

TEACHING BEHAVIORS IN PHYSICAL EDUCATION CLASSES  
FOR THE HANDICAPPED: AN INTERACTION ANALYSIS

---

A DISSERTATION  
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY  
IN THE GRADUATE SCHOOL OF THE  
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF HEALTH, PHYSICAL EDUCATION,  
RECREATION, AND DANCE

BY  
SARAH M. RICH, B.S., M.A.

---

DENTON, TEXAS  
AUGUST 1981

The Graduate School  
Texas Woman's University

Denton, Texas

July 1 19 81

We hereby recommend that the dissertation prepared under  
our supervision by Sarah M. Rich  
entitled Teaching Behaviors in Physical Education  
Classes for the Handicapped: An Interaction  
Analysis.

be accepted as fulfilling this part of the requirements for the Degree of  
Doctor of Philosophy.

Committee:

Jane A. Mott  
Chairman, Physical  
Education

Marilyn Winsor  
Dean, College of Health,  
Physical Education,  
Recreation and Dance

Claudene Sherrill  
Chairman  
B芭芭拉 亨奇  
Marilyn Winsor  
Jane A. Mott  
Susan Jackson

Accepted:

[Signature]  
Dean of The Graduate School



ACKNOWLEDGEMENTS

My sincere appreciation to Dr. Claudine Sherrill, advisor and chairperson of my dissertation committee, for her guidance, encouragement, and patience during this study. Sincere appreciation is also extended to the other members of my dissertation committee for their cooperation and support: Dr. Barbara Gench, Dr. Marilyn Hinson, Dr. Susan Hudson, and Dr. Jane Mott.

I wish to thank Dr. Victor Mancini for the unselfish sharing of his knowledge about CAFIAS and Dr. Patricia Frye for her statistical expertise.

Special thanks are extended to the teachers who allowed the observation of their classes, my colleagues and students at Ithaca College whose encouragement and understanding were invaluable, and to those who helped with the videotaping process by providing expertise in this area.

Finally, I wish to express my appreciation to my family for their interest and support which made the attainment of this educational goal possible.

5510

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	x
CHAPTER	
I. ORIENTATION TO THE STUDY. . . . .	1
Statement of the Problem. . . . .	4
Definitions and/or Explanations of Terms . .	5
Hypothesis of the Study. . . . .	12
Delimitations of the Study. . . . .	12
II. REVIEW OF RELATED LITERATURE. . . . .	14
Evolution of Systematic Observation	
Systems. . . . .	15
Observation Systems Used to Study	
Teaching Behaviors in the Physical	
Education Setting. . . . .	22
The Use of CAFIAS as a Tool to Describe	
Classroom Behaviors. . . . .	31
Studies Utilizing FIAS to Describe Special	
Educators' Teaching Behaviors. . . . .	35

	Page
Studies Which Utilize Systematic Observation Systems to Describe Physical Educators' Behaviors With Special Populations. . . . .	39
III. PROCEDURES FOLLOWED IN DEVELOPING THE STUDY. .	44
Review of Related Literature. . . . .	44
Preliminary Procedures. . . . .	46
Selection of the Subjects. . . . .	47
Selection of the Instrument. . . . .	47
Collection of Data. . . . .	49
Organization and Analysis of the Data. . . .	51
Preparation of the Final Report. . . . .	52
IV. ANALYSIS OF THE DATA. . . . .	53
Description of the Subjects' Teaching and Educational Backgrounds. . . . .	53
Coder Reliability. . . . .	55
Descriptive Data for the CAFIAS Categories .	56
Descriptive Data for 12 CAFIAS Parameters. .	62
Multivariate Analysis of the 12 CAFIAS Parameters. . . . .	68
V. SUMMARY OF THE STUDY. . . . .	74
Findings of the Study. . . . .	77
Conclusion of the Study. . . . .	80

	Page
Discussion. . . . .	80
Recommendations for Further Studies. . . . .	84
 APPENDICES	
A. THE INSTRUMENT. . . . .	86
Categories of the Flanders' Interaction	
Analysis System. . . . .	87
Categories of Cheffers' Adaptation of	
Flanders' Interaction Analysis System. . . . .	88
Summary of CAFIAS Parameters. . . . .	92
Summary of Research Using CAFIAS. . . . .	94
B. PRELIMINARY PROCEDURES. . . . .	100
Approval of Human Subjects Review Com-	
mittee. . . . .	101
List of Directors of Special Education	
for BOCES--1979-80. . . . .	102
Map of Locations of BOCES in New York	
State. . . . .	109
Initial Letter to Directors of Special	
Education. . . . .	110
Questionnaire Sent to Directors of	
Special Education. . . . .	111
Schedule for Data Collection. . . . .	112

	Page
BOCES Teacher Data Form. . . . .	113
Follow-up Letter Sent to All Subjects. . . .	114
C. RAW DATA. . . . .	115
Data Used to Determine Coder Reliability. .	116
Percentages For CAFIAS Categories--	
Physically Handicapped Classes. . . . .	118
Percentages For CAFIAS Categories--Train-	
able Mentally Retarded Classes. . . . .	119
Percentages For CAFIAS Parameters--	
Physically Handicapped Classes. . . . .	120
Percentage For CAFIAS Parameters--Train-	
able Mentally Retarded Classes. . . . .	121
REFERENCES. . . . .	122

## LIST OF TABLES

Table		Page
1	Description of the Subjects' Teaching and Educational Backgrounds . . . . .	54
2	Results of Spearman Rank Order Correlation for Coder Reliability . . . . .	56
3	Summary of the Five Most Frequent Interaction Patterns of Teachers Interacting with Physically Handicapped and Trainable Mentally Retarded Classes . . . . .	61
4	Ranges and Means for Subjects on 12 CAFIAS Parameters for Classes of Physically Handicapped and Trainable Mentally Retarded Students . . . . .	67
5	Cell Means for Subjects on Four CAFIAS Parameters . . . . .	68
6	Discriminant Function Analysis for the Four CAFIAS Parameters for Between Class Difference . . . . .	69
7	Cell Means for Interaction Behaviors on Eight CAFIAS Parameters . . . . .	70

8	Discriminant Function Analysis for the Eight CAFIAS Parameters for Between Class Difference . . . . .	71
9	Univariate Analyses of Variance Comparing Interaction Behaviors in Physically Handicapped and Trainable Mentally Retarded Classes . . . . .	72

## LIST OF FIGURES

	Page
Figure	
1. Categories of CAFIAS. . . . .	6
2. Mean Percentage of Behaviors in Each CAFIAS	
Category . . . . .	57
3. Mean Percentage of Behaviors in Each CAFIAS	
Parameter . . . . .	64



## CHAPTER I

### ORIENTATION TO THE STUDY

Identifying the elements of effective teaching has been of interest to researchers for more than 50 years. Cooper (1977) suggests that the major purpose of such investigations is to maximize student learnings. In order to achieve this end, researchers have studied teaching characteristics, teaching-behaviors, and instructional methodology.

The methodology for scientifically analyzing the teaching act has been slow in evolving, especially in the area of physical education. Locke (1977), in reviewing the status of descriptive analytical research of teaching behaviors in physical education, states that teaching should be "a mirror for what we have been as a profession" (p. 213). He encourages this type of research in order to improve teacher education as well as to be of practical value to the elementary and secondary school teacher.

Since the early 1970s, several systems have evolved in an effort to (a) describe classroom practices, (b) modify teaching behaviors, (c) analyze teaching behaviors, (d) determine relationships between teacher behavior and

student learning, and (e) train student teachers. Some of the currently used systems in physical education have been developed by Anderson (1974) at Columbia, Siedentop (1972) at Ohio State, and Cheffers (1972) at Boston University. In addition to these systems, Locke (1977) cites several colleges and universities which have made a commitment to do sequential research using systematic observational instruments. These institutions include Ithaca College, University of Wisconsin, University of Montana, and Temple University.

At Ithaca College, Mancini, a Boston University graduate, has directed several master's theses (Getty, 1977; Inturrisi, 1979; van der Mars, 1979) which utilized Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) as an instrument to describe physical educators' behaviors in a variety of settings. Mancini (1979) suggested that the Cheffers' Adaptation of Flanders' Interaction Analysis System be used to study physical educators' teaching behaviors with handicapped populations.

Flanders (1970) states that "analysis of teaching behavior allows a greater variety of teaching techniques to be developed in order to meet individual needs" (p. 8). Amidon and Hough (1967) suggest that by observing interaction patterns "process adjustments can be made thus enhancing and enriching the learning experience" (p. 2).

With the increasing need for individualized teaching in physical education classes for the handicapped, it appears that the area of descriptive analysis of teaching behaviors should be given priority.

The analysis of successful interaction patterns and teaching styles for the handicapped can assist in the implementation of P.L. 94-142, which states that "all school-aged handicapped children are entitled to a free and appropriate public education in the least restrictive environment . . . with an emphasis on special educational services to meet their unique needs" (42 Fed. Reg. 42477-42480). The law further states that special education includes "specially designed instruction . . . to meet the unique needs of a handicapped child, including classroom instruction, and instruction in physical education" (p. 42480).

In summary, this study was undertaken because:

1. Descriptive analytic research on teaching behaviors in handicapped classes could provide valuable information for the physical educator and teacher trainer.
2. Little research had been undertaken on teaching behaviors with special populations.
3. The need existed to determine if there were differences in teaching behaviors of physical educators as they interacted with various special populations.

4. More literature in the area of teaching special populations was needed.

#### Statement of the Problem

The problem was to describe and compare the teaching behaviors of 12 New York State certified physical educators as they interacted with classes of handicapped students. The observations of teaching behaviors were made at 12 randomly selected Board of Cooperative Educational Services (BOCES) schools in New York State during the spring of 1980.

Data were collected by videotape recordings using a Sony Betamax portable videocassette recorder with a wireless microphone. Each subject was taped twice while instructing classes of trainable mentally retarded and physically handicapped students in fundamental gross motor skills. The tapes were coded by an expert to determine teaching behaviors using the Cheffers' Adaptation of Flanders' Interaction Analysis System [CAFIAS] (Cheffers, 1972).

Sixteen hundred notations of behaviors were made for each subject. Notations were divided equally between the two types of classes being observed. Based on the analysis of the data obtained, conclusions were drawn concerning behaviors exhibited by physical educators while teaching

classes of trainable mentally retarded and physically handicapped students.

### Definitions and/or Explanations of Terms

For the purpose of clarification, the following definitions and/or explanations of terms were established for the study.

#### Flanders' Interaction Analysis System (FIAS)

This term refers to "an observation system designed to objectively record verbal interaction between the teacher and students" (Flanders, 1970, p. 78).

#### Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS)

This term refers to "an observational tool used to identify predominant interaction patterns and process categories between the teacher and the student" (Martinek & Johnson, 1979, p. 63). The system is designed for use with physical education classes and is capable of describing 10 verbal and 10 nonverbal behaviors. These behaviors are described by the CAFIAS categories shown in Figure 1 (Martinek and Mancini, 1979, p. 19). Cheffers, Amidon, and Rogers (1974) reported that CAFIAS is a valid instrument when compared with Flanders' Interaction Analysis System. Using a "blind-live" interpretation method, CAFIAS was shown to be concordant at the .05 level of significance.

<u>Verbal</u>	<u>Nonverbal</u>	<u>Both</u>	<u>Behavior</u>
2	12	②	Praise, encouragement, joking
3	13	③	Acceptance of student's idea
4	14	④	Question
5	15	⑤	Lecture, information giving
6	16	⑥	Directions
7	17	⑦	Criticism
8	18	⑧	Rote student response
8\	18\	⑧	Analytic student response
9	19	⑨	Unpredictable student response
10	20		Silence, confusion

Figure 1. Categories of CAFIAS

It is important to note that the numbers have no mathematical value but were used as symbols for the categories. The use of these numbers is a method of classifying communication events, not judging them.

#### Verbal Communication

This term refers to audible spoken behaviors. (CAFIAS categories: 2, 3, 4, 5, 6, 7, 8, 8\, 9, and 10).

### Nonverbal Interaction

This term refers to facial gestures and postures (CAFIAS categories: 12, 13, 14, 14, 16, 17, 18, 18\, 19, 20).

### CAFIAS Parameters of Observed Behavior:

This term refers to the 12 variables derived from the 20 CAFIAS categories. A summary of the major parameters of CAFIAS is found in Appendix A. The 12 parameters were chosen because of their relevance to teaching classes of the trainable mentally retarded and physically handicapped students. These 12 parameters were defined as follows:

#### Teacher Verbal Contribution to Class (TCV)

All verbal teacher behaviors observed during the coding period, including verbal forms of praise, acceptance of student ideas, questions, lecture, directions, criticism, and empathy. It is calculated by adding together the tallies for CAFIAS categories 2, 3, 4, 5, 6, and 7.

#### Teacher Nonverbal Contribution to Class (TCNV)

All nonverbal teacher behaviors observed during the coding period, including nonverbal forms of praise, acceptance of student ideas, questions, lectures, directions, criticism, and empathy. It is calculated by adding together the tallies for CAFIAS categories 12, 13, 14, 15, 16, and 17.

Student Verbal Contribution to Class (SCV)

All verbal student behaviors observed during the coding period, including verbal forms of rote response, interpretive or evaluative response, and student initiated unpredictable behavior. It is calculated by adding together the tallies for CAFIAS categories 8, 8\, and 9.

Student Nonverbal Contribution to Class (SCNV)

All nonverbal student behaviors observed during the coding period, including nonverbal forms of rote response, interpretive or evaluative response, and student initiated unpredictable behavior. It is calculated by adding together the tallies for CAFIAS categories 18, 18\, and 19.

Teacher Verbal Questioning Behavior (TQRV)

All verbal questioning behavior of the teacher observed during the coding period compared with all verbal lecturing behaviors. It is calculated by dividing the tallies for CAFIAS category 4 by the sum of the tallies for CAFIAS categories 4 and 5.

Teacher Nonverbal Questioning Behavior (TQRNV)

All nonverbal questioning behavior of the teacher observed during the coding period compared with all nonverbal lecturing behaviors. It is calculated by dividing the tallies for CAFIAS category 14 by the sum of the tallies for CAFIAS categories 14 and 15.



### Teacher Verbal Use of Acceptance and Praise (TAPRV)

All verbal teacher use of acceptance of student ideas, praise, encouragement, and empathy as compared with all verbal use of direction and criticism by the teacher. It is calculated by adding together the tallies for CAFIAS categories 2 and 3 and dividing this sum by the total tallies of CAFIAS categories 2, 3, 6, and 7.

### Teacher Nonverbal Use of Acceptance and Praise (TAPRNV)

All nonverbal teacher use of acceptance of student ideas, praise, encouragement, and empathy as compared with all nonverbal use of direction and criticism by the teacher. It is calculated by adding together the tallies for CAFIAS categories 12 and 13 and dividing this sum by the total tallies of CAFIAS categories 12, 13, 16, and 17.

### Student Initiated Verbal Response, Teacher Suggested (SVITSR)

All verbal student interpretive or evaluative responses and unexpected or unpredictable behaviors are compared with all student verbal responses. It is calculated by adding together the tallies for CAFIAS categories 8 and 9 and dividing this sum by the total tallies of CAFIAS categories 8, 8\, and 9.

Student Initiated Nonverbal Response, Teacher Suggested  
(SNVITSR)

All nonverbal student interpretive or evaluative responses and unexpected or unpredictable behaviors are compared with all student nonverbal responses. It is calculated by adding together the tallies for CAFIAS categories 18 and 19 and dividing this sum by the total tallies of CAFIAS categories 18, 18\, and 19.

Student Initiated Verbal Response, Student Suggested  
(SVISSR)

All unexpected or unpredictable, self-initiated student verbal behaviors are compared with all student verbal behaviors. It is calculated by dividing the tallies for CAFIAS category 9 by the sum of the tallies for CAFIAS categories 8, 8\, and 9.

Student Initiated Nonverbal Response, Student Suggested  
(SNVISSR)

All unexpected or unpredictable, self-initiated student nonverbal behaviors are compared with all student nonverbal behaviors. It is calculated by dividing the tallies for CAFIAS category 19 by the sum of the tallies for CAFIAS categories 18, 18\, and 19.

Board of Cooperative Educational Services (BOCES)

Nyquist (1974) describes them:

New York State's intermediate-level arrangement for

delivering shared services to individual (school) districts which could not provide effectively for all the needs of their students or which needed programs too costly to develop alone. (p. 2)

#### Trainable Mentally Retarded (TMR) Students

According to the Commissioner's Regulations, this term describes students

who on the basis of a comprehensive evaluation, such evaluation to include an individual psychological examination, is determined to possess general intellectual capacity that falls lower than three standard deviations below the mean of the general population, cannot profit from programs established for the educable mentally retarded, but may be expected to profit from a special program for the trainable. (Regulations of the Commissioner, 1979, p. 5)

#### Physically Handicapped (PH) Students

According to the Commissioner's Regulations, this term refers to students with

orthopedic, visual, auditory, neurological and other medical or organic conditions which result in their inability to benefit from regular programs for non-handicapped children without some special services or programs. (Regulations of the Commissioner, 1979, pp. 5-6)

### Hypothesis of the Study

The following null hypothesis was tested at the .05 level of significance for each of the 12 selected CAFIAS parameters: There are no significant differences in the teaching behaviors of physical education teachers in classes for the physically handicapped and in classes for the trainable mentally retarded. The 12 parameters which were used to compare the teaching behaviors of physical educators were (a) teacher verbal contribution to class; (b) teacher nonverbal contribution to class; (c) student verbal contribution to class; (d) student nonverbal contribution to class; (e) teacher verbal questioning behavior; (f) teacher nonverbal questioning behavior; (g) teacher verbal use of acceptance and praise; (h) teacher nonverbal use of acceptance and praise; (i) student initiated verbal response, teacher suggested; (j) student initiated nonverbal response, teacher suggested; (k) student initiated verbal response, student suggested; and (l) student initiated nonverbal response, student suggested.

### Delimitations of the Study

The study was subject to the following delimitations.

1. The 12 New York State certified physical educators employed in 12 randomly selected BOCES.

2. The degree to which the subjects were representative of the population.

3. The degree to which the classes videotaped were representative of the special population to be studied.

4. The videotaping of each teacher as he/she instructed each class twice.

5. The duration of the class periods to be videotaped ranging in length from 10 to 30 minutes.

6. The degree to which the videotapes were typical of the subjects' natural teaching behaviors.

7. The inadvertent influence that the researcher had on the interactions of the classes being videotaped.

8. The objectivity, reliability, and validity of the Cheffers' Adaptation of Flanders' Interaction Analysis System.

9. The behavioral notations for each teacher which were coded from the videotapes.

10. The 12 parameters of observed teaching behaviors as measured by the Cheffers' Adaptation of Flanders' Interaction Analysis System.

11. The use of percentages as parametric data in the statistical analysis.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

A comprehensive examination of the literature indicated that this study did not duplicate any previous research. The studies reviewed are grouped under the following subheadings: (a) Evolution of Systematic Observation Instruments, (b) Observation Systems Used to Study Teaching Behaviors in the Physical Education Setting, (c) The Use of CAFIAS as a Tool to Describe Classroom Behaviors, (d) Studies Utilizing FAIS to Describe Special Educators' Teaching Behaviors, and (e) Studies Which Utilize Systematic Observation Systems to Describe Physical Educators Behaviors With Special Populations. Because of the wide diversity in type and intent of these systematic observation systems, this review is confined to those studies which relate to the development of the Flanders' Interaction Analysis System and the modifications made in that system to permit its application to physical education and special education settings.

### Evolution of Systematic Observation Systems

The earliest work using a category system for the systematic observation of teaching behaviors was done by Anderson (1939). He developed a system which assessed the verbal integrative and dominative behaviors of teachers as they interacted with their students. The contacts of three teachers were recorded as they interacted with three classes of kindergarten children. Each class was observed by two independent coders, and the total number of contacts in 5 minutes was recorded. Contacts were classified as individual or group contacts. Anderson determined that the system was reliable and could be used to measure dominative (children required to conform) and integrative (children encouraged to participate) teaching behaviors.

