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Cooperating teachers' effect on student teachers' behavior in physical education

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COOPERATING TEACHERS' EFFECT ON STUDENT TEACHERS' BEHAVIOR IN PHYSICAL EDUCATION

by

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An Abstract

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of the requirements for the degree of
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ABSTRACT

The behavior patterns of student and cooperating teachers were examined to determine if the cooperating teacher influences the verbal and nonverbal behavioral patterns of student teachers. The 1980 spring semester elementary physical education student teachers at Ithaca College and their cooperating teachers served as subjects. Data were collected in the form of two videotaped class sessions of both cooperating teachers and student teachers. All tapes were coded using Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) and transposed onto data cards for analysis. Canonical correlation, multivariate analysis of variance, discriminant function analysis and univariate analysis of variance were performed on the eight selected CAFIAS variables. Results of these tests led to the conclusions that the behavioral patterns of student teachers in elementary physical education do change during the student teaching period, and that a relationship does exist between the behavioral patterns of cooperating and student teachers, however, cooperating teachers failed to significantly influence the behavioral patterns of student teachers. It was also concluded that cooperating teachers' predominant behavior was determined to be one of information giving followed by directions, which led to predictable

student response. Student teachers demonstrated significant indirect teacher influence with acceptance, praise and questioning leading to more student-to-student interaction.

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A Thesis Presented to the Faculty of
the School of Health, Physical
Education, and Recreation
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In Partial Fulfillment of the
Requirements for the Degree
Master of Science

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by
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May 1982

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Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

Jennifer Ann Goss

submitted in partial fulfillment of the requirements for the degree of Master of Science in the School of Health, Physical Education, and Recreation at Ithaca College has been approved.

Thesis Advisor:

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DEDICATION

This thesis is dedicated with love to my parents and family who taught me countless lessons on life.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF FIGURES

Chapter 1

INTRODUCTION

Throughout the field of education, student teaching is generally regarded as the most important single experience in the professional preparation of a teacher. It is a period of transition for the neophyte teacher. The student teacher exchanges a role as student-learner in the classroom for the role as guide or director of the learning process in the actual classroom setting. This student teaching period may have more impact on the student teacher than theory courses because it bridges the gap between concept and practice.

When the student teacher first enters the classroom, he/she may have little idea of the practicalities of where to start or what to do, therefore, frequently the student teacher begins by observing and working directly with the cooperating teacher for a period of time. This period may lead to the cooperating teacher being the most influential factor on the student teaching experience. Many of those who work in the field of teacher education have suspected that the student teacher often acquires behaviors and attitudes, both positive and negative, from the cooperating teacher.

The relationship of the cooperating teacher and the student teacher has been studied in the areas of the student

teachers acquiring attitudes, educational philosophy, dogmatism, empathy, teaching methods, and verbal behaviors like those of their cooperating teachers. None of these studies, however, has been done in the area of physical education, specifically, at the elementary level.

A number of testing instruments have been used in studying the influence of the cooperating teacher. Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS), developed by Cheffers in 1972 for use in a physical activity setting, was used in this investigation to examine the influence of the cooperating teachers on the behavioral patterns of physical education student teachers at the elementary level.

Scope of Problem

The spring semester 1980 elementary physical education student teachers at Ithaca College, Ithaca, New York, and their cooperating teachers were studied to determine if the cooperating teacher influences the teaching behavior patterns of the student teacher. All subjects were videotaped during two full class periods prior to or within the 8-week student teaching period. Cooperating teachers were videotaped twice prior to the arrival of their student teachers. Student

teachers were filmed once within the first 2 weeks and again within the last 2 weeks of their teaching experience.

Tapes of all cooperating and student teachers were subjected to Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS). Analysis of data was done to determine if significant change in specific patterns of instructional behavior of student teachers occurred. If so, did the behaviors of the student teachers tend to approximate those of their cooperating teachers more at the end than at the beginning of the student teaching period, and in what specific areas, as determined through the eight selected CAFIAS variables, did change occur? The specific areas to be studied include: (a) teaching agents, (b) class structure, (c) teaching behaviors, and (d) student behaviors.

Statement of Problem

This study was undertaken to examine the behavioral patterns of cooperating teachers and student teachers through the use of Cheffers' Adaptation of Flanders' Interaction Analysis System and to determine if the cooperating teachers influence the verbal and nonverbal behaviors of student teachers. Two specific subproblems were examined:

1. Do the behavioral patterns of student teachers change during the student teaching period?

2. If so, do the behaviors of the student teachers tend to approximate those of the cooperating teachers more at the end of the student teaching period than they do at the beginning?

Hypotheses

1. There will be significant change in student teachers' behavioral patterns from the start to the finish of the student teaching experience.

2. There will be no significant difference in relationships between the behavioral patterns of the cooperating teacher and the behavioral patterns of the student teacher, from start to the finish of the student teaching experience.

Assumptions of Study

1. The student teaching assignments were made according to the normal procedure established by the School of Health, Physical Education, and Recreation at Ithaca College, Ithaca, New York.

2. The coding of CAFIAS for an entire class period at each testing period yielded sufficient data to test the hypotheses.

3. Videotaping of classes did not alter the natural environment of the classes.

Definition of Terms

1. Interaction analysis: a technique that records through observations the frequency of teacher-pupil interpersonal behaviors.

2. Verbal behaviors: observable, audible human behaviors.

3. Nonverbal behaviors: expressions without words, generally through gestures, body movement, facial expressions, body posture, and tone of voice.

4. Flanders' Interaction Analysis System (FIAS): a well documented system specifically designed to objectively analyze the verbal interaction between teachers and students as it occurs in the classroom (Flanders, 1960).

5. Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS): a validated extension of FIAS developed to record verbal and nonverbal behaviors and specifically designed for implementation in describing teacher-pupil interaction in classes of physical activity (Cheffers, 1972).

6. Direct teaching behavior: teaching behavior that limits students' freedom of action in the class (Flanders, 1960).

7. Indirect teaching behavior: teaching behavior that encourages students' freedom of action in the class (Flanders, 1960).

8. Student teacher: a senior student involved in the laboratory phase of his or her teacher preparation. For the purpose of this study, the laboratory was a public school elementary physical education class.

9. Cooperating teacher: a public school teacher who teaches children and also supervises student teachers in a school. For the purpose of this study, the cooperating teacher was an elementary physical education teacher from the Ithaca, New York area.

Delimitations of Study

1. The study involved 15 student teachers in elementary physical education who were enrolled at Ithaca College, Ithaca, New York, during the 1980 spring semester and their cooperating teachers.

2. Cheffers' Adaptation of Flanders' Interaction Analysis System was used to record teaching behaviors.

3. Each subject was videotaped for two entire class periods, one at the beginning and one at the end, during the 1980 spring semester student teaching period, beginning and end.

Limitations of Study

1. The findings related to teacher behavior may be valid only when CAFIAS is used as the observational tool.

2. The findings may only apply to elementary physical education student teachers and their cooperating teachers.

Chapter 2

REVIEW OF RELATED LITERATURE

In this chapter are examined the significant studies relating to the cooperating teacher's influence on the attitudes and behaviors of the student teacher and the use of systematic observation, Cheffers' Adaptation of Flander's Interaction Analysis System in particular. Also, a summary of the preceding sections is provided.

Very little research has been recorded regarding the student teacher and cooperating teacher in physical education. This review, therefore, will include literature from other subject areas that relate to student teaching in the classroom. For this reason, the reader should interpret the term "classroom" as synonymous with the physical education setting.

In describing student teaching, Houston (1965) states:

> The transition from college student to teacher is a challenging experience. One is immediately projected into a situation where he is responsible not only for himself, but also 30 or so children who look to him for instruction, leadership, guidance, and comfort. (p. 45)

Teacher preparation programs throughout the country are based upon the assumption that experience, attained through

gradual exposure to the realities of the teaching profession, promotes desirable change in classroom behaviors of the student teachers, thus preparing them to eventually take over the responsibilities of teaching on their own. In the field of teacher education, Yee (1969), Terwilliger (1965), Price (1961), and others have implied that the influence of the cooperating teacher may determine the success or failure of beginning student teachers, and the impact of the cooperating teacher may be greater than college theory courses. The findings and problems of past studies in the area of the cooperating teacher's influence on the student teacher will be examined first.

Cooperating Teacher's Influence on Student Teacher

In one of the earliest and most often quoted studies, McAulay (1960) studied the influence of three first grade cooperating teachers on their six student teachers. After observation of such a limited scope, without using systematic observation, McAulay recommended further study. He also concluded that a great deal of influence seems to be extended by the cooperating teacher. He stated, "Generally, student teachers seem to be greatly influenced by their cooperating teachers in methods of teaching, techniques of classroom housekeeping, and relations with children" (McAulay, 1960, p. 82).

Using Sander's Observation Schedule and the Minnesota Teacher Attitude Inventory (MTAI), Price (1961) discovered that attitudes of student teachers changed considerably after the teaching experience and that these changes tended to be in the direction of the attitudes held by the classroom teachers with whom they worked. Agreeing with McAulay's findings, Price (1961) concluded:

> Probably one of the most significant conclusions of the study was that the correlation between supervising teachers' and student teachers' classroom performances indicated that student teachers seem to acquire many of the teaching practices of their supervising teacher during the internship semester . . . This study has shown that considerable change occurred in student teachers' attitudes during the student teaching semester and that there was a tendency for their attitudes to change in the direction of the attitudes held by their respective supervising teachers. (pp. 474-475)

Yee (1969), also using the MTAI considered the notion of congruent and noncongruent influence and determined that cooperating teachers wield great congruent influence upon

student teachers' attitudes. He stated, "The practical significance of results is that the attitudes of student teachers toward young people generally reflect the predominant influence of their cooperating teacher" (Yee, 1969, p. 331). In a similar study, Jansen (1971) investigated changes in educational values preceptions of student teachers, cooperating teachers, and university supervisors. Completion of pretest scores showed significant differences among all groups. Although the differences in the posttest scores were not significant, it was noted that the greatest congruence occurred between cooperating and student teachers while some dissonance was noted with university supervisors.

