and one's motivational predisposition toward his world." (p. 18) Similarily, Droba (1933) noted that the term "attitude" was a transliteration of the term "aptitude." Aptitude according to Droba was a term that was used by painters and sculptors. Attitude was a term much more general in its application than was the term aptitude.

A second stage of the use of the term attitude paralleled the emergence of a more exacting attempt by science to explore the "elements of consciousness." Wilhelm Wundt's, cited by Boring (1929), studies of mental preparedness, i.e., reaction time, provided examples of more systematic and scientific endeavors to explain attitudes.

A third stage in the development of contemporary concepts of attitudes paralleled the rise of social psychology. Two social psychologists (Thomas and Znaniecki,1927) defined attitude as one's relationship to some significant referent. More specifically, attitude was referred to as the sum of the processes which affect one's potential responses to his environment.

Thurstone (1928) defined an attitude as the total of one's feelings, inclinations, or (and) thought toward a particular subject. Because of the abstract nature of attitude, Thurstone postulated that the object of attitude measurement was one's verbalization of feelings, inclinations, or thought toward a particular subject.

According to Likert (1932) and Droba (1933), attitude reflects one's tendency to act in a certain manner. Likert further asserted that attitudes tend to cluster around generalized qualities. Lewis (1938) agreed stating that an attitude is "an interrelated set of opinions around a point of reference." (p. 65)

Droba (1933) categorized attitudes according to a preparation for action. The categories were (a) the organic set type, (b) general theories, (c) the behavior theory, and (d) the mental preparation theories.

The organic-set category indicated that an attitude is largely a physical preparation for action caused by one's previous experiences. Those who subscribed to the general theories category believed that "an attitude is a very general preparation for action." (p. 448) The behavior theorist indicated that an attitude is the behavior of the individual. Although similar to the organic-set and general theories, the mental preparation theory was described as different because attitude is relative to mental terms rather than to neural and motor terms.

Attitudes, according to Krech and Crutchfield (1948), are at the root of much of one's social behavior. They stated that

> attitudes can be conceived of as integration mediating between the fundamental psychological processes and action. More specifically, an attitude can be defined as an enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world. (p. 152)

Rokeach (1968) stated that the term attitude refers to permanent or more enduring organizations of predispositions. Consequently, attitude indicates one's predisposition to respond according to a preference which is rooted around a persistent organization of beliefs relative to a particular referent.

DeFleur and Westie (1968) elaborated on two conceptions of attitude, both of which are based on a stimulus-response framework. The conceptions are the probability conceptions and the latent process conceptions. The two conceptions of attitude differ with respect to the inferences that can be drawn from the behavior referent. The logical structure of attitude, according to DeFleur and Westie (1968) was that

> the primary inference implied in probability conceptions is that attitudinal responses are more or less consistent. That is, a series of responses toward a given attitudinal stimulus is more likely to show some degree of organization, structure, or predictability. (p. 21)

This being true, attitude referred to the consistency of one's response to a given referent. Therefore, the probability conceptions equated attitude "with the probability of recurrence of behavior forms of a given type or direction." (p. 21)

DeFleur and Westie (1968) referred to a second conception of attitude as the latent process view which

> begins with the fact of response consistency, but goes a step beyond this and postulates the operation of...some hypothetical variable functioning within the behaving individual, which shapes, acts upon or "mediates" the observeable behavior. (p.21)

The author seemed to be saying that the latent process view was based on the premise that the attitude is an intermediate variable which operates between the stimulus and the response. Therefore, an attitude

is the intervening variable which may be inferred from an overt behavior. The latent process concept appears to be more logical than does the stimulus-response framework.

Regarding the nebulous nature of attitudes, Blumer (1969) stated that

> the concept of attitude is empirically ambiguous...the consequence of this empirical ambiguity of the concept becomes a mere logical or ambiguous term. It becomes an unbelievably wide array of concrete instances but is void of any generic features which have been isolated through empirical study. (p. 92)

Kerlinger (1973) more than adequately synthesized recent thought regarding the concept of attitude. He defined attitude as

> an organized predisposition to think, feel, perceive, and behave toward a referent or cognitive object. It is an enduring structure of beliefs that predisposes the individual to behave selectively toward attitude referents. (pp. 495-496)

Dimensions of Attitudes. Although the literature has revealed a number of definitions for the concept of attitude, the literature has consistently supported the existence of identifiable components or dimensions of attitudes. Sherif and Sherif (1953) suggested that attitudes are comprised of cognitive, affective, and behavior components which are similar to the three domains of learning. The cognitive dimensions seemed to be most congruent with one's relatedness to conceptually relevant objects, a criterion necessary for attitude formation. Because attitudes are not neutral, Sherif and Sherif suggested that the affective dimensions of attitudes are readily apparent. Verification of the behavioral dimensions of attitudes was assumed because the "only

possible data from which an attitude can be inferred are behaviors." (p. 113) The behavioral assumption is not tenable if one believes as does Kerlinger (1973) that attitudes reflect not only a predisposition to behave in a certain way, but to feel and think in a predisposed manner.

In a discussion about the nature of attitudes, Katz (1960) postulated the existence of six dimensions of attitudes. In addition to the cognitive, affective, and behavioral dimensions, Katz went on to describe the following dimensions of attitudes: (a) the number of attitudinal links, (b) the strength of attitudinal links, and (c) the centrality of an attitude. He indicated that an attitude may be more enduring if it is tied to some value system than if the attitude is isolated. It was also thought that the attitude's relationship to one's value system is closely related to the individual's self-concept.

Zimbardo, Ebbesen, and Maslach (1977) were in agreement with Sherif and Sherif (1953) and Katz (1960) regarding the existence of the affective, behaviorial, and cognitive dimensions of attitudes. Zimbardo, et. al., defined the three dimensions as follows:

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

Favorableness, intensity, salience, generality, public, private, common, and individual were suggested as being dimensions of attitudes

by Remmers and Gage (1955). Favorableness, intensity, and salience referred to the frequency of measurement strength of feeling, and the arousal threshold. The remaining dimensions appeared to be more related to the affective dimensions as previously described. Remmers and Gage (1955) stated that attitudes lie on a continuum bounded by publicness and privateness. The implication of the continuum is that attitudes may reflect what is socially acceptable.

Attitude Development. The literature has supported the notion that attitudes are learned or acquired. It has been believed that attitudes are unique to the individual. For example, Barrow and McGee (1976) have suggested that attitudes are a sum of all the psychosocial forces acting on the individual. DeFleur and Westie (1963) alluded to "past experience, normative systems, peer groups, or to the types of social systems" as factors affecting attitudes.(p. 22) Newcomb, Turner, and Converse (1965) believed that attitude development is the filter consisting of organized, stored, and summed experience which serves to sift new situations. Rokeach (1968) theorized that attitudes result from the interaction of one's beliefs and the situations (referents) one encounters.

It has been well documented that one's encounters with new situations play an integral role in the development of attitudes. Kelman (1958) identified three processes that are influential in attitude development. Those influences are compliance, identification, and internalization. Compliance occurs when one hopes to gain a favorable

reaction from others. Similar to compliance, identification refers to one's desire to maintain a satisfying relationship with others. When one identifies, one believes in the responses he elicits. When one finds responses to be congruent with one's value system, those responses are said to be internalized. Kelman posed the following questions relative to the three influences in attitude development and/or change:

> Is it a superficial change, on a verbal level, which disappears after a short lapse of time? Or, is it a more lasting change in attitude and belief, which manifests itself in a wide range of situations and which is integrated into the person's value system? Or, to put it in other terms, did the communication produce public conformity without private acceptance, or did it produce public conformity coupled with private acceptance? (p. 51)

Social psychologists have theorized that one's attitudes are influenced by the individual's membership groups. In addition to membership groups, Sherif and Sherif (1953) maintained that reference groups influence the developing attitude. Siegal and Siegal (1957) contended that an individual's attitude change is dependent upon "the attitude norms of his membership group. . .and on the attitude norms of his reference group." (p. 360) An investigation into the validity of the aforementioned hypothesis revealed that the imposition of the nonpreferred membership group as a reference results in significant attitude change.

Integration, differentiation, shock, and adaptation were identified by Remmers (1954) as processes in attitude development. Integration involves the accumulation/summation of one's previous experience. The

development of a specific attitude from an attitude of a general nature is differentiation. Unusual, violent, or painful situations, collectively referred to as shock, can influence attitude development. Similar, Kelman's (1958) concept of compliance, Remmers indicated that adoption was an influence provided by social agents, i.e., membership groups or reference groups.

The Hidden Curriculum

Definition of the Hidden Curriculum. An issue of critical relevance to educators is what do schools teach? Within the last two decades, educators have become increasing cognizant and concerned about learning that is generally not acknowledged in either schools' stated goals, objectives, or curriculum rationales. Learning that is unintentional and not acknowledged has been thought to constitute the so-called hidden curriculum. Although a number of writers have addressed themselves to the phenomena of unintended learning and learning that is not acknowledged, Jackson (1968) was the individual who coined the term "hidden curriculum." There have been a number of definitions for the hidden curriculum advanced in the literature. However, Dickler (1976) provided a comprehensive definition of the hidden curriculum as

> what a teacher, classroom, school, school system, or any instrument or setting of education teaches without the explicit cognizance or intention of educators and which is learned or internalized, consciously or unconsciously, by the receivers or students of the corresponding setting. (p. 240)

The hidden curriculum may be comprised of a variety of norms or values depending upon the situation. The literature has supported the

notion of implicit values teaching by the schooling processes. Punctuality, silence, and productive behavior have been among the values students have learned via the hidden curriculum. Vallence (1973-74) asserted that much of the unintended teaching in the hidden curriculum was historically very much acknowledged in rationales for public education.

Viewpoints of the Hidden Curriculum. The literature has supported the existence of three views of the hidden curriculum which parallel three perspectives of educational ideology. The three views of the hidden curriculum parallel romantic educational ideology, the cultural transmission ideology, and the cognitive-developmental ideology.

Belief in the inner good of the child is a characteristic extolled by the romantics. The romantics have suggested that what comes from the child is the most important aspect of development. Therefore, the use of various techniques to instill the ideas and values of others would be meaningless and suppressive. Friedenburg (1965) suggested that the negative effects of the hidden curriculum on people is the imposition of banal, bureaucratic, and middle-class values on the student. Speaking in more specific terms about what is learned via the hidden curriculum, Friedenburg indicated that what is most learned are the assumptions which govern life for adolescents and that train them for adulthood. He went on to say that the state dictates schooling, in a particular place and under someone's authority, without regard to student interests or wishes. The romantics have viewed the hidden curriculum as negative.

According to Kohlberg and Mayer (1972) the cultural transmissionists have subscribed to the ideology that the primary function of schooling is the transmission of bodies of information, rules, and values to the present generation. More specifically, they stated that

> the educators' job is the direct instruction of such information and rules. The important emphasis, however, is not on the sanctity of the past, but on the view that educating consists of transmitting knowledge, skills, and social and moral rules to the culture. (p. 453)

Acknowledging that only a hypothetical answer could be given to the question of what is taught in schools, Dreeben (1967) concurred with the idea of the so-called socializing function of schooling. Dreeben indicated that "pupils learn to accept norms or principles of conduct and to act according to them." (p. 214) Kohlberg (1975) suggested that those who subscribe to the conservative viewpoint are cultural transmissionists.

Kohlberg and Mayer (1972) stated that those who subscribe to the progressive ideology hold that education should nourish the child's natural interaction with his environment. This interaction with the environment may cause the student to advance from one stage of development to the next higher stage. Kohlberg (1975) believed that an understanding of the progressive point of view would cause one to abdicate both the romantic and the traditional points of view of the hidden curriculum. The potential value of the hidden curriculum, according to Kohlberg, is as a vehicle for the stimulation of moral development.

Kohlberg indicated that this value can be realized only when schools, classrooms, and teachers become democratic and become "systematically engaged in civic and moral education." (p. 52)

Descriptive Research. Research has supported the contention that schooling contributes to the learning of basic assumptions, i.e., those unintended and/or acknowledged out-comes of the schooling processes. Dreeben (1967) hypothesized that "what children learn derives as much from the nature of their experiences in the school setting as from what they are taught." (p. 211) Realizing that the hidden curriculum encompasses all aspects of the school environment, Cowell (1972) conceptualized the following theoretical framework for the hidden curriculum:

The Agent Dimension

I. Methodology used in formal teaching/learning
II. Personal interaction with peers/students
III. Personal interaction with adults/teachers
IV. Structure of the school

The Content Dimension

1. Knowledge
2. The self
3. Social or intergroup interaction
4. Proper action-moral or ethical principles

The Location Dimension

A. Academic setting to which students are formally scheduled
B. Non-academic setting to which students are formally scheduled
C. Connecting or general areas in schools which students are not formally scheduled
D. Areas immediately around the schools to which students are not formally scheduled

The basis for Cowell's research were the framework dimensions (a) structure of the school, (b) knowledge, (c) self, (d) social or

group interaction, (e) proper action-moral or ethical principles, and (f) the academic setting to which students are formally scheduled. The arbitrary selection of "typical" students was an assumption that limited interpretation of the data. Cowell concluded that, in addition to Jackson's (1968) praise and power categories, the hidden curriculum could be defined in terms of arbitrariness, predictability, and distance. It was suggested that arbitrariness was a quality almost omnipresent within the school environment studied.

> There is no, or little, real rationale or justification for much of what is studied, how it is studied, where it is studied, when or how long it is studied or why it is studied. Much of what happens in schools is arbitrary, and students are often given arbitrary reasons for its happening. (p. 284)

The data appeared to support the contention that much of school life is routine and predictable. Cowell cautioned that the term "predictability" does not imply one's being able to predict what will occur in a given class, period, day, etc. He speculated that it is the predictability in schools that accounts for bored and lethargic students.

Observations revealed a quality of physical and psychological distance between the learner and much of his school endeavors. Cowell believed that students' demands for relevance in the curriculum is indicative of "distance" within the school.

Francks (1971) hypothesized that the hidden curriculum can be revealed through a study of the evaluative climate in the classroom. Francks' investigation was concerned with the impact of methodology,

and nonacademic aspects of learning on the social interaction of the student. The research represented the school structure, non-academic setting, and the proper action dimension of the organizational framework for the hidden curriculum. The sample consisted of seven third grade classes in three New York city elementary schools. Although the sample was comprised of schools whose "structures and populations reflect some general city wide patterns," (p. 20) it can not be considered to be representative of the population of elementary schools.

Data sources were observations utilizing Flander's system of interaction analysis, interviews, sociometrics, and report card entries. Data analysis indicated that crowded conditions were a part of the classrooms comprising the sample. Class sizes in the schools studied ranged from 34 to 45. The techniques and influences of evaluation seemed to be consistent, regardless of whether or not the child's personal or schooling needs were supported. The data supported the contention that evaluation was a means of control. Much of the control of students was gained via public messages from the teacher who indicated to the student how well he/she had performed. Speaking of the manner in which schools control their students Dreeben (1968) stated that

> the school, in effect, plays on his self respect. Each pupil is exposed and vulnerable to the judgments of adults in authority and of his equals. If he is not loved, the pupil wonders whether he is a worthwhile person. (p. 38)

Francks' data supported the diminished role of student peers and of the "hypertrophied" presence of the teacher. This contention was supportive of an unequal power relationship which leads to an unquestioning attitude of the student. Francks suggested that the unequal power relationship is critical to the evaluative climate. He further suggested that evaluation is solely a responsibility of the teacher and that the responsibility for evaluation is not shared with the student. It was concluded that the hidden curriculum and the characteristics of power, praise, and crowds were operating in the seven classrooms studied.

An investigation of the conceptual issues surrounding the hidden curriculum and the validation of a hidden curriculum model relative to home economics were the two questions researched by Weideman (1973). The sample was comprised of two junior high school home economics classes and one senior high school home economics class. The classes were selected on the basis of the racial makeup of the community. It appeared that Weideman's investigation paralleled the teaching methodology, adult/teacher interaction, academic setting, and intergroup interaction dimensions of Cowell's organizational framework for the hidden curriculum. Weideman's use of ethnographical techniques enabled the origin and modes of transmission perspective of the hidden curriculum to be verified. Additional data sources were informal informal interviews. The data supported Weideman's conclusion that the hidden curriculum, in general, and with respect to social stratification existed within

the schools studied. The author suggested that the term hidden curriculum is misleading "because of the awareness of some teachers and students of non-academic goals." (p. 152)

Dickler (1976) conducted an investigation to determine the evidence of the hidden curriculum in high school academic settings. The research incorporated the following dimensions from the organizational framework for the hidden curriculum: methodology, student interaction with teacher/students, school structure, proper student action, and the formally scheduled academic setting. More particularly, the study was concerned with the elements of the hidden curriculum, i.e., crowds, praise, and power in the high school academic setting. Data sources were specimen records of six English and history teachers and their students, the Lindgren and Patten Attitude Scale, random classroom observations by four trained observers, and informal interviews with teachers and students. Dickler concluded that the following are functions of crowding: (a) the designing of school activities for the masses, (b) labels which determine treatment of students, (c) forced seating arrangements, (d) cheating on tests, and (e) inhibited teacher frankness. It was also concluded that student sex was a determinant of the nature of praise and blame in the academic setting. Dickler indicated that compliance with school and classroom rules was likely to elicit praise from the teacher. It was pointed out that the teacher is often unaware of the nature of his/her verbal behavior. Conclusions

of the investigation supported the notion of the teachers' power as a controlling mechanism. For example, the teachers who participated in the investigation did not involve their students in the planning of classroom activities. Furthermore, the physical environment of the classroom, such as seating arrangements and bulletin boards, were determined solely by the teacher.

One of the earliest and most extensive investigations of the hidden curriculum was done by Jackson (1968). Two factors accounted for the extensiveness of the investigation. The research was concerned with a considerable number of dimensions from Cowell's organizational framework. The dimensions represented were (a) teaching methodology, (b) student/peer interaction, (c) teacher/adult interaction, (d) academic setting, (e) social interaction, and (f) proper action. Two years of observations of four classrooms at the University of Chicago Laboratory School and one year of observations in three California school classrooms comprised the primary data sources. Jackson identified the phenomena of crowds, evaluation, and power as the hidden curriculum. Crowded classrooms were characterized by delay, denial, and interruption. Evaluation, as observed by Jackson, was an essential element in the elementary school. Evaluation utilized by the teachers participating in the investigation ranged from private to public. Jackson delineated teacher power from parental power. Parental power tended to be prohibitive and teacher power tended to be prescriptive. Jackson asserted that children become skilled in their mastery of

school life. Children were observed learning how to cope with various aspects of the school environment.

Bain (1976a) produced the first description of the hidden curriculum in a physical education environment. Values inherent in the hidden curriculum and relevant to Bain's investigation were studied because of their occurrence in the literature and their applicability to the physical education environment. The values were inferred from dimensions I, II, III, IV, B, and 4 of the organizational framework for the hidden curriculum. The Implicit Values Instrument for Physical Education was the instrument developed to record behavioral data from which value inferences were made. Twelve male and twelve female teachers from four public secondary schools in Chicago and from four Chicago suburban public secondary schools comprised the sample for the investigation. Data analysis indicated (a) a significant difference at the 0.01 level existed between male and female classes, in favor of the female classes on the privacy dimension; (b) a significant difference at the 0.05 level existed between male and female classes, in favor of the female classes, on the specificity dimension; and (c) urban classes were significantly higher at the 0.01 level on autonomy than were suburban classes (p. 156). Bain suggested that societal sex role stereotypes may have accounted for differences that existed between male and female classes. According to Bain, the literature concurred with the finding that differences in the autonomy dimension may be attributed to location.