Lippert and White (1943) used Anderson's system to explore the effect of various leadership styles (authoritarian, democratic, or laissez faire) on boys participating in clubs. They reported that the type of leadership style affected the type of interaction which occurred.

Withall (1949) investigated how the social-emotional climate of a class can affect interpersonal communication. In order to accomplish this, he developed a system of 25 types of responses to identify teacher verbal responses which affected class climate. Through field testing, this system was reduced to seven categories of teacher talk.

The validity of the system was determined based on its concurrence with the Anderson (1939) system in categorizing the same data.

Flanders (1951) used Withall's system to categorize teachers' statements to determine what kind of teacher behaviors elicit a specific student response. He found that student behaviors associated with personal anxiety took priority over behaviors aimed toward achievement. Direct teacher behavior elicited student behaviors of hostility and withdrawal. Teaching behaviors which were accepting, problem oriented, and evaluative elicited behaviors of problem solving, integration, and decreased anxiety. As a result of this study, Flanders stated that "systematic role analysis is possible and should permit the introduction of controlled psychological forces into a spontaneous behavior system" (p. 109). It was this premise that prompted Flanders to begin work on a comprehensive system which could more accurately record verbal interactions. His system was not completed until 1960.

Bales (1950) developed a system (Interaction Process Analysis) of 12 categories to record verbal interaction. He was the first researcher to use the term "interaction process analysis" in the literature. One of his major contributions to systematic observation was the introduction of a standard time factor in the analysis of behavior.



Medley and Mitzell (1958) developed the Observation Schedule and Record (OSCAR) to observe and record classroom behaviors in municipal colleges in New York City. This system was based on that of Withall (1949). Some modifications were made to increase accuracy. The system was simplified and the procedure was changed from having several observers in the same class to having one observer code several classes individually. Medley and Mitzell used the instrument to observe 49 teachers twice for 30 minutes each. Six coders observed each teacher which provided 588 observations. The researchers reported that the instrument had a reliability of at least .60. They concluded that observers using OSCAR could provide reliable information concerning teacher behaviors in the classroom and that this technique could assist in learning why problems exist in certain classroom environments.

Flanders (1960a) utilized the early research, especially that of Withall, to develop a 10-category system known as Flanders' Interaction Analysis System. This system measured teacher talk, student talk, and silence and confusion which occurred in the classroom. The teacher categories were expressed as direct or indirect which related back to the original work of Anderson (1939). Flanders developed the concept of showing sequence and instructional interaction through the use of a matrix. In

this system, coding was done by recording every 3 seconds a number which represented a category in the system. A copy of this system is found in Appendix A.

The Flanders' System of Interaction Analysis is acknowledged as the best known and most widely used of the interaction analysis systems (Amidon & Hunter, 1966). Altenberger and Grossing (1978) reported its use in Germany, and Galton (1979) referred to its extensive use in Britain. Studies by Flanders (1960b), Weber (1968), and Williams (1980) showed that FIAS can be used successfully to summarize teacher and student behaviors and to measure changes in behavior which result from an experimental variable. Most studies indicated that students' attitudes and achievements were better in classrooms where the teachers' behaviors were classified as indirect.

Hough (1964) developed the Observational System for Instructional Analysis (OSIA). This system contained 13 categories which paralleled Flanders' categories and allowed verbal and nonverbal instructional events to be recorded. It distinguished between teacher and student behaviors, substantive and managerial behaviors, and behaviors associated with levels of thought. Interactional behaviors between students and teachers were recorded in 11 categories, and student to student interaction and

nonfunctional behavior were recorded in the remaining two categories.

Another system which modified the Flanders System was developed by Ober (1971). Known as the Reciprocal Category System (RCS), it contained nine categories. Amidon (1966) also produced a modification of FIAS known as the Verbal Interaction Category System (VICS). In this system, Amidon expanded the Flanders categories to permit greater differentiation in the type of interaction observed. He stressed the identification of patterns rather than the analysis of individual behaviors.

Galloway (1968) designed a system which described the nonverbal behavior of the teacher in terms of a continuum ranging from encouraging to restrictive. The scale had six dimensions which were used to measure nonverbal communication. A numerical coding technique and an anecdotal approach were used to describe behavior. Galloway (1969) stated that "teachers rely upon words and verbalisms during instruction to convey information, but true understanding and complete communication are achieved through the use of nonverbal communication" (p. 172). He believed that by making teachers aware of the nonverbal aspects of their behavior, a greater awareness of student reaction and response would be fostered. Galloway's work has affected systematic observation tools developed since that time.

Most have used both verbal and nonverbal analysis in their description of teaching behavior.

French and Galloway (1969) developed a system which was implemented and tested at the University of Tennessee, Knoxville (Achilles & French, 1977). The Indirect/Direct -- Encouraging/Restricting (IDER) system was based on the work of Galloway and was an attempt to categorize teacher verbal and nonverbal communication simultaneously. The Flanders system (indirect/direct) was used as a model to which the nonverbal contributions of Galloway (encouraging/restricting) were added.

Several researchers subsequently used this system. Cosper (1970), who studied the effect of different nonverbal communication cues on fifth-grade and sixth-grade boys and girls, found that all teachers talked significantly more to male than female students and that male students initiated talk more than the female students did. The teachers also tended to exhibit more restricting behaviors and direct behaviors toward the female students. Shepard (1971) used IDER to study the effect of social classes on a teacher's nonverbal behaviors. The subjects were five experienced teachers (had taught more than 6 years) and six inexperienced teachers. The teachers interacted with 283 students from high, middle, and low social classes. Teacher behaviors were coded using the IDER System. Chi square

was used to test for differences in observed behavior frequencies for the variables. Shepard found that

1. Teachers were more encouraging than restricting in their nonverbal behavior for all classes.

2. Female teachers and experienced teachers were more encouraging to upper social class students.

3. Middle social class students received the lowest percentage of encouraging behaviors.

4. More nonverbal behaviors were directed toward the boys of all social classes than the girls.

The research conducted at the University of Tennessee by French and Galloway indicated that nonverbal cues are extremely important in the communication process. It was hypothesized that a child who is unable to interact verbally is more astute at learning from nonverbal communication, and it was suggested that more research is needed to support this hypothesis.

Since the beginning of systematic observational research in 1939, the process has expanded greatly. As a result of the work of Hough, Flanders, Amidon, and others, the tools now available to record classroom interaction are comprehensive and capable of differentiating between discrete teacher-student interactions. Beginning in the 1970s, a greater emphasis was placed on developing observation tools for specific classroom settings. The remainder

of this review focuses on instruments used in the physical education and special education settings.

Observation Systems Used to Study Teaching Behaviors in the Physical Education Setting

The development of systematic observation techniques for specific use in physical education settings was limited until the early 1970s. It was less than 10 years ago that developmental researchers began using systematic observation in physical education. Persons responsible for this advance were Anderson (1971) at Teachers College, Columbia University; Siedentop (1972) at Ohio State University; and Cheffers at Boston University (1974). These pioneers developed tools for the systematic observation of the teaching-learning process in physical education. They also employed a "programatic approach to research on teaching" (Locke, 1957, p. 8) which allowed a wide variety of teaching variables to be studied employing a common tool. Appendix A contains a summary of studies using CAFIAS which illustrate this approach.

Brookhout (1967) was the first to report using observational research techniques to study the relationship between teaching behaviors and the climate of physical education classes. She studied 36 girls in ninth-grade physical education classes taught by women physical educators.

Based on data from a pupil inventory, classes were arranged into a continuum from defensive to supportive. Data were collected during two 30-minute classes by two trained observers using a modified version of OSCAR (Medley & Mitzel, 1958) to record the teaching behaviors. Analysis of variance was used to determine which behaviors differentiated among teachers.

Brookhout concluded that teaching behaviors can be used to differentiate among physical educators. She identified six patterns of teaching behaviors that commonly exist and noted that two of these patterns were climate related. "Integrative interaction" was positively related to a supportive climate, and "restraining direction" was positively related to a defensive climate. It was concluded that class climate varies among classes and that teaching behavior affects the class climate.

Barrett (1969) developed a system for recording and describing teacher-student behavior in movement education classes. In this system the behaviors exhibited in a physical education lesson were divided into four components: movement task, student response, content, and guidance. Barrett (1971) believed that this system could be useful to study the following factors: (a) the relationship of teachers' verbal behaviors and students' achievements; (b) patterns of verbal behavior of experienced and

inexperienced teachers; and (c) teachers' verbal behaviors in relationship to specific content emphasis with different aged students or the same students over varying periods of time. Barrett concluded that the system had promise, but needed to be refined to measure behaviors more accurately.

Anderson (1971) wrote of the importance of accurately describing events that occur in the gymnasium. He advocated the use of descriptive analytic research in a "sequential research effort which starts with the development of systems for describing events in the physical education setting" (p. 6). Anderson (1975) discussed the Videotape Data Bank Project begun in 1971. The major purpose of this project was to collect a significant number of tapes to be used as raw data for individual and joint research efforts (Anderson, 1978).

The development of descriptive systems then became a major research emphasis at Teachers College, Columbia University. New major systems developed were those of Fishman (1971), Laubach (1975), and Anderson (1975).

Fishman (1971) developed and refined a system to measure the amount and type of feedback a teacher gave students. In a followup study, Tobey (1974) coded 81 classes from the Data Bank. A total of 4,392 occurrences of feedback were recorded. It was concluded that teachers do not



vary their feedback method and that feedback is an important variable in teaching physical education.

Laubach (1975) developed a valid and reliable system to code student behavior in the physical education setting. The purpose of the study was to develop a tool which would accurately describe what students do in physical education classes. The system, Behavior of Students in Physical Education (BESTPED), was a complex multidimensional tool which measured function, mode, content, and time. Behaviors were noted at 1-second intervals, and several viewings of the same episode were required to complete the analysis. Three forms of this system evolved. Form I was complex and used for research while Form II and III were used by teachers for evaluation.

The BESTPED system was used to code the student behavior from 20 elementary school videotapes in the Data Bank (Costello & Laubach, 1978). After analyzing the data, it was concluded that the quality of instruction has an influence on student learning and performance.

Anderson (1975) designed a system to describe teaching behaviors in terms of interactive function, subscript mode, and direction. These behaviors were expressed in percentage of class time spent in each behavior. Barrette (1977) used Anderson's system to code 40 videotapes from the Data Bank. He found that teachers spend a substantial

percentage of time silently observing in addition to instructing. Teachers did not spend much time performing a single behavior but changed rapidly from one to another. Verbal interaction was the major mode of communication.

Teaching analysis in physical education at Ohio State University began with the development of the OSU Teacher Behavior Rating Scale (Siedentop & Hughley, 1975). This instrument was designed to allow the observation and classification of physical educators' teaching behaviors. The system contained eight parameters. Locke (1975) cited Ohio State as showing a clear progression in the use of systematic observation to improve preservice teacher education, inservice education, and general teaching behavior.

Olsen (1979), a doctoral student at Ohio State University, adapted Hough's Observational System for Instructional Analysis (1964) for use in physical education. The Observational System for Instructional Analysis--Physical Education (OSIA-PE) was a categorical observational system used to identify behaviors related to instructional events, teaching strategies and styles, and student behaviors related to the instructional process. Events were coded on seven dimensions simultaneously. In order to determine validity and reliability, videotapes were made of 12 classes. The codings were analyzed using Cohen's  $k$  to determine reliability. Coders were reported to be reliable above the

.80 minimum level. The OSIA-PE was found to be a useful, valid, and reliable tool.

Many physical educators have used FIAS or modified it to describe teaching behaviors in the physical education setting. Dougherty (1971) described the use of FIAS in the physical education setting. He stated that FIAS could be used in the physical education domain to (a) modify teacher behavior, (b) determine the effects of direct versus indirect teaching, and (c) discriminate between patterns of teaching. The researcher suggested the need for a modification in FIAS to include the nonverbal domain.

Nygaard (1971) used FIAS to describe the verbal interaction which occurred in physical education classes. The subjects were 40 randomly selected physical education teachers in the public schools of Missoula, Montana. The teachers were assigned to five groups according to grade level taught. Each teacher was taped for a minimum of 20 minutes, and the tapes were coded using FIAS by the Teacher Inservice and Program Services at the University of Oregon. The data collected were treated by chi square to determine significance. The Poisson Distribution Test was used to make specific comparisons when significant differences were found. The .01 level of significance was set for all tests.

Based on the statistical procedures performed, Nygaard concluded that the teachers of physical education described in the study had a direct verbal influence on their classes because they did most of the talking. The most common interaction pattern observed was lecture followed by silence (there was no way to designate nonverbal activity). Nygaard found that male and female teachers differed in their interaction patterns and that interaction patterns varied with grade levels.

Cheffers (1972) listed three limitations in FIAS which inhibited its successful use in physical education: (a) it described only verbal behaviors, (b) it did not allow class structure to be coded, and (c) it considered the teacher as the only instructional agent. Cheffers modified FIAS to allow nonverbal behavior to be coded; to permit peers, teacher, or the environment to be the teaching agent; and to code the class as a whole, in small groups, or individually.

Cheffers (1972) developed CAFIAS to describe classroom behaviors in lessons concerned with physical activity. The validity and reliability of CAFIAS were established by comparing it to FIAS using a "blind" (solely from matrices) "live" (from viewing videotapes) method of comparison. Thirty-three graduate students at Temple University were subjects for the study. Twenty-four of the subjects were

taught to code and interpret using both systems, while the remaining subjects were not trained in either system.

Eighteen of the trained subjects were assigned randomly to two experimental groups. Their task was to code, using the "blind" method of interpretation, six lessons from matrices developed by the main observers. Six volunteers from the group also coded using the "live" method and developed matrices.

Conclusions were that:

1. The "live" method (using videotapes) is better than the "blind" method (development of matrices).
2. The CAFIAS system can more accurately interpret physical activity classes' behaviors than FAIS.
3. CAFIAS as an instrument is reliable in describing physical activity lessons.
4. Individual coders are as reliable as those working in teams.
5. There is a need to record both verbal and nonverbal behaviors in order to accurately represent physical activity classroom behaviors.

Cheffers' Adaptation of Flanders' Interaction Analysis System has been used by many researchers since its development. A summary of studies based upon CAFIAS data are included in Appendix A. A discussion of selected studies

using CAFIAS to describe teaching behaviors is included in the next section.

Rankin (1975) developed the Rankin Interaction Analysis System (RAIS) to determine the types of verbal and non-verbal communication which exist between student teachers and their elementary school physical education students. Specifically, the investigator sought to determine if the amount of selected types of interaction varied depending on the sex of the teacher, the teacher's personality (dominant vs. submissive), and the grade level of the students (primary vs. intermediate). The subjects were University of Kansas student teachers who were enrolled for supervised student teaching. All of the subjects taught within a 50-mile radius of the University of Kansas.

Two instruments were used to collect data. The Cattell Sixteen Personality Factor Test (dominant-submissive scale only) was used to determine the personality type of the subject and the RAIS was developed to collect data on the student teacher behaviors. The RAIS, a modification of other interaction analysis systems, was designed to provide a practical method of evaluating verbal and nonverbal behaviors of the student teachers in elementary school physical education classes. The system contained 10 categories, 5 verbal and 5 non-verbal. RAIS was closely related to CAFIAS in that it used the same categories as

CAFIAS except in collapsed form. Rankin reported satisfactory objectivity, reliability, and validity.

The data collected were coded using RAIS, and an analysis of variance was used to determine significant differences between sex, grade levels, and teacher personalities. A significant difference was found between sexes. Females tended to use more gestures than males. The significant difference between grade levels showed that students tended to frown more at the intermediate level. A significant difference found between personality types indicated that submissive teachers rejected their students more than dominant teachers did. An additional finding was that students who were actively involved in physical education class tended to be more content and happy than students who spent more time watching and listening.

During the past 10 years the use of systematic observation among physical educators has increased rapidly. The systems which have evolved are encouraging in that they demonstrate the importance and complexity of studying the teaching act.

#### The Use of CAFIAS as a Tool to Describe Classroom Behaviors

Of the several systematic analysis instruments used in physical education, CAFIAS has been utilized the most.

According to Cheffers and Mancini (1978), an interaction analysis system such as CAFIAS can be used in a variety of ways: (a) to describe classroom practices, (b) to change or modify teacher behavior, (c) to analyze teaching behavior, (d) to provide a vehicle for self-analysis of teaching behavior, (e) to train preservice teachers, (f) to determine patterns of teaching, and (g) to determine relationships between student progress and classroom behaviors. CAFIAS has been found to be a successful method of categorizing verbal and nonverbal classroom behaviors in the physical education setting.

A summary of completed research using CAFIAS for the years 1972-80 is included in Appendix A. This summary includes 58 studies: 21 unpublished masters' theses, 17 doctoral dissertations, 10 published articles or reports, and 10 others. The studies reviewed in this section are illustrative of those contributing the most to the development and refinement of the CAFIAS system.

Mancini, Cheffers, and Zaichkowsky (1976) studied 505 Boston school children in grades one through six to determine the differences that two decision-making models had on randomly selected classes' attitudes and interaction patterns. The two decision-making patterns studied were



- (a) one where the teacher made all of the decisions and
- (b) one where the decision-making was shared by the teacher and the students.

The subjects attended the Boston University physical education center and received instruction from six teachers who administered both treatments. Data were collected twice during the semester. The variables of day, time, teaching behaviors, facilities, and curriculum were controlled by the researchers.

Student attitudes were measured by the Cheffers and Mancini Human Movement Attitude Scale (CAMHM). This scale used caricatures (nonverbal method) to measure student attitude. Reliability and validity of the instrument were determined to be .97 and .87, respectively. Student interaction was measured from videotape recordings coded by CAFIAS.

A 2 x 2 x 3 factorial analysis of variance was used to analyze the variables of sex, grade, and method on the CAMHM attitude scale. Descriptive statistics were used to analyze the behaviors of three randomly selected teachers.

Results indicated that students who had input in the decision-making process had a more positive attitude, exhibited more interaction with teachers, and showed greater initiative than students who did not participate in the decision-making process. Mancini et al. (1976) stated that

this study supported the educational trend that children given a share in the decision-making process enjoy class more and interact more with the teacher (p. 85).

Martinek and Johnson (1979) used the Dyadic Adaptation to Cheffers' Adaptation of Flanders' Interaction Analysis System (DAC) in a study which described the teacher expectations on specific teacher-student behaviors. Five elementary teachers rated their students according to how they expected them to perform physically. One hundred students (the highest 10 and lowest 10 in each class) comprised the sample. All teachers in the study were experienced physical education teachers who had previously worked with the children under observation. Two coders recorded the behavior of each teacher five times during 16 weeks of instruction. An inter-observer reliability coefficient of .91 was established between the coders.

A  $2 \times 2 \times 5$  multi-analysis of variance was used to determine the differences among high and low achievers, sex, and teachers on the dependent variables measured by the DAC. Significant differences at the .05 level were found in the number of interactions among teachers in several categories. High achievers received significantly more contacts and praise than low achievers. The sex of students did not appear to influence the study.

substantially, although male students demonstrated more student initiated behavior than the female students.

#### Studies Utilizing FIAS to Describe Special Educators' Teaching Behaviors

Flanders' Interaction Analysis System has been used in a variety of special education settings. Researchers, who have used FIAS to describe the classroom, have investigated teaching behaviors hypothesized to affect handicapped students.

Semmel, Herzog, Kreider, and Chaves (1967) used FIAS to describe the verbal behaviors of teachers of the trainable mentally retarded. The Minnesota Teacher Attitude Inventory (MTAI) was administered to 87 public school teachers of the trainable mentally retarded. Seven teachers were selected as subjects from those scoring among the highest and the lowest on the MTAI. Verbal interactions which occurred in their respective classes were recorded by FIAS. A trained observer coded two, 1-hour observations in the classroom.