Johnson (1969) suggested another variable when he introduced the notion of dogmatism or openmindedness. The Rokeach Dogmatism Scale, Form E, was used to measure the change in student teachers' dogmatism. It was hypothesised that students who scored low on the pretest of dogmatism would show a gain on the posttest, and those with high pretest scores would drop. The change in the degree of dogmatism was seen as a direct result of interaction with the cooperating teacher with whom student teachers were placed. The shift of the mean in the direction of the cooperating teachers was found to be

significant, supporting the findings of other studies in which student teachers' personalities were related to those of the cooperating teachers. He concluded that clear evidence shows the change in the direction of closemindedness or open-mindedness of student teachers may be a result of the cooperating teacher.

Examining another variable was Underhill (1968), who used the Affective Sensitivity Scale to study the relationship between the cooperating teachers' empathy and the subsequent shift in student teacher's empathy level toward that of the cooperating teacher. He concluded that a positive relationship exists between the student teacher empathy change and the supervising teacher's empathy level. In general, student teachers tended to gravitate toward the empathy level of supervising teachers.

Copeland (1979) hypothesized the cooperating teacher as the primary factor influencing the student teacher's use of specific "target skills" in the classroom. He suggested that patterns of teaching and learning behavior are part of an interrelated ecological network in the classroom and that exhibition of some types of behaviors "fit into" the network while others do not. Copeland (1979) concluded:

> These results seem to support an ecological interpretation of the relationship between the cooperating teacher behavior and the student teacher utilization of skills . . . Relationships that have been detected between the cooperating and student teacher may be the result of the shaping forces exerted on both by the ecological system of the classroom. (pp. 198, 197)

Flint (1965), using the Observation Schedule and Record form (OScAR), concluded that there was a strong relationship between the verbal behavior of the student teacher and that of the cooperating teacher and that the former's behavior changed during the experience. She recommended further research in verbal behavior to be undertaken using a variety of instruments, settings, and samples. In a similar study, using the teaching styles obtained through use of the Conceptual Systems Manual, Seperson and Joyce (1971) studied the changes that occurred in verbal behavior of student teachers during their teaching experience, the extent of similarity of change, and the relationship between the pattern of verbal behavior of the student teacher and the verbal pattern manifested by his/her cooperating teacher. Correlational

findings revealed negative relationships between student and cooperating teachers for the eight indicators of teaching style prior to contact. These same relationsips proved to be positive after the two groups were exposed to each other. Seperson and Joyce (1971) also suggested the use of a more sophisticated instrument.

Though not such a long listing, there still are some investigators who have produced evidence that cooperating teachers do not influence student teachers' classroom behaviors. Farrow (1964), focusing on changes in student teachers' verbal behavior, was unable to report significant influence by the cooperating teacher. He indicated the necessity for a closer look at the personal characteristics and situational variables which may produce change in student teachers' verbal behavior during student teaching. Similarly, Terwilliger (1965) reported no demonstrable cooperating teacher influence. He thought the design of the study was inadequate to assess changes in verbal behavior of the student teacher as a result of the cooperating teacher.

Boschee, Prescott, & Hein (1978), studying the relative effect that cooperating teachers have on the educational philosophy of student teachers, found their results to be contradictory to studies by Jansen (1971) and Yee (1969).

Boschee et al. (1978) recommended further investigation with a larger sample size and a more sophisticated instrument.

Interaction Analysis

Although a number of studies dealing with student teaching behavior have been reviewed, few reliable instruments were used for measuring teacher-student interaction. Flanders (1970) built on Withall's Social-Emotional Climate Index to produce the most widely used system of analyzing and describing the interaction that occurs within the classroom. Flanders, using 10 categories of verbal behavior, developed Flanders' Interaction Analysis System (FIAS), thus allowing for objective systematic observation. The attitudes and teaching patterns of student and cooperating teachers trained in interaction analysis were studied by Moskowitz (1967). The findings of Price (1961), McAulay (1960), and others, who indicated the influence of the cooperating teacher on the student teacher, led Moskowitz (1967) to the following questions:

1. Would the teaching patterns of cooperating teachers be influenced if the teachers were trained in interaction analysis?
2. If changed, would student teachers emulate those behaviors of the cooperating teacher?

3. Would attitudes of student teachers and cooperating teachers be influenced if either one or both learned interaction analysis?

4. Would there be a relationship between teaching patterns of student and cooperating teachers if either of them learned interaction analysis? (p. 175)

To answer these questions, FIAS was used as a treatment and for data collection within the classrooms. Cooperating teachers trained in interaction analysis displayed significantly more indirect teaching patterns than cooperating teachers not trained. Findings showed that when both student and cooperating teachers received training in FIAS, it led to significantly more positive perceptions of the relationships between teachers and students (Moskowitz, 1967).

Bowers (1971) studied the cooperating teachers' influence on the verbal behaviors of student teachers and the relationship of changes in verbal patterns of the student teachers to those of the cooperating teachers to whom they were assigned. FIAS was used to collect data on the 20 intermediate grade student teachers and their cooperating teachers. He concluded that, although not statistically significant,

more than half of the student teachers' verbal behaviors became like those of their cooperating teachers. Halley (1974) also addressed the problem of cooperating teachers' influence on the verbal behavior of the student teacher. The "one group pretest-posttest" design was used in the study, with the cooperating teacher considered a criterion, but not a control. The results indicated that over 50% of the student teachers did not differ significantly from their cooperating teacher in overall verbal behaviors at the beginning, over 50% differed significantly at the end of the student teaching experience, and over 70% of the student teachers had changed their verbal behavior significantly during the student teaching period. The results also indicated 35% of the student teachers changed verbal behaviors significantly (at the .01 level) to resemble more closely those of the cooperating teacher.

Earlier, Mitchell (1969) used FIAS to determine if student teachers in secondary English tend to take on the verbal classroom behaviors of their cooperating teacher. This study, unlike those of Bowers (1971) and Halley (1974), found a significant positive relationship between direct or teacher oriented and indirect or student oriented teaching behaviors between student and cooperating teacher.

There have been many adaptations of FIAS used in studying teaching behavior. One such system is Rankin's Interaction Analysis System (RIAS), developed by Rankin (1975) and used by him to study the teaching behavior of male and female dominant and submissive elementary physical education student teachers. The Cattell 16PF was used to distinguish dominant or submissive personality traits. RIAS was used in the evaluation of verbal and nonverbal behaviors of student teachers. Results indicated that females tend to gesture more in teaching than males, and student teachers classified as submissive verbally rejected students more than those designated as dominant.

Interaction Analysis in Physical Education

The need for a useful tool for describing behaviors that occurred in the physical education setting has been threefold: (a) class time and amount of nonverbal activity have differed greatly from the regular classroom, (b) pupil participation has varied distinctly from the participation in the classroom, and (c) operational procedures have been unique. Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was developed primarily to measure dimensions of human behavior, specifically found in physical activity classes, that Flanders' Interaction Analysis System (FIAS) could not.

CAFIAS has been used as a tool in studying teaching behaviors in several studies. Cheffers and Mancini (1978) used CAFIAS as part of the Videotape Data Bank Project to collect a substantial number of tapes of physical education classes in order to provide raw data for descriptive-analytic research. CAFIAS was one system used in the project. Results indicated:

1. Minimal differences were detected in category usage, interaction parameters, or interaction patterns between male and female teachers and between elementary and secondary teachers.
2. Teachers used lecture and direction giving as their overwhelmingly predominant model of teaching.
3. By comparison with the total recorded behaviors, virtually no acceptance of student feelings and ideas, praise or questioning behaviors were recorded by the sample teachers.
4. Punishment and correction of student behaviors were minimal.
5. Virtually no genuine student initiated activity was recorded in the sample classes . . . (p. 47).

It also concluded that the main teaching agency in elementary classes was the classroom teacher, with the class structure

mainly whole. Cheffers and Mancini (1978) stated:

> The patterns observed in the elementary classes were remarkably similar, and reflect a predominance of teacher information giving along with directness and predictable student response; there was little student initiation. When student initiation was evident, it tended to take place among students, not between teacher(s). At all times, however, the student behaviors occurred as a result of initial teacher suggestion. (p. 47)

Mancini (1974), and Mancini, Cheffers, and Zaichowsky (1976) compared two decisionmaking models in a human movement program at the elementary level based on attitudes and interaction patterns. Children were found to be positive in their interaction with the teacher and more contributing and initiating to activities when allowed to share in the decisionmaking process. Recent studies by Chertok (1975), Martinek (1976), Martinek, Zaichowsky, and Cheffers (1977), and Lydon (1978) used the interaction patterns established by Mancini (1974) to study the effects of varying models on the development of motor skills and self-concept.

CAFIAS has also been used as a tool by Batchelder (1975) and Scriber (1977) in studying the relationship between

perceived and actual teaching behaviors in English, math, physical education, and health classes. It was concluded by both that educators perceived most of their classroom behaviors differently than what was measured by the parameters of CAFIAS.

Pratt (1975) used CAFAIS to measure the effectiveness of training disruptive elementary children to use special contingency management skills in order to modify teacher behavior. According to Pratt, it is conceivable that facilitative behaviors can stimulate and reinforce desirable teacher behavior. Recent studies by Doenges (1976) and Devlin (1979) supported Pratt (1975).

A number of studies have used CAFIAS as a treatment to test its effects on pre-service teacher education programs. Keilty (1975), Hendrickson (1975), and Rochester (1976) established that pre-service teachers receiving training in CAFIAS were more indirect in their teaching behavior than those who received no treatment. Rochester also concluded that the instruction and practical use of interaction analysis were found to be beneficial to pre-service teachers. Faulkner (1976) compared behaviors of male and female pre-service secondary physical educators. She found no significant differences in male and female pre-service secondary teaching patterns.

Vogel (1976) and Getty (1977) also studied the effects of instruction in interaction analysis but used student teachers as subjects. Both found instruction in CAFIAS to be beneficial to student teachers. Student teachers in the treatment group showed more indirect influence, made more use of questions, and had more pupil initiated behavior than student teachers in the control group.

A study by Paterson (1975) used the parameters of CAFIAS to describe, analyze, and compare the instructional patterns of experienced, novice, and trainee male physical education teachers. He concluded there were no significant differences (a) as to instructional patterns within the group, (b) in the 15 teaching variables, and (c) in behavioral variables related to class control and motivation. There were, however, significant differences found in variables relating to class structure; specifically, classes of novice teachers spent a greater amount of time with the class as a whole than did trainee teachers.