That differences exist in implicit values due to gender was a problem that Bain (1978) replicated in a subsequent investigation. The investigation focused on dimensions I, II, III, IV, B, and 4 of the organizational framework for the hidden curriculum. Twenty male and female physical educators and 20 male and female coaches from ten randomly selected public secondary schools comprised the sample. The data from the IVI-PE were analyzed via a two-factor analysis of variance. The analysis of variance indicated that females were significantly higher at the 0.01 level, than males on the privacy and instructional achievement dimensions. The results were partially supportive of earlier findings of Bain. However, the nonsignificant differences between males and females on the specificity dimension did not concur with earlier findings (Bain, 1976). A research design which would utilize physical education teachers who are also coaches would better control for extraneous sources of variance and would lend additional strength to the results.

Learning Environment

Much of the literature relating to the learning environment has been a product of the Harvard Physics Project, a national experiment in physics curricula. Among those responsible for the proliferation of research about the learning environment has been Herbert Walberg. Typically, the learning has been assessed utilizing an instrument designed to gather data about student perceptions of the social-emotional climate of the classroom.

Student Perceptions. Early research by Walberg (1969) investigated the influence of the classroom social environment on classroom learning. The 14 scales of the Learning Environment Inventory (LEI) were utilized to assess the social-emotional climate of the classroom environment. The sample was comprised of students from 56 randomly selected classrooms from which six measures of learning criteria were obtained. Canonical correlations were utilized to indicate the degree of relationship between the six learning measures and the LEI scales. Walberg concluded that (a) cognitive and noncognitive learning were distinctly different, (b) gains in science interest activities were related to environments perceived as Satisfying and Without Friction, Apathy, and Cliqueness, and (c) gains in physics achievement and physics understanding were related to environments perceived as Difficult. The results suggested that classes which encourage achievement and understanding are intellectually challenging yet not inhibitive of affective or behavioral learning.

Anderson, Walberg, and Welch (1969) investigated potential determinants of the social climate in high school physics classes utilizing the LEI. The sample consisting of 3,264 junior and senior high school students in 150 arbitrarily selected physics classes, was trichotomized according to (a) inexperienced teachers using an experimental physics curriculum, (b) experienced teachers using an experimental physics curriculum, and (c) experienced teachers using a traditional physics curriculum. Discriminant function analysis was utilized to test for climate differences between the three experimental conditions. A highly signi-

ficant Wilkes Lambda, 0.50, $p > 10^8$ indicated that differential effects on the climate were greater relative to the type of course rather than to teacher selectness or teacher experiences. The smallest Mahalanohis Distance, 1.12, was located between the two experimental groups. The experimental physics classes were perceived as more Diverse, less Difficult, and higher on Disorganization than were the traditional physics classes.

The utilization of teacher, student, and class characteristics as predictors of subscales of the LEI was a problem researched by Walberg and Ahlgren (1970). Four cognitive and 44 noncognitive measures were obtained from a trichotomized sample of 3700 students in 144 physics classes. The groups were trichotomized according to (a) experienced teachers in the Harvard Project Physics course, (b) inexperienced teachers in the Harvard Project Physics course, and (c) inexperienced teachers utilizing a physics course designed by the Physical Science Study Committee. Canonical correlations between the 14 LEI subscales and the cognitive tests, personality measures, biographical data, course experience effects, and two class size terms were calculated. Among the conclusions drawn were the following: (a) high cognitive pretest scores predicted a Difficult perception of the learning environment, (b) getting good marks and the importance of intelligence related to Difficulty and Satisfaction, respectively, (c) higher proportions of girls in the classes were positively related to perceptions of Difficulty and inversely related to perceptions of

Formality. The authors wisely cautioned that

> establishing that the environment...predicts cognitive and non-cognitive learning does not imply causal connections between the variables; nor can any generality of the findings be claimed beyond the population sampled. (p. 165)

An investigation by Walberg (1969) replicated a previous hypothesis that dimensions of the learning environment are valid predictors of achievement. In addition, specific LEI dimensions were thought to be related to learning. Homogeniety according to biographical characteristics was thought to be related to mean learning. IQ was thought to be a predictor of learning and class size and proportion of girls in a class were hypothesized to have no effect on learning. Drawn from pre and posttesting of 3700 students in 144 physics classes were learning environment data and measures of achievement and interest in physics, IQ, biographical information, and personality scale information. Canonical correlations were utilized to assess the relationship between dependent and independent variables. Significant correlations indicated that the LEI subscales and biographical items predicted the learning criteria. Results supported the hypothesis that class size and proportion of girls in a class have no effect on learning. Classes with the largest gains on the cognitive criteria were characterized by non-authoritarian students with high intelligent quotients who perceived the classes as Difficult. Classes with the highest gains on the noncognitive criteria were characterized as consisting of students who liked school and who perceived their classes to be without Apathy and Friction.

The learning environment has been demonstrated to have predictive validity for physics achievement. Walberg and Anderson (1972) sought to determine the predictive validity of LEI subscales in other curricular areas. Eight subject matter domains were randomly selected from 64 secondary school classes in Montreal, Canada. Random split sampling was utilized to secure perceptions of the learning environment and IQ data. Achievement criterion was the High School Leaving Examination of the Province of Quebec. Among the conclusions drawn were that (a) books, materials, and working space in the learning environment and the absence of Friction among class members appeared to be more important in mathematics, physics, and history than in biology, chemistry, geography, English literature, and French, (b) teacher sex was not related to student perceptions of the learning environment. Anderson suggested that the results were not consistent with the literature. It was indicated that sex is a component of personality and that personality has been demonstrated to be related to perceptions of class climate. Because all assumptions for the analysis of covariance were not met, one should adopt a guarded interpretation of the results.

Walberg (1968) investigated the relationship between teacher personality measures and classroom climate. The sample was comprised of 2000 junior and senior students of 36 male and female physics teachers teaching experimental physics classes. The Allport-Vernon-Lindsey Study of Values Scale, the Edwards Personal Preference Schedule, and the Minnesota Teacher Attitude Inventory were administered to the 72 teachers. Students were randomly selected to take the Classroom Cli-

mate Questionnaire. A highly significant Wilkes Lambda, 0.0001 level, and canonical correlations of 0.94, 0.93, 0.89, and 0.89 indicated intense relationships between teacher personality measures and class climate. For example, classes with Formal, Subserviant, and Cohesive climates were related to teacher needs of Dependence, Power, Order, and Change. Also Controlled and Goal directed classes were associated with teacher needs of Aggressive and Affiliative interactions with others. The third correlation suggested a teacher personality/class climate relationship similar to a combination of the first two canonical relationships. Order and Change, Aggression, and Nuturative-Affiliation teacher traits were related to classroom climates which tended to be Goal directed, Socially homogeneous, Informally organized, Subservient, and less Equalitarian. Finally, organizational Constraint, loose supervision of student work, and lower group status were climate variables associated with the self-centered teacher. The results seemed to support the hypothesis that needs values, attitudes, and personality are predictors of classroom climate.

In research to consider the effects of the social climate on different types of students Anderson (1970) hypothesized that different types of teachers, methodologies, courses, and classroom social climates are appropriate for different types of learners and different types of learning criteria. The sample was comprised of 800 students ramdomly selected from 113 classes participating in the Harvard Project Physics course. Classroom social climate was assessed via the LEI.

Pre and posttesting were utilized to assess changes in student achievement and understanding of physics. A five-step stepwise multiple regression analysis was utilized to assess the relationship between climate dimensions and interaction with characteristics of individual learning. The following conclusions were drawn: (a) Cliques aid low ability females; (b) Cliques among low ability males are escape mechanisms; (c) classroom Intimacy was positively and negatively related to high and low ability females, respectively.

The differential perceptions of people and curricula among middle-school-aged children were investigated by Yamamoto, Thomas, and Karnes (1969). A semantic differential scale was administered to a ramdomly stratified, by sex and by grade, sample of 800 sixth, seventh, eighth, and ninth grade suburban public school children. The semantic differential consisted of 12 point, bipolar scales on four concepts of people; classmates, parents, teacher, and self, and on four concepts of curriculum; social studies, language, science, and mathematics. Nine scales were utilized to represent three factors of Merit, Movement, and Security in people. Eight scales were utilized to represent two factors, Vigor and Activity in curriculum. A three-way analysis of variance revealed increasingly unfavorable curriculum ratings paralleling grade level increments. Among boys, all curricular areas except mathematics in the eighth grade were rated increasingly lower from grade to grade. Among girls, the Certainty scores increased from the sixth to the seventh grade, then decreased from the eighth to

the ninth grade. It appeared that the intent of the authors was to show trends across a continuum as opposed to differences at specific grade levels.

The investigation of differences in learning environment and intellectual variables between rural and urban students in mathematics, science, social studies, and English courses was undertaken by Randhawa and Michayluk (1975). The sample was comprised of 46 eighth grade classes and 50 eleventh grade classes. A random split sampling technique was utilized in the administration of the LEI and the Primary Mental Abilities Test. Data were analyzed via a four-factor (teacher sex, locale, grade level, and course content) multivariate analysis of variance. Teacher sex main effects or its interactions with locale, grade level, and course content were nonsignificant. This finding supported results by Anderson (1971). The multivariate analysis revealed significant differences, 0.05 level, between rural and urban classes. Rural classes were characterized by Cohesiveness, Cliqueness, Disorganization, and Competitiveness. Urban classes were characterized by Environment, Difficulty, and Satisfaction.

Bookout (1967) investigated observational patterns of teaching behavior and class climate in physical education classes. She hypothesized that classes having similar climates would be characterized by similar teaching behaviors. Data were obtained from 36 female physical education teachers teaching ninth grade physical education classes. Students in the classes also participated in the investigation. Class climate was assessed utilizing the Reed Pupil Inventory.

Observational data were collected utilizing a modified version of Observation Schedule And Record (OScAR). A one-factor analysis of variance was utilized to determine significant differences among classes due to climate. Significant differences were found between the classes at the 0.01 level. Factor analysis of the observational data extracted six factors which accounted for 82 percent of the common variance. Factor one, Integrative Interactions, was positively related to a supportive class climate. Factor two, Restraining Direction, was positively associated with a defensive class climate. The remaining factors, Active Direction, Skill Perfection, Aloofness, and Participation, were negligibly related to climate. Bookout stated that the relationship between teaching behavior and class climate was consistent with findings noted in the literature.

Research by Adler (1972) examined the relationship between inclusion and exclusion and the learning environment elements of people, content, and materials. Inclusion was defined as a perception by the student of being included in the instructional processes. Exclusion was defined as the student perception of peripheral involvement in the instructional processes. Secondary school students a total of 1349 responded to the Inclusion-Exclusion Inventory. The three classes with the highest inclusion-exclusion scores and the classes with the lowest inclusion-exclusion scores were selected for observation using the Physical Education Observation Schedule. Each class was observed on three occasions. Adler concluded the following to be

indicative of a class high in inclusion: (a) teacher giving information to the whole class, (b) teacher asking students questions, (c) teacher accepting and rejecting student ideas, and (d) teacher accepting small group behavior. The rejection of student behavior, singular performance standards, and excessive warmups were viewed as descriptors of classes high in exclusion.

Impact of the Learning Environment. A significant relationship between the quality of teaching and the quality of learning was hypothesized by St. John (1971). The sample was comprised of 956 children from 36 ramdomly selected elementary school classrooms in a large northern city. Data sources included naratives of classroom activities and behavior, teacher-pupil and pupil-pupil interactions, attitude and sociometric tests, and the Characteristics of Teachers Scale. Zero order correlation, analysis of variance, and multiple regression analysis were the procedures utilized to test the hypotheses. St. John noted that Child Orientation and Interpersonal Competence in teachers contributed significantly to reading growth and improved attendance among black children. By the author's admission, the sample size was small. Therefore, St. John suggested that the observed relationships merit the scrutiny of additional study.

Kiritz and Moos (1974) delineated the impact of the psychosocial environment on physiological parameters. Germane to their investigation were environments ranging from psychiatric wards to junior and senior high school classrooms. The authors believed that three basic

dimensions characterized the gamut of environments. Those dimensions were

> relationship dimensions assess the extent to which individuals are involved in the environment. . .Personal development dimensions assess the basic directions along which personal development and self enhancement tend to occur in the particular environment. . .System maintenance and system change are relatively similar. . .(p. 97-98)

The elements identified within the relationship dimensions were involvement, affiliation, peer cohesion, staff support, and permissiveness. Autonomy or independence and responsibility were representative of the personal development dimension. Finally, order and organization, clarity and control, work presence, and innovation were relative to the system maintenance and system change dimensions.

The literature suggested, according to Kiritz and Moos (1974), that support is a vital dimension of the psychosocial environment and has its greatest impact on the maturing individual. Involvement, as suggested by the authors, implies a "strong affective relationship towards the members and goals of the environment in which one is participating." (p. 101) It is believed that an increased hormonal activity in members of an environment is related to higher levels of involvement. The conclusions indicated that social stimuli associated with the relationship dimensions result in favorable effects. The authors stated that individuals respond more readily when there are restricted ranges of levels of the social/environmental variables.

Moos and Moos (1978) studied the relationship between the social environment in 19 classrooms of one high school and student absenteeism

and final grades. The classes represented mathematics, foreign languages, biology, English, art, and bookkeeping. Measures of the social perceptions of the learning environment were obtained via the Classroom Environment Scale. Scores representing 18 dimensions of the Classroom Environment Scale were correlated with the median absenteeism rate for the 19 classes and the mean grades for each of the 19 classes. Significant correlations suggested that classes with high mean grades perceived such classrooms to be high in Involvement and lower in Teacher Control. Absenteeism had significant positive correlations with student perceptions of Competition and Teacher control. The authors suggested that the potential value of the Classroom Environment Scale may lie in its potential as a diagnostic tool. It was indicated that evaluation of the classroom environment early in the year should be followed by preventive counseling when necessary. It was emphasized that when studying perceptions of the classroom environment, one must allow sufficient time for perceptions of that environment to develop fully.

Summary

The literature has revealed a difficulty in uniformly defining the term "attitude." The existence of specific dimensions of attitudes has been indicated in the literature. Generally, the dimensions parallel the three domains of learning, cognitive, affective and motor. Attitudes have been generally thought to be learned or acquired. Past experience, peer groups, and reference groups were among the factors cited as influencing attitude development.

The hidden curriculum was generally defined as teaching that is neither acknowledged nor planned. Viewpoints toward the hidden curriculum paralleled three major educational ideologies: the romantics, the progressives, and the cultural transmissionists. Central to the hidden curriculum were the elements of crowds, praise, and power. Predictability and arbitrariness were hypothesized as additional elements of the hidden curriculum. Within the physical education environment, females were shown to be different from males on the Privacy and the Instructional Achievement dimensions of the hidden curriculum.

The literature about the learning environment has been, for the most part, based on student perceptions of the social-emotional climate of physics classroom environments. The literature has consistently supported the notion of a positive relationship between physics achievement and environments perceived as Difficult. Teacher sex and the proportions of girls in the classroom has been shown to have a negligible relationship with dimensions of the learning environment and physics achievement. Classrooms perceived as high in Competition and in Teacher Control were significantly related to absenteeism. Within the physical education environments, classes perceived to be high in Exclusion were characterized by singular performance standards.

CHAPTER III

METHODOLOGY

Introduction

The purpose of the investigation was to analyze student attitudes toward instructional processes in the learning environment for differences according to (a) days not participated, (b) first semester letter grade, (c) student sex, and (d) the physical education class. Prior to that analysis it was necessary to develop appropriate instrumentation to assess the attitudes of secondary students toward instructional processes in the secondary school physical education environment.

SAI-IPSE Development

Statement Framing. Seventy-five SAI-IPSE statements (See Appendix A) were framed utilizing the subcategories of Bain's (1976b) content items for the Implicit Values Instrument for Physical Education. The subcategories provided a basis for the observation of behaviors in the secondary school physical education environment from which inferences relative to seven value dimensions can be made (See Appendix B for definitions of the seven value dimensions). The subcategories were concerned with (a) the teacher's verbal behavior, (b) the nature of the activities in the class, (c) the organizational patterns inherent in the class, and (d) the rules and regulations that govern the physical education class. In addition to Bain's content items, the investigator's experience as a secondary physical education teacher,

suggestions from physical education teachers, and ideas from arbitrarily selected secondary physical education students were additional knowledge bases from which SAI-IPSPE statements were framed.

All statements were unipolar in nature. The investigator believed this procedure to be less confusing to the respondent than having the student respond to an instrument comprised of bipolar statements. However, one disadvantage to an inventory comprised of unipolar statements is the lack of safeguards against systematic responses to the inventory items. Other factors influencing the decision to utilize the unipolar statement were (a) simplified scoring procedures and (b) simplified interpretations of the underlying constructs of the instrument.

Content Validity. Content validity has been defined in differing terms. Kerlinger (1973) suggested that the degree of representativeness of a sample for a population universe defines content validity. Safrit (1970) defined content validity as the adequate measurement of a previously defined universe of behaviors. In this investigation, the universe of behaviors consisted of the instructional processes in the secondary physical education environment.

The American Psychological Association (1954), stated that content validity may be developed through a description of the method of sampling behaviors from the universe of behaviors. Safrit (1970) tended to concur with this concept. A description of the procedures used to sample a defined universe constitutes evidence of an instrument's content validity, according to Safrit.

Kerlinger (1973) asserted that the assessment of the representativeness of the sampled items is an arbitrary judgment of the investigator, either alone or with others. However, Lemon (1973) indicated that whether or not a measure satisfies the criterion of content validity is a matter that can be assessed only by the investigator. The content validity of the SAI-IPSPE was a product of the investigator's judgment, the reaction of tenth grade physical education students to the inventory items, the description of the sampling of the universe of instructional processes, and the evaluation of the internal consistency of the SAI-IPSPE items.

Cronbach (1970) stressed that the form of inventory items is as important as the content of the items. An instrument does not have content validity unless the persons responding are able to read and understand the items. An initial draft of the SAI-IPSPE was submitted to the scrutiny of an arbitrarily selected class of tenth grade physical education students for the following purposes: (a) to identify statements with ambiguous meaning, (b) to identify words and phrases for clarity of meaning, and (c) to obtain additional concepts for consideration for inclusion in the pool of SAI-IPSPE items.

The final criterion for content validity was the assessment of the internal consistency of the inventory items. (Jackson and Messick, 1967). Inventory items that were not related to the other variables were inappropriate for inclusion in the item pool. An item was inappropriate if it had a final estimate of communality less than 0.65.

Construct Validity. Construct validity defined the constructs underlying the SAI-IPSPE. Intuitive evidence suggested that seven constructs paralleling Bain's (1976) seven value dimensions were inherent in the SAI-IPSPE. However, preliminary factor analysis of pilot study data did not support this hypothesis. The construct validity of the SAI-IPSPE was determined via factor analytic procedures. Gorsuch (1974) perceived the role of factor analysis as providing empirical clarification of the constructs of a given area of investigation.