The results of the study did not support the hypothesis that a teacher's verbal behavior in the classroom could be predicted from MTAI scores; however, it was shown that teachers who scored high on the MTAI used more questions and had more student response whereas low scorers on the

MTAI used more lecture and criticism. Semmel et al. (1967) believed that interaction analysis held great promise as a research tool for the study of verbal interaction in special and regular classrooms.

Crispin and Walker (1969) employed a modified Flanders' Analysis System to describe the behavior of socially maladjusted children in the classroom. They also studied the relationship between the students' behaviors and changes in the behavior of their teachers.

The subjects were 15 boys and one girl who attended the Diagnostic Counseling and Remedial Center in Terre Haute, Indiana. Fifty-minute videotape recordings of the class were made twice in January, 1969, and once in May, 1969. The behaviors collected were coded using the Profile of Interaction in the Classroom (PIC), a system which follows FIAS but avoids the use of a matrix. An additional category "maladjusted behavior" was created for use in this research. All of the rules for FIAS were followed in the PIC system.

An analysis of the data showed a significant difference in student behaviors between the January and May observations. It was shown that response to teacher and self-initiated behaviors increased, whereas silence, confusion, and maladjusted behaviors decreased.

The teacher's behavioral changes were measured to determine if an intensive workshop on teaching given in February had an effect on behavior. Significant changes in teaching behavior were found. It was shown that the teacher had become more indirect in her approach. She had reduced controlling behaviors, increased the amount of praise given, and involved the students in the learning process to a greater degree. Crispen and Walker concluded that workshops on teaching are successful in modifying teaching behavior and that interaction analysis is a valuable tool for assessing in the classroom behavior of socially maladjusted children.

Craig and Collins (1969) created a system of interaction analysis which permitted observations of classroom interaction among deaf students and between deaf students and their teachers. The Flanders System was used as a model, but modifications were made to allow the description of deaf students' nonverbal behavior. This was accomplished by increasing the 10 categories of the Flanders System to 20 categories.

In order to determine the efficacy of the modified instrument, Craig and Collins tested it on classes of primary, intermediate, and high school deaf students in residential and public schools. The subjects were 94 deaf students in 12 classes for the deaf in Pennsylvania, Ohio, and

Indiana. All of the children had hearing losses greater than 60 db, losses sustained prior to age 2 years, and communicative disorders which required special education for the deaf.

Data were collected by trained observers who sat in the classrooms and coded the communicative acts as they occurred. All observers followed the general guidelines as outlined by Flanders.

Results of the study showed that teachers initiated communication at all educational levels; however, at the high school level more student response and initiation were found than at other levels. Questioning and informing were the two most common communication categories observed. The verbal mode predominated at the primary and intermediate levels. The most significant outcome of this study was the creation of a technique which allowed systematic observation of classroom communication of the deaf.

Lanasea and Mayo (1979) used Flanders' Interaction Analysis System to study 46 special education teachers of grades 7 through 12 from the Houston Independent School District. The purpose of the investigation was to describe and compare verbal interaction patterns in classrooms of learning disabled, educable mentally retarded, and trainable mentally retarded students.

Each class was observed for 2 hours, and the data obtained were analyzed using FIAS to determine if the classroom climate was direct or indirect. Results showed that the direct style was used predominantly. Few instances of praise, acceptance, or independence were observed. Specifically, the researchers found that the teachers of the trainable mentally retarded were less direct than the teachers of the learning disabled and the educable mentally retarded. Children in trainable classes also received more praise, got more directions, and received less criticism. Total student talk in the trainable mentally retarded classes was 29%. Lanasea and Mayo urged further investigation as to how teaching behaviors affect learning with special populations.

Studies Which Utilize Systematic Observation Systems  
to Describe Physical Educators' Behaviors  
With Special Populations

The paucity of systematic research relating to physical education teachers interacting with special populations is in startling contrast to the amount of systematic observation research completed in other areas of education. Research interest in this area, however, is growing as a result of federal legislation and increased educational opportunities available to the handicapped.

Bechtold (1976) used CAFIAS to study the effect of a tutorial relationship between high school student volunteers and peer-aged moderately retarded students as they participated in individually prescribed physical education programs. The subjects were 12 high school students from Newton South High School in Newton, Massachusetts, who volunteered to work with 14 moderately retarded peers from the Peabody, Massachusetts, Special Education School.

Bechtold coordinated and prescribed the individual physical education programs. The volunteers participated in an 8-session inservice training program before the tutoring treatment began. Treatment consisted of two 8-week periods of activity in the physical fitness room. The effects of the treatment were measured by three instruments in a pretest, posttest, and post posttest format. The interaction between the tutor and student was studied by CAFIAS. Three 5-minute tapes were taken and coded. Analysis of variance was used to determine if tutor-student interaction was positive at the beginning of the treatment and if it improved throughout the study, which it did. Other findings were that nonverbal activity was the predominant mode of interaction (52%). The pattern of nonverbal response changed from teacher-directed to student-initiated during the treatment period, and the amount of teacher praise was high (13%).



Mawdsley (1977) studied the behavior interaction patterns and teacher-student relations of physical education teachers in regular and adapted first- second- and third-grade physical education classes. The subjects were 24 teachers in the Boston, Massachusetts, area school districts. The Cheffers' Adaptation of Flanders' Interaction Analysis System was used to code the observations. The Fiedler's Group Atmosphere Scale (Fiedler & Chemers, 1974) was used to measure student-teacher relations.

Mawdsley's findings indicated that teaching behaviors in adapted physical education classes were similar to those in regular classes in many ways and that there were no significant differences between the teaching behaviors of men and women physical educators. A two-way analysis of variance was used to compare the teacher-student interactions of male and female teachers in regular and adapted classes.

Implications of this study were that adapted physical education teachers appeared to be more accepting of students' feelings and to exhibit more empathy, praise, and encouragement than regular physical education teachers. Students in adapted classes appeared to use more nonverbal behavior when interpreting a teacher's instructions and tended to show more unpredictable behaviors than their normal peers.

Cratty's Six Category Gross Motor Proficiency Test (Cratty, 1969) was used to determine improvement in the gross motor proficiency of the students. The test was administered three times by the researcher. An analysis of variance showed significant gains in motor proficiency. Seven additional physical performance tests were administered and significant gains were made on five of the seven test items.

Bechtold concluded that using high school volunteers as peer tutors for the moderately retarded was successful. The high school students improved affectively and cognitively, and the moderately retarded students improved significantly in gross motor proficiency and physical performance.

Gauthier (1980) completed a descriptive study concerning the manner in which physical education teachers interacted with mainstreamed and nonmainstreamed second grade physical education classes in the Lafayette, Indiana vicinity. The investigator used four mainstreamed classes which contained three or less learning disabled children in each and compared them with four classes which contained no handicapped students. Students in the classes were matched by sex.

Each class was videotaped on five occasions during the fall of 1979. The Observational System for Instructional

Analysis-Physical Education (Olson, 1979) was used to code the verbal and nonverbal behavior of the teachers and students. A  $4 \times 2 \times 4$  multivariate analysis of variance with repeated measures was used to determine the significance of the seven variables. The results showed a significance for main effects as well as significant interaction effects. Univariate analysis of the dependent variables showed two were significant at the .05 level. Gauthier found that handicapped children received more positive feedback and that the type of feedback received was more general in nature. On the basis of the results, Gauthier concluded that teacher-student interaction does not differ greatly in elementary school physical education classes which contained handicapped students.

## CHAPTER III

### PROCEDURES FOLLOWED IN DEVELOPING THE STUDY

The present study was developed to describe and compare the teaching behaviors of 12 New York State certified physical educators as they interacted with classes of handicapped students. The observations of teaching behaviors were made at 12 randomly selected BOCES schools in New York State. Data were collected using a portable videocassette recorder. The videotapes were coded to determine teaching behaviors using Cheffers' Adaptation of Flanders' Interaction Analysis System (Cheffers, 1972). The procedures followed in the development of the study are presented under the following headings: (a) Review of Related Literature, (b) Preliminary Procedures, (c) Selection of the Subjects, (d) Selection of the Instrument, (e) Collection of the Data, (f) Organization and Analysis of the Data, and (g) Preparation of the Final Report.

#### Review of Related Literature

The investigator surveyed the information from all sources pertaining to the evolution of systematic observation systems, the use of systematic observation to study

physical education teaching behaviors, the use of systematic observation to study special educators' teaching behaviors, the use of CAFIAS in physical education settings, and the use of systematic observation to describe physical educators' behaviors with special populations. An ERIC computer search (1968-80) was conducted in order to locate all of the available sources and other available references were also consulted. Key words used to locate information were: interaction process analysis, systematic observation, teaching behavior, teaching methods, evaluation of teaching, handicapped, physical education, special education, Flanders' Interaction Analysis System, and Cheffers' Adaptation of Flanders' Interaction Analysis System.

An additional source of guidance and information was Dr. Victor Mancini, an expert in the development and use of CAFIAS. He provided consultation and advice throughout the preparation of this report.

A tentative outline of the proposed study was developed and revised with suggestions from the dissertation committee. The approved outline was filed in the form of a Prospectus in the Office of the Provost of the Graduate School at Texas Woman's University.

### Preliminary Procedures

Before the study began, certain preliminary procedures were followed. Permission to use human subjects was secured from the Texas Woman's University Human Subjects Review Committee. A copy of the committee's approval is included in Appendix B. Permissions were secured from the administrators of the selected BOCES schools to allow the investigator to videotape classes in their institutions. Human Subject Consent Form B and a permission to videotape form were signed by all subjects.

To locate the BOCES which offered physical education classes for the trainable mentally retarded and physically handicapped, the investigator obtained a list of Directors of Special Education for New York State BOCES for the school year 1979-80. The 44 Directors of Special Education were contacted by letter. They were asked to complete a brief questionnaire concerning physical education programs for the handicapped provided by their institutions. A copy of the list of directors of special education, a map showing the location of the 44 BOCES in New York State, and a copy of the initial letter and questionnaire are included in Appendix B. Of the 44 special education directors contacted, 34 (77%) returned the questionnaire and were willing to participate in the study if their programs and teachers met the established criteria of the study. The

criteria included (a) the school offering physical education classes to the trainable mentally retarded and physically handicapped in a nonmainstreamed setting, (b) having a New York State certified physical education teacher with a minimum of 2 years of experience on the staff, and (c) that the physical educator teach classes of trainable mentally retarded and physically handicapped in nonmainstreamed classes. Of the 34 BOCES responding, 28 met these criteria. From this group, 12 institutions were randomly selected to take part in the study. The location of these BOCES are indicated on the map provided in Appendix B.

#### Selection of the Subjects

The sample was composed of 12 physical educators who taught at the randomly selected BOCES during the spring of 1980. All of the subjects met the following criteria: (a) were New York State certified physical education teachers, (b) had taught for a minimum of 2 years, (c) had taught nonmainstreamed classes of trainable mentally retarded and physically handicapped students, and (d) had agreed to participate in the study.

#### Selection of the Instrument

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was selected to measure the teaching

behaviors of physical educators as they interacted with classes of handicapped in accordance with pre-established criteria: (a) capacity to measure both verbal and nonverbal teaching behaviors, (b) an established validity of .70 or more, and (c) a reliability of .80 or more.

Cheffers (1972) designed CAFIAS to measure verbal and nonverbal behaviors in physical education classes. CAFIAS can also describe class structure, student response behavior, and teacher student interaction (Cheffers, Amidon, & Rodgers, 1974). The categories measured by CAFIAS and a description of each category are found in Appendix A.

Cheffers (1972) determined the validity of CAFIAS by comparing teachers' performances with their performances as measured by Flanders' Interaction Analysis System (FIAS). He used a "blind-live method" to establish reliability. The "blind" group reconstituted lessons based on CAFIAS and FIAS matrices while the "live" group interpreted videotapes of the selected physical education classes. Pearson Product-Moment Correlations were employed to determine if the two groups' interpretations were related to each other and to a control group which viewed the actual classes. Cheffers (1972) reported a  $r$  of .80, which was significant at the .05 level.



Cheffers (1972) determined the inter-coder reliability for the instrument through the use of inter-observer agreement while the observers were coding selected physical education classes. There was an emphasis on cell loading rather than tally for tally accuracy. Kendall's Coefficient of Concordance was used to compare the cell rankings of the observers. On comparison the total matrices yielded a  $\omega$  which ranged from .60 to .81. A comparison of the 10 most used cells yielded a  $\omega$  of .44 to .87. Both methods of comparison showed reliability at the .05 level of significance.

The investigator selected CAFIAS as the instrument to be used in coding the data for this study because of its applicability to the physical education class atmosphere, its established reliability and validity, and the availability of an expert in the use of CAFIAS who could code the data and act as a consultant for the study. The use of CAFIAS by Mawdsley (1977) in investigating teaching behaviors in regular and adapted movement education classes indicated that the system can be used successfully with physical educators instructing special education classes.

#### Collection of Data

Data concerning the teaching behaviors of the 12 subjects were collected during May, 1980. Each subject was

videotaped twice while instructing a class of trainable mentally retarded students and twice while instructing a class of physically handicapped students. A Sony Betamax portable videocassette recorder with a wireless microphone was used to collect the data.

Consistency was maintained during the data collection in (a) the time of day, (b) the use of the same classes for each taping, and (c) the personnel who operated the videotape machine. Both of the tapes for a specific class were collected during a 7-day period. A schedule of the dates and times of the data collection are found in Appendix B.

The classes which were videotaped ranged in length from 15 to 30 minutes and in size from 2 to 18 students. Teacher's aides were present in some classes to maintain an adequate teacher-student ratio. Each videotape was labeled with the name of the BOCES, the teacher's name, the class type, and the number of students in the class.

In addition to the videotaped data, each subject was asked to complete a BOCES Teacher Data Form. After the data were collected, a follow up letter was sent to the subjects, thanking them for their cooperation in the study. A copy of these forms can be found in Appendix B.

### Organization and Analysis of the Data

Data were collected from the two videotapes of each class; these videotapes were coded by an expert coder using CAFIAS. For each taped class, the coder made behavioral notations every 3 seconds or whenever a new behavior appeared. He continued the coding process until 400 notations were made.

Coder reliability was determined by having the coder make two independent observations of two randomly selected tapes. The Spearman Rank Order Correlation Method was used to determine coder reliability. Coder reliability was calculated at  $r = .95$ .

The data collected from the coding were transferred to computer cards for analysis using Rodgers "Prototype Fortran Program for Interaction Analysis" (Cheffers, Amidon, & Rodgers, 1974, p. 55). The computer printout provided the ratios and percentages used in the study. The raw data are presented in Appendix C.

Multivariate analyses of variance (MANOVA's) were used to determine significant multivariant differences in the teaching behaviors. Discriminant function analysis was used to determine the percentage that each variable contributed to the difference. Univariate analyses of variance were used to identify which of the individual differences were significant at the .05 level.

Preparation of the Final Report

A topical outline was used in the development of each chapter. The written report was prepared and presented to the members of the dissertation committee. Revisions were made based on their suggestions. A final report of the study was completed which included findings, conclusions, recommendations for additional studies, appendices, and a reference list.

## CHAPTER IV

### ANALYSIS OF THE DATA

The purpose of the study was to describe and compare the teaching behaviors of 12 New York State certified physical educators as they interacted with separate classes of physically handicapped and trainable mentally retarded students. The findings are reported under these headings: (a) Descriptive Data for Subjects' Teaching and Educational Backgrounds; (b) Coder Reliability; (c) Descriptive Data for CAFIAS Categories; (d) Descriptive Data for CAFIAS Parameters; and (e) Multivariate Analysis of Data on 12 Selected CAFIAS Parameters.

#### Descriptive Data for Subjects' Teaching and Educational Backgrounds

A description of the subjects' teaching and educational backgrounds is presented in Table 1. All of the subjects were experienced New York State certified teachers. Three of the teachers had from 1 to 5 years, six had 6 to 10 years, and three had 11 or more years of experience in teaching physical education. The subjects as a group had less experience in teaching adapted physical education. Six of the subjects had less than 5 years with

Table 1

Description of the Subjects' Teaching  
And Educational Backgrounds

Background	Males ( <u>n</u> = 6)	Females ( <u>n</u> = 6)	Total ( <u>n</u> = 12)
Physical Education Experience (in yrs.)			
1-5	1	2	3
6-10	5	1	6
11-30	0	3	3
Adapted Physical Education Experience (in years)			
1-5	3	3	6
6-10	3	1	4
11-30	0	2	2
Highest Academic Degree Earned			
Bachelor's	4	2	6
Master's	2	4	6
Area of Specialization for Highest Degree Earned			
Physical Education	5	3	8
Adapted Physical Education	1	2	3
Special Education	0	1	1
Type of N.Y. Teacher Certification			
Provisional	2	1	3
Permanent	4	5	9

the handicapped, four had 6 to 10 years, while only two had 11 or more years of experience.

Educationally, the subjects were divided evenly between those with bachelor's and those with master's degrees. Eight of the subjects had specialized in physical education during study toward their highest earned degree whereas three had specialized in adapted physical education and one had specialized in a related area of special education. All of the subjects had participated in adapted physical education classes and inservice workshops.

The sexes of the subjects were divided evenly between males and females. The sample selected seemed to be representative of the population from which it was obtained.

#### Coder Reliability

In order to assess the reliability of the coder for this study, two videotapes were selected randomly by the investigator for an expert to code two times. The time between the independent coding observations was 2 months. The Spearman rank order correlation technique was used with the top 10 cell concentration for the two independent observations being correlated for each tape.

The resulting correlations are presented in Table 2. The mean of the correlations was .95, which was sufficiently high to indicate acceptable reliability for the coder.

Table 2

Results of Spearman Rank Order Correlation  
for Coder Reliability

Subject/Class <sup>a</sup>	Rho	<u>M</u>
8 / PH	.900	.950
11 / TMR	.997	

Note. Information concerning raw data is found in Appendix C.

<sup>a</sup>Class abbreviations used are:

PH Physically handicapped

TMR Trainable mentally retarded

Descriptive Data for CAFIAS Categories

Figure 2 is a graphic representation of the percentage of occurrence for each of the CAFIAS categories. The graphic comparison shows the similarities in teaching behaviors of the subjects as they interacted with PH and TMR classes.