Summary

A review of literature suggests a conflict concerning the influence of the cooperating teacher. Studies by Price (1961), McAulay (1960), Yee (1969), and Flint (1965) laid the groundwork in research on the influence of the cooperating

teacher on the attitudes and teaching behaviors of the student teacher. Research by Underhill (1968), Johnson (1969), and Jansen (1971) on the student teachers' dogmatism, empathy, and educational values supported earlier studies. Recently, Copeland (1979) introduced the aspect of an ecological network within the classroom and indicated that the relationships of behaviors between the student and cooperating teachers may result from the forces exerted on both by the ecological network.

Seperson and Joyce (1970), using the Conceptual Systems Manual, studied changes in the verbal behavior of the student teacher and the relationship between patterns of verbal behavior of student and cooperating teachers. The findings supported the earlier work by Flint (1965) and also called for a more sophisticated instrument and an increase in sample size.

There are studies which do not conclude that the cooperating teacher influences the student teacher. Farrow (1964), focusing on the verbal behavioral changes in student teachers, and Terwilliger (1965), using the Observation Schedule and Record (OScAR), found no significant influence by the co-operating teacher on the verbal behavior of the student teacher.

Boschee et al. (1978) studied the relative effect that cooperating teachers have on the educational philosophy of student teachers and found his results to be contradictory to those of Yee (1969) and Jansen (1971).

Flanders (1970) built upon the Withall system to develop Flanders' Interaction Analysis System (FIAS). Using FIAS as the treatment, Moskowitz (1967) examined the attitudes and teaching patterns of student teachers. She concluded that cooperating teachers trained in FIAS displayed significantly more indirect teaching patterns than those not trained.

Bowers (1971), studying the verbal behavior patterns of cooperating and student teachers, concluded that although not statistically significant, more than half of the student teachers' behaviors became like those of the cooperating teacher. Halley (1974) also addressed the influence of the cooperating teacher over the student teacher. The null hypothesis was accepted (at the .01 level), indicating only 35% of the student teacher's verbal behaviors gravitated toward those of their cooperating teachers. In an earlier study, Mitchell (1969) also used FIAS to determine the effect of the cooperating teacher on student teachers. The finding, unlike Bowers (1971) and Halley (1974), indicated a significant positive relationship between direct and indirect teaching

behaviors of student and cooperating teachers.

There have been many adaptations to FIAS and CAFIAS in studying teaching behavior. One such system was developed by Rankin (1975) in studying male and female dominant and submissive elementary student teachers.

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was developed for use with physical activity classes. As an expansion of FIAS, it offers nonverbal categories and makes allowances for the distinction of teaching agency and class structure, which differs from traditional classrooms.

Mancini (1974) and Mancini et al. (1976) compared decisionmaking models in a human movement program. When allowed to share in the decisionmaking process, students were found to be more positive toward the teacher and more initiating in class activities. Chertok (1975), Martinek (1976), Martinek et al. (1977), and Lydon (1978) used the interaction parameters established by Mancini (1974) in studying the effects of varying teacher models on the development of motor skills.

CAFIAS was used to measure the effectiveness of training disruptive elementary children in special contingency management skills in order to modify teacher behavior (Devlin, 1979;

Doenges, 1976; Pratt, 1975). Results indicated that students do have the ability to modify teachers' behavior.

A number of studies have used CAFIAS as the treatment in testing its effects on pre-service teachers. Keilty (1975), Hendrickson (1975), and Rochester (1976) all found instruction in the use of CAFIAS to be beneficial to pre-service teachers. Getty (1977) and Vogel (1976) studied the effects of instruction in interaction analysis in student teachers. Both supported the idea that instruction and use of CAFIAS are beneficial.

Paterson (1975) used CAFIAS to compare interaction patterns of novice, experienced, and trainee male physical educators. He found no significant difference of instructional patterns within the group, behaviors in class control, or motivation.

Chapter 3

METHODS AND PROCEDURES

In this chapter the selection of subjects, the testing instrument employed, and the method of data collection are explained. The establishment of coder reliability and statistical analysis applied to the data are also described. In a final section the methods and procedures used in this study are summarized.

Selection of Subjects

The subjects in this study were the 1980 spring semester elementary physical education student teachers (n=15) at Ithaca College, Ithaca, New York, and their cooperating teachers (n=15). The teaching assignments were made according to standard procedures within the School of Health, Physical Education, and Recreation at Ithaca College. All subjects, prior to participation, were required to sign informed consent forms. A copy of these forms may be found in Appendix A.

Testing Instrument

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was used to measure teacher-pupil behavioral patterns in this study. This system was developed primarily for use in physical activity classes. Through the 20 CAFIAS categories one can objectively record both verbal and nonverbal

behaviors, identify class structure and specific teacher behaviors, and elaborate on student response and behavior. These behaviors, measured by CAFIAS, are recorded every 3 seconds or as often as behaviors change. Through blind-live interpretation of comparisons it was determined that CAFIAS measured aspects of human behavior that could not be measured by Flanders' Interaction Analysis System. Appendix B includes the categories of CAFIAS.

Methods of Data Collection

In an effort to obtain data concerning the hypotheses of this study, all participants were observed under uniform conditions. Subjects in this study were videotaped for two full class periods. Cooperating teachers were videotaped for two class periods prior to the arrival of the student teachers. The student teachers were videotaped one class period within the first 2 weeks and again within the last 2 weeks of the student teaching assignment. The lessons were coded by Dr. Victor Mancini using CAFIAS.

Coder Reliability

Coder reliability for this investigation was assessed by the use of the Spearman rank-order correlation. The rankings for two randomly selected lessons, one for a student teacher and one for a cooperating teacher, were each coded by Dr.

Victor Mancini at two independent observations, and subjected to the Spearman rank-order correlation.

Scoring of Data

Data collected from the codings of CAFIAS were transposed to computer data cards for analysis. Ratios and percentages were compiled by the computer at Ithaca College.

Treatment of Data

Multivariate analysis of variance was used to determine if there was a significant change in the teaching behaviors, as identified by CAFIAS, of student teachers during their student teaching experience. The univariate analysis of variance technique was used to determine the CAFIAS variables that independently indicated significant differences between cooperating and student teachers. Discriminant function analysis was then run to determine which variables contributed to the differences in student teachers' behaviors. To determine the relationships of cooperating and student teachers' behaviors a canonical correlation was run. CAFIAS was also used to study predominant interaction patterns of cooperating and student teachers. The .05 level of probability was used for all tests of significance.

Summary

The 1980 spring semester student teachers in elementary physical education at Ithaca College, Ithaca, New York, and

their cooperating teachers served as subjects. Each subject was videotaped for two full class periods. Cooperating teachers were filmed prior to the arrival of the student teachers. Student teachers were videotaped once within the first 2 weeks and a second time within the last 2 weeks of student teaching. Scores for each of the lessons were transposed to computer cards for analysis. Multivariate analysis of variance, discriminant function analysis, univariate analysis of variance, and canonical correlation were used to determine if significant change occurred in the student teachers' behaviors, to identify variables that may account for the significant change in teachers' behaviors and to determine the relationship, if any, between cooperating and student teachers' behavioral patterns.

Chapter 4

ANALYSIS OF DATA

The spring semester elementary physical education student teachers at Ithaca College, Ithaca, New York, and their cooperating teachers were studied to determine if the cooperating teacher influences the verbal and nonverbal behaviors of the student teacher. In this chapter are presented (a) coder reliability, (b) differences in student teachers' behaviors, (c) relationship of cooperating and student teachers' behavioral patterns, (d) descriptive analysis of cooperating and student teachers' behavioral patterns, and (e) summary.

Coder Reliability

To assess the reliability of the coder for this study, two videotapes, one of a student teacher and one of a cooperating teacher, were selected by the investigator. The two selected tapes were coded twice by an expert coder during two independent observation periods. The Spearman rank-order correlation technique was used to correlate the rankings of the top 10 cell concentrations for the two independent observations of each tape. An overview of the correlations is shown in Table 1. The mean score of the correlation was .993, which was sufficient to indicate the reliability of the coder.

Table 1

Coder Reliability

Subjects	Spearman Rho	M
Student Teacher	.997	.993
Cooperating Teacher	.988	

Note: Coder reliability determined by Spearman Rho correlations of two codings of teaching behaviors for a student teacher and a cooperating teacher.

Differences in Student Teachers' Behaviors

In order to assess the change in behavioral patterns of student teachers, multivariate analysis of variance (MANOVA) was performed on eight selected variables identified through Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS). The MANOVA procedure, run on the codings of student teachers' tapes at the start and end of their student teaching experience, resulted in a value of $F(8,7) = 9.044$, which was significant at the .05 level. The finding of this significant difference led to the rejection of the first hypothesis that there would be no significant change in the student teachers' behavioral patterns over the student teaching period.

The discriminant function analysis identified the percentage of contribution to the between-groups difference for each of the eight CAFIAS variables. Teacher use of questioning, verbal (TQV), accounted for 63.66% of the variance. This was followed by teacher use of questioning, nonverbal (TQNV); pupil verbal initiation, student suggestion (PVISS); and pupil nonverbal initiation, teacher suggestion (PNVITS); which accounted for 10.72%, 9.59%, and 7.73% of the variance respectively. The remaining four variables contributed less that 10% of the between-groups difference. These results are shown in Table 2.

Table 2

Discriminant Function Analysis for the Eight CAFIAS Variables for Student Teachers at Start and End of Student Teaching Period

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution To the Discriminant Function
Variable 1			
TQV	.79793	.63669	63.669
Variable 2			
TQNV	.32746	.10723	10.723
Variable 3			
TAPV	.16679	.0278	2.782
Variable 4			
TAPNV	.05539	.00307	.307
Variable 5			
PVITS	.11464	.01314	1.314
Variable 6			
PNVITS	.27638	.07638	7.738
Variable 7			
PVISS	.30982	.09599	9.599

Table 2 (continued)

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution to the Discriminant Function
Variable 8			
PNVISS	.19916	.03966	3.966

Univariate analyses of variance on the eight CAFIAS variables (results shown in Table 3) were unable to identify any variable on which the students changed significantly when those variables were considered independently.