Germane to the development of the construct validity of the SAI-IPSPE was the replication and invariance of the factors. Replication of the rotated factors referred to the emergence of similar factor patterns in different samples. Invariance of the rotated factors indicated that similar factor patterns emerge following the manipulation of the variables in the preliminary instrument. The replication and invariance of the factor patterns were determined by the investigator's evaluation of factor loadings, factor patterns, and the factor structure.

Reliability. The internal consistency, item-composite reliability of the SAI-IPSPE, was approximated using the final estimates of communality that were derived from the factor analytic procedures. Child (1970) suggested that an inventory item be interpreted as being unreliable if the communality of the item is in the region of 0.30 or less. The critical value for the rejection was communalities less than 0.65.

Test-retest procedures were utilized to assess the reliability of the SAI-IPSPE. The pool of 75 statements was administered to 278 students. Following the factor analysis and elimination of certain statements, a revised SAI-IPSPE was administered to 54 students randomly drawn from the first sample. Six students were selected from each of the nine classrooms comprising the first sample. The SAI-IPSPE responses were correlated using the Pearson Product-Moment procedure with responses to the same 45 items from the original 75 item pool.

SAI-IPSPE Revision. Items comprising the SAI-IPSPE were retained based on the item's final estimate of communality and factor loading. Inventory items having final estimates of communality less than 0.65 or factor loadings less than 0.50 in the rotated factor structure were eliminated. The decision to use a stringent criterion for the factor loading was designed as a measure to control for spurious loadings. Spurious loadings may exist when the ratio of subjects to inventory items is of a questionable nature. This procedure was followed to foster factor replication and invariance in the SAI-IPSPE. Because of the variable nature of factor loadings and the final estimates of communality, the number of statements to be retained in the revised SAI-IPSPE was not preset.

Scoring Procedures. Each inventory statement had five possible responses. The range of responses was (a) strongly agree, (b) agree, (c) undecided, (d) disagree, and (e) strongly disagree. It appeared that conflicting opinions regarding the inclusion of the "undecided"

category as an option of responses existed. The investigator recognized the tendency among some respondents to rely on the undecided category rather than to make a commitment to one of the other categories. However, the investigator believed the undecided category to be a legitimate option of response for the student. Assuming that the inventory items were salient, there was no basis for believing that a disproportionate number of students would respond to the inventory items in a systematic fashion.

Numerical values were assigned the response options as follows: (a) strongly agree = 5, (b) agree = 4, (c) undecided = 3, (d) disagree = 2, and (e) strongly disagree = 1. The numerical values underwent these transformations: (a) the factor analysis procedures converted the raw scores to standard scores, (b) the second transformation occurred when factor scores were computed, and (c) the MANOVA procedure produced a single discriminant function score representing simultaneously the factor scores utilized as the dependent measures.

Sampling Procedures

Cluster Sampling. Two independently drawn cluster samples (Som, 1973), one consisting of nine classes and the second consisting of eight classes,comprised the total sample. Two hundred seventy-eight tenth grade physical education students comprised the first sample, 246 the second sample. The sample classes were randomly drawn from a pool of 92 tenth grade physical education classes in the Cumberland County, North Carolina School system.

The method of sampling utilized in the investigation was supported by the concept that "populations in general and school populations specifically, are not at the unqualified disposal of the educational researcher" (Bricknell, 1974, p. 34). Although certain constraints prohibited the use of simple random sampling in the investigation, the cluster sampling procedure retained some of the virtues of randomness (Kerlinger, 1973).

Sample Size. The question of sample size in relation to the number of variables in factor analytic procedures appears to be unsettled. Aleamoni (1976) suggested that the number of variables not exceed the number of subjects. Humphreys, Ilgen, McGrath, and Montanelli (1969) indicated that no minimum of subjects can be set. However, it is generally acknowledged that the sample size should be as large as possible. In contrast, Gorsuch, (1974) suggested that an absolute ratio of subjects to variables be five. That is, there should be five subjects for every variable. The ratio of subjects to variables was 3.6 for the factor analysis of the original data pool. For the factor analysis of the SAI-IPSPE data, the ratio of subjects to variables was 5.1.

SAI-IPSPE Administration

Procedures. A pool of 75 SAI-IPSPE items was administered to subjects in the first week of November, 1978 following the elimination of certain items, the SAI-IPSPE was administered to 54 students randomly selected from the original sample of subjects to ascertain test retest reliability. The SAI-IPSPE was administered to the second sample during

the second week of January, 1979. The investigator administered the SAI-IPSPE to all subjects. The SAI-IPSPE was administered according to standardized instructions. Refer to Appendix C.

Informed Consent. Prior to the administration of the SAI-IPSPE, the inventory administrator read to the respondents a standardized statement describing the nature of the research. The respondents were informed of their privilege to withdraw their participation from the investigation at any time. The student's signature on the informed consent (Appendix D) constituted evidence of agreement to participate in the investigation.

The Research Design

Subjects for the investigation were male and female tenth grade physical education students in the Cumberland County, North Carolina School system. Two independently drawn cluster (classes) samples (N_1 = 278, N_2 = 246) responded to the Student Attitude Inventory for Instructional Processes in Secondary Physical Education. Data from the first sample were analyzed via principal axis factor analysis to determine the nature of student attitudes toward instructional processes. Data derived from the second sample were utilized to assess the replication and invariance of factors of the SAI-IPSPE. A four-factor univariate analysis of variance was utilized to provide adjunct information about the contribution of each dependent variable to multivariate analysis of variance provided empirical information regarding the research questions.

Variables. Independent variables were (a) the physical education class, (b) the student sex, (c) the number of days the student failed to participate in the physical education class, and (d) the student's first semester letter grade. Dependent variables were selected from the factor structure derived from a principal axis factor analysis with a varimax rotation of the responses to the SAI-IPSPE by subjects in the second sample. Criteria for the selection of dependent variables were as follows: (a) visual inspection of a graph of factors by eigenvalues and the point at which the plotted line breaks sharply from the vertical axis, (b) the representation of each of Bain's (1976) seven value dimensions, and (c) arbitrary decisions by the investigator with approval of the doctoral committee.

The factors selected for inclusion in the data analysis were (a) factor one, Order-Autonomy: student incidental behavior and participation; (b) factor two, Instructional Achievement-Universalism-Specificity: content of teacher's verbal behavior; (c) factor three, Universalism: teacher sex; (d) factor five, Autonomy-Universalism: required physical education; and (e) factor fourteen, Competitive Achievement: student evaluation. Bain (1974) described the physical education learning environment in terms of seven value dimensions. (Refer to Appendix E, F, G, H, I). The seven value dimensions reflected environmental characteristics related to the nature of class activities, patterns of class organization, and rules/regulations which govern the physical education environment. The value dimensions provided a basis for the naming of the SAI-IPSPE factors.

Statistical Procedures

Germane to the proposed investigation were a number of analytical procedures. Descriptive statistics, factor analysis statistics, and statistics relative to multivariate analysis of variance were the principal methodologies for data analysis. The statistics were generated by the Statistical Analysis System, SAS, (Bar, Goodnight, Sall, and Helwig, 1976).

Descriptive Statistics. Means, and standard deviations for SAI-IPSPE items were generated. Factor score means for responses to the SAI-IPSPE were computed according to the levels for each of the independent variables. Data analysis yielded frequencies, cumulative frequencies, percents, and cumulative percents of subjects per level of the independent variable. The Pearson Product-Moment correlation procedure was utilized to estimate the test-retest reliability of the SAI-IPSPE.

Factor Analysis. SAI-IPSPE data were analyzed via a general linear model principal axis factor analysis. Relative to the factor analytic procedure, the following statistics were generated: (a) intercorrelations between inventory items, (b) eigenvalues, (c) proportions and cumulative proportions of the variance for the eigenvalues, (d) prior and final estimates of cummunality, (e) unrotated and rotated factor patterns, (f) interfactor correlations, and (g) factor scores.

A minimum eigenvalue of 1.00 was used as the criterion for the extraction of factors. A rule of thumb adhered to in many factor

analytic investigations has been to allow an eigenvalue of 1.00 (Kaiser's criterion) to represent the cutoff point (Rummell, 1970). However, Child (1973) noted that there is a tendency for too many factors to be extracted when utilizing Kaiser's criterion when there are more than 50 variables.

A value of 0.50 was utilized to assess the significance of the factor loadings. A common practice for the interpretation of the significance of factor loadings has been to interpret them as one interprets correlation coefficients. Child (1973) stated that the value required for significance increases as the successive factors are extracted.

The unrotated factors were rotated orthogonally and obliquely with three rotations. Harris (1967) suggested that the advantage of several rotations rather than one rotation was a test of factor robustness. If factors are robust, the factors will be similar irrespective of the rotation. The factors from the original statement pool were rotated via quartimax rotation, varimax rotation, and promax rotation. The rotation yielding the simplest factor structure was the rotation utilized in the analysis of the second set of data.

Because the content items utilized by Bain to describe her value dimensions were often relevant to more than one dimension, it was believed that factors generated by the SAI-IPSPE data would be correlated. Therefore, the use of the promax rotation was warranted. The guiding principle of the quartimax rotation was the desire to

simplify the factor structure. With the quartimax rotation, a variable loading high on one factor had the tendency to load lower on the remaining factors. Simplicity was also a virtue of the varimax rotation. The simplicity was a characteristic of the individual factor. When the varimax rotation was utilized, a tendency existed for the loadings in each column, factor, to be either high or low.

ANOVA. A four-factorial univariate analysis of variance provided adjunct information regarding the contribution of each dependent variable to multivariate results. Overall sums of squares, mean squares, F ratios, dependent variable means, and standard deviations were computed. In addition, sequential sums of squares, partial sums of squares, and their respective F ratios were computed. An alpha level of 0.05 was required for significant F ratios.

MANOVA. A four-factorial multivariate analysis of variance was utilized to test the research questions. An alpha level of 0.05 was required for signficant effects. The MANOVA procedures generated partial sums of squares and cross products matrices, correlation matrices, and univariate analyses of variance for each of the dependent variables. In addition, the percent of variance accounted for by the characteristic root and the normalized characteristic vector were germane to the analyses. Roy's characteristic root was the statistic utilized to assess any multivariate differences. Hypotheses were tested for significance with a conversion of the characteristic root utilizing Heck's charts (Harris, 1975). Whenever significant main effects were found, post hoc analyses via the Tukey procedure ascertained the location of differences.

The analyses generated canonical variables and correlations between the canonical variables. The canonical variables made it possible to discern the relative contribution of each dependent variable to any multivariate differences. All statistical procedures were executed at the University of North Carolina at Greensboro computer center.

CHAPTER IV

PRESENTATION AND DISCUSSION OF DATA

Introduction

The purpose of this investigation was to explore student attitudes toward instructional processes in secondary physical education. Because of the lack of available instrumentation, it was necessary to develop an inventory to assess student attitudes about instructional processes. Germane to the development of the instrument was an assessment of the constructs underlying student attitudes about instructional processes.

The following questions were relative to the purpose of the investigation. (a) Will student attitudes be differentiated according to the class in which the students are enrolled? (b) Will attitudinal differences exist according to the intervals of nonparticipation by students in the physical education class? (c) Will student gender be a factor relative to attitudinal differences in instructional processes? (d) Will attitudinal differences toward instructional processes parallel students' first semester letter grades?

Two independently and randomly drawn samples of coeducational tenth grade physical education classes comprised the sample. The original data set was obtained from 278 students in nine classes. These data were utilized to assess the factor patterns and the internal consistency of the pool of 75 SAI-IPSPE statements. In addition, the data obtained from students in the first sample were utilized to assess

the test-retest reliability of the SAI-IPSPE. Data obtained from the final SAI-IPSPE were utilized to (a) assess the replication and invariance of the underlying constructs of the SAI-IPSPE, (b) produce factor scores from the factors selected as the dependent measures, and (c) investigate the research questions.

SAI-IPSPE Development

Responses of the 278 male and female tenth grade physical education students to the 75-statement SAI-IPSPE pool were analyzed via principal axis factor analysis. Varimax, quartimax, and promax rotations were utilized to assess the robustness of the SAI-IPSPE factor structure.

Twenty-seven, 16, and 16 factors were extracted by the varimax, the quartimax, and the promax rotations, respectively. The 27 varimax factors accounted for 68.2% of the SAI-IPSPE variance. The quartimax and promax rotations produced factors accounting for 66.1% of the inventory variance. Refer to Figure 1 for a cumulative frequency polygon illustrating percents of the SAI-IPSPE variance accounted for by the factor structures from the three rotations.

The factor content was the criterion for judging the similarity of the rotated factors. The order of the factors in the rotated factor matrix was not considered. Eight factors were identical in each of the three rotations. Five factors were the same in two of the three rotation procedures. The promax rotation yielded six unique factors,

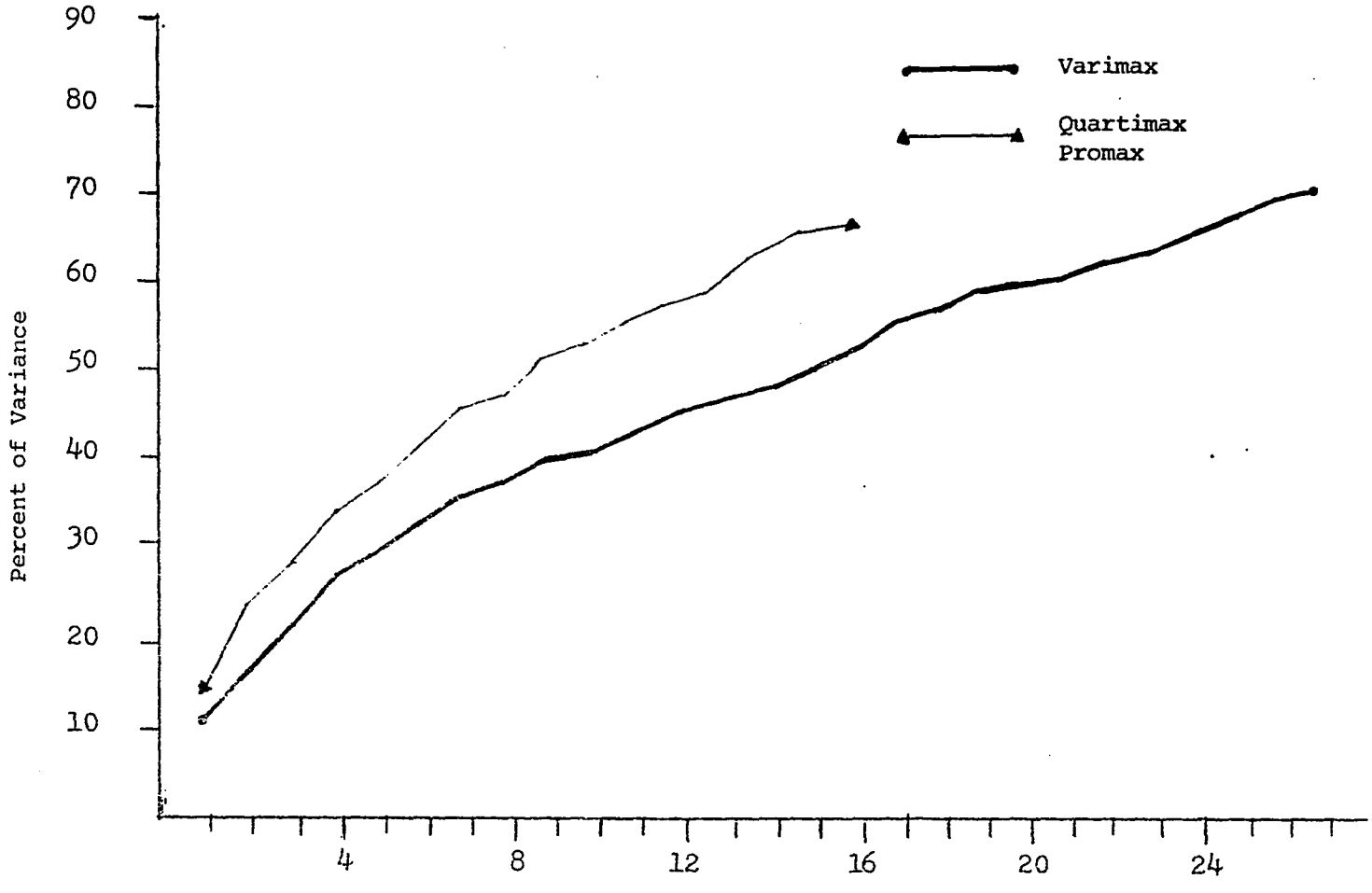

Figure 1

SAI-IPSPE Variance by Factors

that is, factors with only one significant loading (hereafter, the term significant was synomous with the term statistically significant). Four of the quartimax factors were unique and 13 of the varimax factors were unique.

The 27 varimax factors were comprised of 50 statements with significant loadings (significance criterion = 0.50). The quartimax factors were comprised of 34 significant loadings and the promax factors were comprised of 30 significant loadings (See Table 1). Thirteen inventory statements loaded significantly in the same factor irrespective of the method of rotation.

A number of statements clustered together but did not appear in the same factors across rotations. For example, inventory items 41 and 64 loaded significantly in quartimax factor one and in varimax and promax factors eight. Statements seven and 71 loaded significantly in quartimax and promax factors 11 and in varimax factor 10. Table 2 illustrates the number of SAI-IPSPE statements loading significantly on identical factors and also contributing significant loadings to a third factor.

An examination of the final estimates of communality revealed that the promax and the quartimax communalities were identical. However, the final estimates of communality were somewhat lower than were the final estimates of communality derived from the varimax rotation with the quartimax and promax rotations. Only one inventory item had a communality (H^2 = 0.69) equal to or greater than 0.65, whereas,

TABLE 1

Comparisons of Communalities and Factor Loadings: SAI-IPSPE Statement Pool

Item	Communality			Significant Load		
	Var.	Quarti.	Pro.	Var.	Quarti.	Pro.
1	0.56	0.37	0.37			
2	0.60	0.35	0.35	0.74		
3	0.69	0.38	0.38			
4	0.71	0.46	0.46	0.73	-0.57	0.60
5	0.68	0.42	0.42			
6	0.65	0.36	0.36			
7	0.77	0.63	0.63	0.74	0.72	-0.73
8	0.65	0.46	0.46			
9	0.71	0.36	0.36			
10	0.63	0.37	0.37			
11	0.68	0.51	0.51	-0.55	0.53	
12	0.71	0.45	0.45	-0.78		
13	0.73	0.38	0.38	-0.75		
14	0.75	0.58	0.58	-0.81	0.71	0.72
15	0.72	0.51	0.51	0.72	0.55	0.57
16	0.68	0.36	0.36	0.72		
17	0.68	0.38	0.38	-0.72		
18	0.67	0.38	0.38	0.65	0.65	0.65
19	0.69	0.43	0.43			
20	0.70	0.48	0.48			0.51
21	0.72	0.48	0.48	-0.75		
22	0.71	0.43	0.43	0.57	-0.64	0.64
23	0.72	0.46	0.46	0.78	-0.54	0.61
24	0.68	0.43	0.43	0.58	0.52	0.51
25	0.72	0.48	0.48	-0.73	-0.64	
26	0.69	0.48	0.48			
27	0.69	0.45	0.45		-0.52	
28	0.74	0.59	0.59	0.73	-0.66	0.68
29	0.67	0.39	0.39			
30	0.63	0.36	0.36			
31	0.80	0.69	0.69	-0.83	-0.81	-0.82
32	0.68	0.42	0.42	-0.67	-0.57	-0.55
33	0.68	0.51	0.51	0.58	-0.60	-0.58
34	0.67	0.36	0.36	-0.69		
35	0.67	0.46	0.46	0.73	-0.59	0.58
36	0.75	0.64	0.64	-0.80	-0.76	-0.78

TABLE I - (CONTD.)