With both classes, the most frequent behaviors exhibited by the subjects were verbal and nonverbal direction-giving to the students (CAFIAS categories 6 and 16). It should be noted that the TMR students received slightly more verbal (14.8%) and nonverbal (11.4%) direction than



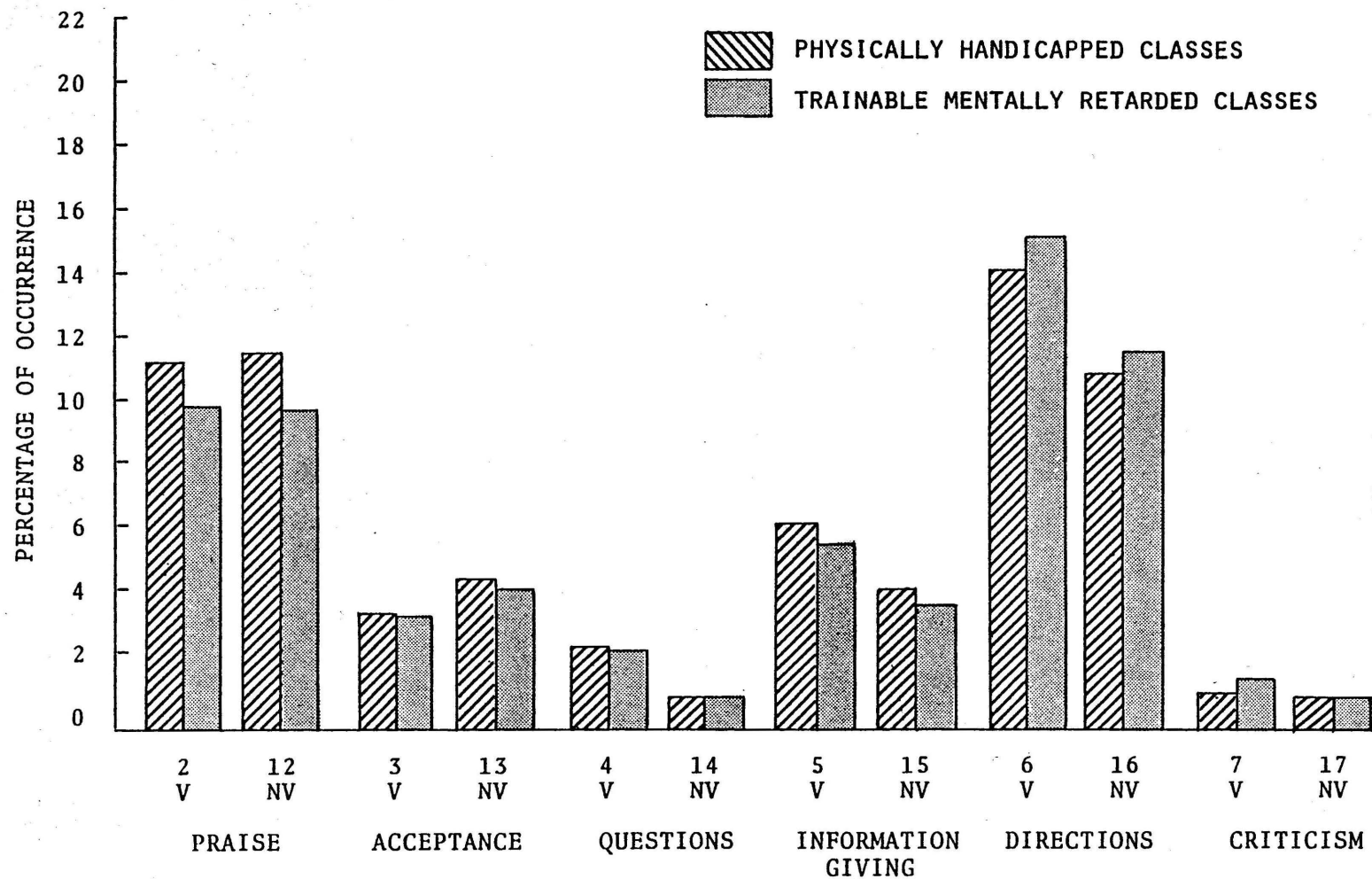
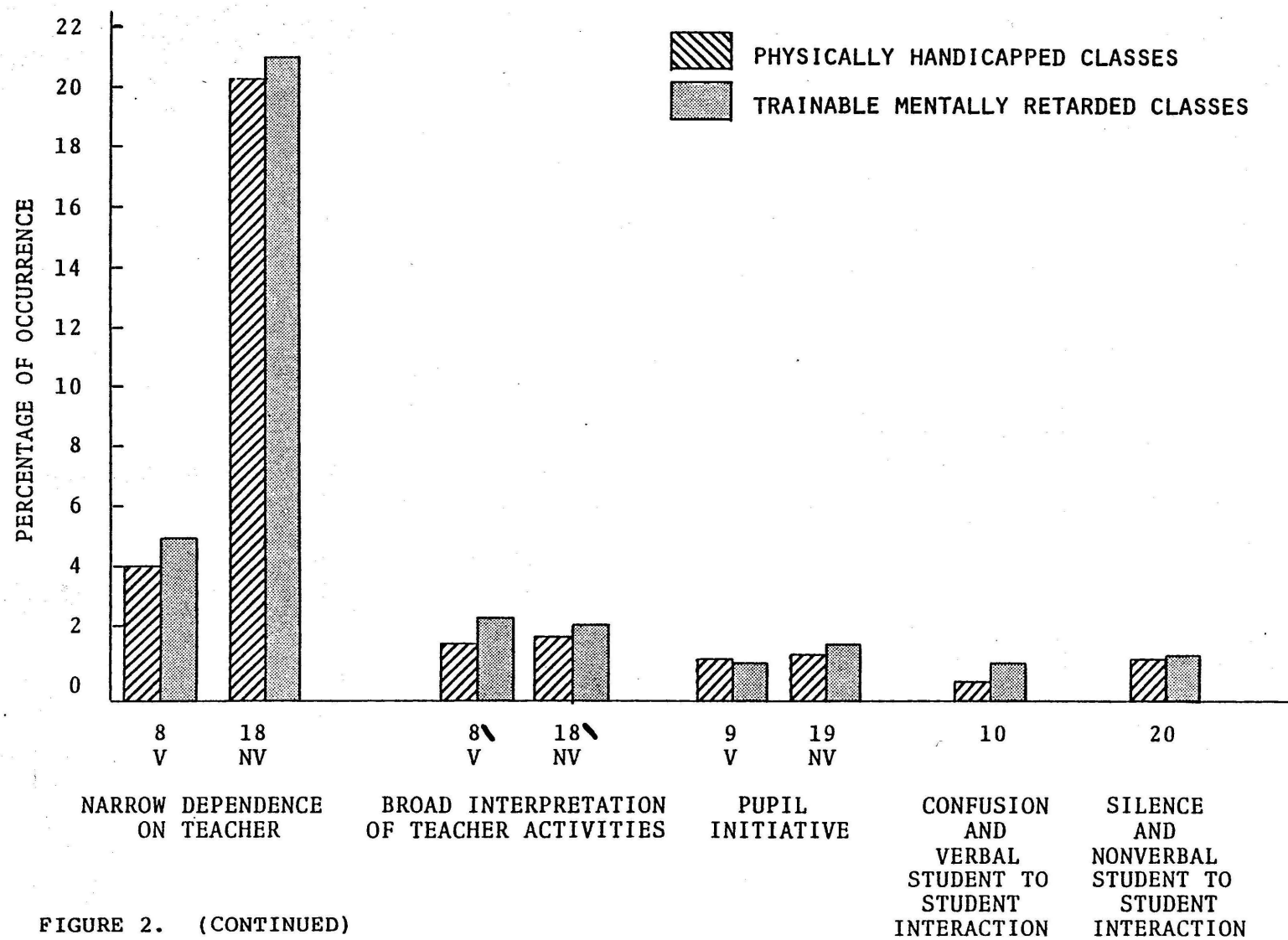


FIGURE 2. MEAN PERCENTAGE OF BEHAVIOR IN EACH CAFIAS CATEGORY.



the PH students who received 14.0% and 10.8%, respectively. The reverse was found for verbal and nonverbal information-giving (CAFIAS categories 5 and 15). The PH students received 6.0% verbal and 4.0% nonverbal information-giving behaviors from the subjects whereas the TMR students received 5.4% and 3.5%, respectively.

The next most frequent behaviors demonstrated by the subjects were verbal and nonverbal praise (CAFIAS categories 2 and 12). These behaviors were exhibited more often in PH classes (22.8%) as compared to TMR classes (19.5%). An interesting comparison exists between CAFIAS categories 2 and 12, praise, and CAFIAS categories 7 and 17, criticism. It appears that as a group the subjects exhibited very few behaviors which could be considered critical or negative in comparison with the number of positive behaviors coded as praise. If the sequence of critical behaviors is studied, it can be determined that much of the critical behavior can be considered constructive in nature. Most behaviors coded as CAFIAS category 7 or 17 were followed by a CAFIAS coding of 2 or 3 which showed acceptance of the student's behavior and encouragement. Very few behaviors were coded as 7-7 which would be interpreted as negative criticism.

All of the other subject categories were very similar in the two types of classes. It should be noted also that the percentages of the occurrence of these behaviors were low.

With regard to students' responses to their teachers, the behaviors which accounted for the highest percentage of student behavior were nonverbal predictable response (CAFIAS category 18). This form of behavior and its verbal counterpart were exhibited slightly more often in TMR classes (25.6%) than in PH classes (24.1%).

In summary, Figure 2 shows that the subjects were direct in their teaching behaviors, which resulted in a very structured classroom setting. The typical pattern of this direct model was teacher verbal and nonverbal direction-giving and encouragement, followed by nonverbal rote response by the student, and by praise by the teacher (CAFIAS categories 6-2-18-2).

The patterns seen in Figure 2 are demonstrated also in Table 3, which indicates the five predominant interaction patterns for PH and TMR classes. The density of tallies in the cells revealed not only the predominant teachers' and students' behaviors but also the sequence of those behaviors. The most common behavior pattern for subjects interacting separately with PH and TMR classes was 6-8; this represents direction-giving by the teacher followed by

rote student response. This pattern was found more frequently in TMR classes (14.67%) than in PH classes (11.70%). The pattern of direction-giving by teacher

Table 3

Summary of the Most Frequent Interaction Patterns of Teachers Interacting with Physically Handicapped and Trainable Mentally Retarded Classes

Physically Handicapped			Trainable Mentally Retarded	
Rank	Interaction Pattern <sup>a</sup>	Percentage of Occurrence	Interaction Pattern	Percentage of Occurrence
1	6-8	11.70	6-8	14.67
2	6-2	9.19	6-2	7.72
3	2-6	7.13	2-6	7.56
4	5-6	6.63	8-6	7.24
5	8-2	6.46	8-2	5.72

Note. All cells represent verbal and nonverbal behaviors in that category.

<sup>a</sup>Interaction patterns included:

- 6-8 Directions given by teacher followed by predictable student response.
- 6-2 Directions given by teacher followed by teacher praise.
- 2-6 Praise given by teacher followed by directions given by teacher.
- 5-6 Information followed by directions given by teacher.
- 8-6 Predictable student response followed by direction given by teacher.
- 8-2 Predictable student response followed by teacher praise.

followed by teacher praise (6-2) was more evident in PH than TMR classes. This type of pattern was coded when the subject concurrently gave directions and nonverbally encouraged the student to perform the activity. The only difference which was noted in the top five cells was that the fourth-ranked cell for PH classes was 5-6 (information followed by direction), whereas for the TMR classes, it was 8-6 (rote behavior followed by more direction). This difference may be accounted for if one considers possible differences in the mental levels of the students in the two types of classes.

Using the CAFIAS categories to describe and compare the teaching behaviors of the subjects in the study has resulted in the evolution of a clear pattern. The pattern was direct and structured in nature and can be simply stated: the subject directs and encourages the students to do an activity, the students comply with a rote, nonverbal response, and the subject praises the students for their responses. This pattern was followed in classes both for the PH and TMR.

#### Descriptive Data for CAFIAS Parameters

The CAFIAS parameters were obtained by combining the CAFIAS categories to permit further comparisons of the data. Each of the 12 parameters to be considered in this

study was described in detail in Chapter I. Parameters 1 to 4 (TCV, TCNV, SCV, and SCNV) are expressed as percentages of the whole and were treated separately from the remaining eight parameters, which are the results of ratios reported as percentages. Caution should be exercised in interpreting the percentages reported in parameters which resulted from ratios, as the ratio may be high but the total number of behaviors on which it is based may be low.

Figure 3 presents graphically the percentage of occurrence of each of the parameters. As with the CAFIAS categories, it should be noted that the results for PH and TMR classes were similar for all of the parameters studied.

The first four parameters were the percentages of teacher (subject) and student contribution to the class. The differences between the total of these four percentages and 100% are attributed to silence and confusion (CAFIAS categories 10 and 20). The verbal and nonverbal contribution of the subjects accounted for approximately two-thirds of the behaviors. Subjects contributed more to PH classes (69.2%) than to TMR classes (66.1%). Subjects contributed more verbally than nonverbally to both PH and TMR classes. The subjects' contributions were slightly more frequent in PH classes than in TMR classes. Nonverbal student contributions occurred more often in both classes. The TMR

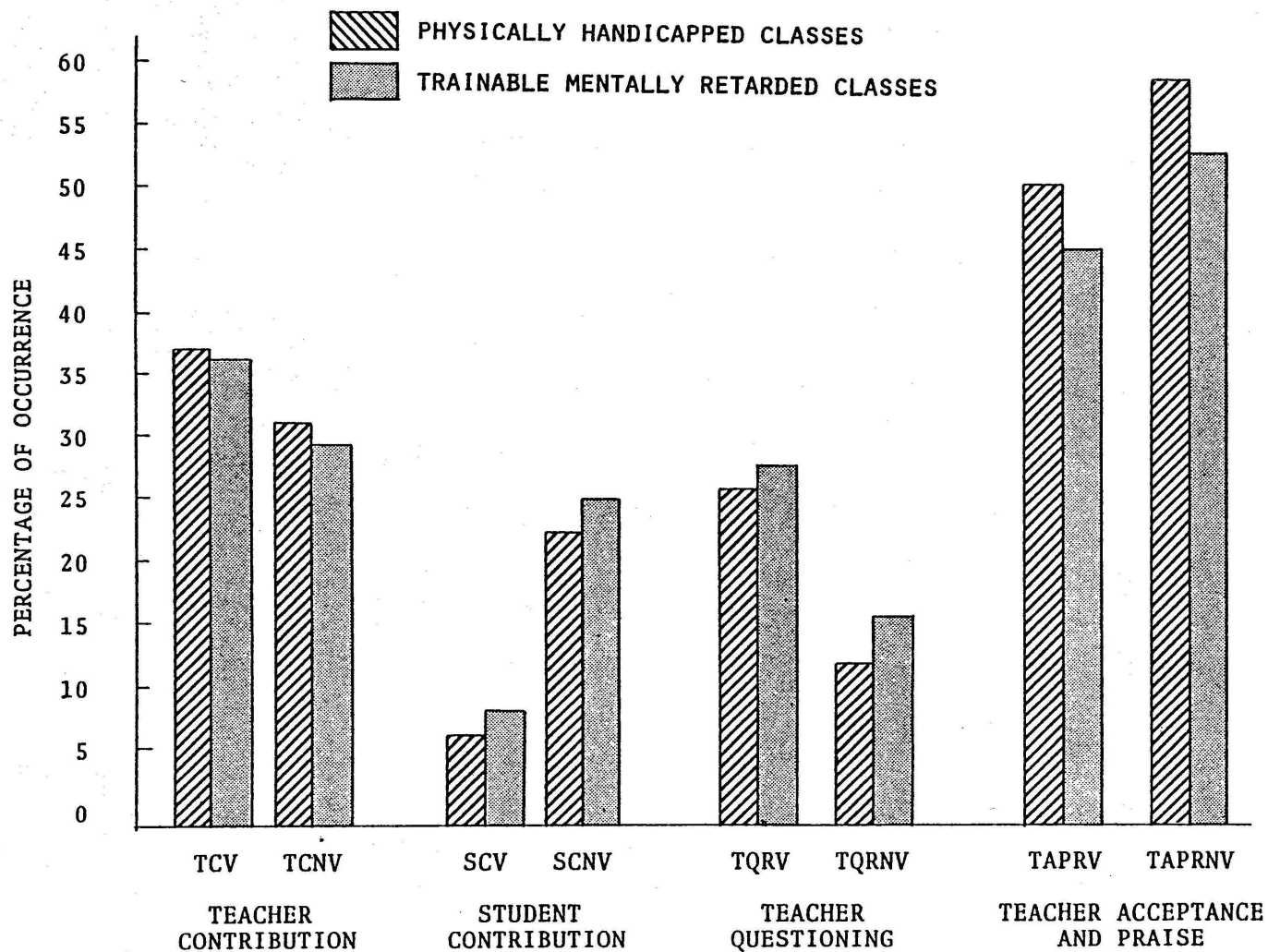


FIGURE 3. MEAN PERCENTAGE OF BEHAVIOR IN EACH CAFIAS PARAMETER.



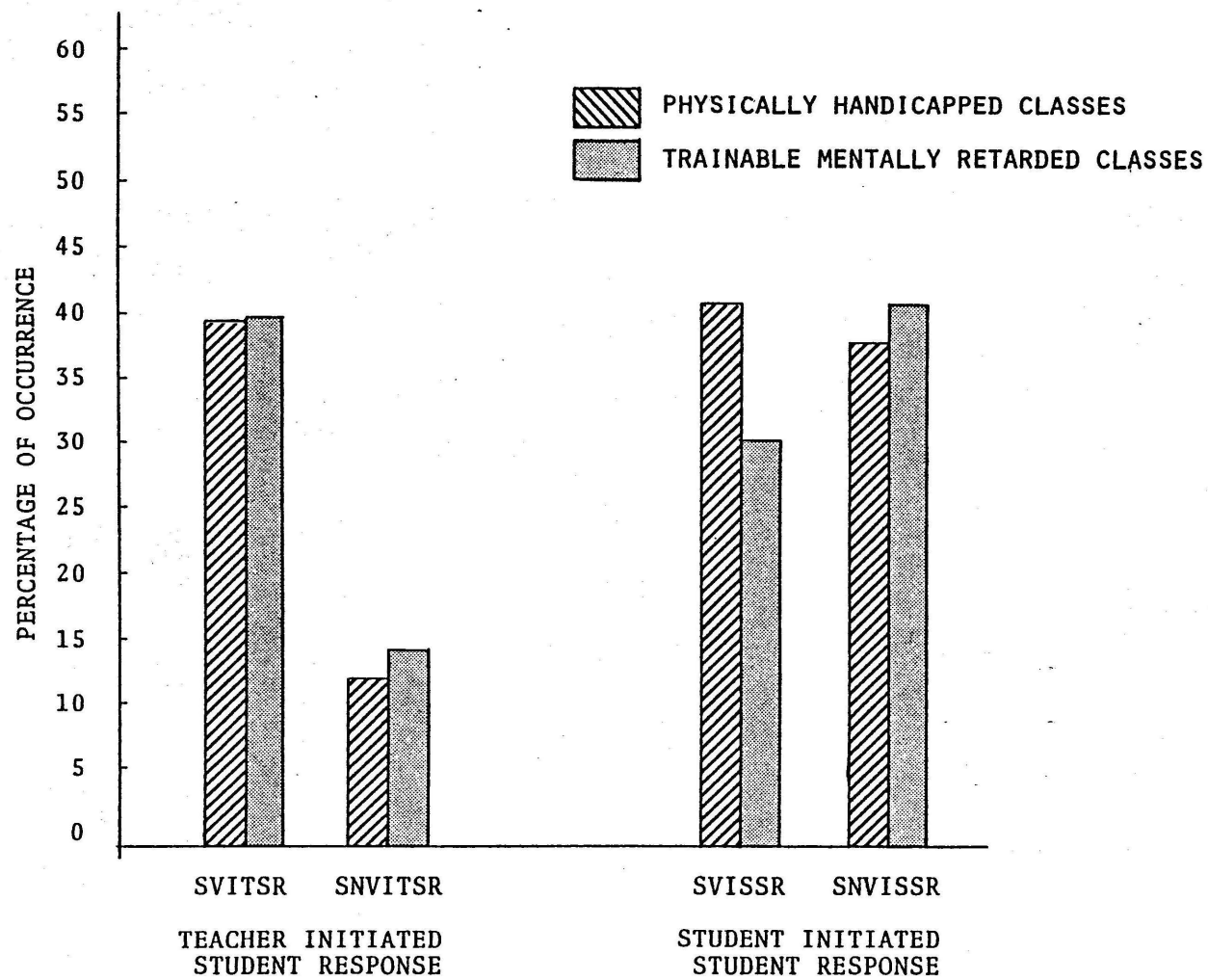


FIGURE 3. (CONTINUED)

students contributed more to the class, both verbally and nonverbally, than their PH counterparts.

In considering the other eight parameters, it is important to note the high percentage that was recorded for teacher acceptance and praise. This reinforces the observation made previously that the subjects were very positive in their behaviors toward the handicapped students and gave more praise to the PH students than to the TMR students.

Figure 3 indicates that the PH classes displayed verbal student-initiated responses more often than the TMR classes who showed more nonverbal student-initiated responses. One explanation for this is the lack of verbal ability common to TMR students. It should be noted, however, that the teachers used questioning, both verbal and nonverbal, more often for TMR than PH classes.

Table 4 indicates the range of scores for each subject for classes of physically handicapped and trainable mentally retarded students. Although there were variations in teaching behaviors noted among subjects, most subjects follow the profile established by the mean of the group shown in Figure 3.