Relationship of Cooperating and Student Teachers' Behavioral Patterns

In order to assess the relationship between the cooperating and student teachers' behavioral patterns, the canonical correlation technique was used on the eight CAFIAS variables. From Table 4 and Table 5, it can be seen that the canonical correlations between cooperating teachers' and student teachers' behaviors at each of the two measured periods were statistically significant.

Multivariate analysis of variance (MANOVA) was performed on eight selected variables of cooperating and student teachers both at the beginning and at the end of student teaching to assess differences between these groups. The MANOVA of cooperating and student teachers at the start of student teaching resulted in a value of $F(8, 21) = 5.460$, which was significant at the .05 level. The MANOVA on cooperating and student teachers at the end of student teaching resulted in the value of $F(8, 21) = 4.975$, which was also significant at the .05 level.

Table 3

Univariate Analyses of Variance Contrasting Student Teachers at Start and End of Student Teaching Period for the Eight CAFIAS Variables

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 1 TQV					
Mean	8.19	8.19	1	.17	.6834
Error	602.22	266.08	28		
Variable 2 TQNV					
Mean	356.85	356.85	1	1.37	.2604
Error	3724.25	266.08	28		
Variable 3 TAPV					
Mean	3.42	3.42	1	.02	.8793
Error	2009.04	143.50	28		
Variable 4 TAPNV					
Mean	385.81	385.81	1	1.53	.2357
Error	7625.02	544.64	28		
Variable 5 PVITS					
Mean	357.80	357.80	1	.46	.5048
Error	1069.19	763.79	28		

Table 3 (continued)

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 6 PNVITS					
Mean	3.84	3.84	1	.00	.9597
Error	20323.14	1451.65	28		
Variable 7 PVISS					
Mean	1597.98	1597.98	1	3.71	.0745
Error	6024.67	430.33	28		
Variable 8 PNVISS					
Mean	937.50	937.50	1	1.86	.1992
Error	7227.44	516.24	28		

Table 4

Analysis of Canonical Correlations on the Relationship Between Student and Cooperating Teachers at the Start of the Student Teaching Period

Order	Eigenvalue	Canonical Correlation	Chi-square	df	Significance
1	1.00000	1.00000	9999.00000	64	0.000
2	1.00000	1.00000	9999.00000	49	0.000
3	.99806	.99903	42.77881	36	0.203
4	.54815	.74037	8.43842	25	0.999
5	.32001	.56569	4.06920	16	0.999
6	.22262	.47182	1.94799	9	.992
7	.09045	.30075	.56298	4	.967
8	.00753	.08675	.04155	1	.838

Table 5

Analysis of Canonical Correlations on the Relationship Between Student and Cooperating Teachers at the End of the Student Teaching Period

Order	Eigenvalue	Canonical Correlation	Chi-square	df	Significance
1	1.00000	1.00000	9999.00000	64	0.000
2	1.00000	1.00000	9999.00000	49	0.000
3	0.98404	0.99199	47.61638	36	0.093
4	0.95610	0.97780	24.86050	25	0.470
5	0.60232	0.77609	7.66842	16	0.958
6	0.26584	0.51560	2.59679	9	0.978
7	0.14495	0.38072	0.89714	4	0.925
8	0.00650	0.08061	0.03585	1	0.850

The percentage of the contribution of each of the eight CAFIAS variables to the between-groups difference was identified through discriminant function analysis. For the cooperating and student teachers at the start of student teaching, teacher use of questioning, verbal accounted for 32.33% of the between-groups variance. This was followed by teacher use of acceptance and praise, verbal (32.14%); teacher use of acceptance and praise, nonverbal (16.54%); and pupil nonverbal initiation, student suggestion (10.70%). Results are shown in Table 6. For the cooperating and student teachers at the end of the student teaching period, pupil verbal initiation, student suggestion accounted for 30.88% of the variance. This was followed by pupil nonverbal initiation, student suggestion (30.76%); teacher use of questioning, nonverbal (24.11%); and teacher use of questioning, verbal (8.79%). Results are shown in Table 7.

The univariate analysis of variance (ANOVA) technique, run on the eight CAFIAS variables (results shown in Table 8), identified four variables that independently indicated significant differences between cooperating and student teachers at the start of student teaching. These four variables were teacher use of questioning, verbal ($\underline{F}(1, 28) = 5.46$); teacher use of questioning, nonverbal ($\underline{F}(1, 28) = 12.34$); teacher use of acceptance and praise, verbal ($\underline{F}(1, 28) = 18.93$);

Table 6

Discriminant Function Analysis for the Eight CAFIAS Variables for Cooperating and Student Teachers at the Start of the Student Teaching Period

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution to the Discriminant Function
Variable 1			
TQV	.56860	.32330	32.330
Variable 2			
TQNV	.20690	.04280	4.280
Variable 3			
TAPV	.56689	.32135	32.135
Variable 4			
TAPNV	.40667	.16538	16.538
Variable 5			
PVITS	.00977	.00010	.010
Variable 6			
PNVITS	.19614	.03847	3.847

Table 6 (continued)

Discriminant Function Analysis for the Eight CAFIAS Variables for Cooperating and Student Teachers at the Start of the Student Teaching Period

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution to the Discriminant Function
Variable 7			
PVISS	.03884	.00151	.151
Variable 8			
PNVISS	.32712	.10701	10.701

Table 7

Discriminant Function Analysis for the Eight CAFIAS Variables for Cooperating and Student Teachers at the End of the Student Teaching Period

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution to the Discriminant Function
Variable 1			
TQV	.29643	.08786	8.786
Variable 2			
TQNV	.49105	.24113	24.113
Variable 3			
TAPV	.18481	.03415	3.415
Variable 4			
TAPNV	.12502	.01563	1.563
Variable 5			
PVITS	.06828	.00466	.466
Variable 6			
PNVITS	.01209	.00015	.015

Table 7 (continued)

Discriminant Function Analysis for the Eight CAFIAS Variables for Cooperating and Student Teachers at the End of the Student Teaching Period

Variables	Standardized Discriminant Weight	Squared Discriminant Weight	Percent of Contribution to the Discriminant Function
Variable 7			
PVISS	.55567	.30877	30.877
Variable 8			
PNVISS	.55464	.30763	30.763

Table 8

Univariate Analyses of Variance Contrasting Cooperating and Student Teachers at Start of Student Teaching Period for the Eight CAFIAS Variables

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 1 TQV					
Mean	515.76	515.76	1	5.46	.0005*
Error	933.74	933.74	28		
Variable 2 TQNV					
Mean	799.38	799.38	1	12.34	.0015*
Error	1813.52	64.75	28		
Variable 3 TAPV					
Mean	4269.50	4269.50	1	18.93	.0016*
Error	6312.41	255.44	28		
Variable 4 TAPNV					
Mean	2575.94	2575.94	1	7.21	.0120*
Error	10001.85	357.20	28		
Variable 5 PVITS					
Mean	1582.53	1582.53	1	2.23	.14645
Error	19862.36	709.37	28		

Table 8 (continued)

Univariate Analyses of Variance Contrasting Cooperating and Student Teachers at Start of Student Teaching Period for the Eight CAFIAS Variables

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 6 PNVITS					
Mean	2311.07	2311.07	1	3.01	.09367
Error	21489.41	767.47	28		
Variable 7 PVISS					
Mean	.60	.60	1	.00	.96956
Error	11230.58	401.09	28		
Variable 8 PNVISS					
Mean	37.90	37.90	1	.09	.76980
Error	12153.92	434.06	28		

*$p < .05$

and teacher use of acceptance and praise, nonverbal ($F(1, 28) = 7.21$).

The ANOVA run on the cooperating and student teachers at the end of student teaching identified seven variables to have significantly different scores for the two groups. These seven variables were teacher use of questioning, verbal ($F(1, 28) = 91.74$); teacher use of questioning, nonverbal ($F(1, 28) = 16.00$), teacher use of acceptance and praise, verbal ($F(1, 28) = 23.57$); teacher use of acceptance and praise, nonverbal ($F(1, 28) = 17.48$); pupil verbal initiation, teacher suggestion ($F(1, 28) = 5.51$); pupil nonverbal initiation, teacher suggestion ($F(1, 28) = 4.16$); and pupil verbal initiation, student suggestion ($F(1, 28) = 4.43$). Results are shown in Table 9.

The hypothesis that there will be no significant difference in relationships between the behavioral patterns of the cooperating teacher and the behavioral patterns of the student teacher from the start to the end of the student teaching period was rejected due to (a) high canonical correlations between the cooperating and student teachers, (b) significance of the MANOVAs run on the cooperating and student teachers, and (c) univariate analysis of variance which found more significant differences between cooperating and student

Table 9

Univariate Analyses of Variance Contrasting Cooperating and Student Teachers at End of Student Teaching Period for the Eight CAFIAS Variables

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 1 TQV					
Mean	3236.06	3236.06	1	91.74	.0000*
Error	987.60	35.27	28		
Variable 2 TQNV					
Mean	1747.11	1747.11	1	16.00	.0004*
Error	3055.72	109.13	28		
Variable 3 TAPV					
Mean	4442.19	4442.29	1	23.57	.0000*
Error	5276.71	188.45	28		
Variable 4 TAPNV					
Mean	5068.90	5068.90	1	17.48	.0002*
Error	8188.88	8188.88	28		
Variable 5 PVITS					
Mean	2825.61	2825.61	1	5.51	.0261*
Error	14355.25	511.97	28		

Table 9 (continued)

Univariate Analyses of Variance Contrasting Cooperating and Student Teachers at End of Student Teaching Period for the Eight CAFIAS Variables

Source of Variation	Sum of Squares	Mean Square	df	F	p
Variable 6 PNVITS					
Mean	2179.75	2179.75	1	4.16	.0508*
Error	14659.20	523.54	28		
Variable 7 PVISS					
Mean	843.33	843.33	1	4.33	.0465*
Error	5443.82	194.42	28		
Variable 8 PNVISS					
Mean	239.98	239.98	1	1.60	.2906
Error	5791.78	206.84	28		

*p < .05

teachers at the end of the student teaching experience than at the beginning.