37	0.74	0.60	0.60	0.82	0.73	0.75
38	0.64	0.36	0.36			
39	0.80	0.27	0.27	-0.85		
40	0.69	0.45	0.45	0.70	0.55	0.55
41	0.62	0.37	0.37	-0.72	-0.56	0.57
42	0.66	0.45	0.45			
43	0.58	0.40	0.40		-0.52	0.52
44	0.68	0.51	0.51	-0.73	-0.63	-0.68
45	0.62	0.36	0.36			
46	0.61	0.39	0.39			
47	0.67	0.54	0.54	-0.69	0.67	
48	0.66	0.40	0.40			
49	0.63	0.33	0.33	0.66		
50	0.72	0.51	0.51	0.77	0.66	0.67
51	0.61	0.41	0.41		-0.51	
52	0.68	0.42	0.42	0.65	0.56	0.55
53	0.66	0.41	0.41	-0.73	-0.57	-0.59
54	0.63	0.44	0.44	0.56		
55	0.62	0.43	0.43	0.62		
56	0.72	0.46	0.46	0.54		
57	0.65	0.38	0.38	0.55		
58	0.73	0.47	0.47			
59	0.63	0.43	0.43			
60	0.77	0.61	0.61	0.79	0.79	0.76
61	0.72	0.47	0.47	0.51	0.51	0.53
62	0.64	0.40	0.40	-0.53		
63	0.70	0.43	0.43	0.76		
64	0.71	0.52	0.52	0.66	-0.57	0.54
65	0.72	0.55	0.55	0.76	0.61	0.63
66	0.68	0.44	0.44	0.51		
67	0.70	0.60	0.50			
68	0.64	0.49	0.49			
69	0.69	0.54	0.54	-0.74	-0.68	-0.66
70	0.61	0.48	0.48	0.76	0.56	-0.56
71	0.71	0.46	0.46	0.55		
72	0.65	0.47	0.47			
73	0.71	0.48	0.48	0.53		
74	0.70	0.50	0.50	0.70	-0.64	0.66
75	0.78	0.36	0.36	-0.83		

TABLE 2

Comparison of Varimax, Quartimax, and Promax Factor Structures

Factor	Statements		
	Varimax	Quartimax	Promax
1	28,37	41,43,51,64	28,37
2	15,65	15,65	15,65
3	4,18,22,33	4,18,22,33	4,18,33,22
4	31,36,69	31,36,69	31,36,69
5	11,14,47	11,14,27,47	14
6	25,32,44	25,32,44	32,44
7	24,49,52,57	35,74	24,52
8	41,64,66	28,37	41,43,64
9	35,74	24,52	35,74
10	7,54,71	50,60	50,60
11	50,56,60	7,71	7,71
12	40		20
13	23	23	23
14	3,61	61	61
15	53	40	40
16	55,70,73	53	53
17	9		
18	17		
19	16		
20	63		
21	12,62		
22	13		
23	34		
24	29		
25	75		
26	39		
27	21		

varimax final estimates of communality yielded 59 values equal to or greater than 0.65 (Table 1).

The contrast in estimates of communality between the quartimax and promax procedures and the varimax procedure may have resulted from the number of factors extracted in each of the solutions. Gorsuch (1974) suggested that

> the communality for a variable interacts with the number of factors extracted...communality estimates will change depending upon the number of factors that are being extracted from the matrix as common factors. Most estimation procedures are dependent upon the knowledge of the number of factors to be extracted. (p. 94)

A subjective evaluation of these rotations of the SAI-IPSPE factor structure supported the robustness of the underlying constructs. Factors 2, 3, 4, and 13 were identical irrespective of the method of rotation. In addition, eight factors were identical in two of the three rotations.

Although each of the rotations yielded a simple factor structure, the decision was made to utilize the varimax rotation in the subsequent analyses. The following considerations governed that decision: (a) the varimax rotation extracted 11 more factors accounting for 2.1% more SAI-IPSPE variance than did the quartimax or promax rotations, (the varimax rotation produced a greater number of inventory statements with significant loadings than did either the quartimax or promax rotations, and (c) the varimax rotation produced final estimates of communality with values substantially larger than did the other two rotations.

The criteria for including a statement in the SAI-IPSPE were two-fold: (a) the statements must have final estimates of communality equal to or greater than 0.65 to be retained and (b) the factor loadings of statements must be equal to or greater than 0.50. Fifty-three statements had loadings equal to or greater than 0.50. Sixty statements had final estimates of communality equal to or greater than 0.65.

Twenty statements failed to meet either the communality or the factor loading criterion. Ten statements had final estimates of communality equal to or greater than 0.65. Ten statements failed to load significantly. The implication of this phenomenon was that statements that failed to load significantly had no common relationships with other statements. That is, statements that loaded significantly were responded to in a similar fashion. More succinctly, Harris (1975) defined that relationship saying that "the correlation (loading) of each original variable with (on) each latent variable (factor)..." was the factor structure. (p. 27)

The significance of those statements that failed to meet the communality criterion was the percent of variance the individual statement had in common with other statements. The larger the common variance of the item, the larger the final estimate of communality. Therefore, the inclusion of a statement in the inventory should have theoretical justification. Child (1970) indicated that the other source in the test item is called unique variance which is subdivided into specific variance and error variance. Specific variance was defined as that variance uniquely related to the inventory statement. However, because the error

variance was not partitioned from the specific variance, it was assumed that the statements with low communalities were unreliable in terms of internal consistency.

The issue of communality was germane to this investigation because of the relationship of high communalities to the replication of the factor structure. Gorsuch (1974) stressed that "factors from variables with lower communalities will be more difficult to replicate due to the error components." (p. 317)

Assessment and evaluation of the 75 SAI-IPSPE statement pool in terms of the aforementioned criteria revealed the existence of 46 statements meeting both criteria. Those 46 statements comprised the SAI-IPSPE (Appendix J).

Reliability. Test-retest procedures were utilized to assess the reliability of the SAI-IPSPE. The original pool of 75 SAI-IPSPE statements was administered to 278 students. Approximately five weeks later, the revised SAI-IPSPE was administered to 54 students randomly drawn from each of the nine classrooms comprising the first sample. The Pearson Product-Moment procedure was utilized to estimate the inventory reliability. The 46 statements were correlated with the same 46 statements drawn from the original data set.

The reliability of the SAI-IPSPE was estimated to be 0.72. Although the reliability coefficient was considered to be within an acceptable range for affective measures, three considerations were identified as placing an upper-bound on the inventory reliability.

One, the investigator believed that reliability would have been higher had the SAI-IPSPE been readministered. Rather, the SAI-IPSPE items were correlated with responses from the same items drawn from the original 75-statement pool. Because it was impossible to discern the effects of the 46 items imbedded in the statement pool, the effects of this procedure were deemed to be detrimental to SAI-IPSPE test retest reliability.

Two, the time interval between test administrations had a reciprocal effect on the reliability. That is, the larger the time interval between test administrations, the lower the reliability of the inventory. Guilford (1965) suggested that time intervals allow for changes to occur in the test respondents. He stated that once a student has

> taken a certain test, he is not the same individual when taking it again. The skills and knowledge required during the first test administration and in the interval between administrations will have their effects upon the second administration. (p. 447)

Presentation of Data

The 46-statement SAI-IPSPE (Appendix J) was administered to 246 male and female tenth grade physical education students in the Cumberland County, North Carolina School system.

Descriptive Statistics. Means and standard deviations were computed for each of the SAI-IPSPE statements. Statement means ranged from 2.31 for statement 8 to 4.28 for statement 44. The means for these two items were similar to the means derived for the same

statements from the original data set. The mean of statement 8 in the initial analysis was 2.71. The mean of statement 44 in the initial analysis was 3.91.

Standard deviations for the SAI-IPSPE statements ranged between 0.92 (statement two) and 1.38 (statement 15). These values compared with standard deviations from the original data set of 0.85 and 1.30, respectively. Comparisons of means and standard deviations from the first and second data sets on SAI-IPSPE statements with significant loadings are presented in Appendix K.

Factor Analysis. The responses to the SAI-IPSPE were analyzed via principal axis factor analysis. Factor patterns were rotated orthogonally via the varimax procedure. Using Kaiser's criterion of 1.00, the analysis extracted 15 factors accounting for 62.7 percent of the common variance. The SCREE test, Figure 2, indicated the presence of five "strong" factors which accounted for 33.55 percent of the common variance. The 10 factors whose plots closely paralleled the horizontal axis of the graph were analogous to the scree or debris at the base of a cliff (Cattell, 1970). The rationale was that the Kaiser criterion resulted in the extraction of too many factors. According to Gorsuch (1974), one contribution to this phenomenon is the number of variables (statements) in the analysis. Child (1970) suggested that when the number of variables is high, too many factors may be extracted. Because the 46 variables were necessary to adequately sample attitudes, these results may support the contention

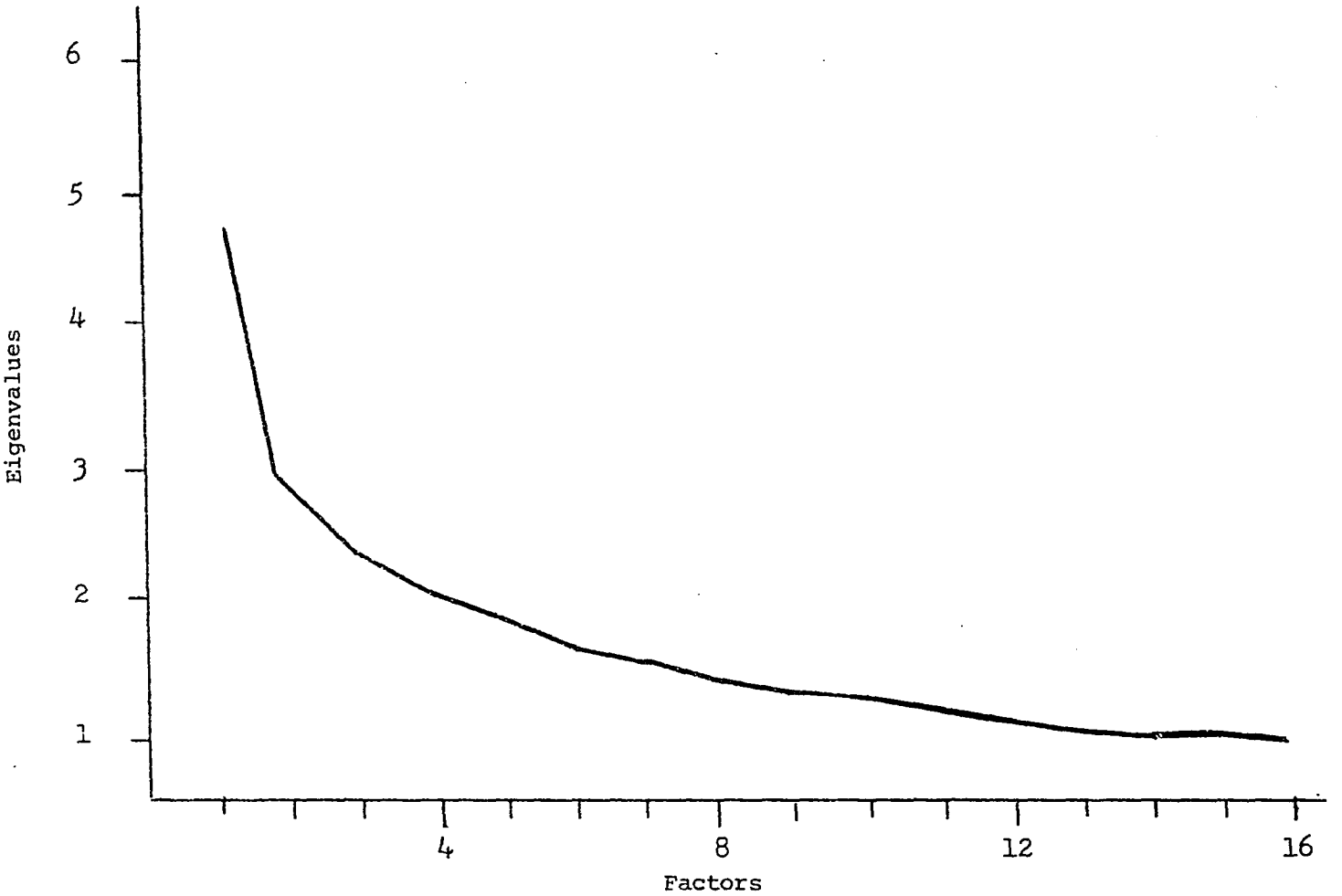

Figure 2

Scree Test Second Data Set

that attitudes about the physical education learning environment are complex and dimensional.

Factor Replication. Because certain factors were to be utilized as dependent measures in the subsequent analyses, factor replication was an important component of the SAI-IPSPE development. The more replicable the factors, the more the generalizability of the results can be maximized. Gorsuch (1974) stated that the more often factors match, the more likely the factor analytic procedure is worthwhile.

A subjective evaluation of the factor structures derived from the original and from the second data sets revealed the following. Three of the first five factors (one, two, and four) from the original pool also appeared in the first five factors derived from the final SAI-IPSPE (see Table 3). Factors 3 and 17, original pool, appeared in the final SAI-IPSPE as factor 2, factor 4 as factor 5, and factors 5 and 8 as factor 1. The first factor from the original pool appeared as factor 14 from the final SAI-IPSPE. Factor 2, original pool, appeared as the seventh factor from the final SAI-IPSPE.

Eleven of the first 15 factors of the final SAI-IPSPE were identical to factors from the original pool. Ten SAI-IPSPE factors (3, 5, 6, 7, 8, 10, 11, 12, 13, and 14) were identical to ten factors from the original pool (1, 2, 4, 6, 10, 11, 12, 18, 20, and 21). Factor 2, SAI-IPSPE, was identical to factors 3 and 17 from the original pool. Those 12 factors, original pool,

TABLE 3

Comparison of Original Pool Factor Structure
and SAI-IPSPE Factor Structure

Original Pool			Final SAI-IPSPE		
factor	eigenvalue	% var.	factor	eigenvalue	% var.
1	7.745	0.103	14	1.124	0.024
2	5.209	0.069	7	1.582	0.034
3	3.030	0.040	2	2.973	0.065
17	1.300	0.017			
4	2.492	0.033	5	1.733	0.038
5	2.347	0.031	1	5.930	0.129
8	1.833	0.024			
6	2.180	0.029	3	2.592	0.056
7	1.929	0.026	4	2.166	0.047
16	1.344	0.018			
9	1.743	0.023	10	1.372	0.030
10	1.660	0.022	6	1.670	0.036
11	1.397	0.021	9	1.435	0.031
12	1.450	0.020	11	1.280	0.028
13	1.425	0.019			
14	1.419	0.019	15	1.093	0.024
22	1.108	0.015			
15	1.374	0.018			
18	1.204	0.016	8	1.535	0.033
19	1.182	0.016			
20	1.174	0.016	13	1.173	0.026
21	1.134	0.015	12	1.190	0.026

TABLE 3 (CONTD)

23	1.103	0.015
24	1.082	0.014
25	1.071	0.014
26	1.045	0.014
27	1.011	0.013

matching the 11 factors from the SAI-IPSPE, accounted for 40.3 percent of the common variance. The 11 factors of the final SAI-IPSPE accounted for 39.6 percent of the common variance.

A second approach to examining the replication of the factor structure yielded less concrete results. The 46 items of the SAI-IPSPE were extracted from the original 75 item statement pool and factor analyzed via principal axis procedures with a varimax rotation. The procedure extracted 16 factors which accounted for 62.7 percent of the common variance. Fifteen factors accounting for 62.7 percent of the common variance were extracted from the final SAI-IPSPE data.

Factor 3 of the final SAI-IPSPE was the same as factor 2 of the original pool. Factor 4, final SAI-IPSPE, was the same as factor 9, original pool. Factor 7, final SAI-IPSPE was the same as factor 4 of the original pool. Factor 10 of the final SAI-IPSPE was the same as factor 11 of the original pool. These results indicated that only four factors were replicated.

Extracting the 46 SAI-IPSPE statements from the original data set provided little additional information with which to assess factor replication. Four factors were replicated from the extracted statements, original pool of statements, to the factor analysis of the final data set. The replication of only four factors could have been the result of the meaning of the 46 statements imbedded in the 75-item statement pool being different from the meaning of the same 46 statements when standing alone. Eleven factors were replicated from the full 75 item

statement pool, original data set, to the factor analysis of data produced by the final SAI-IPSPE.

Gorsuch (1974) recommended randomly splitting the sample and factor analyzing the two "sets" of data to assess factor replication. This procedure was not feasible in this investigation because the number of subjects (N = 139) for each set of data would have lowered the subject-to-statement ratio, thereby, raising the level required for factor loading significance too high. Consequently, available information indicated that 10 factors were replicated.

Invariance. The invariance of the five factors utilized in the MANOVA of the final SAI-IPSPE data was important to the investigation. Gorsuch (1974) indicated that a factor "solution is invariant when a variable has the same factor pattern in the new study as it does in other solutions containing the same factor"(p. 297). Stated differently, Thurstone (19 8) believed that invariance referred to the consistency of factor content from different analyses.

Examination of the second data set indicated that factors 2, 3, 5, and 14 were invariant. This conclusion was drawn (Table 4) because (a) each row of the data matrix contained at least one nonsignificant loading, and (b) the factor structure contained a large proportion of loadings that were nonsignificant. In addition, no variable was statistically significant in more than one factor.

It was impossible to assess the invariance of factor 1 because of its "hybrid" nature. That is, factor one was comprised of statements

TABLE 4

Varimax Solution of Four
SAI-IPSPE Factor

Factor Number	Data Set	Variable	Statement Content			
			Teacher's Verbal Beh.	Teacher Sex	Student Decisions	Student Eval.
2	final	3	0.57	-0.13	-0.11	-0.13
	original	4				
2	final	8	0.72	0.06	0.12	0.09
	original	22	0.57	-0.02	-0.01	-0.12
2	final	17	-0.69	0.06	-0.14	-0.12
	original	9	0.71	0.11	0.08	0.07
2	final	30	0.69	0.02	0.02	-0.05
	original	18	0.66	0.03	-0.04	0.13
2	final	40	0.63	-0.21	0.07	-0.09
	original	33	0.58	0.05	-0.13	0.19
3	final	6	-0.06	0.74	-0.07	0.01
	original	25	-0.04	-0.73	-0.13	-0.05
3	final	33	-0.09	0.74	0.05	-0.02
	original	32	-0.11	-0.67	0.03	0.04
3	final	43	0.00	0.80	-0.09	-0.07
	original	44	-0.01	-0.73	0.01	0.09

TABLE 4 (CONTD.)