The parameters which appeared to be the most divergent between subjects were student-initiated student

Table 4  
 Ranges and Means for Subjects on 12 CAFIAS Parameters  
 for Classes of Physically Handicapped and  
 Trainable Mentally Retarded Students

Parameter <sup>a</sup>	PH Classes		TMR Classes	
	Range (Max--Min)	M	Range (Max--Min)	M
TCV	18.5 (45.18--26.68)	37.55	8.65 (40.47--31.82)	36.68
TCNV	23.84 (40.32--16.48)	31.28	18.28 (40.85--22.57)	29.55
SCV	20.52 (22.50--1.98)	6.69	14.25 (16.14--1.89)	7.57
SCNV	16.48 (35.15--18.67)	23.23	13.89 (33.38--19.49)	24.59
TQRV	49.79 (59.79--10.00)	27.73	60.54 (69.05--8.51)	28.44
TQRNV	25.00 (30.00--5.00)	15.60	59.52 (64.10--4.58)	18.53
TAPRV	32.67 (60.32--27.65)	48.25	28.18 (58.55--30.37)	43.79
TAPRNV	25.42 (64.55--39.13)	56.28	25.34 (62.70--37.36)	51.04
SVITSR	60.12 (72.62--12.50)	39.07	34.03 (56.25--22.22)	42.07
SNVITSR	29.40 (31.75--2.35)	12.01	29.26 (33.57--4.31)	14.03
SVISSR	61.71 (77.78--16.07)	42.35	45.11 (57.14--12.03)	36.58
SNVISSR	59.75 (75.00--15.25)	39.22	42.14 (60.00--17.86)	45.98

<sup>a</sup>A description of these parameters is found in Chapter I.  
 Parameter abbreviations represent:

TCV	Teacher verbal contribution to class
TCNV	Teacher nonverbal contribution to class
SCV	Student verbal contribution to class
SCNV	Student nonverbal contribution to class
TQRV	Teacher verbal questioning behavior
TQRNV	Teacher nonverbal questioning behavior
TAPRV	Teacher verbal use of acceptance and praise
TAPRNV	Teacher nonverbal use of acceptance and praise
SVITSR	Student initiated verbal response, teacher suggested
SNVITSR	Student initiated nonverbal response, teacher suggested
SVISSR	Student initiated verbal response, student suggested
SNVISSR	Student initiated nonverbal response, student suggested

response and teacher use of questioning. Since differences in teaching behaviors among teachers are an accepted fact, this variation is not to be considered unusual for the subjects of this study.

#### Multivariate Analysis of 12 CAFIAS Parameters

Multivariate analyses of variance (MANOVA's) were performed, one on four parameters (TCV, TCNV, SCV, and SCNV) and one on the eight remaining parameters. Table 5 shows the cell means for the subjects interacting separately with PH classes and TMR classes on the first four parameters.

Table 5

Cell Means for Subjects on Four CAFIAS Parameters

Parameters	PH M Percentage	TMR M Percentage
TCV	37.55	36.68
TCNV	31.28	29.55
SCV	6.69	7.58
SCNV	23.23	24.59

The MANOVA on the four CAFIAS parameters indicated no significance,  $F(4,8) = 2.65$ ,  $p > .05$ . Since this value did not reach the table valued of 3.84, the null hypothesis

of no significant difference in the teaching behaviors of physical education teachers in classes for the PH and in classes for the TMR for each of the four parameters was accepted.

Although no significance was found, Table 6 is a report of the amount of variance contributed by each parameter as determined by discriminant function analysis.

Table 6  
Discriminant Function Analysis for the  
Four CAFIAS Parameters for  
Between Class Difference

Parameters	Standardized Discriminant Weight	Discriminant Weight Squared	Percentage of Contribution to Multivariate Difference
TCV	.60749	.36904	36.90
TCNV	.47862	.22907	22.91
SCV	.54026	.29188	29.19
SCNV	.33162	.10997	11.00

Teacher verbal contribution to the class (TCV) accounted for the most variance. None of the parameters deviated greatly in the amount of variance accounted for. Since no significance was found in the multivariate analysis, the

univariate analyses of variances for each parameter were not reported.

The eight variables involving ratios were treated by multivariate analysis of variance. The means for the interaction behaviors in separate classes of PH and TMR students are shown in Table 7.

Table 7  
Cell Means for Interaction Behaviors  
on Eight CAFIAS Parameters

Parameters	PH <u>M</u> Percentage	TMR <u>M</u> Percentage
TQRV	27.73	28.44
TQRNV	15.60	18.53
TAPRV	48.25	43.79
TAPRNV	56.28	51.04
SVITSR	39.07	42.07
SNVITSR	12.01	14.03
SVISSR	42.35	36.58
SNVISSR	39.22	45.98

The results of the MANOVA on the eight CAFIAS parameters indicated significance,  $F(4,8) = 14.42$ ,  $p < .05$ . This exceeded the tabled value of 3.84 which indicated a significant difference for the eight CAFIAS parameters treated.

The results of the discriminant function analysis are presented in Table 8. It reveals that the major contributor to the multivariate difference was student initiated

verbal response, which accounted for 46.84% of the variance. Other major contributors to the multivariate difference were the other nonverbal parameters, teacher praise and acceptance (19.17%), teacher questioning (14.44%), and teacher-initiated student response (12.02%).

The significant multivariate  $F$  obtained for the eight CAFIAS parameters indicated the need for univariate

Table 8  
Discriminant Function Analysis for  
the Eight CAFIAS Parameters for  
Between Class Difference

Parameters	Standardized Discriminant Weight	Discriminant Weight Squared	Percentage of Contribution to Multivariate Variance
TQRV	.23438	.05493	5.49
TQRNV	.37985	.14428	14.43
TAPRV	.03644	.00133	.13
TAPRNV	-.43779	.19166	19.17
SVITSR	.08449	.00714	.71
SNVITSR	.34677	.12024	12.02
SVISSR	-.10943	.01197	1.20
SNVISSR	.68442	.46843	46.84

analyses of variance to determine if significant differences existed, for an individual parameter, in separate classes of PH and TMR students. The results of the univariate analyses of variance are found in Table 9. The interactions of teachers with the classes, each containing

Table 9

Univariate Analysis of Variance Comparing Interaction  
Behaviors in Physically Handicapped and  
Trainable Mentally Retarded Classes  
for the Eight CAFIAS Parameters

Source of Variance	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F*</u>
TQRV				
Between Classes	1	6.063	6.063	.026
Error	11	2262.951	232.996	
TQRNV				
Between Classes	1	102.785	102.785	.447
Error	11	2367.828	215.257	
TAPRV				
Between Classes	1	238.253	238.253	1.853
Error	11	1414.400	128.582	
TAPRNV				
Between Classes	1	329.701	329.701	3.642
Error	11	995.693	90.518	
SVITSR				
Between Classes	1	108.240	108.240	.201
Error	11	5938.312	90.518	
SNVITSR				
Between Classes	1	62.563	62.563	.649
Error	11	1061.119	96.465	
SVISSR				
Between Classes	1	400.439	400.439	1.171
Error	11	3760.248	341.841	
SNVISSR				
Between Classes	1	547.965	547.965	2.691
Error	11	2239.701	203.609	

\*F .95 (1,11) = 4.84



either PH or TMR students, did not differ significantly in any of these eight parameters. Based on the statistical analysis of the data for the eight parameters, the null hypothesis that there is no significant difference in the teaching behaviors of physical education teachers in separate classes for PH and TMR students is rejected. When each parameter is considered independently of others, however, the null hypothesis is accepted. No significant difference was found in the teaching behaviors of the subjects, for any of the parameters treated separately, in classes for PH and TMR students.

Multivariate and univariate analyses of variance procedures resulted in different conclusions for the hypothesis of no significant difference in the teaching behaviors of physical educators in PH classes and TMR classes as measured by the eight CAFIAS parameters. In the multivariate analysis, the behavioral interactions as described by the combination of the eight CAFIAS parameters were sufficiently unique to cause a significant difference in the PH and TMR classroom environments. However, in the univariate analyses, no behaviors as described by an individual CAFIAS parameter were unique enough to cause a significant difference in the interaction patterns of PH classes and TMR classes.

## CHAPTER V

### SUMMARY OF THE STUDY

The purpose of the study was to describe and compare the teaching behaviors of 12 New York State certified physical educators as they interacted with classes of physically handicapped and trainable mentally retarded students. The observations of teaching behaviors were made at 12 randomly selected BOCES schools in New York State during the spring of 1980.

Data were collected by a portable videocassette recorder. Each subject was taped twice while instructing classes of PH and TMR students in fundamental gross motor skills. The tapes were coded by an expert to determine teaching behaviors using Cheffers' Adaptation of Flanders' Interaction Analysis System. The coded data were subjected to computer analysis, and the computer output provided the ratios and percentages for the calculation of descriptive and inferential statistics.

Analysis of the percentage of occurrence of each of the CAFIAS categories resulted in a pattern of teaching behaviors for the subjects studied. It was direct and structured in nature and consisted of direction-giving by

the subject (CAFIAS categories 6 and 16), rote nonverbal response by the students (CAFIAS category 18), and praise by the subject of the students' efforts (CAFIAS categories 2 and 12). Other descriptive findings indicated that PH classes received more direction and praise while TMR classes received more information-giving behavior and provided more nonverbal predictable response.

Interpretation of the percentage of occurrence for the 12 CAFIAS parameters was divided into two parts based on the method of calculation of the percentages. The first four parameters were expressed as percentages of the whole and were treated separately from the other eight which were results of ratios reported as percentages.

In considering the first group of four parameters, it was shown that the teacher contribution to the class (TCV and TCNV) accounted for approximately two-thirds of the observed behaviors. The verbal mode was favored by the subjects in both TMR and PH classes. The subjects' contributions were slightly larger in PH than in TMR classes. Student contributions were highly nonverbal in nature, with the TMR students contributing more to the class verbally (SCV) and nonverbally (SCNV) than their PH counterparts.

The highest percentage of occurrence found in the remaining eight parameters was recorded for teacher acceptance and praise (TAPV and TAPNV). The PH classes received

more praise than the TMR classes. The PH classes showed more verbal student-initiated responses whereas the TMR classes exhibited more nonverbal student-initiated responses.

In summary, descriptive analysis of the CAFIAS categories and parameters indicated slight variations in the interaction behaviors between the two classes. Generally, however, the pattern of behaviors was similar in classes of PH and TMR students.

Multivariate analyses of variance were used to determine if significant differences existed in the interaction behaviors of the PH classes and the TMR classes as measured by the 12 selected CAFIAS parameters. Discriminant function analysis was used to identify the percentages of contribution of each of the individual parameters to the between class difference. Univariate analyses of variance were used to identify the parameters which independently contribute to the between-class differences. The level of significance was established at .05.

Although a significant multivariate difference was found for the eight CAFIAS parameters which were ratios expressed as percentages, no significant differences were found when each of the 12 parameters was considered independently of the other parameters. No multivariate difference was found for the first four CAFIAS parameters

studied. The null hypothesis was accepted that there is no significant difference in the teaching behaviors of the subjects, for any of the parameters treated separately, in classes for PH and TMR students.

### Findings of the Study

The findings of the study are summarized in this section.

1. There were no significant differences in the teaching behaviors of physical educators as measured by the first four CAFIAS parameters in classes for the physically handicapped and in classes for the trainable mentally retarded -- Accepted. Multivariate analysis indicated no significant differences in teaching behaviors were obtained for the CAFIAS parameters of teacher contribution, verbal; teacher contribution, nonverbal; student contribution, verbal; and student contribution, nonverbal, in classes for physically handicapped and trainable mentally retarded students.

2. There were no significant differences in the teaching behaviors of physical educators as measured by the remaining eight CAFIAS parameters in classes for the physically handicapped and in classes for the trainable mentally retarded -- Rejected. Statistically significant

differences were found for the eight CAFIAS parameters studied.

- (a) Teacher questioning response, verbal -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (b) Teacher questioning response, nonverbal -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (c) Teacher acceptance and praise response, verbal -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (d) Teacher acceptance and praise, nonverbal -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (e) Student verbal initiated, teacher suggested, response -- Accepted. No significant difference was found for this parameter in

physically handicapped and trainable mentally retarded classes.

- (f) Student nonverbal initiated, teacher suggested, response -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (g) Student verbal initiated, student suggested, response -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.
- (h) Student nonverbal initiated, student suggested, response -- Accepted. No significant difference was found for this parameter in physically handicapped and trainable mentally retarded classes.

Multivariate and univariate analyses of variance procedures resulted in different conclusions for the null hypothesis being tested. This difference was seen because in the multivariate analysis the behavioral interactions, described by the combination of the eight CAFIAS parameters, were sufficiently unique to cause a significant difference in the PH and TMR classroom environments. In the

univariate analyses, however, no behaviors as described by an individual CAFIAS parameter were unique enough to cause a significant difference in the interaction patterns of participants in PH and TMR physical education classes. It is also possible that some univariate results would be significant with a larger sample size.

#### Conclusion of the Study

Based on the findings of this investigation, it appears that the physical educators studied do not vary in their teaching-interaction behaviors, as measured by CAFIAS, with classes of physically handicapped and with classes of trainable mentally retarded. The results indicated that the teaching behaviors with both classes are direct and structured and that the nonverbal domain plays a large role in the interaction process.

#### Discussion

Generally, the subjects followed a fundamental pattern of teaching interaction. It consisted of direction giving, followed by rote student response, followed by acceptance and praise of the students' efforts. It seemed that the subjects, through their behaviors, attempted to structure the learning environment to ensure an appropriate and successful student response. In order to accomplish this the



subjects deviated from the "direct-restrictive" model described by Flanders (1960a) and provided a more humanistic direct approach through the use of praise and encouragement behaviors in response to the students' efforts.

Some of the variations in the subjects' behaviors were necessitated by differences in the physical and intellectual abilities of PH and TMR children. The teacher contribution, both verbal and nonverbal, was greater in PH than in TMR classes. This may have been attributable to the restricted movement ability of the PH students. This difference also may have been the reason for the subjects giving the physically handicapped more praise than the TMR students and more information and demonstration about the activity to be performed.

The trainable mentally retarded classes exhibited more student-initiated response and received more constructive criticism than the physically handicapped classes. This was possibly because the trainable mentally retarded students were, in general, more active than the PH students and needed to have their behaviors controlled by the teacher. This resulted in giving more direction and more criticism to the TMR classes than the PH classes. Because of the shorter attention span common to trainable mentally retarded classes, less information giving behaviors were used.

Many of the teaching behaviors exhibited were nonverbal, consisting of "hands on" direction, manipulation, and praise. Often both verbal and nonverbal behaviors were used concurrently. The percentage of nonverbal behaviors for both types of handicapped classes was approximately 55.

It appears that, regardless of the type of motor activity presented or the type of student being instructed, the teachers attempted to elicit rote responses from the students which could then be rewarded with praise and acceptance. The teachers did not often use behaviors such as questioning which might encourage student participation on a level higher than rote response. If one of the goals of segregated classes for the handicapped is to prepare students for the mainstreamed setting, then it seems that teachers should exhibit more behaviors which encourage interpretive student response.

The present study supports many of the findings of previous researchers who used systematic observation to describe the teaching behaviors of physical educators with special populations. The descriptive findings of the present study are in agreement with Mawdsley's (1977) conclusions that teachers in the adapted setting give more praise than in a regular setting. Handicapped students used more nonverbal activity in their response to the teachers' instructions than did nonhandicapped. Bechtold (1976) found

that nonverbal activity was the predominant form of interaction (52%) and the amount of teacher praise was high (13%). In the present study, nonverbal behavior accounted for 55% of the interactions for each type of class. The percentage of occurrence of praise was 11.4% for physically handicapped classes and 9.8% for trainable mentally retarded classes. This supports Gauthier's (1980) findings that handicapped children received more positive feedback than nonhandicapped children.

The present study differs from the findings of Mawdsley (1977) and Gauthier (1980); they stated that interaction patterns did not vary between handicapped and nonhandicapped classes. The pattern of interaction for the handicapped classes in the present study was teacher direction-giving and encouragement, followed by rote nonverbal student response, and teacher praise (6-2-18-2). This was quite different from the pattern reported in the literature (Cheffers & Mancini, 1978; Nygaard, 1975) for regular physical education classes. The pattern reported was teacher extended information-giving, followed by teacher direction giving followed by rote student nonverbal student response (5-5-6-18). A possible explanation for this difference in results might be the type and severity of the handicaps exhibited by the subjects (students). Both

Mawdsley and Gauthier used subjects who were less severely handicapped than those in the present study.

Since the present study was the first to use an interaction analysis system to describe and compare the teaching behaviors of physical educators with different types of handicapped students, there is still much to learn. If this study has accomplished its purpose, then further research will be undertaken to describe teacher behaviors and student behaviors in the adapted physical education setting. By studying the interaction process involved, the art of teaching will be enhanced.

#### Recommendations for Further Studies

The following recommendations are suggested for further studies regarding the use of CAFIAS to investigate the teaching behaviors of physical educators in classes for the handicapped:

1. A replication of the present study should be undertaken with a larger number of subjects.
2. Studies similar to the present study should be conducted using classes containing other handicapping conditions.
3. Studies should be conducted to compare physical educators' teaching behaviors in regular classes,

main streamed classes, and segregated classes for the handicapped.

4. Studies should be conducted to determine the effect that teaching experience with classes of handicapped students and training in adapted physical education has on physical educators' teaching behaviors.
5. Studies should be conducted to determine if training in interaction analysis will change the teaching behaviors of physical educators as they interact with classes with the handicapped.
6. Studies should be conducted to determine if teachers interact differently with individual students within a class based on the type of severity of the handicap.

## **APPENDIX A**

### **THE INSTRUMENT**

Categories of Flanders' Interaction  
Analysis System  
(Cheffers, Amidon, and Rodgers, 1974, p. 4)

TEACHER TALK	INDIRECT INFLUENCE	<ol style="list-style-type: none"> <li>1. * <b>ACKNOWLEDGES FEELINGS:</b> Clarifying or dealing with the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings is included.</li> <li>2. * <b>PRAISES OR ENCOURAGES:</b> Praising or encouraging student action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "um hm?" or "go on" and statements of confirmation such as "That's right" are included.</li> <li>3. * <b>USES IDEAS OF STUDENTS:</b> Clarifying, building on, summarizing, developing or repeating exactly the ideas suggested by a student. As teacher brings his own ideas into play, shift to Category 5.</li> <li>4. * <b>ASKS QUESTIONS:</b> Asking a question about content or procedure with the intent that a student answer.</li> </ol>
	DIRECT INFLUENCE	<ol style="list-style-type: none"> <li>5. * <b>LECTURES OR ORIENTS:</b> Giving facts or opinions about content or procedures; expressing his own ideas, asking rhetorical questions.</li> <li>6. * <b>GIVES DIRECTIONS:</b> Giving directions, commands, or orders with which a student is expected to comply.</li> <li>7. * <b>CRITICIZES OR JUSTIFIES AUTHORITY:</b> Statements intended to change student behavior from nonacceptable to acceptable pattern. Bawling someone out. Using the fact that one is the teacher to justify a point or to counteract student response.</li> </ol>
STUDENT TALK		<ol style="list-style-type: none"> <li>8. * <b>STUDENT TALK—LIMITED:</b> A student makes a predictable response to teacher. Teacher initiates the contact or solicits student statement and sets limits to what the student says.</li> <li>9. * <b>STUDENT TALK—UNLIMITED OR INITIATED:</b> Open-ended or unpredictable statements in response to teacher. Talk by students, which they initiate. Shift from 8 to 9 as student introduces own ideas.</li> </ol>
		<ol style="list-style-type: none"> <li>10. * <b>SILENCE OR CONFUSION:</b> Pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.</li> </ol>

\*There is NO scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate—not to judge a position on a scale.