Descriptive Analysis of Cooperating and Student Teachers' Behavioral Patterns

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was used to study the predominant interaction patterns of cooperating and student teachers. Table 10 shows the top 10 ranked interaction patterns for cooperating and student teachers at both the start and the end of their experience, along with their percentages of occurrence. The density of tallies in each cell determines not only the predominant teacher and student behaviors, but also the sequence in which they occur. This resulted in the following sequences of behavior patterns for the cooperating teacher: extended information giving by the teacher, directions given by the teacher followed by extended predictable student response (5-5-6-8-8). This was followed by student-to-student interaction in the form of interpretive behavior, teacher giving information followed by directions given by the teacher and predictable student response (8\-10-8\-5-6-8). The behavioral pattern demonstrated by cooperating teachers is similar to those seen by Cheffers and Mancini (1978) reflecting "a predominance of teacher information giving along with directions and predictable student response"

Table 10

Summary of Most Frequent Interaction Patterns

Among the Top 10 Cells of Cooperating and Student Teachers

Cooperating Teachers		Student Teachers at Start of Student Teaching Period		Student Teachers at End of Student Teaching Period	
Interaction Pattern	% of Occurrence	Interaction Pattern	% of Occurrence	Interaction Pattern	% of Occurrence
5-5	16.79	8-6	8.97	8-6	8.84
8-6	12.18	10-8\	8.81	10-8\	7.26
8-8	7.72	8\-10	8.66	8\-10	7.16
6-8	6.87	5-5	7.96	5-5	6.30
8\-10	6.16	6-5	3.71	3-8\	4.28
10-8\	6.08	3-8	3.66	6-5	4.18
5-8	4.07	6-8	3.58	6-8	3.66
6-5	3.82	5-8	3.10	5-8	3.59
8-5	2.79	8\-5	2.52	8\-6	3.56
10-8	2.42	8-5	2.44	3-8	3.38

Note: 5-5 Extended information giving by the teacher

8-6 Predictable student response followed by teacher directions

Table 10 (continued)

8-8	Extended predictable student response
6-8	Teacher directions followed by predictable student response
8\-10	Student-to-student interaction in the form of interpretive behavior
10-8\	Student-to-student interaction in the form of interpretive behavior
5-8	Teacher information giving followed by predictable student response
6-5	Teacher information giving followed by teacher directions
8-5	Student predictable response followed by teacher information giving by the teacher
10-8	Student-to-student interaction in the form of predictable behavior
3-8	Teacher acceptance followed by predictable student response
3-8\	Teacher acceptance followed by student interpretive behavior

(p. 74). An example of this would be a traditional skills drill in which the teacher gives instruction and directions which the student mechanically follows. Feedback is in the form of further instruction and directions.

Student teachers demonstrated similar behavior patterns from the start to finish of the student teaching experience. Directions given by the teacher followed by predictable student response and extended student-to-student interaction in the form of interpretive behavior followed by teacher acceptance (6-8-8\-10-8\-3) was found to be their predominant behavior pattern. This was followed by extended information giving by the teacher, directions given by the teacher followed by predictable student response and teacher acceptance (5-5-6-8-3). Student teachers tended to ask questions and pose problems allowing for student interpretation of instructions while accepting behaviors and offering information as well as directions.

Figure 1 shows the differences in occurrence of each of the 20 CAFIAS categories between cooperating and student teachers from start to end of the student teaching experience. For each category of behaviors, the mean percentage of occurrence was calculated. It was found that student teachers, throughout the student teaching experience, used greater percentages of praise, acceptance, questioning, broad interpretation of teacher

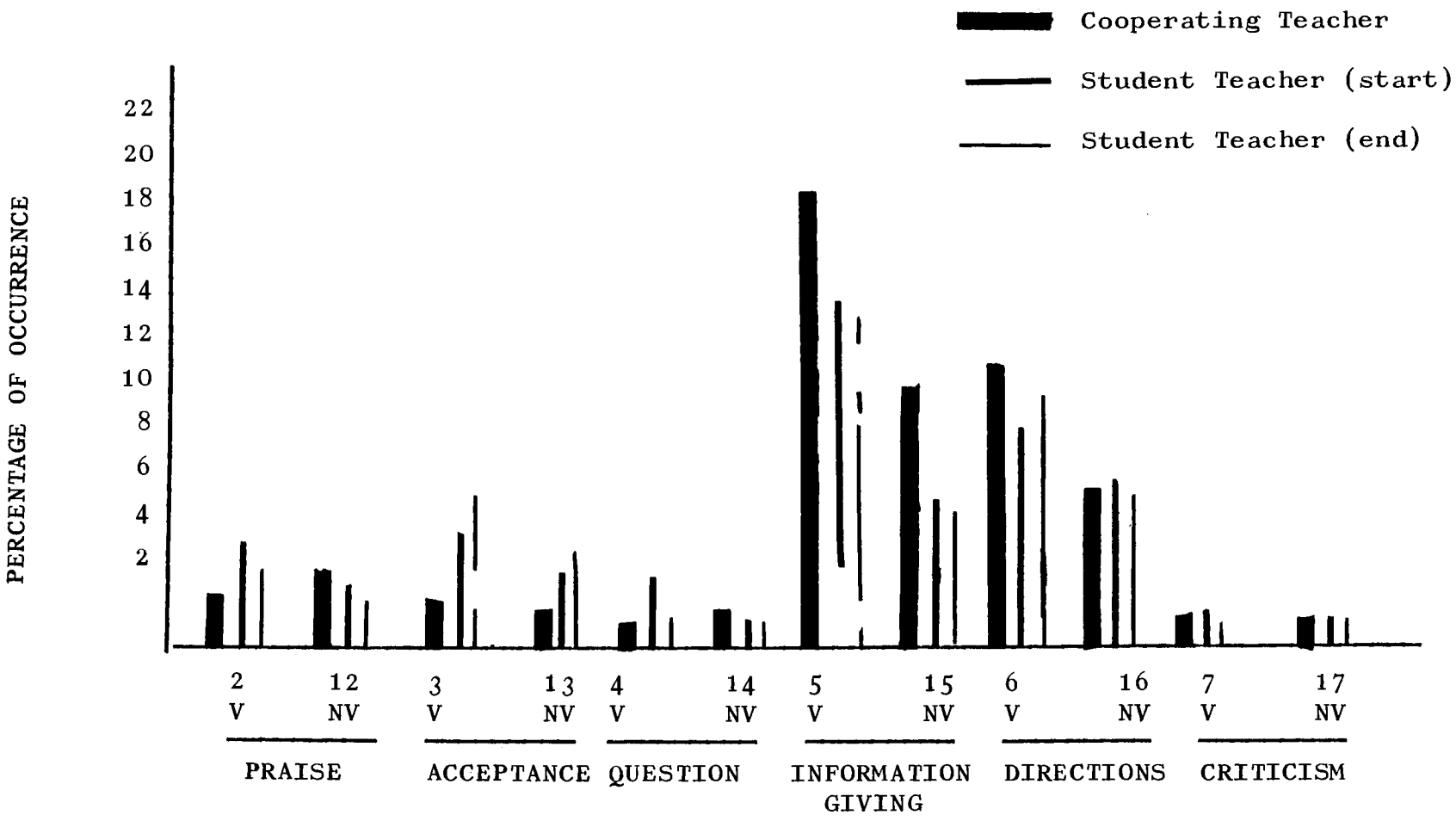

Figure 1. Mean percentage of behavior in each CAFIAS category.

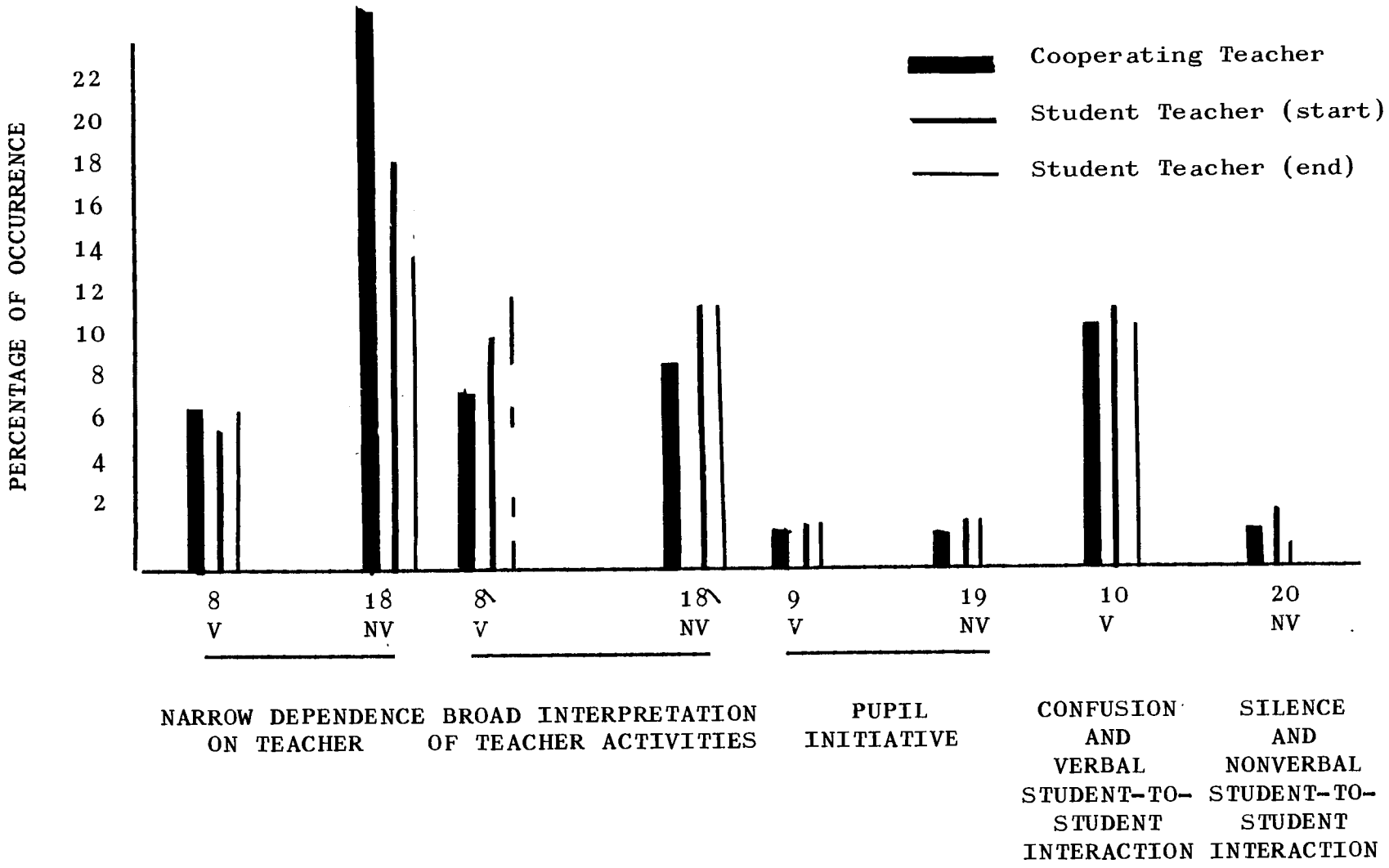

Figure 1. (continued)