5	final	31	0.07	-0.02	0.83	0.03
	original	36	-0.01	-0.02	-0.80	-0.02
5	final	41	0.06	-0.05	0.75	0.15
	original	69	0.12	0.00	-0.75	0.11
14	final	1	-0.07	-0.10	0.05	0.79
	original	28	0.06	-0.09	-0.08	0.73
14	final	28	-0.01	0.01	0.12	0.79
	original	37	0.01	-0.05	-0.10	0.81

that loaded significantly in two factors from the original data set.

These results implied that any conclusions drawn from the MANOVA would have to be restricted to the sample from which they were drawn and not be generalized to a larger population.

MANOVA for Class. The MANOVA procedure analyzed the five dependent measures simultaneously for class main effects. According to the analysis, the discriminant function scores (Table 5) were significantly different.

TABLE 5

Discriminant Function Score Means for Class

Class	N	DFS $\bar{X}$
1	30	-0.033
2	44	0.025
3	34	-0.016
4	26	-0.012
5	27	0.050
6	31	-0.004
7	25	-0.010
8	29	-0.010
Overall	246	0.000

Roy's maximum root criterion was 0.138, s = 5.00, M = 0.50, and N = 116. An upperbound approximation of Roy's maximum root yielded an F = 4.70, 7 and 238 degrees of freedom which was significant beyond the 0.05 level of confidence. See Appendix L for discussion of MANOVA statistics.

The correlations between each of the factor score were 0.12, 0.29, (presented in Table 6) and the discriminant function score were 0.12, 0.29, -0.17, 0.37, (shown in Figure 4), and 0.83 for factors one, two, three, five, and 14, respectively. The correlation of 0.83 indicated that factor 14 contributed heavily to multivariate differences. A significant (0.01 level of confidence) univariate F = 3.70 indicated that the classes were significantly different with respect to factor 14. This result was also indicative that factor 14 contributed heavily to multivariate differences between the classes. A summary of the univariate ANOVAs for each of the dependent measures is presented in Table 7.

The Tukey procedure (Table 8) was utilized to ascertain the location of any significant differences between classes. Figure 3 represents the locations of the class means for the discriminant function scores. Significant differences, at the 0.01 level of confidence, were found to exist between the following classes: (a) class one and classes two and five, (b) three and class five, (c) class four and class five, and (d) class five and classes six, seven, and eight. Significant differences at or beyond the 0.01 level of confidence existed between the following classes: (a) class one and classes six, seven, and eight, and (b) class two and classes three, four, five, six, seven and eight.

The greatest differences between the discriminant function score means occurred between class one and class five ($\bar{X}d = 0.08$). Factor

TABLE 6

Class Means for Factor Scores

Class	N	Factor 1	Factor 2	Factor 3	Factor 5	Factor 14
1	30	-0.37	-0.18	0.40	-0.23	-0.26
2	44	-0.00	0.23	0.18	0.18	0.31
3	34	-0.18	-0.29	0.05	-0.20	-0.04
4	26	0.12	-0.21	-0.34	0.08	-0.27
5	27	0.04	0.04	-0.22	0.20	0.69
6	31	0.10	0.04	-0.22	0.11	-0.18
7	25	0.08	0.06	0.02	-0.02	-0.16
8	29	0.33	0.22	-0.12	-0.16	-0.21

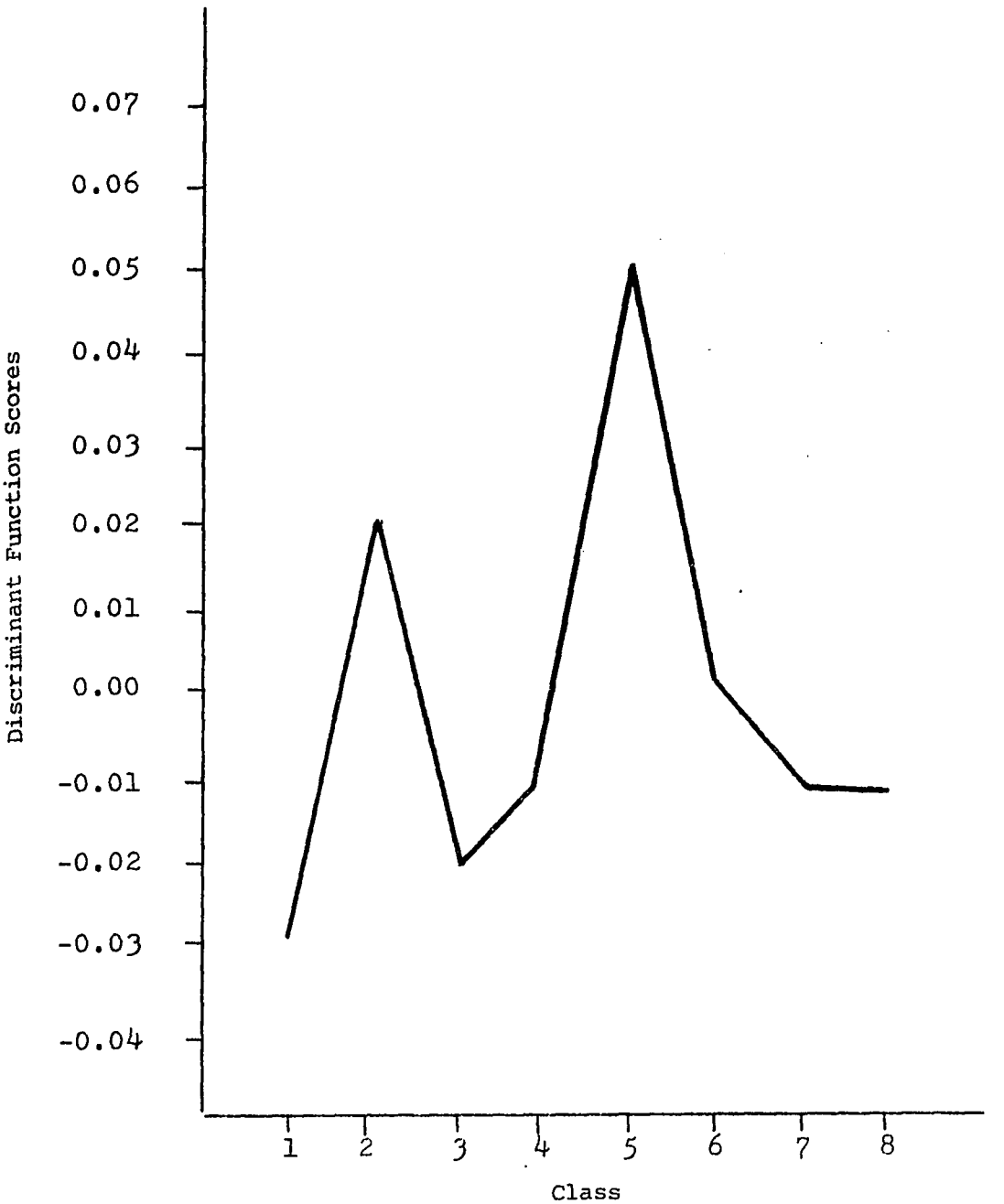

Figure 3

Discriminant Function Scores for Class

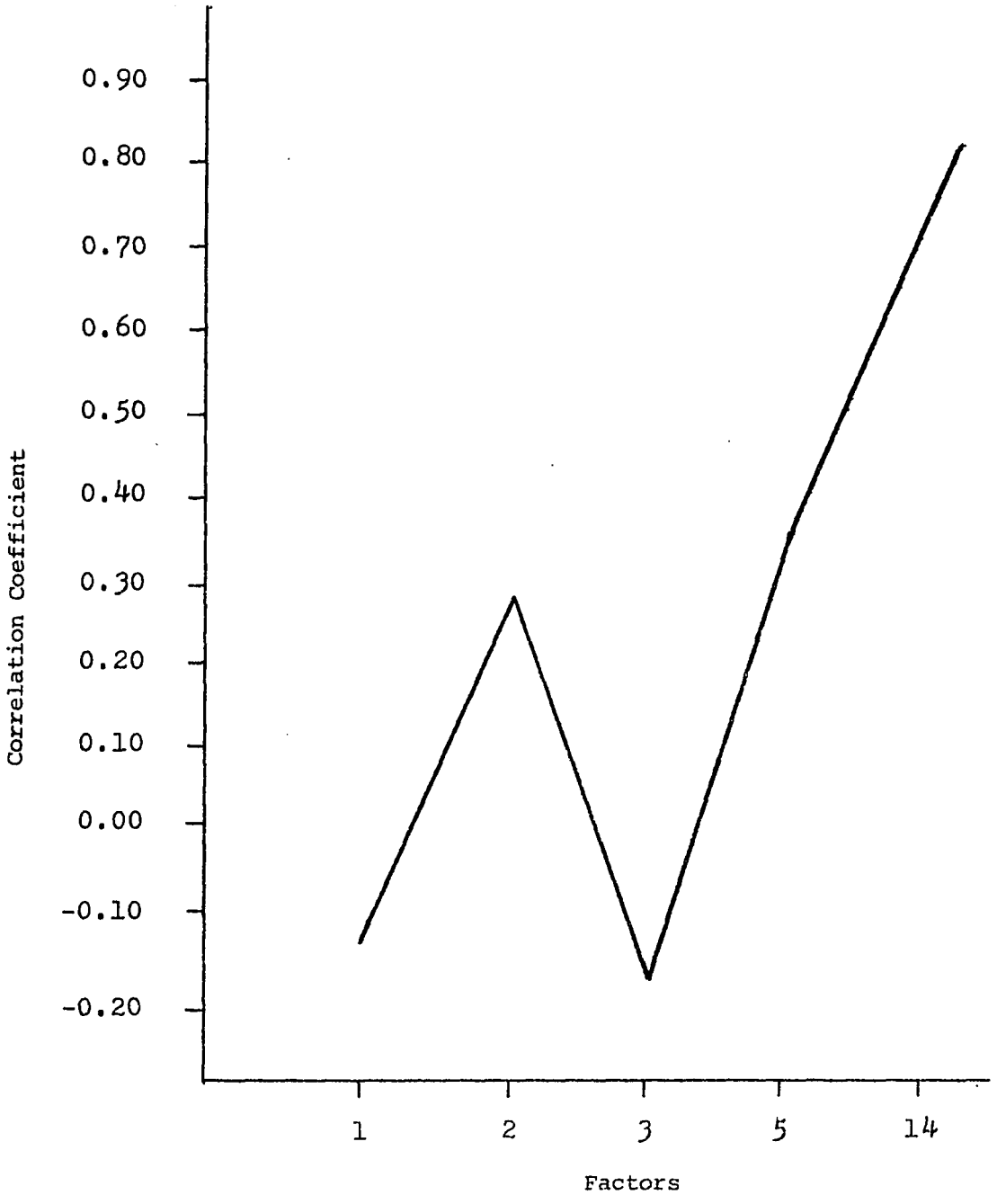

Figure 4

Correlations Between Discriminant Function Scores and Factor Scores for Class

TABLE 7

ANOVA on Factor Scores for Class

Dependent Variable	Source	Degrees of Freedom	Sum of Squares	Mean Squares	F
Factor 1	Class	7	9.207	1.315	1.33
	Error	238	235.793	0.990	
	Total	245	245.000		
Factor 2	Class	7	8.500	1.214	1.22
	Error	238	236.500	0.993	
	Total	245	245.00		
Factor 3	Class	7	11.431	1.633	1.66
	Error	238	233.569	0.981	
	Total	245	245.000		
Factor 5	Class	7	6.671	0.952	0.95
	Error	238	238.321	1.001	
	Total	245	244.992		
Factor 14	Class	7	24.049	3.436	3.70*
	Error	238	220.951	0.938	
	Total	245	245.000		

* Significant beyond the 0.01 level of confidence

TABLE 8

Tukey Test for Location of Significant
Differences Between Classes Due to
SAI-IPSPE

Class/Class	1	2	3	4	5	6	7	8
1		0.06*	0.02	0.02	0.08*	0.03+	0.03+	0.03+
2			0.04+	0.04+	0.03+	0.03+	0.03+	0.03+
3				0.00	0.07*	0.01	0.01	0.01
4					0.07*	0.02	0.02	0.02
5						0.05*	0.06*	0.06*
6							0.00	0.00
7								0.00

* Significant at or beyond the 0.01 level of confidence

+ Significant at or beyond the 0.05 level of confidence

score means for class one were -0.37, -0.18, 0.40, -0.23, and -0.26 for factors one, two, three, five and 14, respectively. Factor score means for class five were -0.04, 0.04, -0.22, 0.20, and 0.69 for factors one, two, three, five, and 14 respectively.

MANOVA for Student Sex. The MANOVA procedure produced discriminant function scores representing the scores by sex for the five dependent measures simultaneously. The discriminant function scores (Figure 5) were -0.02 and 0.02 for males and females, respectively. The discriminant function scores represented factor scores of 0.10, -0.06, -0.01, -0.13, and -0.21 for factors 1, 2, 3, 5, and 14, respectively. In the same sequence, the scores for females were -0.10, 0.06, 0.01, and 0.21.

Roy's maximum root was 0.081, s = 1.0, M = 1.5, and N = 119.0. The characteristic root was not utilized in the assessment of significance of differences because s = 1. Therefore, the F approximation of Hotelling-Lawley's Trace was utilized to test for multivariate differences. The F = 3.908, 5 and 240 degrees of freedom, was significant beyond the 0.01 level of confidence.

It appeared that factors 5 and 14 contributed most significantly to the multivariate differences (Table 9). An univariate F = 4.59, 1 and 244 degrees of freedom, was significant at the 0.05 level of confidence indicating that females were signficantly different from males on factor 5. Factor 14 scores were significantly different, F = 10.65, beyond the 0.01 level of confidence in favor of females. Highly

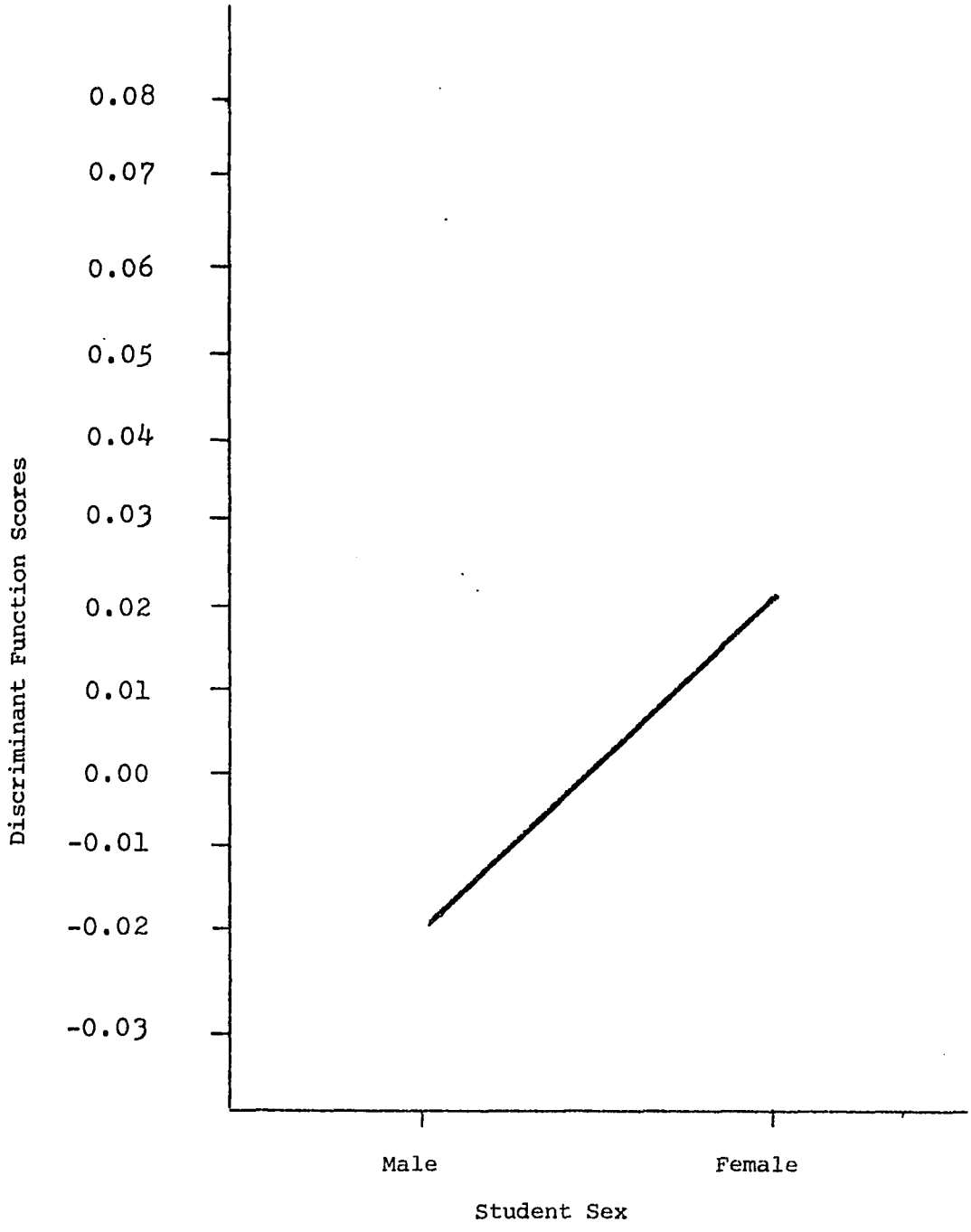

Figure 5

Discriminant Function Scores for Student Sex

TABLE 9

ANOVA on Factor Scores for Student Sex

Dependent Variable	Source	Degrees of Freedom	Sums of Squares	Mean Squares	F
Factor 1	Sex	1	2.733	2.733	2.75
	Error	244	242.267	0.993	
	Total	245	245.000		
Factor 2	Sex	1	0.904	0.904	0.90
	Error	244	244.096	1.000	
	Total	245	245.000		
Factor 3	Sex	1	0.033	0.033	0.03
	Error	244	244.967	1.004	
	Total	245	245.000		
Factor 5	Sex	1	4.525	4.525	4.59*
	Error	244	240.467	0.986	
	Total	245	245.000		
Factor 14	Sex	1	10.250	10.250	10.65**
	Error	244	234.750	0.962	
	Total	245	245.000		

* Significant beyond the 0.05 level of confidence

** Significant beyond the 0.01 level of confidence

significant correlations (r = 0.73 and r = 0.48) between the discriminant function scores and factors 14 and 5 supported this contention. Refer to Figure 6.

MANOVA for Days Not Participated. Differences in student attitudes according to five intervals of days students failed to participate in the physical education class were germane to the investigation. Those intervals, in terms of days missed, were 1 to 5, 6 to 10, 11 to 15, 16 to 20, and 21 and over. Discriminant function scores were for each interval of the independent measures were calculated. The discriminant function scores were -0.-20, 0.20, 0.020, 0.060, and 0.050 for the ordered intervals (refer to Table 10).