**THE CATEGORIES OF  
CHEFFERS' ADAPTATION OF  
FLANDERS' INTERACTION ANALYSIS SYSTEM  
(Cheffers, Amidon and Rodgers, 1974, pp.15-17)**

**Coding Symbols**

Teacher  
Environment (E)  
Student (S)

Categories	Verbal	Relevant Behaviors	Nonverbal
2-12	2		12
	Praises, commends, jokes, encourages	Face:	Smiles, nods with smile, (energetic) winks, laughs
		Posture:	Claps hands, pats on shoulder, places hand on head of student, wrings student's hand, embraces joyfully, laughs to encourage, spots in gymnastics, helps child over obstacles.
3-13	3		13
	Accepts, clarifies, uses, and develops suggestion and feelings by the learner.	Face:	Nods without smiling, tilts head in empathetic reflection, sigh empathetically.
		Posture:	Shakes hands, embraces sympathetically, places hand on shoulder, puts arm around shoulder or waist, catches an implement thrown by student, accepts facilities.



Categories	Verbal	Relevant Behaviors	Nonverbal
4-14	4		14
	Asks questions requiring student answer.	Face:	Wrinkles brow, opens mouth, turns head with quizzical look.
		Posture:	Places hands in air, waves finger to and fro anticipating answer, stares awaiting answer, scratches head, cups hand to ear, stands still half turned towards person, awaits answer.
5-15	5		15
	Gives facts, opinions, expresses ideas, or asks rhetorical questions.	Face:	Whispers words inaudibly, signs, or whistles.
		Posture:	Gesticulates, draws, write, demonstrates activities, points.
6-16	6		16
	Gives directions or orders.	Face:	Points with head, becons with head, yells at.
		Posture:	Points finger, blows whistle, holds body erect while barking commands, pushes child through a movement, pushes a child in a given direction.

Categories	Verbal	Relevant Behavior	Nonverbal
7-17	7		17
	Criticizes, expresses anger or distrust, sarcastic or extreme self-reference.	Face:	Grimaces, growls, frowns, drops head, throws back in derisive laughter; rolls eyes, bites, spits, butts with head, shakes head.
		Posture:	Hits, pushes away, pinches, grpples with, pushes hands at student, drops hands in disgust, bangs table, damages equipment, throws things down.
8-18	8		18
	Student response that is entirely predictable, such as obedience to orders, and responses not requiring thinking beyond the comprehension phase of knowledge (after Bloom)	Face:	Poker face response, nod, shake, gives small grunts, quick smile.
		Posture:	Moves, mechanically to questions or directions, responds to any action with minimal nervous activity, robot like.

Categories	Verbal	Relevant Behaviors	Nonverbal
	EINE (8\)		EINETEEN (18\)
eine (8\) & eineteen (18\)	Predictable student responses requiring some measure of evaluation and synthesis from the student, but must remain within the province of predictability. The initial behavior was in response to teacher initiation.	Face: Posture:	A "What's more, Sir" look, eyes sparkling. Adds movements to those given or expected, tries to show some arrangement requiring additional thinking; e.g., works on gymnastic routine, dribbles basketball, <i>all game playing</i> .
9-19	9		19
	Pupil-initiated talk that is purely the result of their own initiative and that could not be predicted.	Face: Posture:	Interrupting sounds, gasps, sighs. Put hands up to ask questions, gets up and walks around without provocation, begins creative movements education, makes up own games, makes up own movements, shows initiative in supportive movement, introduces new movements into games not predictable in the rules of the games.
10-20	10		20
	Stands for confusion, chaos, disorder, noise, much noise.	Face:	Silence, children sitting doing nothing, noiselessly awaiting teacher just prior to teacher entry, etc.

## MAJOR PARAMETERS OF CAFIAS

<u>Major Parameters of CAFIAS</u>	<u>Abbreviations</u>	<u>Statistics</u>
1. Teacher Contribution, Verbal	TCV	%
2. Teacher Contribution, Nonverbal	TCNV	%
3. Total Teacher Contribution	TTC	%
4. Student Contribution, Verbal	SCV	%
5. Student Contribution, Nonverbal	SCNV	%
6. Total Student Contribution	TSC	%
7. Silence	S	%
8. Confusion	C	%
9. Total Silence and/or Confusion	TSC	%
10. Teacher (as teacher)	TT	%
11. Other Students (as teacher)	ST	%
12. The Environment (as teacher)	ET	%
13. Verbal Emphasis	VE	%
14. Nonverbal Emphasis	NVE	%
15. Class Structure (as one unit)	W	%
16. Class Structure (group or individualized)	P	%
17. Class Structure (no teacher influence)	I	%

## MAJOR PARAMETERS OF CAFIAS (cont).

<u>Major Parameters of CAFIAS</u>	<u>Abbreviations</u>	<u>Statistics</u>
18. Teacher Use of Questioning, Verbal	TQRV	Ratio
19. Teacher Use of Questioning, Nonverbal	TQRNV	Ratio
20. Teacher Use of Questioning, Total	TTQR	Ratio
21. Teacher Acceptance and Praise, Verbal	TAPRV	Ratio
22. Teacher Acceptance and Praise, Nonverbal	TAPRNV	Ratio
23. Teacher Acceptance and Praise, Total	TTAPR	Ratio
24. Pupil Initiation, Verbal (teacher suggestion)	SVITSR	Ratio
25. Pupil Initiation, Nonverbal (teacher suggestion)	SNVITSR	Ratio
26. Pupil Initiation, Total (teacher suggestion)	TSITSR	Ratio
27. Pupil Initiation, Verbal (student suggestion)	SVISSR	Ratio
28. Pupil Initiation, Nonverbal (student suggestion)	SNVISSR	Ratio
29. Pupil Initiation, Total (student suggestion)	TSISSR	Ratio
30. Content Emphasis (teacher input)	CETI	Ratio
31. Content Emphasis (student input)	CESI	Ratio

Note. From Interaction analysis: An application to non-verbal and verbal activity (2nd ed.) by J. T. Cheffers, V. H. Mancini, and T. J. Martinek, 1980, p. 75.

Summary of Research Employing Cheffers' Adaptation  
of Flanders' Interaction Analysis System  
1972-1980

Year	Researchers	Dissemination Mode	Research Substance
1972	J.T. Cheffers	doctoral dissertation	Development and validation of CAFIAS instrument
1974	J.T. Cheffers, E.J. Amidon, K.D. Rodgers	book	Description of CAFIAS as a tool to measure teaching behavior
1974	V.H. Mancini	doctoral dissertation	Description of the interaction patterns of students in different decision making situations
1975	A. Batchelder	doctoral dissertation	Comparison of behaviors and teaching patterns in math, English, and physical education
1975	H. Chertok	master's thesis	Comparison of teaching models on the development of motor skills
1975	C.E. Hendrickson	master's thesis	Description of the effect of interaction analysis on the preparation of preservice teachers
1975	F.J. Keane	doctoral dissertation	Comparison of sex of teacher and leadership style
1975	G.C. Kielty	doctoral dissertation	Description of the effect of interaction analysis on the preparation of preservice

Year	Researchers	Dissemination Mode	Research Substance
1976	W. Bechtold	doctoral dissertation	Description of the relationship between volunteer high school students and moderately retarded peer aged students in a high school physical education program
1976	J.T. Cheffers, A. Batchelder, L.D. Zaichkowsky	unpublished manuscript	Description of the effects of movement on improving ethnic relationships.
1976	R. Doenges	master's thesis	Description of elementary children as modifiers of teaching behaviors
1976	T. Evaul	book	Comparison of open and traditional classrooms
1976	M. Faulkner	master's thesis	Comparison of male and female preservice teachers' behaviors
1976	V.H. Mancini, J.T. Cheffers, L.D. Zaichkowsky	journal article	Description of the interaction patterns of students in different decision making situations
1976	T.J. Martinek	doctoral dissertation	Description of the effects of various teaching models on the development of motor skills and self-concept
1976	R. Vogel	master's thesis	Description of the effects of interaction analysis on preservice teachers
1977	M. Agnew	master's thesis	Comparison of female teaching and coaching behaviors

Year	Researchers	Dissemination Mode	Research Substance
1977	A. Batchelder, F. Keane	journal article	Analysis of college teacher lecturing
1977	J.T. Cheffers	journal article	Description of CAFIAS and its uses
1977	H.L. Getty	master's thesis	Description of the effects of interaction analysis on preservice teachers
1977	R.H. Mawdsley	doctoral dissertation	Comparison of the teaching behaviors in regular and adapted physical education classes
1977	D.A. Rochester, V.H. Mancini, H.H. Morris	conference paper	Description of effects of interaction analysis on preservice teachers
1977	K. Scriber	master's thesis	Comparison of predictive estimates and observed teaching behaviors in health classes
1977	W. Travis	doctoral dissertation	Comparison of the effect of selected affective and cognitive skills on the teaching performance of doctoral students in the social sciences
1978	D.E. Avery	master's thesis	Comparison of interaction patterns of effective and less effective coaches
1978	P.L. Barr	master's thesis	Description of effects of interaction analysis on coaching behaviors



Year	Researchers	Dissemination Mode	Research Substance
1978	J.T. Cheffers	unpublished paper	Used CAFIAS to evaluate alternative schools
1978	J.T. Cheffers, V.H. Mancini	journal article	Analysis of videotape bank project using CAFIAS
1978	S. Cohen	doctoral dissertation	Description of the relationship of interaction and speech patterns between clients and therapists
1978	T. Durkin	doctoral dissertation	Evaluation of attitude changes during a residential field experience
1978	J.E. Hayes	master's thesis	Description of the effects of teaching models on the development of motor skills
1978	R. Hirsch	master's thesis	Comparison of coaching behaviors in different athletic environments
1978	D.M. Hope	doctoral dissertation	Verification of treatment effect in recreational programs for the aged
1978	M. Lydon	doctoral dissertation	Description of the effects of various teaching models on motor skill development and self concept
1978	V.H. Mancini, H.L. Getty, H.H. Morris	conference paper	Description of the effect of interaction analysis on preservice teacher preparation

Year	Researchers	Dissemination Mode	Research Substance
1978	A. Mason	unpublished paper	Comparison of male coaching and teaching behaviors at colleges and universities
1978	T.P. O'Donnell	doctoral dissertation	Comparison of various group learning experiences in college history classes
1978	D. Wood	doctoral dissertation	Evaluation of attitude changes during a residential field experience for urban youth
1979	J.T. Cheffers	unpublished paper	Comparison of Kodaly music training with normal classroom training
1979	J.T. Cheffers, V.H. Mancini	unpublished paper	Interaction analysis feedback as a modifier of teacher behavior
1979	G.L. Devlin	master's thesis	Description of the effects of elementary children as modifiers of teacher behavior
1979	E. Inturrisi	master's thesis	Effects of interaction analysis on preservice teachers
1979	B.J. Lombardo	doctoral dissertation	Longitudinal study of teaching behaviors
1979	T.J. Martinek, S.B. Johnson	journal article	Introduction of the dyadic form of CAFIAS to measure teacher expectations and effects on interaction patterns and self concept
1979	T.J. Martinek, V.H. Mancini	journal article	Description of dyadic interaction and its uses

Year	Researchers	Dissemination Mode	Research Substance
1979	T. Proulx	master's thesis	Comparison of coaching behaviors in different athletic environments
1979	A. Rotsko	master's thesis	Comparison of coaching behaviors of successful and less successful coaches
1979	E. Staurowsky	master's thesis	Comparison of female coaching behaviors in a variety of athletic environments
1979	M.E. Stevens	master's thesis	Description of the effects of instruction in interaction analysis on teaching behavior
1979	T.E. Underwood	master's thesis	Comparison of interaction patterns of high anxiety and low anxiety student teachers
1979	H. van der Mars	master's thesis	Comparison of perceived vs observed teaching behaviors in preservice physical education teachers
1980	P.J. Reisenweaver	master's thesis	Comparison of teaching behaviors of female physical educators with high skilled and low skilled students
1980	B.F. Streeter	master's thesis	Comparison of teaching behaviors of male physical educators with high skilled and low skilled students
1980	D.A. Wuest	doctoral dissertation	Multidimensional analysis of the teaching process

## **APPENDIX B**

### **PRELIMINARY PROCEDURES**

101

TEXAS WOMAN'S UNIVERSITY  
Box 23717, TWU Station  
DENTON, TEXAS 76204

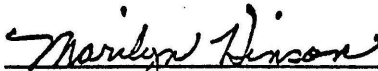
HUMAN SUBJECTS REVIEW COMMITTEE

6-5-80  
Date

TO: Project Director

Director of School or  
Chairman of Department

This is to inform you that, as of this date, Sarah Rich  
has placed on file with the Human Subjects Review Committee the signatures  
of the subjects who participated in his/her research. The signatures consti-  
tute evidence of informed consent of each subject.

  
Marilyn Hinson  
Chairman, Human Subjects Review  
Committee

cc: Investigator  
cc: Graduate School

DIRECTORS OF SPECIAL EDUCATION FOR  
NEW YORK STATE BOCES  
1979-1980

1. Mr. John J. Daly  
Director of Special Education  
Albany-Schenectady-Schoharie BOCES  
Maywood Elementary School  
1979 Central Avenue  
Albany, New York 12205  
PHONE: (518) 456-9064
2. Dr. Charles Orlando  
Director of Special Education  
Allegany BOCES  
Learning Diagnostic Center  
33 Willetts Avenue  
Belmont, New York 14813  
PHONE: (716) 268-7652
3. Mr. Lyle A. Green  
Director of Special Education  
Broome-Delaware-Tioga BOCES  
Special Education Office  
P.O. Box 1450, Upper Glenwood Road  
Binghamton, New York 13902  
PHONE: (607) 729-9301 Ext. 345
4. Mr. J. Michael Hughes  
Director of Special Education  
Cattaraugus-Erie-Wyoming BOCES  
Windfall Road  
Olean, New York 14760  
PHONE: (716) 372-8293
5. Mr. Mark Costello  
Director of Special Education  
Cayuga-Onondaga BOCES  
234 South Street Road  
Auburn, New York 13021  
PHONE: (315) 253-0361
6. Mr. James Mangano  
Director of Special Education  
Chautauqua BOCES  
9520 Fredonia Stockton Road  
Fredonia, New York 14063  
PHONE: (716) 672-4371

7. Mr. Paul Wight  
Director of Special Education  
Clinton-Essex-Warren-Washington BOCES  
Box 455  
Plattsburgh, New York 12901  
PHONE: (518) 561-0100
8. Mr. A. Paul Hackett  
Director of Special Education  
Cortland-Madison BOCES  
McEvoy Education Center  
Clinton Avenue Extension  
Cortland, New York 13045  
PHONE: (607) 753-9301
9. Mr. Richard Snyder  
Director of Special Education  
Delaware-Chenango-Madison-Otsego BOCES  
East River Road, RD #3  
Norwich, New York 13815  
PHONE: (607) 334-2771
10. Mr. Joseph Meehan  
Director of Instructional Services  
Dutchess County BOCES  
RD #1, Salt Point Turnpike  
Poughkeepsie, New York 12601  
PHONE: (914) 471-9200
11. Dr. Roger Reger  
Director of Special Education  
Erie BOCES #1  
2 Pleasant Avenue West  
Lancaster, New York 14086  
PHONE: (716) 686-2016
12. Mr. Harold Shepard  
Director of Special Education  
Erie #2 - Cattaraugus BOCES  
4071 Hardt Road  
Eden, New York 14057  
PHONE: (716) 992-3413
13. Mr. Paul Goodrow  
Director of Special Education  
Franklin-Essex-Hamilton BOCES  
P.O. Box 28  
Malone, New York 12953  
PHONE: (518) 483-1697

14. Mr. Charles Harrison  
Director of Special Education  
Genessee-Wyoming BOCES  
8250 State Street Road  
Batavia, New York 14020  
PHONE: (716) 343-1400
15. Mr. Stephen J. Proskowsky  
Director of Special Education  
Greene-Delaware-Schoharie-Otsego BOCES  
Rexmere Park  
Stamford, New York 12167  
PHONE: (607) 652-7531
16. Ms. Marlene Ernst  
Supervisor of Handicapped Education  
Hamilton-Fulton-Montgomery BOCES  
Fonda Fultonville Central School  
Cemetery Street  
Fonda, New York 12068  
PHONE: (518) 853-3322
17. Mr. James Miller  
Director of Special Education  
Herkimer-Fulton-Hamilton-Otsego BOCES  
Gros Boulevard  
Herkimer, New York 13350  
PHONE: (315) 866-6040
18. Mr. Gary McDermott  
Jefferson-Lewis-Hamilton-Herkimer-Oneida BOCES  
Outer Arsenal Street  
Watertown, New York 13601  
PHONE: (315) 788-0400
19. Mr. James Noether  
Director of Special Education  
Livingston-Steuben-Wyoming BOCES  
3 Parkway - Education Center  
Leicester, New York 14481  
PHONE: (716) 382-3300
20. Dr. J. Robert Raub  
Director of Instructional Service  
Madison-Oneida BOCES  
Spring Road  
Verona, New York 13478  
PHONE: (315) 363-8000



21. Mr. John Campolieto  
Director of Special Education  
Monroe #1 BOCES  
41 O'Connor Road  
Fairport, New York 14450  
PHONE: (716) 377-4660
22. Mr. Robert Reynolds  
Director of Special Education  
Monroe #2 - Orleans BOCES  
3599 Big Ridge Road  
Spencerport, New York 14559  
PHONE: (716) 352-2447
23. Dr. Henry V. Colella  
Assistant Superintendent for Special Education  
Nassau BOCES  
Valentines Road and the Plain Road  
Westbury, New York 11590  
PHONE: (516) 997-8700
24. Mr. Charles V. Mead  
Director of Special Education  
Oneida-Madison-Herkimer BOCES  
P.O. Box 70 - Middle Settlement Road  
New Hartford, New York 13413  
PHONE: (315) 792-4605
25. Dr. Wayne Jones  
Director of Special Education  
Onondaga-Madison BOCES  
6820 Thompson Road  
Syracuse, New York 13211  
PHONE: (315) 437-1631
26. Mr. Dean W. Riley  
Director of Special Education  
Ontario-Seneca-Yates-Cayuga-Wayne BOCES  
Finger Lakes Education Center  
RD #2  
Stanley, New York 14561  
PHONE: (315) 526-6381
27. Mr. Raymond Cramer  
Director of Special Education  
Orange-Ulster BOCES  
Gibson Road  
Goshen, New York 10924  
PHONE: (914) 294-5431