activities, pupil initiation, silence, and student-to-student interaction than did cooperating teachers. However, cooperating teachers gave more information and verbal directions and received more predictable student response. Criticism and non-verbal directions were found to be equal for both cooperating and student teachers. Cooperating teachers exemplified the traditional behavioral pattern of teaching, predominantly seen in our schools today. Students are given instruction and directions allowing for little student initiation or imagination. Student teachers, on the other hand, were exposed to a variety of teaching behaviors and styles in their professional preparation classes. This was reflected in their student teaching experience. Student teachers expanded on the traditional teaching behavioral patterns to include other aspects of teacher behavior. They gave information, acceptance, praise and encouragement as well as directions allowing for more student-to-student interaction and student initiation behaviors.

Student teaching is widely accepted as an integral part of the professional preparation of a teacher. This study and others have demonstrated the existence of a relationship between the cooperating and student teacher. This raises the following questions. Do we as educators want to perpetuate the traditional behavioral patterns by exposing student teachers to this within

the student teaching experience? Should cooperating teachers be screened prior to placement of the student teacher to assure a positive student teaching experience? If so, should the basis of screening be teaching behavior, overall teaching philosophy, or level of experience? If the student teaching experience is so important to the professional development of the teacher should not the placement of student teachers be on a basis other than availability?

Summary

The coder used in this study was determined to be reliable through a process of correlating the results of coding two independent observations of a student teacher and a cooperating teacher. The two Spearman rank-order correlations yielded a mean of .993, which was sufficient to indicate that the coder was reliable.

A MANOVA was performed on the eight CAFIAS variables to assess a change in the behavioral patterns of student teachers. The findings were statistically significant, and the first hypothesis that the behavioral patterns of student teachers would not change over the student teaching period was rejected. The discriminant function analysis indicated that verbal teacher use of questioning accounted for the largest amount of the between-groups variance. Univariate analysis of variance failed

to show significant differences for any variables when they were considered independently.

The canonical correlation technique was used to assess the relationship between cooperating and student teachers. Significant correlations were determined for the cooperating and student teachers at the start of student teaching and for the cooperating and student teachers at the end of student teaching. Multivariate analysis of variance for cooperating and student teachers at both times in their experience resulted in significant between-groups differences. The percentage of contribution of each of the eight CAFIAS variables was determined through the use of discriminant function analysis. For the cooperating teachers and student teachers at the start of the student teaching period, teacher use of questioning, verbal (TQV) proved to have accounted for the greatest amount of between-groups variance. This was followed by teacher use of acceptance and praise, verbal (TAPV); teacher use of acceptance and praise, nonverbal (TAPNV); and pupil nonverbal initiation, student suggestion (PNVISS). For cooperating teachers and student teachers at the end of the student teaching period, pupil verbal initiation, student suggestion (PVISS) was found to have accounted for the greatest amount of between-groups variance. This was followed by pupil nonverbal initiation, student

suggestion (PNVISS); teacher use of questioning, nonverbal (TQNV); and teacher use of questioning, verbal (TQV). Univariate analysis of variance identified four variables that independently indicated significant differences between the cooperating and student teachers at the start of student teaching. These variables were teacher use of questioning, verbal (TQV); teacher use of questioning, nonverbal (TQNV); teacher use of acceptance and praise, verbal (TAPV); and teacher use of acceptance and praise, nonverbal (TAPNV). The univariate analyses of variance run on the cooperating and student teachers at the end of student teaching indicated seven CAFIAS variables to be significant. They were teacher use of questioning, verbal (TQV); teacher use of questioning, nonverbal (TAPNV); pupil verbal initiation, teacher suggestion (PVITS); pupil nonverbal initiation, teacher suggestion (PNVITS); and pupil verbal initiation, student suggestion (PVISS).

The hypothesis that there will be no significant difference in the relationship between the behavioral patterns of the cooperating teacher and the behavioral patterns of the student teacher from the start to the end of the student teaching period was rejected. This was due to (a) high canonical correlations between the cooperating and student teacher at the start and end of the student teaching period, (b) significance of MANOVAs

run on both cooperating and student teachers, at the start and end of student teaching, and (c) univariate analyses of variance which found more significant differences between student and cooperating teachers at the end of student teaching than at the start.

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was used to study the predominant interaction patterns of cooperating and student teachers. Cooperating teachers were found to exhibit the following behavioral sequence: extended information giving by the teacher followed by directions given by the teacher, extended predictable student response, and extended student-to-student interaction in the form of interaction in the form of interpretive behavior (5-5-6-8-8-8\-10-8\). The most frequent student teacher behavior pattern was one of directions given by the student teacher, predictable student response, extended student-to-student interaction in the form of interpretive behavior, teacher acceptance followed by predictable response and more teacher acceptance (6-8-8\-10-8\-3-8-3). Cooperating teachers were found to exemplify the predominant teaching behavioral pattern seen in our schools today. Students are given instruction and directions which they mechanically follow. Student teachers expanded upon this to include acceptance, praise, encouragement, and question-

ing.

This study and others have demonstrated the existence of a relationship between the cooperating and student teacher. This raised certain questions about the student teaching experience. Do we as educators want to expose student teachers to the traditional teacher behavior pattern or to a variety of teaching methods and behaviors? Should cooperating teachers be screened to assure a productive student teaching experience? What should the basis of screening be? And, if student teaching is such an important aspect in the development of the teacher, should not the cooperating teacher be chosen on a basis other than availability?

Chapter 5

DISCUSSION OF RESULTS

In this chapter the findings of this investigation and the results of previous studies will be related. The chapter will be divided into four sections. In the first section the results of this study will be compared and contrasted with earlier studies on change in student teachers during the student teaching period. In the second section comparisons of the results of this study with those of earlier studies regarding the influence of the cooperating teacher will be reported. In the third section results of this study will be compared and contrasted with earlier studies on the behavioral patterns of cooperating teachers and student teachers, and in the final section the chapter will be summarized.

Change in Student Teachers' Behaviors During the Student Teaching Experience

This study examined the change in student teachers' behavioral patterns over the student teaching experience and investigated the degree to which the cooperating teacher influenced the student teacher's behavioral patterns. Eight selected CAFIAS variables and predominant interaction patterns from CAFIAS were used to determine the behavioral interaction

of cooperating and student teachers. The multivariate analysis of variance indicated significant differences between the student teachers' behaviors at the beginning and at the end of their student teaching experience. Discriminant function analysis found that teacher use of questioning, verbal; teacher use of questioning, nonverbal; pupil verbal initiation, student suggestion; and pupil nonverbal initiation, teacher suggestion accounted for over 90% of the between-group variance. Univariate analyses of variance on the eight CAFIAS variables considered individually were unable to identify any variables on which the student teachers' scores differed significantly between the beginning and end of their student teaching experience.

The findings of between-groups difference led to the rejection of the first hypothesis that there will be no significant change in student teachers' behavioral patterns over the student teaching period. These results indicated that student teachers' behavior patterns do change within the student teaching experience.

These findings seem to support earlier work by Price (1961), Flint (1965), and Halley (1974). Price (1961) concluded that considerable change occurred in student teachers' attitudes during the student teaching period. Flint (1965) also

concluded that student teachers' verbal behavior changed during the student teaching period. Halley (1974) concluded that 70% of the student teachers had changed their verbal behavior during the student teaching term.

The reader needs to be aware of differences which exist between studies in deciding the emphasis to be placed upon comparisons between these studies:

1. The variables being examined were different; Price (1961) examined attitudes of student teachers, and Flint (1965) and Halley (1974) examined only the verbal behavior of student teachers.

2. The testing instruments used were different; Price (1961) used the Minnesota Teacher Attitude Inventory (MTAI), Flint (1965) used the Observation Schedule and Record Form (OScAR), and Halley (1974) used Flanders' Interaction Analysis System (FIAS) to record verbal behavior only.

3. The samples used were different; Price (1961), Flint (1965), and Halley (1974) all used elementary education student teachers.

Despite the differences in the studies, certain broad aspects can be used for comparison. In all cases, student teachers who served as subjects were being studied in conjunction with their cooperating teachers to assess the

influence of the cooperating teacher in the student teaching experience. In all cases, two significant changes were observed in student teachers' behavioral patterns from the start to finish of the student teaching period.

Cooperating Teachers' Influence on Student Teachers' Behaviors

This study is an extension of earlier studies concerning the influence of the cooperating teacher on the student teacher during the student teaching period. The present study used the canonical correlation procedures for the eight CAFIAS variables for the cooperating teacher and student teacher at the beginning of the student teaching experience and for the cooperating teacher and student teacher at the end of student teaching. The canonical correlation revealed significant correlations at both times in the student teaching experience. Multivariate analysis of variance resulted in significant differences between the cooperating teachers and student teachers both at the start of student teaching and the end of student teaching. Discriminant function analysis found that teacher use of acceptance and praise, verbal; teacher use of questioning, nonverbal; teacher use of questioning, verbal; and pupil nonverbal initiation, student suggestion accounted for over 90% of the between-groups variance for cooperating teachers and student teachers at the start of student teaching. For

the cooperating teachers and student teachers at the end of the student teaching experience, pupil verbal initiation, student suggestion; pupil nonverbal initiation, student suggestion; teacher use of questioning, nonverbal; and teacher use of questioning, verbal were found to account for over 90% of the between-group variance.