TABLE 10

Discriminant Function Scores for DNP

DNP	N	Discriminant Functions
1-5	142	-0.020
6-10	56	0.010
11-15	26	0.020
16-20	9	0.060
21-up	12	0.050

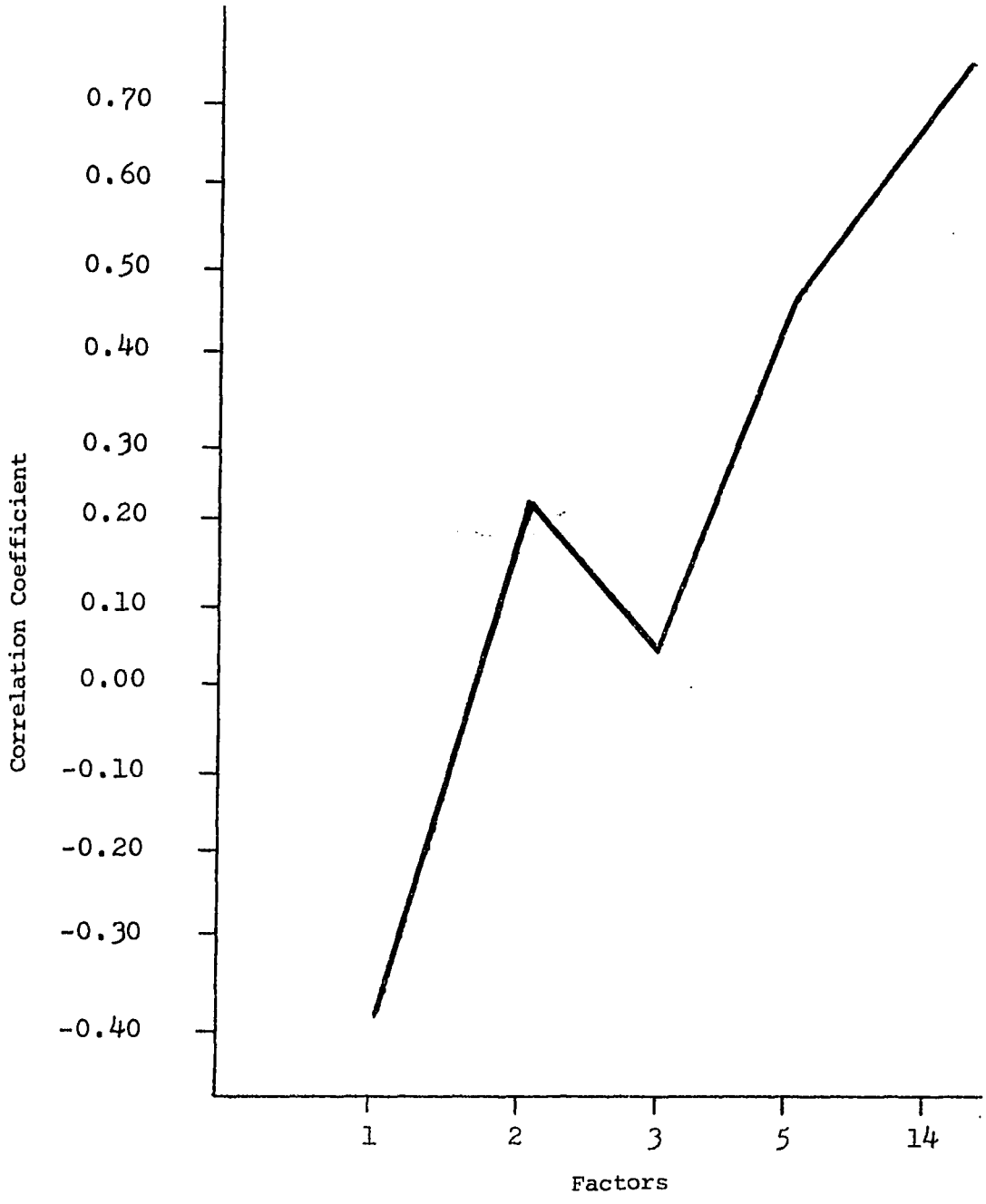

Figure 6

Correlations Between Discriminant Function Scores and Factor Scores for Student Sex

Roy's maximum root criterion was utilized to assess the significance of any multivariate differences among the intervals of DNP. The characteristic root was 0.105, s = 4, M = 0.0, and N = 117.5. A value from the greatest characteristic root distribution of 0.091 was required for significance at the 0.05 level of confidence. The location of significant differences was assessed via the Tukey procedure (Table 11). Differences at or beyond the 0.01 level of confidence were located between the 1 to 5 interval and the 21 and up interval and between the 6 to 10 interval and the 16 to 20 interval.

TABLE 11

Tukey Test for Location of Significant Differences Between Intervals of DNP Due to SAI-IPSPE

DNP/DNP	1-5	6-10	11-15	16-20	21-up
1 - 5		0.03	0.04	0.08*	0.07+
6 - 10			0.01	0.05+	0.04
11 - 15				0.04	0.30
16 - 20					0.01
21 - up					

* Significant at or beyond the 0.01 level of confidence

+ Significant at or beyond the 0.05 level of confidence

TABLE 12

ANOVA on Factor Scores for Days Not Participating

Dependent Variable	Source	Degrees of Freedom	Sums of Squares	Mean Squares	F
Factor 1	DNP	4	12.340	3.085	3.20*
	Error	241	232.600	0.965	
	Total	245	245.000		
Factor 2	DNP	4	4.683	1.171	1.17
	Error	241	240.316	0.997	
	Total	245	245.000		
Factor 3	DNP	4	0.810	0.203	0.20
	Error	241	244.190	1.013	
	Total	245	245.000		
Factor 5	DNP	4	11.003	2.751	2.83*
	Error	241	233.997	0.971	
	Total	245	245.000		
Factor 14	DNP	4	6.026	1.506	1.42
	Error	241	238.975	0.992	
	Total	245	245.000		

* Significant beyond the 0.05 level of confidence

Significant univariate F ratios (Table 12) at the 0.05 level of confidence (F's = 3.20 and 2.83) suggested that factors 1 and 5 contributed the most to multivariate differences. Supporting this contention were correlations between the discriminant function scores and factors 1 and 5 (Figure 7). The correlations were 0.65 and 0.66 for factors 1 and 5, respectively.

Students, N = 142, who did not participate in the physical education class five days or less had factor score means of -0.15, -0.07, -0.02, -0.15, and 0.06 for factors 1, 2, 3, 5, and 14, respectively (Table 13). Students, N = 9, who failed to participate in the physical education class 16 days and not more than 20 days had factor scores of 0.28, 0.20, -0.06, 0.71, and 0.61 for factors 1, 2, 3, 5, and 14 respectively.

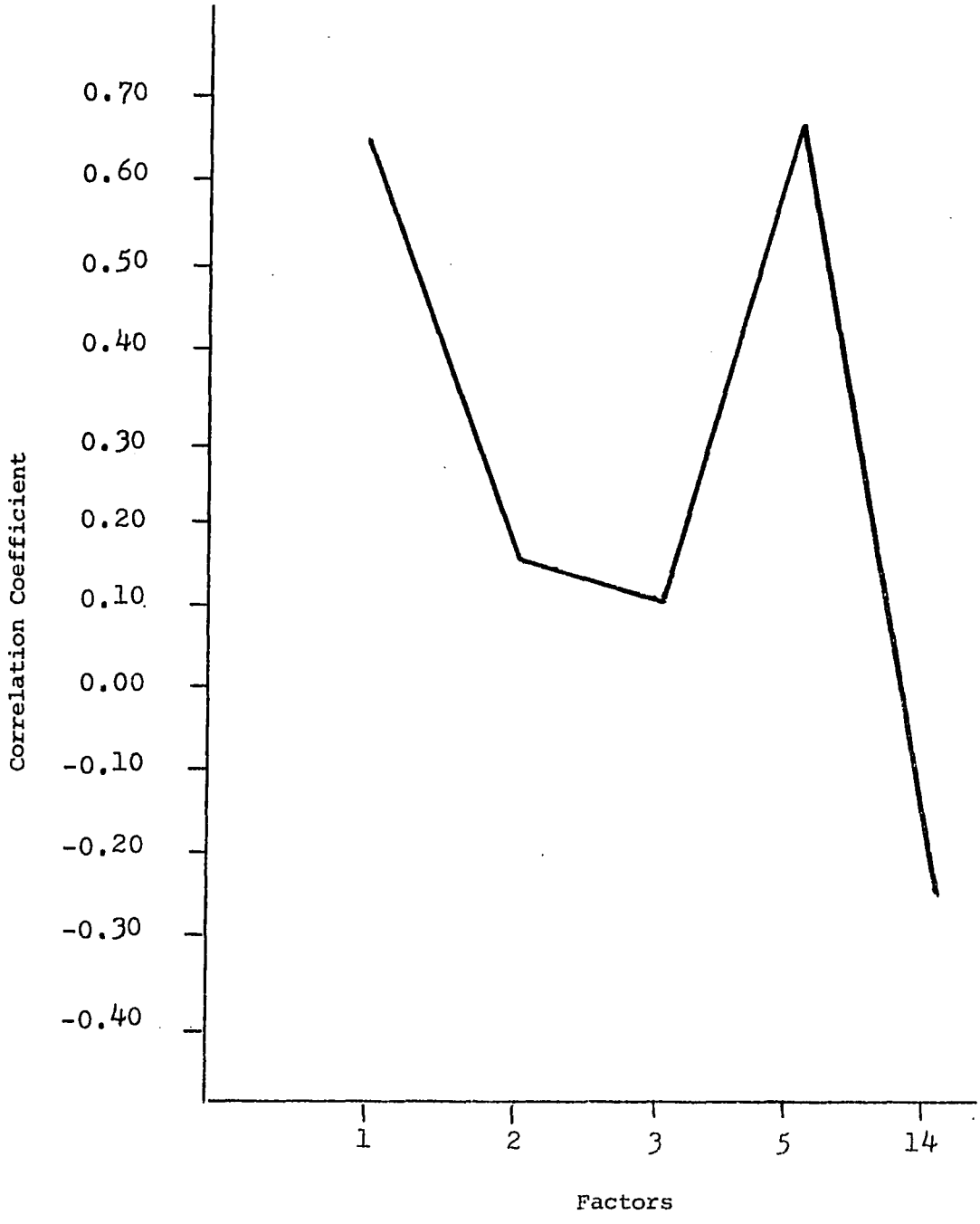

Figure 7

Correlations Between Discriminant Function Scores and Factor Scores for DNP

TABLE 13

Factor Score Means for Days Not Participating

DNP	N	Factor 1	Factor 2	Factor 3	Factor 5	Factor 14
1 - 5	142	-0.15	-0.07	-0.02	-0.15	0.06
6 - 10	56	0.03	0.20	-0.01	0.09	-0.15
11 - 15	27	0.30	-0.02	0.05	0.20	0.17
16 - 20	9	0.28	0.29	-0.06	0.71	-0.61
21 - up	12	0.72	-0.27	0.23	0.38	0.10

MANOVA for First Semester Letter Grade. Germane to the investigation was the analysis for differences in student attitudes toward instructional processes according to first semester letter grade. Utilizing a discriminant function approach to MANOVA, discriminant function scores representing the five factors were calculated simultaneously for each of the five levels of the independent variable. The discriminant function scores (Table 14) were -0.03, 0.00, 0.01, and 0.01 for first semester letter grades of A, B, C, D, and F, respectively.

TABLE 14

Discriminant Function Scores for FSLG

FSLG	N	Discriminant Function
A	47	-0.03
B	93	-0.00
C	54	0.01
D	22	0.00
F	28	0.01

Roy's maximum root was 0.069 with s = 5, M = -0.05, and N = 116.0. A characteristic root value greater than 0.119 was required for significance at the 0.05 level of confidence. This indicated that no differences existed between students comprising the letter grade groups on the five dependent measures simultaneously. The discriminant function scores are graphically illustrated in Figure 8.

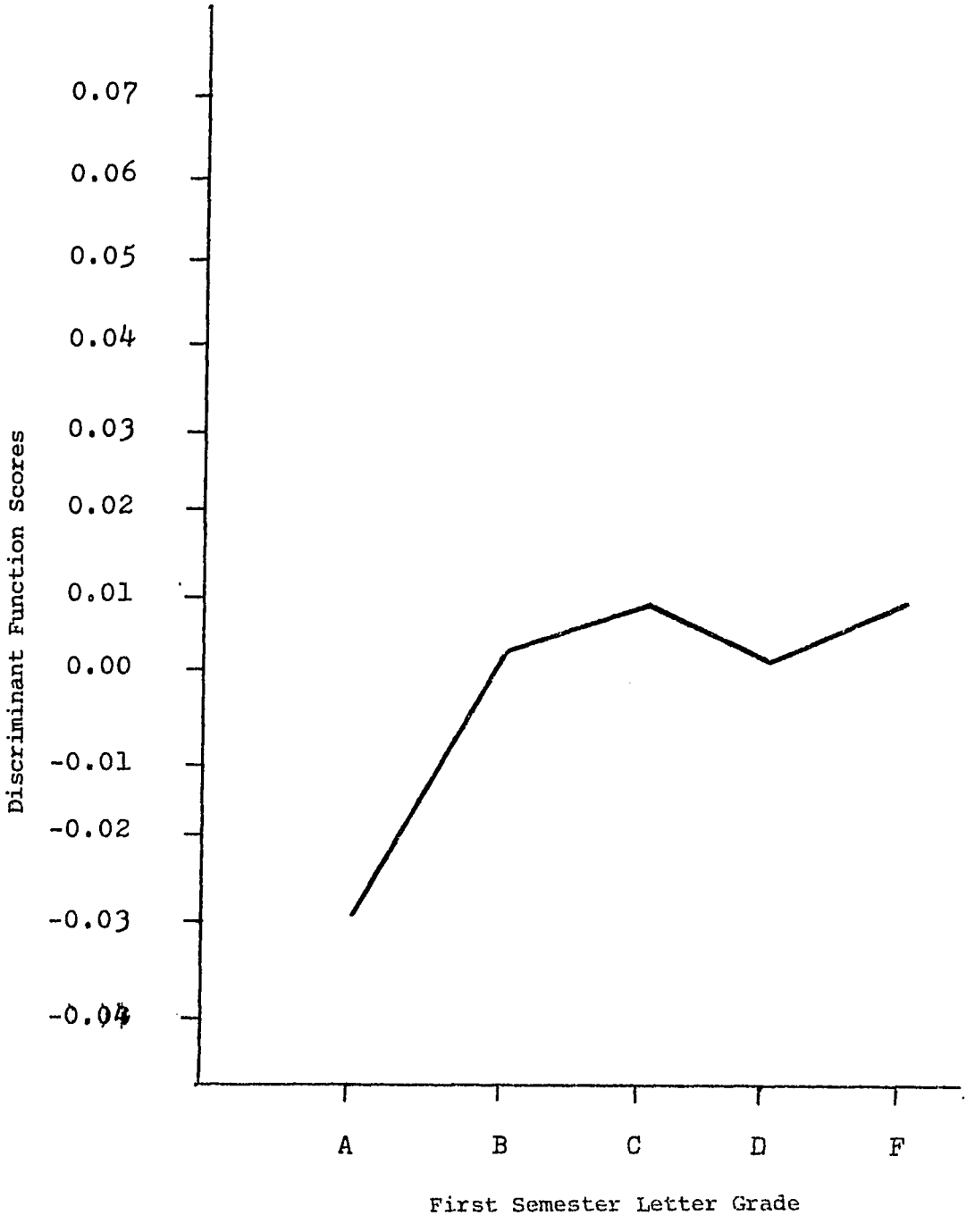

Figure 8

Discriminant Function Scores for FSLG

Discussion of Data

Comparison to Bain's Value Dimensions. Of interest to the investigator during the development of the SAI-IPSPE was a comparison of the SAI-IPSPE factor structure to Bain's (1976) seven value dimensions. Refer to Appendix B for descriptions of the seven value dimensions.

A principal axis factor analysis, varimax rotation, of the SAI-IPSPE data extracted 15 factors. None of the 15 factors were identical parallels to any of Bain's value dimensions. Ten of the SAI-IPSPE factors represented single concepts (Table 14). Bain's value dimensions are multiconceptual. For example, the Instructional Achievement dimension referred to the provision of learning opportunities for students. This dimension could be assessed through the substantive content of the teacher's verbal behavior, the number of students active at a single moment in the class, or the number of activities occurring simultaneously in the learning environment. However, in this investigation inventory statements referring to three indicators of Instructional Achievement loaded significantly in two factors. Statements 8, 17, 30, 40, teacher verbal behavior, related significantly to Instructional Achievement as factor two. Statement 21 which referred to the nature of games in the physical education class loaded significantly in another Instructional Achievement factor, factor 12.

Five factors yielded information about two or more value dimensions simultaneously. For example, factor 1 contained information about Order, Autonomy, and Universalism (Table 15). One explanation for this

phenomenon was that a concept that explains one value dimension may also define another value dimension. For example, the concept of the required physical education program is applicable to both the dimensions of Autonomy and Universalism. Autonomy and Universalism were value dimensions represented simultaneously in factors 1 and 5.

Because many of Bain's content items for describing the seven value dimensions are applicable, in many instances, to multiple value dimensions, it became apparent that the categorization of values inherent in a multivariate learning environment into separate unities was a bit limited. The difference between a simple theoretical definition of the value constructs of a learning environment and the student's view of the same learning environment are not one and the same. When isolated those content items are simple. However, those items contribute to what Mcdonald (1969) characterized as complex and multidimensional learning environments.

Autonomy was a concept appearing in three of the SAI-IPSPE factors. Autonomy in factor 1 appeared with Order and Universalism. Student incidental behavior, student participation, and rules which govern those actions, are all related to Order, Autonomy, and Universalism. In factor 5 Autonomy appeared with Universalism. Three statements, 4 31, and 41 which loaded significantly on factor 5 contained information about student decisions and required physical education. Autonomy (student decisions about showers) appeared as a unique factor, factor 4.

TABLE 15

SAI-IPSPE Factor Structure

Factor	SAI-IPSPE Statements	Content	IVI-PE Correlates
1	5, 32, 35, 42	Student Incidental Behavior, Participation	Order, Autonomy, Universalism
2+	3, 8, 17, 30, 40	Content of Teacher Verbal Behavior	Instructional Achievement, Universalism
3*	6, 33, 43	Teacher Sex	Specificity
4	7, 16	Student Decisions about Showering	Autonomy
5*	4, 31, 41	Student Decisions Required Physical Education	Autonomy, Universalism
6*	10, 37	Number of Activities	Order
7*	2, 29	Teacher Appearance	Universalism
8*	18	Performance Standards	Competitive Achievement
9	11, 46	Procedure, Equipment Distribution	Order
10*	9, 36	Teacher Verbal Behavior, Personal	Specificity

TABLE 15 (CONTD).

11*	12	Teacher Verbal Behavior, Praise	Competitive Achievement
12*	21	Nature of Activity	Instructional Achievement
13*	20	Multiple Evaluation Standards, Teacher View of Students	Universalism, Competitive Achievement
14*	1, 28	Student Evaluation	Competitive Achievement
15	39, 22	Sex Composition of Class, Teacher View of Students	Competitive Achievement Universalism

+ Identical to two combined factors from the original pool of statements

* Identical to single factors from the original pool of statements

Order appeared singly in factors 6 and 9. Statements 10 and 37 which loaded significantly on factor 6 provided information about the number of activities occurring in the physical education class. Statements 11 and 46 loaded significantly on factor 9. Those statements were concerned with procedural routines in the physical education class. As previously noted, Order appeared with Autonomy in factor 1.