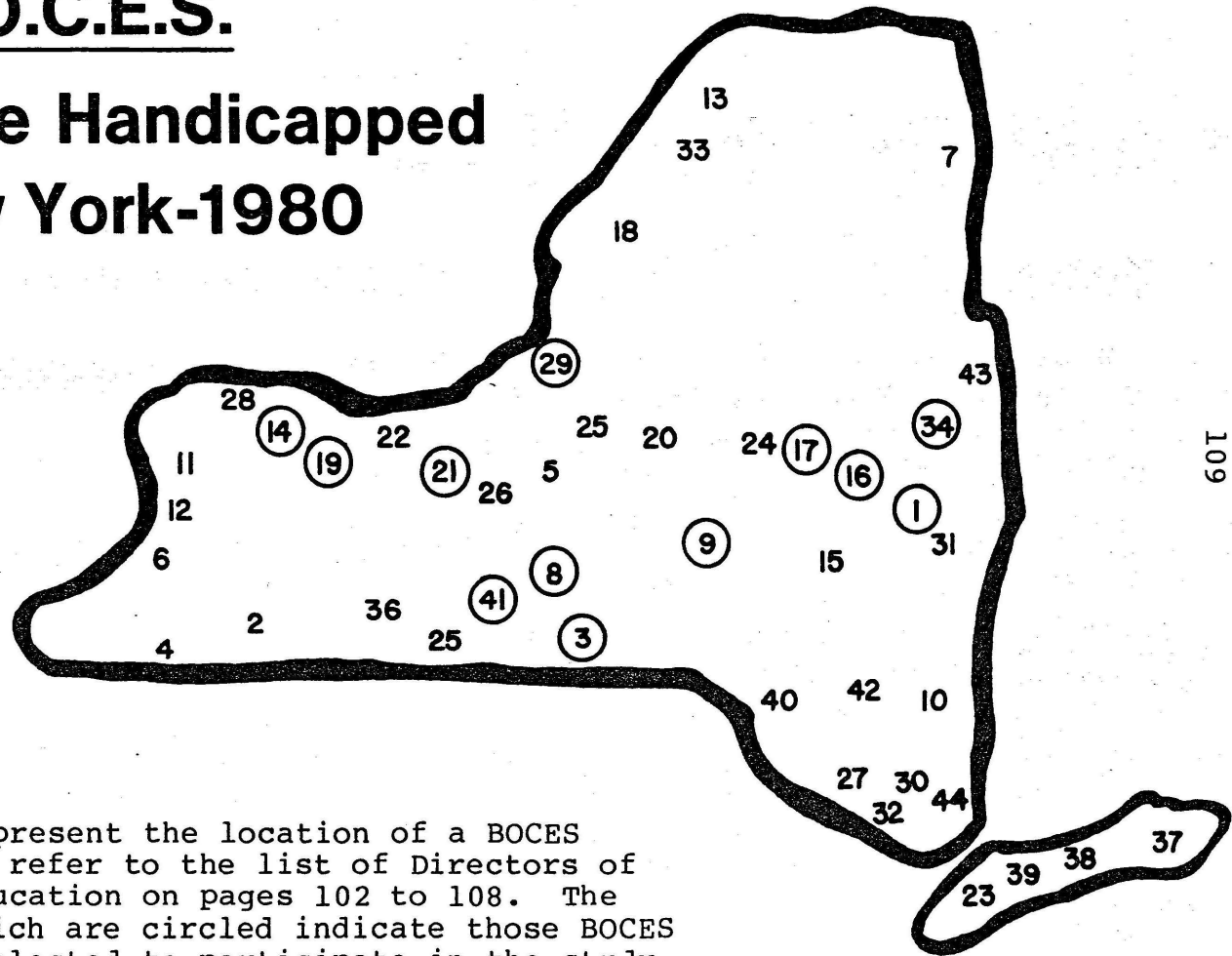
28. Mr. Louis D. Salen  
Assistant Superintendent for Instruction  
Orleans-Niagara BOCES  
4232 Shelby Basin Road  
Medina, New York 14103  
PHONE: (716) 798-4800
29. Dr. David Stern  
Director of Special Education  
Oswego BOCES  
County Route 54  
Mexico, New York 13114  
PHONE: (315) 963-7251
30. Dr. Paul Irvine  
Director of Special Education  
Putnam-Westchester BOCES  
Education Building  
Yorktown Heights, New York 10598  
PHONE: (914) 245-2700 Ext. 209/210
31. Ms. Ann Myers  
Director of Special Instructional Services  
Rensselaer-Columbia-Greene BOCES  
1550 Schuurman Road  
Castleton, New York 12033  
PHONE: (518) 477-8771
32. Dr. Eugene Plenert  
Director of Special Education  
Rockland BOCES  
61 Parrot Road  
West Nyack, New York 10994  
PHONE: (914) 623-3828
33. Mr. Edward Schaeffer  
Director of Special Education  
St. Lawrence-Lewis BOCES  
Box 231, Outer State Street  
Canton, New York 13617  
PHONE: (315) 386-4504
34. Mr. John Irving  
Principal of Special Education  
Saratoga-Warren BOCES  
Henning Road  
Saratoga Springs, New York 12866  
PHONE: (518) 584-6741

35. Mrs. Merna Morgan  
Director of Special Education  
Schuyler-Chemung-Tioga BOCES  
431 Philo Road  
Elmira, New York 14903  
PHONE: (607) 739-3581
36. Dr. Susan Gray  
Director of Special Education  
Steuben-Allegany BOCES  
RD #1  
Bath, New York 14810  
PHONE: (607) 776-7631
37. Mr. Alvin Migdal  
Director of Special Education  
Suffolk 1 BOCES  
215 Old Riverhead Road  
Westhampton Beach, New York 11978  
PHONE: (516) 288-6400 Ext. 211/212
38. Mr. Reginald Feltham  
Director of Special Education  
Suffolk 2 BOCES  
201 Sunrise Highway  
Patchogue, New York 11772  
PHONE: (516) 289-2200
39. Mr. Fred Gehm  
Director of Special Education  
Suffolk 3 BOCES  
James E. Allen Learning Center  
762 Deer Park Road  
Dix Hills, New York 11746  
PHONE: (516) 667-6000
40. Mr. Albert VanDyke  
Director of Special Education  
Sullivan BOCES  
P.O. Box 391  
Liberty, New York 12754  
PHONE: (914) 292-4332
41. Mr. Michael Pronti  
Director of Special Education  
Tompkins-Seneca-Tioga BOCES  
555 Warren Road  
Ithaca, New York 14850  
PHONE: (607) 257-1551

42. Mr. William LeDoux  
Director of Special Education  
Ulster BOCES  
175 Route 32 North  
New Paltz, New York 12561  
PHONE: (914) 255-1400
43. Mr. Colin Gray  
Director of Special Education  
Washington-Warren-Hamilton-Essex BOCES  
Dix Avenue  
Hudson Falls, New York 12839  
PHONE: (518) 793-7721
44. Dr. Robert M. Hanson  
Director of Special Education  
Westchester BOCES  
17 Berkley Drive  
Port Chester, New York 10573  
PHONE: (914) 937-3820

# B.O.C.E.S.

## Serving the Handicapped in New York-1980



Note. Numbers represent the location of a BOCES School and refer to the list of Directors of Special Education on pages 102 to 108. The numbers which are circled indicate those BOCES randomly selected to participate in the study.

ITHACA

Ithaca College  
Ithaca, New York 14850School of Health,  
Physical Education,  
and Recreation

DATE

ADDRESS

Dear (NAME):

As a faculty member at Ithaca College in the area of adapted physical education and therapeutic recreation, I am concerned with improving the quantity and quality of our pre-service training for future physical educators and recreators who will be working with handicapped populations.

Currently I am working toward my doctoral degree at Texas Woman's University in the area of adapted and developmental physical education under the direction of Dr. Claudine Sherrill. For my dissertation I would like to explore the teaching behaviors of experienced physical educators as they teach children with various handicapping conditions. The study would involve video taping the teaching behavior of selected teachers and analyzing these tapes using a systematic approach for analyzing teaching behavior known as CAFIAS. I will be sharing my results and analysis with each teacher who becomes a part of the study.

In order to accomplish this task, I am collecting information about existing physical education programs which are currently offered by B.O.C.E.S. This information will be used to help me select the populations I wish to study and to provide me with a specific contact in the area of physical education in your program.

By returning the enclosed questionnaire you have not obligated your program in any way to participate in the study. The purpose of the questionnaire is only to help define the scope of the study. Please complete the questionnaire and return it by March 1, 1980. I am enclosing a self-addressed, stamped envelope for your convenience.

Thank you for your cooperation. If you have any further questions, please contact me at (607) 274-3418.

Sincerely,

Sarah M. Rich  
School of HPERSMR:cp  
Enclosure

**PHYSICAL EDUCATION FOR THE HANDICAPPED**  
**Programs Provided by BOCES - 1980**

School: \_\_\_\_\_ Address: \_\_\_\_\_

Director of Special Education: \_\_\_\_\_

Total Number of Children Served in Special Education Program: \_\_\_\_\_

Number Served in Special Classes: \_\_\_\_\_

Number Served in Mainstreamed Classes: \_\_\_\_\_

Number Served in Home/Hospital Instruction: \_\_\_\_\_

Do You Offer Physical Education as Part of Your Special Education Program: \_\_\_\_\_

Total Number of Students Participating in Physical Education: \_\_\_\_\_

Number Participating in Special Classes: \_\_\_\_\_

Number Participating in Mainstreamed Classes: \_\_\_\_\_

Name of Physical Education Teacher: \_\_\_\_\_

Years of Teaching Experience: \_\_\_\_\_

Years in Present Position: \_\_\_\_\_

NYS Certification: \_\_\_\_\_

Area of Certification: \_\_\_\_\_

For each of the following handicapping conditions which are described in the Commissioner's Regulations, indicate how many students in your school currently participate in a non-mainstreamed physical education program. Please categorize by chronological age.

	<u>Age in Years</u>			
	5-9	10-14	15-19	20+
Trainable Mentally Retarded				
Educable Mentally Retarded				
Multiply Handicapped				
Hearing Impaired				
Visually Impaired				
Emotionally Disturbed				
Physically Handicapped				
Autistic				
Severely Speech/Language Impaired				

## Collection of Data Schedule

<u>Date</u>	<u>Time</u>	<u>Boces</u>	<u>Teacher</u>	<u>Class</u>
May 2	P.M.	Cortland	Tier	PH
May 5	AM/PM	Ithaca	Hollern	TMR/PH
May 5	A.M.	Cortland	Tier	TMR
May 6	AM	Binghamton	Sammon	TMR/PH
May 7	AM/PM	Ithaca	Hollern	TMR/PH
May 7	AM	Cortland	Tier	TMR
May 8	AM	Binghamton	Sammon	TMR/PH
May 9	AM	Mexico	Furnal	TMR/PH
May 9	PM	Cortland	Tier	PH
May 12	AM	Albany	Donnelly	TMR/PH
May 12	PM	Saratoga	McMaster	TMR/PH
May 13	AM	Fonda	Yost	TMR/PH
May 13	PM	Herkimer	Green	TMR/PH
May 14	AM	Fonda	Yost	TMR/PH
May 14	PM	Herkimer	Green	TMR/PH
May 15	AM	Albany	Donnelly	TMR/PH
May 15	PM	Saratoga	McMaster	TMR/PH
May 16	AM	Mexico	Furnal	TMR/PH
May 19	PM	Batavia	Albiel	TMR/PH
May 20	AM	Leister	Owens	TMR/PH
May 20	PM	Fairport	Spacloni	TMR/PH
May 21	AM	Leister	Owens	TMR/PH
May 21	PM	Batavia	Albiez	TMR/PH
May 22	PM	Fairport	Spadoni	TMR/PH
May 27	AM	Norwich	McGill	TMR/PH
May 29	AM	Norwich	McGill	TMR/PH



113  
BOCES Teacher Data Form

Name: \_\_\_\_\_ BOCES: \_\_\_\_\_

Experience: Total Year Physical Education Teaching  
Experience: \_\_\_\_\_  
Total Years Adapted Physical Education  
Teaching Experience: \_\_\_\_\_  
Total Years in Present Position: \_\_\_\_\_

Education: \_\_\_\_\_ Bachelor Master Other

Institution: \_\_\_\_\_

Major: \_\_\_\_\_

Degree: \_\_\_\_\_

Year: \_\_\_\_\_

Number of APE Courses Taken: \_\_\_\_\_

Certification:

Type: \_\_\_\_\_

Subject Area(s): \_\_\_\_\_

Present Teaching Experience:

Total Number of Students Taught: \_\_\_\_\_

Total Number of Classes Taught: \_\_\_\_\_

Average Number of Times/Week Child Receives Physical  
Education: \_\_\_\_\_

List Disabilities Presently Included in Your Class:

ITHACA

Ithaca College  
Ithaca, New York 14850

---

School of Health,  
Physical Education,  
and Recreation

(Date)

(Address)

Dear (Name):

I enjoyed meeting you and appreciated your help and cooperation in the filming for my doctoral dissertation. It is evident that you are contributing to the education of children with special needs.

I hope that my study will facilitate a better understanding of the teaching process as it effects adapted physical education.

Thank you again and I will keep you informed of my progress.

Sincerely,

Sarah M. Rich

SMR:smq

## APPENDIX C

### RAW DATA

Coder Reliability\* for Subject 8--  
 Physically Handicapped Class Using  
 Spearman Rank Order Correlation Method

	Observation 1	Observation 2		
Top 10 Cells	Rank	Rank	D	D <sup>2</sup>
6-8	1	1	.00	.00
8-2	2	2	.00	.00
2-2	3	6.5	3.50	12.25
2-6	4	3	-1.00	1.00
8-6	5	4	-1.00	1.00
6-2	6	5	-1.00	1.00
5-6	7	6.5	.50	.25
4-8	8	8	.00	.00
2-8	9	10	1.00	1.00
8-3	10	9	-1.00	1.00
Total				17.50

\* $\underline{r} = .90$

Coder Reliability\* for Subject 11--  
Trainable Mentally Retarded Class Using  
Spearman Rank Order Correlation Method

Top 10 Cells	Observation 1   Observation 2		D	D <sup>2</sup>
	Rank	Rank		
6-2	1	1	.00	.00
2-8	2	2	.00	.00
3-6	3	3	.00	.00
8-3	4	4	.00	.00
2-6	5	5	.00	.00
6-8	6	6	.00	.00
8-2	7	7.5	-.5	.25
8-6	8	7.5	-.5	.25
4-8	9	9	.00	.00
5-6	10	10	.00	.00
Total				.50

\*r = .997

PERCENTAGES FOR CAFIAS CATEGORIES\*

PHYSICALLY HANDICAPPED CLASSES

Subject	2	12	3	13	4	14	5	15	6	16	7	17	8	18	8\	18\	9	19	10	20
1	19.8	18.8	0.8	2.4	1.5	0.2	3.4	2.4	13.6	11.5	1.0	0.2	1.0	19.5	0.2	0.4	0.8	1.3	0.0	1.0
2	12.4	14.0	5.1	6.4	1.4	0.6	4.4	2.9	11.1	11.7	0.4	0.2	4.0	15.7	2.4	2.6	0.5	0.5	2.3	1.4
3	14.4	17.3	1.8	2.9	0.8	0.5	3.8	3.3	13.5	16.0	0.3	0.3	2.3	20.8	0.5	0.4	0.3	0.3	0.0	0.8
4	11.8	11.3	5.2	5.2	3.1	0.4	2.1	1.1	14.9	11.7	1.6	1.0	3.4	17.5	2.3	1.7	2.6	2.3	0.2	0.5
5	9.2	8.0	5.4	3.6	3.2	0.8	12.1	9.1	14.7	9.1	0.5	0.2	3.3	19.5	0.2	0.2	0.2	0.2	0.0	0.3
6	5.5	4.5	3.6	3.0	0.8	0.3	7.4	4.1	17.1	8.4	1.2	1.1	5.7	33.1	0.8	1.2	0.8	0.8	0.0	0.3
7	10.5	7.9	3.6	4.9	2.0	0.8	11.0	7.8	17.3	9.1	0.8	0.5	1.8	19.0	1.1	1.0	0.3	0.3	0.0	0.3
8	11.7	12.6	3.5	2.8	5.1	1.5	5.0	3.6	12.3	9.0	0.6	0.3	4.8	18.6	2.6	3.5	1.2	0.8	0.0	0.5
9	10.7	10.2	2.9	7.1	2.4	0.4	9.9	7.3	11.2	11.6	0.8	0.7	3.6	16.6	1.8	1.4	0.6	0.7	0.0	0.3
10	13.9	16.7	1.8	3.6	1.9	0.6	4.9	4.0	13.0	15.0	0.5	0.4	2.1	18.4	0.3	0.7	0.5	0.6	0.0	1.1
11	12.4	12.0	0.8	2.0	2.3	0.6	5.4	2.0	17.9	6.6	1.0	0.6	1.6	19.2	2.4	2.8	1.8	2.7	0.0	6.1
12	3.8	3.5	2.4	2.4	1.4	0.4	3.0	1.0	14.9	8.1	1.2	1.0	15.4	27.6	4.3	3.4	2.7	1.4	1.6	0.3
ALL	11.3	11.5	3.2	4.1	2.1	0.6	6.0	4.0	14.0	10.8	0.8	0.6	4.0	20.1	1.5	1.7	1.0	1.1	0.4	0.9

\*For a description of CAFIAS categories refer to Appendix A.

PERCENTAGES FOR CAFIAS CATEGORIES\*

TRAINABLE MENTALLY RETARDED CLASSES

Subject	2	12	3	13	4	14	5	15	6	16	7	17	8	18	8\	18\	9	19	10	20
1	11.1	10.2	1.7	2.3	1.9	0.9	4.7	2.8	15.9	11.5	2.6	0.7	1.9	23.2	1.4	1.7	1.0	2.3	0.0	2.0
2	11.3	11.1	4.3	6.3	1.1	0.4	3.3	2.3	11.3	10.8	0.6	0.3	5.8	12.9	5.5	5.4	0.7	1.2	5.1	0.4
3	17.7	19.9	1.3	5.3	0.2	0.1	2.5	1.6	13.0	14.6	0.5	0.4	0.8	18.1	0.6	0.6	0.5	0.9	0.0	1.4
4	10.5	8.6	3.2	3.2	2.7	1.2	1.2	0.7	13.8	11.2	1.4	0.9	11.9	18.2	2.7	2.9	1.6	2.5	0.9	0.7
5	6.4	5.6	4.0	2.9	2.5	0.5	11.4	7.7	14.2	8.6	2.0	1.2	6.3	17.3	3.4	1.5	2.0	1.5	0.7	0.3
6	10.8	10.0	4.2	2.2	1.6	0.4	5.7	1.9	15.2	10.3	0.8	0.5	2.2	29.0	1.5	1.2	0.8	1.0	0.0	0.5
7	7.5	9.8	4.1	8.2	2.1	0.6	5.0	3.3	18.5	11.1	0.6	0.4	4.2	16.1	2.9	3.3	0.5	1.0	0.0	0.7
8	5.7	3.9	3.2	2.3	2.9	0.8	11.1	7.9	13.7	7.1	1.7	0.5	5.7	23.1	3.4	1.8	1.2	1.7	0.7	1.6
9	6.2	5.6	1.3	2.0	1.2	0.3	9.4	7.3	14.8	12.2	1.0	0.5	6.1	26.5	0.8	1.7	0.9	1.5	0.3	0.4
10	12.2	11.6	2.3	3.0	2.6	0.5	4.9	2.8	15.9	14.6	1.4	0.8	1.4	22.4	0.5	0.5	0.5	0.7	0.0	1.4
11	10.1	10.5	5.7	5.8	4.3	1.2	3.7	2.9	14.0	10.4	0.7	0.5	5.4	16.8	2.3	1.8	0.8	1.6	0.1	1.5
12	8.1	6.5	1.3	2.4	1.1	0.4	3.9	2.3	20.0	14.2	1.4	0.8	2.8	31.9	0.4	0.6	0.6	0.9	0.0	0.4
ALL	9.9	9.6	3.1	3.9	2.0	0.6	5.4	3.5	14.8	11.4	1.2	0.6	4.8	20.8	2.2	2.0	0.9	1.4	0.8	1.0

\*For a description of CAFIAS categories refer to Appendix A.

# RAW SCORES FOR TWELVE CAFIAS PARAMETERS\*

## PHYSICALLY HANDICAPPED CLASSES

Subject	TCV	TCNV	SCV	SCNV	TQV	TQNV	TAPV	TAPNV	PVITS	PNVITS	PVISS	PNVISS
TCV	40.11	35.59	1.98	21.27	31.11	8.33	58.62	64.55	50.00	8.29	77.78	75.00
TCNV	34.87	35.84	6.91	18.69	24.56	16.18	60.32	63.13	41.48	16.16	16.07	15.25
SCV	34.50	40.21	3.05	21.47	17.14	13.56	53.90	55.26	25.53	3.02	33.33	40.00
SCNV	38.66	30.72	8.36	21.58	59.79	28.57	50.79	56.42	59.49	18.87	53.19	57.14
TQRV	45.09	30.84	3.77	20.01	20.77	8.33	49.01	55.62	12.50	2.35	50.00	50.00
TQRVN	35.70	21.50	7.31	35.15	10.00	6.25	33.17	44.35	22.64	5.88	50.00	40.00
TAPRV	45.18	31.03	3.17	20.30	15.42	9.77	43.78	57.06	42.86	6.37	19.05	20.00
TAPRVN	38.33	29.84	8.49	22.89	50.63	30.00	53.88	62.50	43.94	18.54	31.03	18.18
SVITSR	37.78	37.28	5.95	18.67	19.37	5.00	53.02	58.66	39.81	11.21	23.26	34.21
SNVITSR	35.94	40.32	2.86	19.78	28.21	13.92	53.91	57.03	26.53	6.78	61.54	47.83
SVISSR	37.74	25.72	5.90	26.56	23.36	20.00	40.93	61.63	72.62	31.75	54.10	43.33
SNVISSR	26.68	16.48	27.50	32.44	32.35	27.27	27.65	39.13	31.40	14.92	38.98	29.73
ALL	37.59	31.65	6.58	22.87	26.23	12.66	49.47	57.73	39.33	12.21	40.31	37.88

\*Description of CAFIAS parameters are found on pages 7-10.