Univariate analyses of variance (ANOVA), which were run on the eight CAFIAS variables independently, identified four variables--teacher use of questioning, verbal (TQV); teacher use of questioning, nonverbal (TQNV); teacher use of acceptance and praise, verbal (TAPV); and teacher use of acceptance and praise, nonverbal (TAPNV)--that were significantly different between cooperating teachers and student teachers at the start of student teaching. Seven variables--teacher use of questioning, verbal (TQV); teacher use of questioning, nonverbal (TQNV); teacher use of acceptance and praise, verbal (TAPV); teacher use of acceptance and praise, nonverbal (TAPNV); pupil verbal initiation, teacher suggestion (PVITS); pupil nonverbal initiation, teacher suggestion (PNVITS); and pupil verbal initiation, student suggestion (PVISS)--were identified as significantly different between the cooperating teachers and student teachers at the end of student teaching.

The hypothesis that there will be no significant differences in the relationships between the behavioral patterns of cooperating and student teachers, from start to end of the student teaching period, was rejected due to (a) significant canonical correlations between cooperating and student teachers at the start of student teaching and at the end of the student teaching period, (b) significance of MANOVAs used on cooperating and student teachers both at the start of student teaching and at the end of student teaching, and (c) univariate analyses of variance, which found more variables to have significant differences between student and cooperating teachers at the end of student teaching than at the start of student teaching.

These results indicated that there is a relationship between the behavioral patterns of cooperating and student teachers. However, greater individual differences were found at the end of student teaching than at the start of student teaching, indicating that student teachers' behavioral patterns become less like their cooperating teachers, not more like them, as is suggested in related literature. These findings support earlier studies by Farrow (1964), Terwilliger (1965), Boschee, Prescott & Hein (1978), Bowers (1971), and Halley (1974). Terwilliger (1965) reported no demonstrable cooperating teacher influence. Boschee et al. (1978) found no influence,

based on educational philosophy, of the cooperating teacher on the student teacher. Cooperating teachers' effect on the verbal behavior of student teachers was studied by Farrow (1964), Bowers (1971), and Halley (1974). Farrow (1964) was unable to develop significant data indicating the influence of the cooperating teacher. While Bowers (1971), using FIAS did find student teachers' verbal behavior to gravitate toward that of the cooperating teacher, the change was not statistically significant. Halley (1974) also used FIAS to study change in student teachers' verbal behavior in relationship to the verbal behavior of the cooperating teachers. The findings of Halley (1974), that the behavior patterns of student teachers changed, becoming less like their cooperating teacher, supported the results of this study.

The results of this study do not, however, support findings by McAulay (1960), Price (1961), Yee (1969), Johnson (1969), Underhill (1968), Flint (1965), Seperson and Joyce (1971), and Mitchell (1969). McAulay (1960) studied the influence of three cooperating teachers on their six student teachers. After observation of such a limited scope, without using systematic observation, McAulay (1960) concluded that student teachers seem to be greatly influenced by their cooperating teachers. He also concluded that further study of the problem was needed. Price (1961) and Yee (1969) concluded that

cooperating teachers influence the attitudes of student teachers. Johnson (1969), examining dogmatism, and Underhill (1968), studying empathy level, examined other variables on which the student teacher was found to be influenced by the cooperating teacher. Verbal behavior patterns of cooperating and student teachers were studied by Flint (1965), Seperson and Joyce (1971), and Mitchell (1969). Flint (1965), using the Observation Schedule and Record Form (OScAR), concluded that there was a strong relationship between the change in student teacher's verbal behavior and the verbal behavior of the cooperating teacher. She also recommended further research be undertaken using a variety of instruments. In a similar study, using Conceptual Systems Manual, Seperson and Joyce (1971) found significant relationships between student and cooperating teachers for the eight indicators of teaching style. A more sophisticated instrument was also recommended. In an earlier study, Mitchell (1969) used FIAS to determine if student teachers tend to take on the verbal behaviors of their cooperating teachers. These researchers, unlike Bowers (1971) and Halley (1974), reported a positive relationship between student and cooperating teachers' verbal behavior.

In understanding relationships between this study and those of McAulay (1960), Price (1961), Yee (1969), and others,

the reader must consider certain differences in the studies:

1. The variables examined were, once again, different than the variables in this study.

2. A variety of testing instruments was used, however, none dealt with nonverbal interaction within the physical activity setting, as did this study.

3. The samples of subjects used in these studies were different, with the number of subjects ranging from 3 to over 20, and with all previous studies being centered within the traditional classroom setting.

Certain broad comparisons can be made, however, when comparing the findings of the present study to those of related studies. Although a number of variables have been examined in conjunction with the student teacher being influenced by the cooperating teacher in the classroom or gymnasium, there are a great number of variables which intertwine and contribute to the overall act of teaching. Some variables may prove difficult to separate for study, affective variables in particular. Results of past studies very often depended on the design of the study and the validity of the testing instrument used within the study, with the more sophisticated tools demonstrating a greater ability in determining the success or failure in finding significance. Although a number of

related studies did find student teachers to be influenced by their cooperating teachers, the need for a more sophisticated testing instrument was noted.

Behavioral Patterns of Cooperating Teachers and Student Teachers in Physical Education

CAFIAS was used to study predominant behavioral patterns of cooperating teachers and student teachers. The following sequences of behavior patterns were identified for the cooperating teachers: extended information giving by the teacher followed by directions given by the teacher, extended predictable student response, and extended student-to-student interaction in the form of interpretive behavior (5-5-6-8-8\-10-8\). The most frequent overall student teacher behavior pattern was one of directions given by the student teacher, predictable student response, extended student-to-student interaction in the form of interpretive behavior, teacher acceptance followed by predictable student response, and teacher acceptance (6-8-8\-10-8\-3-8-3).

Differences in occurrence of each of the 20 CAFIAS categories between the student and cooperating teacher resulted in the following findings: (a) student teachers, both at the beginning and at the end of the student teaching experience, used a greater percentage of praise, acceptance,

questioning, broad interpretation of teacher activities, pupil initiation, silence, and student-to-student interaction; (b) cooperating teachers gave more information and verbal directions and received more predictable student response than did student teachers; and (c) criticism was minimal among both student teachers and cooperating teachers.

The results indicated:

1. Cooperating teachers used lecture and direction giving followed by predictable student response as their predominant behavior pattern. This supports the findings of the Videotape Data Bank Project, Cheffers and Mancini (1978), which concluded: (a) teachers used lecture and direction giving as overwhelmingly predominant models of teaching; (b) patterns observed in the elementary classes were remarkably similar and reflected a predominance of teacher information giving, along with predictable student response; and (c) the student behaviors occurred as a result of initial teacher suggestion.

2. Criticism was found to be minimal for both cooperating and student teachers. Cheffers and Mancini (1978) also supported this, with the conclusion that teacher use of punishment and correction of student behavior were minimal.

The finding that student teachers used a greater percentage of praise, acceptance, questioning, broad interpretation of teacher activities, pupil initiation, silence, and student-to-student interaction supported previous research by Vogel (1976) and Getty (1977). They concluded that student teachers instructed in the use of CAFIAS demonstrated more indirect teacher influence, made more use of questions, and had more pupil initiated behavior than student teachers in the control group, who did not receive CAFIAS instruction. Getty (1977) also noted the influence of lasting effects of instruction in interaction analysis on the teaching behavior of student teachers.

The results of this study may not be directly comparable to those of Vogel (1976) and Getty (1977) due to the fact that the treatment groups in their studies received instruction in CAFIAS as their treatment. However, certain observations may be made when comparing the findings of student teachers' behavioral patterns in this study with those of Vogel (1976) and Getty (1977). Many of the student teachers who served as subjects in this study also participated in a study in 1979 in which instruction in and supervision through CAFIAS served as the treatment. Physical education majors at Ithaca College, Ithaca, New York, also receive feedback in the use of

CAFIAS along with various teaching methods as part of their undergraduate teacher preparation program. This study would seem to support the findings by Getty (1977) on the lasting effects of instruction in interaction analysis on the teaching behavior of student teachers.

Summary

Elementary physical education student teachers in this study were observed to change behavioral patterns, as identified by the eight selected CAFIAS variables. However, the cooperating teachers' behavioral patterns, although related, were not found to be a significant direct influence on the change in behavioral patterns. Multivariate analysis of variance, followed by discriminant function analysis and univariate analysis of variance resulted in the findings of significant differences between student teachers at the start and end of student teaching. Discriminant function analysis showed the four variables concerning teacher behavior to be the major contributors to the between-groups difference. The hypothesis that there would be no significant change in student teachers' behavioral patterns was rejected. This is in agreement with studies by Price (1961), Flint (1965), and Halley (1974).

The hypothesis that there will be no significant difference in relationships between the behavioral patterns of

student teachers and behavioral patterns of cooperating teacher, from start to finish of the student teaching experience, was rejected due to (a) high canonical correlations between cooperating teachers and student teachers at the start and at the end of the student teaching experience; (b) significance of MANOVAs run on both cooperating teachers and student teachers both at the start of student teaching and cooperating teachers and student teachers at the end of student teaching; and (c) univariate analyses of variance which found more variables to be significantly different between cooperating teachers and student teachers at the end of the student teaching experience than at the start of the student teaching experience.

It was concluded that there is a relationship between the behavioral patterns of cooperating teachers and student teachers. However, greater individual differences were found at the end of the student teaching experience than at the start of the student teaching experience, indicating that student teachers' behavioral patterns become less like their cooperating teachers', not more. This conclusion supported earlier findings by Farrow (1964), Bowers (1971), and Halley (1974). Numerous previous studies by McAulay (1960), Price (1961), Yee (1969), Flint (1965), and others did not support the second conclusion of this study.

Interaction patterns of cooperating teachers and student teachers were investigated to determine their predominant behavioral patterns. It was determined that this study supported findings by Cheffers and Mancini (1978) that teacher use of lecture and directions followed by predictable student response is the predominant behavioral pattern of physical educators in our schools today.