In this investigation, the Specificity dimension of the hidden curriculum was represented by questions (8, 17, 30, and 40) concerned with the substantive content of the teacher's verbal behavior. Attitudes of male students tended to favor content directed toward game rules, strategy, and sports skills. It was interesting to note that Bain (1976) found that female teachers' classes were characterized by high Specificity. The same contrast was evident when results were compared to Bain's (1978) finding that female teachers' classes were more concerned with Instructional Achievement than were male classes. These results suggest the need for a study of the relationship of the hidden curriculum and student attitudes about instructional processes. The rationale for such an investigation was reported by Rich and Bush (1978) in their investigation into the effects of congruent teacher-student characteristics on instructional outcomes. In their report it was suggested that there is a need for congruency and consistency between the environmental structure and learner characteristics.

Instructional Achievement, in concert with Specificity and Universalism, defined factor 2. Factor 12 was uniquely defined by Instructional Achievement. That is, information relative to the number of activities occurring in the physical education class. Support for the Instructional Achievement/Specificity combination was derived from Bain's (1976) description of the value dimensions. On three occasions Instructional Achievement and Specificity were defined simultaneously by the same content items. Specificity appeared in factor 10 as a unique factor. In this instance the content of the factor was concerned with the personal nature of the teacher's verbal behavior (SAI-IPSPE statements 9 and 36).

The Universalism dimension appeared in five factors, two of which were unique factors. Universalism combined with Autonomy in factor 5 and with Competitive Achievement in factor 15. Bain (1976) described the two value dimensions similarily when she referred to the required physical education course requirement. Two indicators of Universalism and Competitive Achievement (student grouping and evaluation of students) were related to factor 15 (SAI-IPSPE statements 22 and 39). The statements in factor 15 were related to the sex composition of the class and to teacher expectations of student performance.

The seventh of Bain's value dimensions, Privacy, failed to appear in the SAI-IPSPE factor structure. Four statements which sampled three of the content items for Privacy were included in the SAI-IPSPE statement pool. Those statements (13, 24, 27, and 44) were concerned with

(a) the nature of the showering facilities, (b) the number of students active in the class at once, (c) teacher checks for student showers, and (d) teacher checks for student dress in uniforms. The Privacy dimension contributed to significant findings in Bain's (1976) report of the implicit values in the physical education environment. Female classes were found to be higher on the Privacy dimension than were the male classes. However, this finding was not replicated in a subsequent investigation (Bain, 1978).

One reason for the failure of the four statements to emerge as a Privacy factor was the dissimilarity among the response patterns of students to those Privacy-related SAI-IPSPE statements. The absence, in this instance, of a similarity of response patterns could be attributed to a lack of what Cattell (1978) referred to as a "third factor." It is this third factor which causes similar response patterns and thus the emergency of the factor construct. The lack of the intangible third factor, organized response patterns, resulted in the failure of a Privacy factor to be extracted in the analysis.

In an effort to characterize the complexity of student attitude paralleling Bain's description of the hidden curriculum in physical education, second order factor analysis of the primary order correlation matrix would be appropriate. It has been previously noted that the content items overlap into two or more value dimensions, thus indicating correlated constructs. This being the case, the rationale for a higher order factor analysis would be informative. The discussion is purely

speculative however, higher order factor analysis could result in SAI-IPSPE factors which are closer parallels to Bain's seven value dimensions th n were the primary factors extracted from the SAI-IPSPE data.

MANOVA for Class. According to post-hoc analysis the greatest differences existed between class one and class five. A value of 0.08 derived from the Tukey test supported this fact. Class one was characterized by a feeling that students should not move about or talk and that students should be penalized for not participating in the physical education class. This observation was supported by a factor score mean of -0.37 for factor 1 by class one. A factor score mean of -0.04 for factor 1 by class five suggested more ambivalent feelings toward student incidental behavior and participation.

It appeared that students in both class one and class five shared similar feelings about whole class lectures about skills, strategy, and games/sports rules. Factor 2 score means were -0.18 and 0.04 for class one and class five, respectively. The students in class one appeared to have negative attitudes toward Specificity (factor 3 score mean of 0.40). That is, it made no difference to students in class one whether dance, gymnastics or basketball/football was taught by a male or female teacher. A factor 3 score mean of -0.22 indicated that those students in class five believed that teacher gender did make a difference in instruction in dance, gymnastics, and basketball/football. That is, class five students were more favorable toward Specificity.

The boys and girls in class five believed that students should decide whether to take physical education and that physical education should not be a required course. Attitudes expressed by class one students were different. Class five had a factor (five) score mean of 0.20; class one produced a score of -0.23.

Attitudes of class one about Competitive Achievement (student evaluation) tended to be favorable. These students believed that grades should be based on sports skills abilities. On the other hand, students in class five had different attitudes about Competitive Achievement. Support for this observation was drawn from factor 14 score means for class one and for class five of -0.26 and 0.69, respectively.

The Competitive Achievement dimension (factor 14) was the factor which contributed the greatest to multivariate differences between classes. Statistical evidence indicated this fact. A univariate ANOVA ($F = 3.70$, 7 and 238 degrees of freedom) indicated the eight classes to be different with respect to factor 14. In addition, a high negative relationship existed between the discriminant function scores and factor 14 scores ($r = -0.83$).

The multivariate differences in student attitudes toward instructional processes in secondary physical education according to class have implications for the interpretation of significant differences relative to the other independent variables. According to Kerlinger (1973)

one of the functions of research design for the researcher is "to control the variance of extraneous or "unwanted" variables that may have an effect on his experimental out-comes, but in which he is not interested" (p. 306). For this reason, class effects were utilized as an independent variable in the analysis. The inability to study the interaction of class effects with the remaining independent variables further complicated the interpretation of significant differences.

The existence of multivariate differences between the classes suggested that control of extraneous variance via the cluster sampling procedure was not tenable. Perhaps this was due to the fact that attitudes, in young adolescents, are in a continuous state of development. Because attitudes tend to be nebulous dimensions, they may change as a response to the interaction of one's beliefs and the situations one encounters (Rokeach, 1968). Therefore it seemed plausible that attitudes may be a manifestation of the teacher's personality, instructional behaviors, and/or other salient experiences in the physical education class.

Kelman (1958) posed questions about attitude development, one of which appeared significant at this point. He asked, "did the communication produce public conformity without private acceptance...?"(p. 51) Student attitudes may have reflected compliance by the student to the experiences that were prevalent in the physical education class at the time of the SAI-IPSPE administration. If this were the case, the standardized administration procedures for the SAI-IPSPE can not adequately control for this source of error.

MANOVA for Student Sex. A significant multivariate F (4.59, 7 and 244 degrees of freedom) indicated that significant differences existed between male and female students relative to the dependent measures. Although factor score means for males and females were generally very close to zero (indicating undecided attitudes), attitudes expressed by the two groups were different. For example, attitudes of males reflected higher Order and lower Autonomy than did attitudes of female students. That is, male students did not favor moving and talking when not participating in the physical education class. Male students tended to believe that students should be penalized for failure to participate (factor 1 score mean = 0.10). Attitudes of female students resulted in a factor 1 score mean of -0.11.

Females did not like lectures to the class nor did they favor lectures on strategy. Responses of male students indicated a trend for different attitudes relative to the content of the teacher's verbal behavior and its target. Factor 2 score means were -0.06 and 0.06 for males and females, respectively.

Attitudes of male students about teacher sex was different than were the attitudes of female students. A factor 3 score mean of -0.06 for males suggested that it did make a difference to them whether male or female teachers instructed activities such as basketball/football or gymnastics and dance. The factor 3 score for females was 0.06.

Factor 5 which was concerned with student decisions about taking physical education and with the physical education course

requirement indicated differences between male and female students. Factor 5 score means were -0.14 and 0.14 for males and females, respectively. Female students believed that students should decide whether or not to take the physical education course. They also indicated that physical education should not be a required course.

Male students expressed attitudes higher in Competitive Achievement (student evaluation) than did females (factor 14 score means = -0.20 and 0.21 respectively). Male students were more favorable toward the concept of evaluation based on sports skill achievement than were female students. These attitudes may have a basis rooted in traditional societal sex role expectations. Francks (1971) has suggested that evaluation procedures tend to support diminished roles of students and hypertrophied roles of the teacher. He went on to say that such an unequal power relationship leads to unquestioning attitudes of students. Historically, females have been assigned passive roles. Therefore, the demonstration of physical skills by female students would not be consistent with what has been traditionally expected of the female adolescent.

MANOVA for Days Not Participated. According to the greatest characteristic root (0.105) significant multivariate differences existed among the intervals of days not participated. The Tukey test indicated the greatest differences occurred between the 1 to 5 interval and the 16 to 20 interval. Discriminant function scores for those intervals were -0.02 and 0.06, respectively.

Students in the first interval (days 1 to 5 expressed attitudes higher in Order and lower in Autonomy (factor one score mean = -0.15) than did students in the 16 to 20 interval (factor 1 score mean = 0.28). Students in the one to five interval did not favor moving about or talking in the gym when not participating in class activities. This group of students favored being penalized for failure to participate. The 16 to 20 group did not favor whole class lectures or lectures about sports skills, strategy, and rules (factor 2 score mean= 0.29). Students in the first interval tended to believe differently (factor two score mean = -0.07). The implication of these results suggest that consideration be given by the gym teacher to instructional methods that allow all students to be active simultaneously. Instructional methods that are characterized by inactive students may be a function of crowded classes. Dickler (1976) suggested that school activities are designed for the masses.

Differences between the 1 to 5 interval and the 16 to 20 interval were negligible regarding teacher sex and instruction in certain activities. Factor 3 score means were -0.02 and -0.06 for the 1 to 5 group and the 16 to 20 group, respectively.

A factor 5 score mean of 0.71 indicated those students missing between 16 and 20 days believed very strongly that students should decide whether or not to take the physical education course. Students in the first interval believed differently (factor 5 score mean = -0.15).

Relative to the attitude that students should decide whether or not to elect physical education is Cowell's (1972) notion that schools are characterized by arbitrariness. He believed that there is little justification of what is studied or how it is studied. . . and that students are given arbitrary reasons for its happening. (p. 284) Therefore, one implication of this result (assuming students have had a variety of experiences in physical education) is that senior high school physical education be elective.

Student evaluation was a dimension which appeared to differentiate between the 1 to 5 interval (factor 14 score mean = 0.06) and the 16 to 20 interval (factor 14 score mean = -0.61). The latter believed that sports skills should not be the basis on which students are graded.

The implications of nonparticipation in the physical education environment are far reaching. Participation in the physical education class activities is an intermediate step in the learning process. Therefore, students who failed to participate in the class activities did not have the greatest access to the learning activity and, consequently, the potential for achievement was diminished.

Moos and Moos (1978) found that absenteeism was significantly related to student perceptions of Teacher Control of the classroom climate. These findings tended to support the concept that students who failed to participate expressed the more autonomous attitudes, that is, attitudes unfavorable toward teacher control. Students who

failed to participate on a minimum of 16 occasions believed that students should have the freedom to move and talk when not participating and that students should decide whether or not to enroll in the physical education course.

DeFleur and Westie (1963) intimated, according to a latent process point of view, that attitude is an intermediate variable which operates between a stimulus and a response. According to the latent process framework, the stimulus for students in the 16 to 20 interval was a teacher not tolerant of student Autonomy. This group of students expressed attitudes higher in Autonomy than did the students comprising the 1 to 5 interval. Therefore, it seems plausible that the response of the students in the 16 to 20 interval was due to their failure to participate in the physical education class. Consequently, attitudes expressed via the SAI-IPSPE would be congruent with their response. The line of thought suggests the appropriateness of a future investigation of the hidden curriculum, student attitudes toward instructional processes, and days not participated in the physical education environment.

MANOVA For First Semester Letter Grade. Considering the five dependent measures simultaneously, no significant differences between the levels of first semester letter grade existed. The failure to find either multivariate significance or univariate significance between the independent measures suggested that student perceptions may provide more pertinent information than student attitudes about grades that students earn.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Introduction. The quality of the learning environment to which students are exposed has been of concern to educators. The learning environment has been characterized as multidimensional. Because of the multidimensional character of the learning environment, the schooling medium has the potential for impact upon students with implicit messages.

Although learning has long been acknowledged as resulting from subject matter, authorities presently believe that the processes in the learning environment are responsible for student learning. For example, student perceptions of the learning environment have been shown to be related to student behavior and achievement. Absenteeism from the learning environment has been shown to be related to student perceptions of the learning environment. Absenteeism from or attendance to the learning environment is an intermediate variable in the learning process. That is, the learning process in the school setting cannot have an effect on the student who is absent.

Research about student perceptions of the learning environment has been voluminous. However, there have been very few reports of research about student attitudes toward the learning environment. The rationale for the research about student perceptions was applied equally to students' attitudes about the learning environment.

The use of student ideas in curriculum and instruction development has, traditionally, been limited. Elements in the physical education

learning environment have been considered as factors which may tend to inhibit the development of positive student attitudes toward physical education.

Educators have embraced the concept of providing for students the optimum conditions for learning. It appeared that research endeavors must be extended beyond those investigations of student attitudes about the learning environment. The development of an instrument to assess student attitudes about the instructional processes in the secondary physical education learning environment was deemed to be warranted.

The purpose of this investigation was to explore student attitudes toward instructional processes in secondary physical education. The Student Attitude Inventory for Instructional Processes in Secondary Physical Education was developed to provide information relative to the following research questions.

1. Will differences exist in student attitudes according to the class in which the students are enrolled?

2. Will attitudes differ according to the levels of nonparticipation by students in the physical education class?

3. Will student gender be a factor in additudinal differences about instructional processes?

4. Will attitudinal differences toward instructional processes parallel differences among students according to first semester letter grade?

Two independently and randomly drawn samples of coeducational tenth grade physical education classes comprised the sample. The samples were drawn from a pool of 92 tenth grade physical education classes in the Cumberland County, North Carolina School system. The first sample (class N = 9, student N = 278) was utilized to assess the factor patterns and the internal consistency of the 75-item SAI-IPSPE statement pool. The second sample (class N = 8, student N = 246) was utilized to (a) assess the replication and invariance of the SAI-IPSPE constructs, (b) produce factor scores, and (c) answer the research questions.

Literature. The review of the literature was concerned with the nature of attitudes, the hidden curriculum, and the learning environment. Definitions of attitudes, dimensions of attitudes, and attitude development were reviewed. The literature about the hidden curriculum was concerned with definitions of the hidden curriculum and with descriptive research about the hidden curriculum. Literature about the learning environment was concerned with student perceptions of the learning environment and with the impact of the learning environment on intermediate outcomes of the schooling processes.

The literature revealed a difficulty in uniformly describing the term "attitude." The existence of specific dimensions of attitudes has been described. Generally, the dimensions parallel the three domains of learning, i.e., the cognitive, affective, and the psycho-motor domains. It has been believed that attitudes are either learned or acquired. Past experience, peer groups, and reference groups were

among the factors cited as influencing attitude development.

The hidden curriculum was defined as that part of teaching that is neither acknowledged nor planned. Viewpoints toward the hidden curriculum paralleled three major educational ideologies: the romantics, the progressives, and the cultural transmissionists. Central to the hidden curriculum were the elements of crowds, praise, and power. Predictability and aribtrariness were hypothesized as additional elements of the hidden curriculum. Within the physical education learning environment, females were shown to be different from males on the Privacy and the Instructional Achievement dimensions of the hidden curriculum.

The literature about the learning environment was based on student perceptions of the social-emotional climate of the learning environment. The literature has consistently supported the existence of positive relationships between physics achievement and learning environments perceived as Difficult. Teacher sex and the proportion of girls in the classroom have been shown to be negligibly related to dimensions of the learning environment and to physics achievement. Classrooms perceived as high in Competitiveness and in Teacher Control were significantly related to absenteeism. Within the physical education environment, classes perceived as high in Exclusion were characterized by singular performance standards.

Methodology. Seventy-five SAI-IPSPE statements were framed utilizing the subcategories of Bain's (1976b) content items for the Implicit

Values Instrument for Physical Education. In addition, the investigator's experience as a secondary physical education teacher, suggestions from other physical education teachers, and ideas from arbitrarily selected physical education students were additional knowledge bases from which the SAI-IPSPE statements were framed.

The content validity of the SAI-IPSPE was a product of the investigator's judgment, reaction of tenth grade physical education students to the inventory items, the description of the sampling of the universe of instructional processes, and the evaluation of the internal consistency of the statements. The construct validity of the SAI-IPSPE was ascertained via principle axis factor analysis procedures. Test-retest reliability of the SAI-IPSPE was assessed via the Pearson Product-Moment procedure.

The 75-statement pool was reduced to 46 statements based on each statement's final estimate of communality and factor loading. Inventory statements having communalities less than 0.65 or factor loadings less than 0.50 were not retained in the SAI-IPSPE.

Data from the first sample were analyzed via principal axis factor analysis to determine the nature of student attitudes toward instructional processes. A four-factor univariate ANOVA was utilized to provide adjunct information about the contribution of each dependent variable to multivariate results. An eight by two by five by five factorial MANOVA provided empirical information regarding the research questions. Independent variables were (a) the physical education classes, (b) the

student's sex, (c) the number of days the student failed to participate in the physical education class, and (d) the student's first semester letter grade. Dependent variables were selected from the varimax rotated factor structure derived from the factor analysis procedures. Factors selected as dependent variables were (a) factor 1, Order-Autonomy: student incidental behavior and participation, (b) factor 2, Instructional Achievement-Specificity: content of the teacher's verbal behavior, (c) factor 3, Universalism: teacher sex, (d) factor 5, Autonomy-Universalism: required physical education, and (e) factor 14, Competitive Achievement: student evaluation.

Data Analysis. The first data set was analyzed by principal axis factor analysis. The unrotated factor patterns were rotated orthogonally and obliquely by varimax, promax, and quartimax rotations. The varimax solution extracted 27 factors accounting for 68.3 percent of the SAI-IPSPE variance. Communalities and factor loadings derived from the varimax solution were utilized in reducing the statement pool to 46 statements. The test-retest reliability was estimated to be 0.72.

Factor analysis of the 46 statements SAI-IPSPE extracted 15 factors accounting for 62.7 percent of the inventory variance. It was ascertained that ten factors were replicated from the first to the second data set. It appeared that four of the five factors utilized as dependent variables were found invariant.

Of interest to the investigation was the comparison of the SAI-IPSPE factor structure to Bain's seven value dimensions. It appeared

that all of the value dimensions except the Privacy dimension were imbedded in the SAI-IPSPE constructs. The failure of the Privacy dimension to define any of the SAI-IPSPE constructs was rationalized by the fact that although showering, an indicator of Privacy, was encouraged in the Cumberland County Physical Education Program, it was not required. Therefore, the concept of showering was not a salient matter with students.

The MANOVA for class produced a maximum root cirterion of 0.138 which approximated an upperbound F ratio of 4.70, significant beyond the 0.05 level of confidence. The Tukey procedure indicated that 16 pairs of discriminant function scores were significantly different from each other at the 0.01 level of confidence.