# RAW SCORES FOR TWELVE CAFIAS PARAMETERS\*

## TRAINABLE MENTALLY RETARDED CLASSES

Subject	TCV	TCNV	SCV	SCNV	TQV	TQNV	TAPV	TAPNV	PVITS	PNVITS	PVISS	PNVISS
TCV	38.12	28.45	4.31	27.16	28.70	25.00	40.90	50.50	55.71	14.74	43.59	58.46
TCNV	31.82	31.17	12.01	19.49	24.47	14.04	56.56	60.98	51.75	33.57	12.03	17.86
SCV	35.22	41.89	1.89	19.59	8.51	6.90	58.55	62.70	56.25	7.83	44.44	57.69
SCNV	32.80	25.78	16.14	23.58	69.05	64.10	47.49	49.22	26.38	22.82	37.36	46.09
TQRV	40.47	26.61	11.65	20.23	17.70	5.97	39.17	46.67	46.32	14.55	36.36	50.00
TQNV	38.47	25.33	4.52	31.21	22.22	17.65	48.46	52.98	51.52	7.02	35.29	43.75
TAPRV	37.81	33.50	7.60	20.43	29.06	15.38	37.62	61.11	44.80	21.13	16.07	22.54
TAPNV	38.21	22.57	10.27	26.58	20.49	9.37	36.69	44.61	44.37	13.04	25.37	49.02
SVITSR	33.86	27.87	7.85	29.67	11.05	4.58	32.17	37.36	22.22	10.78	53.33	45.45
SNVITSR	39.25	33.43	2.38	23.57	34.40	16.07	45.71	48.92	42.50	5.04	52.94	55.00
SVISSR	38.37	31.34	8.47	20.21	53.85	29.73	51.82	59.96	36.60	16.71	25.00	45.90
SNVISSR	35.76	26.69	3.81	33.38	21.74	13.51	30.37	37.43	26.42	4.31	57.14	60.00
ALL	36.43	29.67	7.92	24.21	27.27	15.17	44.79	52.92	39.76	14.24	29.86	40.62

\*Description of CAFIAS parameters are found on pages 7-10.

## REFERENCES

## References

- Achilles, C. M., & French, R. L. Inside classrooms: Studies in verbal and nonverbal communication. Knoxville: University of Tennessee, 1977.
- Agnew, M. Comparisons of female teaching and coaching behaviors in secondary schools. Unpublished master's thesis, Ithaca College, 1977.
- Altenberger, H., & Grossing, S. Systematic classroom observation as a method of sport pedagogy. International Journal of Physical Education, 1978, 15, 21-25.
- Amidon, E. J. Interaction analysis. Theory into Practice, 1968, 7, 159-167.
- Amidon, E. J., & Flanders, N. A. The role of the teacher in the classroom: A manual for understanding and improving teacher classroom behavior. Minneapolis: Association for Productive Teaching, 1971.
- Amidon, E. J., & Hough, J. B. (Eds.). Interaction analysis: Theory, research, and application. Reading Ma: Addison-Wesley, 1970.
- Amidon, E. J., & Hunter, E. Improving teaching: The analysis of classroom verbal interaction. New York: Holt Rinehart and Winston, 1966.
- Anderson, H. H. The measurement of domination and of socially integrative behavior in teachers' contacts. Child Development, 1939, 10(2), 73-89.
- Anderson, W. G. Descriptive analytic research on teaching. Quest, 1971, 15, 1-8.
- Anderson, W. G. Videotape data bank. Journal of Physical Education and Recreation, 1975, 46(7), 31-34.
- Anderson, W. G., & Barrette, G. T. (Eds.). What's going on in the gym: Descriptive studies of physical education classes. Newtown, Ct: Motor skills: Theory into practice, 1978.

- Anderson, W. G. Analysis of teaching physical education. St. Louis: Mosby, 1980.
- Avery, D. E. A comparison of interaction patterns of effective and less effective coaches. Unpublished master's thesis, Ithaca College. 1978.
- Bales, C. F. A set of categories for the analysis of small group interaction. American Sociological Review, 1950, 15, 181-187.
- Barr, P. L. The effects of instruction and supervision of interaction analysis on coaching behaviors. Unpublished master's thesis, Ithaca College, 1978.
- Barrett, K. R. A procedure for systematically describing teacher-student behavior in primary physical education lessons implementing the concept of movement education. Unpublished doctoral dissertation, University of Wisconsin, 1969.
- Barrett, K. R. The structure of movement tasks--A means for gaining insight into the nature of problem solving techniques. Quest, 1971, 15, 22-31.
- Barrette, G. T. A descriptive analysis of teacher behavior in physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1977.
- Batchelder, A. Process objectives, observed behaviors, and teaching patterns in elementary math, English, and physical education classes. Unpublished doctoral dissertation, Boston University, 1975.
- Batchelder, A., & Keane, F. BAKE: An analysis of lecture in the college classroom. The Journal of Classroom Interaction, 1977 13, 33-43.
- Bechtold, W. A study of the effect of a tutorial relationship between volunteer high school students and moderately retarded peer aged students participating in an individualized program. Unpublished doctoral dissertation, Boston University, 1976.
- Brookhout, E. C. Teaching behavior in relation to the socioemotional climate of physical education classes. Research Quarterly. 1967, 38, 336-347.

- Cheffers, J. T. The validation of an instrument designed to expand the Flanders' system of interaction, different varieties of teacher behavior and pupil responses. Unpublished doctoral dissertation, Temple University, 1972.
- Cheffers, J. T. Observing teaching systematically. Quest, 1977, 28, 17-28.
- Cheffers, J. T. Evaluating alternative schools. The Education Collaborative, Boston University, 1978.
- Cheffers, J. T. Evaluating Kodaly methods of music training. Unpublished manuscript, Boston University, 1979.
- Cheffers, J. T., Amidon, E. J., & Rogers, K. D. Interaction analysis: An application to nonverbal activity. Minneapolis: Association for Productive Teaching, 1974.
- Cheffers, J. T., Batchelder, A., & Zaichkowsky, L. Achieving racial integration through movement oriented programs. Unpublished manuscript, Boston University, 1976.
- Cheffers, J. T., & Mancini, V. H. Teacher student interaction. In W. G. Anderson & G. T. Barrette (eds.), What's going on in the gym: Descriptive studies of physical education classes. Newtown, Ct: Motor skills: Theory into practice, 1978.
- Cheffers, J. T., & Mancini, V. H. Change without threat or compulsion. Unpublished manuscript, Boston University, 1979.
- Cheffers, J. T., Mancini, V. H., & Martinek, T. J. Interaction analysis: An application to nonverbal and verbal activity (2nd ed.). St. Paul: Paul S. Amidon & Associates, 1980.
- Chertok, H. A comparison of two methods of teaching ball handling skills to third grade students. Unpublished master's thesis, Ithaca College, 1975.
- Cohen, S. Therapist-client similarity and compatibility: Their relationship to intra-personal interaction and speech patterns. Unpublished doctoral dissertation, Boston University, 1978.

- Cooper, S. H. Hope for the future: A view of research in teacher effectiveness. Quest, 1977, 28, 29-37.
- Cosper, W. B. An analysis of sex differences in teacher student interaction as manifested in verbal and non verbal behavior clues. Unpublished doctoral dissertation, The University of Tennessee, Knoxville. 1970.
- Costello, J. A. A descriptive analysis of student behavior in elementary school physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1977.
- Craig, W. N., & Collins, J. L. Communication patterns in classes for deaf. Pittsburgh: Pennsylvania School of Education, 1969. (ERIC Document Reproductive Service No. ED 034 367).
- Cratty, B.J. Motor activity and the education of retatardates. Philadelphia: Lea & Febiger, 1969.
- Crispen, D. B., & Walker, K. P. Socially maladjusted children in the classroom: An interaction analysis. Terre Haute, In: Counselling and Remedial Center, 1969.
- Devlin, G. L. The effects of contingency management skills to elementary students on the student's self-concepts and physical education behaviors. Unpublished master's thesis, Ithaca College, 1979.
- Doenges, R. Use of elementary-age students as modifiers of physical education teacher behavior. Unpublished master's thesis, Ithaca College, 1976.
- Dougherty, M. J. A plan for the analysis of teacher-pupil interaction in physical education classes. Quest, 1971, 15, 39-50.
- Durkin, T. The effects of adventure-challenge programs on health attitudes of middle school children. Unpublished doctoral dissertation, Boston University, 1978.
- Evaul, T. A comparison of open and closed classrooms. Annapolis, Md: Maryland Department of Curriculum Studies, 1976.

- Faulkner, M. A comparison of the teaching behavior of male and female pre-service secondary physical education teachers. Unpublished master's thesis, Ithaca College, 1976.
- Federal Register. Tuesday, August 23, 1977. Part II: Implementation of Part B of the Education for All Handicapped Children Act of 1975.
- Fieldler, F. E., & Chemers, M. M. Leadership and effective management. Glenview, IL: Scott Foresman, 1974.
- Fishman, S. E. A procedure for recording augmented feedback in physical education classes: Unpublished doctoral dissertation, Teachers College, Columbia University, 1970.
- Flanders, N. A. Personal social anxiety as a function in experimental learning situations. Journal of Educational Research, 1951, 45, 100-110.
- Flanders, N. A. Interaction analysis in the classroom: A manual for observers. Minneapolis: University of Minnesota 1960 (a).
- Flanders, N. A. Teacher influence, pupil attitudes, and achievement. Washington D.C.: U.S. Department of HEW. Cooperative Research Project No. 397, 1960(b).
- Flanders, N. A. Analyzing teaching behavior. Reading Ma: Addison-Wesley, 1970.
- French, R. L., & Galloway, C. M. A description of teacher behavior: Verbal and nonverbal. Research in Education, 1969, 15, 14-23.
- Galloway, C. M. Nonverbal communication. Theory into Practice, 1968, 7, 172-175.
- Galton, M. Systematic classroom observations: British research. Educational Research, 1979, 21, 109-115.
- Gauthier, R. A. A descriptive-analytic study of teacher-student interaction in mainstreamed physical education classes. Unpublished doctoral dissertation. Purdue University, 1980(a).
- Gauthier, R. A. Personal communication, January 15, 1980, and September 9, 1980(b).

- Getty, H. L. Effects of instruction and supervision in interaction analysis on the teaching behavior of student teachers. Unpublished master's thesis, Ithaca College, 1977.
- Goldberger, M. Studying your teaching behavior. Journal of Health, Physical Education and Recreation, 1974, 45(3), 33-36.
- Hayes, J. E. The effects of three teaching styles on the acquisition of badminton skill and knowledge. Unpublished master's project, Ithaca College, 1978.
- Hendrickson, C. E. The use of the Cheffers' Adaptation of Flanders' Interaction Analysis System in a preservice training program of physical education teachers. Unpublished master's thesis, Ithaca College, 1975.
- Hirsch, R. A comparison of coaching behavior in two different athletic environments. Unpublished master's thesis, Ithaca College, 1978.
- Hope, D. M. The development and evaluation of recreation programs and their effect upon morale and functioning of elderly nursing home residents. Unpublished doctoral dissertation, Boston University, 1978.
- Hough, J. E. An observational system for the analysis of classroom interactions. Unpublished manuscript, The Ohio State University, 1964.
- Inturrisi, E. The effects of feedback and interpretation of interaction analysis on the attitudes and teaching behaviors of student teachers, Unpublished master's thesis, Ithaca College, 1979.
- Keane, F. J. The relationship of sex, teacher leadership style, and teacher-leader behavior in teacher student interaction. Unpublished doctoral dissertation, Boston University, 1975.
- Kielty, G. C. Differential multiprofessional stimulus through interaction analysis. Unpublished doctoral dissertation, Boston University, 1975.
- Lunasea, P. J., & Mayo, N. B. Verbal interaction in secondary special education classes: An observation study. The High School Journal, 1979, 63, 120-123.



- Laubach, S. A. The development of a system for coding student behavior in physical education, Unpublished doctoral dissertation, Teachers College, Columbia University, 1975.
- Lippert, R., & White, R. K. The social climate of children's groups. In R. G. Barker, J. Kounin, and H. F. Wright (Eds.), Child behavior and development. New York: McGraw-Hill, 1943.
- Locke, L. F. Research on teaching physical education: New hope for a dismal science. Quest, 1977, 28, 2-16.
- Lombardo, B. J. The observation and description of the teaching and behavioral interaction of selected physical education teachers. Unpublished doctoral dissertation, Boston University, 1979.
- Love, A. M., & Roderick, J. Teacher nonverbal communication: The development and awareness unit. Theory Into Practice, 1971, 295-299.
- Lydon, M. Decision-making in elementary school age children: Effects of a convergent curriculum model upon motor skill development, self-concept, and group interaction. Unpublished doctoral dissertation, Boston University, 1978.
- Mancini, V. H. A comparison of two decision-making models in an elementary human movement program based on attitudes and interaction patterns. Unpublished doctoral dissertation, Boston University, 1974.
- Mancini, V. H. Personal communication, July 15, 1979.
- Mancini, V. H., Cheffers, J. T., & Zaichkowsky, L. D. Decision making in elementary children: Effects in attitudes and interaction patterns. Research Quarterly, 1976, 47, 80-85.
- Mancini, V. H., Getty, H. L., & Morris, H. H. Effects of interaction and supervision in interaction analysis on the teaching behavior of student teachers. Paper presented at the meeting of the American Association for Health, Physical Education, and Recreation, Kansas City, 1978.

- Martinek, T. J. A comparison of vertical and horizontal models of teaching in the development of specific motor skills and self-concept in elementary age children. Unpublished doctoral dissertation, Boston University, 1976.
- Martinek, T. J., & Johnson, S. B. Teacher expectations: Effects on dyadic interactions and self-concepts in elementary age children. Research Quarterly, 1979, 50, 60-70.
- Martinek, T. J., & Mancini, V. H. CAFIAS: Observing dyadic interaction between teacher and student. Journal of Classroom Interaction, 1979, 2, 18-23.
- Mason, A. Comparisons of male teaching and coaching behaviors in colleges and universities. Unpublished manuscript, Ithaca College, 1978.
- Mawdsley, R. H. Comparison of teacher behaviors in regular and adapted movement classes. Unpublished doctoral dissertation, Boston University, 1977.
- Medley, D. M., & Mitzell, H. E. A technique of measuring classroom behavior. Journal of Educational Psychology 1958, 49(2), 86-92.
- Murray, C. K. The systematic observation movement. Journal of Research and Development in Education, 1970, 4(2), 3-7.
- Nyquist, E. B. Remarks on the Silver Anniversary of BOCES. Albany, N.Y.: State Department of New York, 1974.
- Nygaard, G. A. An analysis of verbal interaction in physical education. Unpublished doctoral dissertation, University of Oregon, 1971.
- Nygaard, G. A. Interaction analysis of physical education classes. Research Quarterly, 1975, 46, 351-357.
- Ober, R. L., Bentley, E. L., & Miller, E. Systematic observation of teaching. Englewood Cliffs, N.J.: Prentice-Hall, 1971.
- O'Donnell, T. P. Developing small group process skills in a world civilization survey course. Unpublished doctoral dissertation, Boston University, 1978.

- Olsen, J. K. Adaptation of the observational system for instructional analysis for use in physical education. Unpublished doctoral dissertation, The Ohio State University, 1979.
- Pratt, R. E., & Owen, S. An experimental study of student influence in teacher behavior. Paper presented at Northeastern Research Association, New York, 1973.
- Proulx, T. Environmental analysis and interaction patterns of high school basketball coaches. Unpublished master's thesis, Ithaca College, 1979.
- Quarterman, J. An observational system for observing the verbal and nonverbal behaviors emitted by physical educators. Physical Educator, 1980, 37, 15-20.
- Rankin, K. D. Verbal and nonverbal interaction analysis of student teachers with students in elementary physical education. Unpublished doctoral dissertation, University of Kansas, 1975.
- Regulations of the Commissioner of Education. Part 200-Handicapped Children, Sec. 200.2, Revised July 1, 1979. The State Education Dept., Albany, N.Y.
- Reisenweaver, P. J. The teaching interaction patterns of secondary female physical education teachers with high-skilled students and with low-skilled students. Unpublished master's thesis, Ithaca College, 1980.
- Rochester, D. A., Mancini, V. H., & Morris, H. H. The effects of supervision and instruction in the use of interaction analysis on the teaching behavior of preservice teachers. Paper presented at meeting of American Association for Health, Physical Education, and Recreation, Seattle, 1977.
- Rodgers, K. D. Computerization of CAFIAS: A Prototype Fortran program for interaction analysis. Lawrence: University of Kansas, 1974.
- Rotsko, A. A comparison of coaching behaviors of successful and less successful coaches. Unpublished master's thesis, Ithaca College, 1979.
- Scriber, K. The relationship between perceived teaching behavior and observed teaching behavior of school health educators. Unpublished master's thesis, State University College at Cortland, 1977.

- Semmel, M. I., Herzog, B., Kreider, J., & Chaves, M. Analysis of teacher pupil verbal interaction patterns in classes for the mentally retarded. Ann Arbor, Mich.: University of Michigan, 1967. (ERIC Document Reproduction Service No. ED 021-372).
- Shepard, R. G. An analysis of teacher-nonverbal behaviors as exhibited toward pupils representing three social classes. Unpublished doctoral dissertation, The University of Tennessee, Knoxville, 1971.
- Siedentop, D. Behavior analysis and teacher training. Quest 1972, 18, 26-32.
- Siedentop, D., & Hughley, C. O.S.U. teacher behavior rating scale. Journal of Physical Education and Recreation, 1975, 46(2), 45.
- Staurowsky, E. A comparison of female coaching behaviors in two athletic environments. Unpublished master's thesis, Ithaca College, 1979.
- Streeter, B. F. Interaction behavior patterns of male secondary physical educators with high-skilled and low-skilled students. Unpublished master's thesis, Ithaca College, 1980.
- Stevens, M. E. The effects of instruction and supervision in interaction analysis on the teaching behavior of selected physical education teachers. Unpublished master's thesis, Ithaca College, 1979.
- Travis, W. The effect of selected affective and cognitive teaching skills on teaching performance of doctoral fellows teaching social sciences. Unpublished doctoral dissertation, Boston University, 1977.
- Tobey, C. A descriptive analysis of the occurrences of augmented feedback in physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1974.
- Underwood, T. E. A comparison of interaction patterns of high-anxiety and low-anxiety student teachers. Unpublished master's thesis, Ithaca College, 1979.
- Vogel, R. Effects of instruction and supervision in Cheffers' Adaptation of Flanders' Interaction Analysis System on the teaching behavior of student teachers. Unpublished master's thesis, Ithaca College, 1976.

- Van der Mars, H. The effects of instruction in and supervision through interaction analysis on relationship between perceived and observed teaching behaviors of pre-service physical education teachers. Unpublished master's thesis, Ithaca College, 1979.
- Weber, W. A. Relationships between teacher behavior and pupil creativity in the elementary school. Chicago: American Educational Research Association, 1968. (ERIC Document Reproduction Service No. ED 028 150).
- Williams, W. C. Pupil role and verbal following behaviors. Education, 1980, 100, 326-349.
- Withall, J. The development of a technique for the measurement of social-emotional climate in classrooms. Journal of Experimental Education, 1949, 17, 347-361.
- Wood, D. Adventure-education through participant observation and interaction analysis. Unpublished doctoral dissertation, Boston University, 1978.
- Wuest, D. A. Social and psychophysiological concomitants of interaction and involvement in pedagogical processes: A multidimensional analysis. Unpublished doctoral dissertation, Boston University, 1980.