Student teachers used praise, acceptance, questioning, broad interpretation of student activities, pupil interaction, silence, and student-to-student interaction as predominant behavior patterns. Vogel (1976) and Getty (1977) concluded that student teachers taught CAFIAS were more indirect in their overall teaching behavior. Student teachers in this study were also found to be more indirect than their cooperating teachers. A number of subjects in this study were instructed in and supervised through CAFIAS in a study done previously. This would support findings by Getty (1977) on the lasting effects of instruction in interaction analysis on the teaching behaviors of student teachers.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The behavior patterns of cooperating teachers and student teachers were examined through the use of eight selected CAFIAS variables to determine if the cooperating teacher influences the verbal and nonverbal behaviors of the student teacher. Specific subproblems were examined:

1. Do the behavior patterns of the student teacher change during the student teaching period?

2. If the behaviors of the student teacher do change, do they tend to approximate those of the cooperating teacher more at the end of the student teaching period than at the beginning?

The 1980 spring semester student teachers in elementary physical education at Ithaca College, Ithaca, New York, and their cooperating teachers served as subjects. Each subject was videotaped for two full class periods. Cooperating teachers were videotaped prior to the arrival of the student teachers. Student teachers were videotaped once within the first 2 weeks and a second time within the last 2 weeks of student teaching. Scores for each of the lessons were transposed to computer cards for analysis. Multivariate

analysis of variance, discriminant function analysis, univariate analysis of variance, and canonical correlation were used to determine if significant change occurred in student teachers' behaviors, to identify variables that accounted for the significant change in teachers' behaviors, and to determine the relationship, if any, between cooperating teachers' and student teachers' behavioral patterns.

Multivariate analysis of variance was performed on the eight CAFIAS variables to assess change in behavioral patterns of student teachers. The findings were significant, and the first hypothesis that there would be no significant change in student teachers' behavioral patterns over the student teaching period was rejected. The discriminant function analysis for within-groups difference indicated teacher use of questioning, verbal (TQV); teacher use of questioning, nonverbal (TQNV); pupil verbal initiation, student suggestion (PVISS); and pupil nonverbal initiation, teacher suggestion (PNVITS) accounted for over 90% of the between-groups variance.

The canonical correlation technique was used to assess the relationship between the cooperating teachers and student teachers. Significant correlations were determined for cooperating teachers and student teachers at the start of

student teaching and at the end of student teaching. Univariate analysis of variance failed to show significant differences in student teachers' behaviors from start to finish of student teaching when each CAFIAS variable was considered independently.

The acceptance of the hypothesis that there will be no significant relationship between the behavioral patterns of cooperating teachers and student teachers from the start to the end of the student teaching period was accepted due to (a) high canonical correlations between cooperating teachers and student teachers at the start of student teaching and at the end of student teaching, (b) significance of MANOVAs run on both cooperating teachers and student teachers at the start of student teaching and at the end of student teaching, and (c) univariate analyses of variance which found more significant differences at the end of the student teaching period than the start.

The predominant interaction patterns of cooperating teachers and student teachers were analyzed. It was determined that cooperating teachers' predominant behavioral pattern was one of information giving, followed by directions and predictable student response. Student teachers, however, showed significant indirect teacher influence with acceptance, praise, questioning, then student-to-student interaction as their predominant behavioral pattern.

The results of the first hypothesis that student teachers' behavioral patterns change during the student teaching period seem to support findings in earlier studies (Price, 1961; Flint, 1965; Halley, 1974) that the student teachers do indeed change during the student teaching period.

The findings related to the second hypothesis also concurred with earlier results (Farrow, 1964; Terwilliger, 1965; Bowers, 1971; Halley, 1974) which indicated no significant relationship between student teachers' behavioral pattern change and the cooperating teachers' behavioral pattern. Studies which did find significant influence by the cooperating teacher included Price (1961), McAulay (1960), Flint (1965), and Yee (1969).

Conclusions

From the findings provided by this investigation, the following conclusions were drawn:

1. The behavioral patterns of student teachers in elementary physical education do change during the student teaching period.

2. A relationship does exist between behavioral patterns of cooperating teachers and student teachers, however, cooperating teachers failed to significantly influence the behavioral patterns of elementary physical education student teachers.

3. Cooperating teachers' predominant behavior was determined to be one of information giving followed by directions, which led to predictable student response.

4. Student teachers demonstrated significant indirect teacher influence with acceptance, praise, and questioning leading to more student-to-student interaction.

Recommendations for Further Study

The following recommendations are suggested for further study:

1. A replication of this study using secondary school physical education student teachers.

2. A study of the effects of sex, experience, and teaching style of the cooperating teacher on the behavior patterns of student teacher.

3. Due to the differences involved in teaching team activities versus individual activities, all subjects should be videotaped teaching either all team activities or all individual activities.

Appendix A

INFORMED CONSENT FORMS

Cooperating Teacher Copy

The study in which you are asked to participate is looking at the interaction patterns of student teachers and cooperating teachers with students at the elementary level in physical education.

The following procedures will be used: You will be videotaped in two classes, during the week prior to student teaching. During that time you will be wearing a microphone which should not interfere with your teaching.

The videotape will be subjected to a widely used interaction analysis system. This interaction analysis system consists of 20 categories to describe verbal and nonverbal behaviors which occur between teachers and students.

All names and information in this study will be kept confidential. If you do not have any questions and agree to take part in this study, please sign your name in the space provided below.

Name_____

Date_____

Appendix A (continued)

Student Teacher Copy

The study in which you are asked to participate is looking at the interaction patterns of student teachers and cooperating teachers with students at the elementary level in physical education.

The following procedures will be used: You will be videotaped in two separate classes, once within the first 2 weeks and a second time during the last 2 weeks of your student teaching experience. During those times you will be wearing a microphone which should not interfere with your teaching activities.

The videotapes will be subjected to a widely used interaction analysis system. This system consists of 20 categories to describe verbal and nonverbal behaviors which occur between students and teachers.

All names and information will be kept confidential. If you do not have any questions and agree to take part in this study, please sign your name in the space provided.

Name_____

Date_____

Appendix B

THE CATEGORIES OF CHEFFERS' ADAPTATION OF FLANDERS' INTERACTION ANALYSIS SYSTEM[1]

Teacher
Environment (E)
Student (S)

Categories	Verbal Relevant Behaviors		Nonverbal
2-12	2 Praises, comments jokes, encourages.	Face:	12 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 Accepts, clarifies, uses, and develops suggestions and feelings by the learner.	Face:	13 Nods without smiling, tilts head in empathetic reflection, sighs emphathetically.
		Posture:	Shakes hands, embraces sympathetically, places hand on shoulder, puts arm around shoulder or waist, catches an implement thrown by student, accepts facilities.

Appendix B (continued)

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

Appendix B (continued)

Categories	Verbal Relevant Behaviors	Nonverbal
7-17	7 Criticizes, expresses anger or distrust, sarcastic or extreme self-reference.	17 Face: Grimaces, growls, frowns, drops head back in derisive laughter, rolls eyes, bites, spits, butts with head, shakes head. Posture: Hits, pushes away, pinches, grapples with, pushes hands at student, drops hands in disgust, bangs table, damages equipment, throws things down.
8-18	8 Student response that is entirely predictable, such as obedience to orders, and responses not requiring thinking beyond the comprehension phase of knowledge.	18 Face: Poker face response, nods, shakes, gives small grunts, quick smile. Posture: Moves mechanically to questions or directions, responds to any actions with minimal nervous activity, robot like.
Eine (8\)	Eine (8\) Predictable student responses requiring some measure of	Eineteen (18\) Face: A "What's more sir", look, eyes sparkling.

Appendix B (continued)

Categories	Verbal Relevant Benaviors		Nonverbal
	Eine (8↖)		Eineteen (18↖)
Eineteen (18↖)	evaluation and synthesis from the student, but must remain within the province of predictability. The initial behavior was in response to teacher initiation.	Posture:	Adds movement to those given or expected, tries to show some arrangement requiring additional thinking; e.g., works on gymnastic routine, dribbles basketball, all game playing.
	9		19
9-19	Pupil initiated talk that is purely the result of their own initiative and that could not be predicted.	Face:	Interrupting sounds, sighs.
		Posture:	Puts hands up to ask questions, gets up and walks around without provocation, begins creative movement education, makes up own movements, shows initiative in supportive movement, introduces new movement into games not predictable in the rules of the game.

Appendix B (continued)

Categories	Verbal Relevant Behaviors		Nonverbal
	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.

[1]From Cheffers, Amidon, and Rogers (1974).

Appendix C

CODER'S RELIABILITY* FOR SELECTED SUBJECTS USING SPEARMAN'S RHO

Student Teacher

Top 10 Cells	Rank Observation One	Rank Observation Two	d	d^2
6-8	1	1	.00	.00
5-5	2	2	.00	.00
5-6	3	3	.00	.00
8-6	4	4	.00	.00
8-8	5	5	.00	.00
8-3	6	6	.00	.00
4-8	7	7	.00	.00
3-5	8	8	.00	.00
3-6	9.5	9	.50	.25
8-3	9.5	10	.50	.25
Total				.50

*.997

Top 10 cells listed refer to the order of coder's numerical frequency.

Rank observation one and rank observation two refer to the origin of the coding.

d refers to the differences between the ranks of each cell for observation one and observation two.

d^2 refers to the d column squared.

Appendix C (continued)

Cooperating Teacher

Top 10 Cells	Rank Observation One	Rank Observation Two	$\underline{d}$	$\underline{d}^2$
6-8	1	1	.00	.00
8-10	2	2	.00	.00
8-6	3	3	.00	.00
10-8	4	4	.00	.00
5-5	5	5	.00	.00
5-8	6	6	.00	.00
8-3	7	7	.00	.00
10-8\	8	8	.00	.00
8\-10	9	10	1.00	1.00
6-5	10	9	1.00	1.00
Total				2.00

*.988

Top 10 cells listed refer to the order of coder's numerical frequency.

Rank observation one and rank observation two refer to the origin of the coding.

$\underline{d}$ refers to the differences between the ranks of each cell for observation one and observation two.

$\underline{d}^2$ refers to the d column squared.

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