The MANOVA for student sex revealed that discriminant function scores were significantly different beyond the 0.01 level of confidence (Hotelling-Lawley F = 9.91).

For days not participated, the MANOVA produced discriminant function scores that were significantly different at the 0.05 level of confidence (maximum root = 0.11). The Tukey procedure revealed that one pair of discriminant function scores were different at the 0.01 level of confidence. Two pairs of discriminant function scores were different at the 0.05 level of confidence.

The MANOVA for first semester letter grade produced a nonsignificant maximum root criterion (0.07) indicating that the discriminant function scores were not statistically different from each other.

Conclusions

Within the scope of this investigation and the limitations established by the sample population, the following conclusions were drawn:

1. The Student Attitude Inventory for Instructional Processes in Secondary Physical Education is a content valid assessment instrument.

2. The Student Attitude Inventory for Instructional Processes in Secondary Physical Education is a reliable assessment instrument.

3. Student attitudes toward instructional processes in the secondary physical education environment were significantly different according to the class in which the student was enrolled.

4. Male and female students demonstrated significantly different attitudes about instructional processes in the secondary physical education environment.

5. Student attitudes about instructional processes were significantly different paralleling the number of days the student failed to participate in the physical education class.

6. Attitudes about instructional processes of students according to first semester letter grades were not significantly different.

Recommendations

As a result of the investigation of student attitudes about instructional processes in secondary physical education, recommendations for further investigation are as follows:

1. The investigation should be replicated utilizing a larger sample population for the purposes of continued verification of the SAI-IPSPE constructs.

2. The relationship of student attitudes about instructional processes to the hidden curriculum in physical education should be investigated.

3. The relationship of student attitudes about instructional processes to Inclusion and Exclusion in the physical education environment should be investigated.

4. A longitudinal study relative to the development of student attitudes would provide empirical data about the relationship of student chronological maturation to attitude development.

5. The relationship between teacher and student attitudes toward instruction processes in the secondary physical education environment should be researched.

6. The effects of student opportunities for decision making upon absenteeism in the secondary physical education environment should be investigated.

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APPENDIX A

SAI-IPSPE Statement Pool

1. I like for my teacher to talk with me individually.
2. It is O.K. for my teacher to encourage me by asking challenging questions.
3. It is a waste of my time to have to wait in order to participate (example: standing in line to do ayups).
4. I do not like it when my teacher spends a lot of time talking to the class.
5. I like classes in which my teacher demonstrates activities to the class.
6. I dislike staying in one place when I am not participating.
7. I believe that more than one activity should be going on at same time in my physical education class.
8. I like having a chance to help decide which activities and sports will be offered in the class.
9. I get a lot out of the class when my teacher talks about sports skills.
10. I enjoy having a choice about the groups (teams) I'm on (in).
11. I should not have to stay quiet when I am not participating in my gym class.
12. I like games in which there are no losers.
13. My teacher should expect that students will perform in different ways.
14. I like the freedom of moving about in the gym when I am not actively involved in an activity.
15. My teacher's clothing for P.E. class should be appropriate for participating in the class activities.
16. I should be excused when I am not going to participate in the class.
17. I like being introduced to new skills by having a skilled student demonstrate the skill.

APPENDIX A - (CONT)

18. I do not like gym class when my teacher uses a lot of time discussing game strategy.

19. If I am not going to participate in my gym class activities, I should not have to dress-out.

20. I should not have to wear the same kind of gym uniform that all other students wear.

21. I do not like to give my excuse for not dressing for gym when the teacher checks the roll.

22. It is a waste of time for a teacher to spend a lot of time talking about sports skills.

23. I do not mind showering if private stalls are in the shower room.

24. I should make the decision to shower.

25. It does not make any difference to me whether a man or a woman is teaching such activities as dance or gymnastics.

26. Groups or teams in the P.E. class should be a matter of student choice.

27. When I am not participating, I like to talk with my class mates.

28. I do not like having my grade based on how well I do sports skills.

29. I enjoy my P.E. class more when everyone is participating.

30. It's O.K. with me if my teacher asks a lot of questions.

31. Students should decide whether or not to take P.E.

32. It does not make any difference to me whether a man or a woman is teaching such things as basketball or football.

33. Classes in which my teacher talks about game rules bores me.

34. I do not like class activities that emphasize staying in one place.

35. My teacher does not have the right to question or talk with me about things not concerned with school.

36. I should have a choice whether or not to take P.E.

APPENDIX A - (CONT)

37. My grade for P.E. should not be determined by how well I do sports skills.

38. I prefer a dressing room that allows me to dress and undress privately.

39. I should be corrected for my mistakes individually.

40. I like it when my teacher praises me.

41. Neat, orderly arrangements are not necessary in gym classes.

42. My time is wasted when I'm watching others participate.

43. I believe that my attitude should have no effect on the grade I receive for P.E.

44. It does not matter to me whether my teacher is a man or a woman.

45. I do not like classes that are characterized by straight lines and circles.

46. I like it when my teacher participates with us in class activities.

47. When I do not participate, I like to be free to move about.

48. I should not be expected to do things exactly the same way as my classmates.

49. The activities that I like the most are those in which there are no rewards (example: winners do not have to run extra laps).

50. I do not think class time should be taken up with matters such as giving out equipment.

51. There should be no checks by my teacher to see if I am participating in the class activities.

52. I do not believe the teacher should check to see if I have showered.

53. I like doing gymnastics and tumbling when the class has both boys and girls participating.

54. Not all students should have to participate in the same activities.

APPENDIX A - (CONT)

55. I think student ideas are valuable in determining what activities should be included in my P.E. program.

56. I think it is a waste of time when a lot of my time is taken up by matters such as roll check.

57. I do not believe that groups or teams I'm on should be decided on the basis of my ability to do certain skills.

58. It should make no difference if there is a lot of noise in the gym.

59. I like activities that do not involve competition with my classmates.

60. I like not having class time taken up by matters such as the giving out of equipment.

61. Activities such as football and baseball should be taught with boys and girls in the same class.

62. I like activities that do not require score keeping.

63. My teacher should see me as different from my classmates.

64. The teacher should not check to see if I am wearing my gym uniform.

65. When I am dressed for participating, it is reasonable to expect my teacher to be dressed for activity too.

66. I do not believe that I should be penalized for not participating in class.

67. When I do not participate in my P.E. class, I do not like to wear my gym uniform.

68. It is reasonable that I decide what to wear in P.E. class.

69. I do not believe that I should be required to take P.E.

70. I should be able to select from among a number of things those activities that appeal to me.

71. I like my P.E. class when there are a number of activities going on at the same time.

72. When I'm not dressed for P.E., I'd rather explain the matter privately to my teacher.

APPENDIX A - (CONT)

73. I like making the decision whether or not to shower after gym class.

74. My personal life should be of no concern to my teacher.

75. Standards for grading should be determined separately for each student.

APPENDIX B

Bain's Value Dimension

Autonomy. Autonomy refers to the extent to which the teacher recognizes and allows the student to regulate his/her participation in the physical education environment. Student opportunities for decision making are the most significant indicators of autonomy.

Privacy. Privacy is the right of an individual to withdraw one's self, behavior, and property from public display. Recognition and regard for privacy may be indicated by the visability of student performance, by ability grouping, and by the nature of the dressing and the showering facilities.

Orderliness. The degree to which regularity and uniformity are maintained in the learning environment indicates order. A preoccupation with procedural matters, uniforms, regularity of patterns in grouping, and minimal incidental noise and movement by the student reveals an emphasis on order.

Universalism. Universalism is the treatment of all members of a class in a similar manner. Indicators of a high emphasis on universalism are set standards for the control of showering and of dress, ability grouping, class target for verbal behavior, and set standards for evaluation.

Competitive Achievement. One's reaction to another based on that person's performance refers to competitive achievement. Substanitive content of verbal behavior and ability grouping are suggestive of an emphasis on competitive achievement. The nature of the class activi-

APPENDIX B - (CONT)

ties and a skill and knowledge component in evaluation is indicative of competitive achievement.

Instructional Achievement. The committment to the provision of learning opportunities for each student refers to instructional achievement. Verbal behavior which has a substantive content is reflective of an emphasis on instructional achievement.

Specificity. Specificity refers to the keeping of interactions with students to the purpose of the instructional content. An environment characterized by a high emphasis on specificity would be one in which the content of the teacher's verbal behavior is substantive rather than personal.

APPENDIX C

Directions for the Administration of the SAI-IPSPE

Directions. This is not a test. This inventory will not be used for grading purposes. The SAI-IPSPE will not in any way affect the way you are treated in this class. You are being asked to indicate your feelings about a number of things that are commonly done in physical education classes.

Read the following directions carefully. For each statement, go to the corresponding number on the answer sheet and darken the circle which best represents your feelings about the statement.

A = Strongly Agree, B = Agree, C = Undecided, D = Disagree
E = Strongly Disagree

Example: If you agree with statement one, you would darken the circle in the column headed by "B". Should you change your mind, then "X" out that circle and then darken the circle for your answer.

Your answers to these statements will not require a lot of thought. Your first impression will usually represent best your feelings about the statement. It is very important that you answer all statements.

APPENDIX D

Informed Consent

The purpose of this investigation is to develop an inventory to evaluate attitudes of students toward instructional processes in the physical education class. A secondary purpose of this research is to see if attitudes are different between males and females, between those who receive different grades, between those who participate and those who do not participate in the physical education class, and between physical education classes.

I understand that my participation in this research project is completely voluntary and that I am not being persuaded by any means to cooperate. I have the right to withdraw my consent to participate at any time, at which time my responses (answers) to the SAI-IPSPE are to be discarded.

I understand that my responses to the SAI-IPSPE will remain completely anonymous. At the completion of the research, a written summary of the results will be made available to me upon my request.

Please check one of the following:

_____ I agree to participate in the investigation.

_____ I am not willing to participate in the investigation.

_____
(signed)

_____
(date)

APPENDIX E

Composition of Factor 1

Variable	SAI-IPSPE Statement	Loading
5	I should not have to stay quiet when I am not participating in my gym class.	0.57
32	I like the freedom of moving about in the gym when I am not actively involved in an activity.	0.54
35	I do not believe that I should be penalized for not participating in the class.	0.51
42	When I do not participate, I like to be free to move about.	0.67
	Σ (Loadings)^2 = Eigenvalue =	5.93
	Percent of Total Sai-IPSPE Variance	12.90

APPENDIX F

Composition of Factor 2

Variable	SAI-IPSPE Statement	Loading
3	I do not like it when my teacher spends a lot of time talking to the whole class.	0.58
8	It is a waste of my time for a teacher to spend a lot of time talking about sports skills.	-0.72
17	I get a lot out of the class when my teacher talks about sports skills.	0.70
30	I do not like gym class when my teacher uses a lot of time discussing game strategy.	-0.69
40	Classes in which my teacher talks about game rules bore me.	-0.63

Σ (Loadings)^2 = Eigenvalue = 2.97

Percent of Total SAI-IPSPE Variance = 6.50

APPENDIX G

Composition of Factor 3

Variable	SAI-IPSPE Statement	Loading
6	It does not make any difference to me whether a man or woman is teaching such activities as dance or gymnastics.	0.74
33	It does not make any difference to me whether a man or woman is teaching such things as basketball or football.	0.74
43	It does not matter to me whether my teacher is a man or woman.	0.80
Σ (Loadings)^2 = Eigenvalue =		2.59
Percent of Total SAI-IPSPE Variance =		5.60

APPENDIX H

Composition of Factor 5

Variable	SAI-IPSPE Statement	Loading
4	Students should decide whether or not to take P.E.	-0.84
31	I should have a choice whether or not to take P.E.	-0.83
41	I do not believe that I should be required to take P.E.	-0.75

Σ (Loadings)^2 = Eigenvalue = 1.73

Percent of Total SAI-IPSPE Variance = 3.80

APPENDIX I

Composition of Factor 14

Variable	SAI-IPSPE Statement	Loading
1	I do not like having my grade based on how well I do sports skills.	-0.79
28	My grade for P.E. should not be determined by how well I do sports skills.	-0.79
Σ (Loadings)^2 = Eigenvalue =		1.12
Percent of Total SAI-IPSPE Variance =		2.40

APPENDIX J

SAI-IPSPE

1. I do not like having my grade based on how well I do sports skills.

2. My teacher's clothing for P.E. class should be appropriate for participating in the class activity.

3. I do not like it when my teacher spends a lot of time talking to the whole class.

4. Students should decide whether or not to take P.E.

5. I should not have to stay quiet when I am not participating in my gym class.

6. It does not make any difference to me whether a man or a woman is teaching such activities as dance or gymnastics.

7. I should make the decision to shower.

8. It is a waste of time for a teacher to spend a lot of time talking about sport skills.

9. My teacher does not have the right to question or talk with me about things not concerned with school.

10. I believe that more than one activity should be going on at the same time in my physical education class.

11. I do not think class time should be taken up with matters such as giving out equipment.

12. I like it when my teacher praises me.

13. I do not mind showering if private stalls are in the shower room.

14. It is a waste of time to have to wait in order to participate (example: standing in line to do layups).

15. I like doing gymnastics and tumbling when the class has both boys and girls participating.

16. I like making the decision whether or not to shower after gym class.

17. I get a lot out of the class when my teacher talks about sports skills.

APPENDIX J - (CONT)

18. I like being introduced to new skills by having a skilled student demonstrate the skill.

19. I should be excused when I am not going to participate in class.

20. My teacher should see me as different from my classmates.

21. I like games in which there are no losers.

22. My teacher should expect that students will perform in different ways.

23. I do not like class activities that emphasize staying in one place.

24. I enjoy my P.E. class more when everyone is participating.

25. Standards for grading should be determined separately for each student.

26. I should be corrected for my mistakes individually.

27. I do not like to give my excuse for not dressing for gym when the teacher checks the roll.

28. My grade for P.E. should not be determined by how well I do sports skills.

29. When I am dressed for participating, it is reasonable to expect my teacher to be dressed for activity too.

30. I do not like gym class when my teacher uses a lot of time discussing game strategy.

31. I should have a choice whether or not to take P.E.

32. I like the freedom of moving about in the gym when I am not actively involved in an activity.

33. It does not make any difference to me whether a man or a woman is teaching such things as basketball or football.

34. The activities that I like the most are those in which there are no rewards (example: winners do not have to run extra laps).

35. I do not believe that I should be penalized for not participating in the class.

36. My personal life should be of no concern to my teacher.

APPENDIX J - (CONT)

37. I like my class when there are a number of activities going on at the same time.

38. I think it is a waste of time when a lot of my time is taken up by matters such as role check.

39. Activities such as football and baseball should be taught with boys and girls in the same class.

40. Classes in which my teacher talks about game rules bores me.

41. I do not believe that I should be required to take P.E.

42. When I do not participate, I like to be free to move about.

43. It does not matter to me whether my teacher is a man or a woman.

44. I do not believe the teacher should check to see if I have showered.

45. The teacher should not check to see if I am wearing my gym uniform.

46. I like not having class time taken up by matters such as the giving out of equipment.

APPENDIX K

Summary of Factor Statistics
for
SAI-IPSPE Constructs with Significant Loadings

Factor	Item	Mean		St. Dev.		Factor Load		Communality	
		Orig.	Final	Orig.	Final	Orig.	Final	Orig.	Final
1	5	3.02	2.76	1.27	1.28	-0.55	0.57	0.68	0.54
	32	3.72	3.78	1.09	0.98	-0.81	0.54	0.75	0.57
	35	3.73	3.02	1.05	1.36	-0.69	0.51	0.67	0.61
	42	3.01	3.48	1.14	1.17	0.66	0.67	0.68	0.64
2	3	3.04	3.03	1.23	1.23	0.73	0.58	0.72	0.58
	8	2.71	2.31	1.17	1.12	0.57	-0.72	0.76	0.62
	17	3.41	3.33	1.11	1.12	0.71	0.70	0.71	0.65
	30	3.46	3.28	1.26	1.19	0.66	-0.69	0.67	0.58
	40	3.17	3.09	1.17	1.20	0.58	-0.63	0.68	0.54
3	6	3.90	3.83	1.04	1.16	0.73	0.74	0.72	0.61
	33	3.77	3.83	1.04	1.13	-0.67	0.74	0.68	0.62
	43	4.10	4.03	1.04	0.94	0.73	0.80	0.68	0.67
4	7	4.15	4.28	1.01	0.98	0.59	-0.69	0.69	0.68
	16	4.01	4.24	0.93	0.79	0.53	-0.78	0.71	0.75
5	4	3.52	3.68	1.32	1.34	-0.83	-0.84	0.80	0.76
	31	3.75	3.72	1.14	1.28	-0.80	-0.83	0.76	0.77
	41	3.35	3.43	1.22	1.35	-0.74	-0.75	0.70	0.69
6	10	2.93	3.18	1.28	1.28	0.74	0.83	0.77	0.73
	37	3.41	3.39	1.11	1.19	0.74	0.74	0.71	0.71

APPENDIX K - (CONT)

7	2	4.15	4.04	0.85	0.92	0.72	0.72	0.76	0.66
	29	4.08	4.26	0.91	1.01	0.75	0.73	0.72	0.68
8	18	3.63	3.76	0.97	1.01	0.72	0.67	0.69	0.58
9	11	2.86	2.83	1.13	1.19	0.77	0.76	0.72	0.72
	46	3.13	3.13	1.01	1.07	0.79	0.72	0.77	0.68
10	9	3.41	3.36	1.11	1.17	0.70	0.71	0.67	0.73
	36	3.86	3.83	1.11	1.17	0.70	0.67	0.70	0.63
11	12	3.60	3.58	1.00	0.99	0.70	0.73	0.69	0.69
12	21	2.63	2.68	1.21	1.25	0.78	-0.77	0.71	0.68
13	20	3.50	3.07	1.24	1.34	0.76	-0.81	0.70	0.72
14	1	3.63	3.45	1.28	1.48	0.73	-0.79	0.74	0.69
	28	3.52	3.68	1.24	1.32	0.82	-0.79	0.74	0.75
17	39	3.35	3.23	1.18	1.30	0.74	0.58	0.69	0.61
	22	4.51	4.49	0.78	0.75	-0.76	-0.70	0.73	0.64

APPENDIX L

Statistics for Assessing Significant Multivariate Differences

A number of multivariate statistics are available whenever comparisons are made between two or more groups on two or more dependent variables. The value of multivariate procedures in educational research has been described by Kerlinger (1973). He stated that the research design must "account for the complex psychological and sociological phenomena of education" and must be "capable of handling the complexity, which manifests itself above all in multiplicity of independent and dependent variables." (p. 149)

Among the criteria for assessing multivariate differences generated by the SAS (Bar, Goodnight, Sall, and Helwig, 1976), general linear models procedures were the Hottelling-Lawley trace, Pillai's trace, Wilks' criterion, and Roy's maximum root criterion. Historically, Wilks' criterion was the first among the multivariate statistics utilized. A disadvantage of Wilks' criterion is that it must be converted to an F ratio. Roy's maximum root criteria is derived from discriminant function analysis. Roy's maximum root criterion is a more powerful test of multivariate differences than is the Hottelling-Lawley trace or Pillai's trace. Specialized tables are available to assess significant differences when utilizing those three statistical techniques.