INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.

2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in "sectioning" the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.

University
Microfilms
International

300 N. ZEEB ROAD, ANN ARBOR, MI 48106
18 BEDFORD ROW, LONDON WC1R 4EJ, ENGLAND

LORD, MADELEINE CHARLOTTE

THE TEACHING OF DANCE: A CHARACTERIZATION OF DANCE TEACHER BEHAVIORS IN TECHNIQUE AND CHOREOGRAPHY CLASSES AT THE UNIVERSITY LEVEL

The University of North Carolina at Greensboro ED.D. 1979

PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs _____
2. Colored illustrations _____
3. Photographs with dark background _____
4. Illustrations are poor copy _____
5. Print shows through as there is text on both sides of page _____
6. Indistinct, broken or small print on several pages ✓ throughout _____
7. Tightly bound copy with print lost in spine _____
8. Computer printout pages with indistinct print _____
9. Page(s) _____ lacking when material received, and not available from school or author _____
10. Page(s) _____ seem to be missing in numbering only as text follows _____
11. Poor carbon copy _____
12. Not original copy, several pages with blurred type _____
13. Appendix pages are poor copy _____
14. Original copy with light type _____
15. Curling and wrinkled pages _____
16. Other _____

University Microfilms International

300 N. ZEEB RD., ANN ARBOR, MI 48106 (313) 761-4700

THE TEACHING OF DANCE: A CHARACTERIZATION OF DANCE TEACHER BEHAVIORS IN TECHNIQUE AND CHOREOGRAPHY CLASSES AT THE UNIVERSITY LEVEL

by

Madeleine C. Lord

A Dissertation Submitted to
the Faculty of the Graduate School at
the University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Greensboro
1979

Approved by

Dissertation Adviser

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Dissertation Adviser _____

Committee Members _____

_____

_____

_____

August 21 1979
Date of Acceptance by Committee

August 21 1979
Date of Final Oral Examination

ABSTRACT

LORD, MADELEINE. The Teaching of Dance: a Characterization of Dance Teacher Behaviors in Technique and Choreography Classes at the University Level. (1979)
Directed by: Gay E. Cheney, Ph.D. Pp. 244.

The study intended to characterize dance teacher behaviors as observed in two choreography and two technique classes at the university level. The characterization was made in terms of verbal and nonverbal behaviors, the directness and indirectness of approach, the flexibility of strategy and the dominant teaching patterns.

Prior to data collection, Joyce's System of teacher behaviors analysis (1967) was modified to account for the nonverbal and verbal communication as well as the teacher-student interaction taking place in dance classes. A training program using the modified system (LAJS), subsequently carried out by two coders, gave opportunity to estimate reliability of the tool. Satisfactory standards of objectivity and reliability were met.

Data were generated from the systematic observation and coding of 20 audio-video recordings of choreography and technique classes distributed over the introductory, core, and end parts of a 17-week semester. The recorded information was subsequently tabulated by computer into six

50 x 50 matrices which served as a basis for the characterization of dance teacher behaviors in each type of class. The characterization in terms of the proportion of verbal and nonverbal behaviors relied on the analysis of the verbal, nonverbal and total dimensions of the teacher categories. The characterization in terms of directness and indirectness of approach relied on the analysis of I/D ratios calculated for the procedure and information category, while that of instructional flexibility relied on the analysis of reflective/structured strategy ratios calculated for the same categories. The characterization in terms of dominant teaching patterns relied on the analysis of five patterns emerging from the five top cells of the matrix.

Within the limitations of this study, the teacher behaviors observed in choreography classes were revealed to be 2.53 times more verbal than nonverbal; moderately direct when dealing with procedure and indirect when dealing with content; inflexible when dealing with content and more flexible when dealing with procedure; most frequently evoking unpredictable student behaviors through the communication of teacher's conclusions or opinions, most frequently providing feedback in the form of teacher's conclusions or opinions, and dominated by unpredictable student behaviors. The teacher behaviors observed in technique classes were revealed to be 1.17 times more verbal than nonverbal; very

direct when dealing with both content and procedure; inflexible when dealing with both content and procedure; most frequently eliciting predictable student behaviors through imposing a plan or a procedure or delivering information; most frequently providing feedback in the form of information or imposition of plan or procedure, and dominating the interaction process.

Following the investigator's use of the LAJS in this study, a critique based on the model of Herbert and Attridge (1975) was developed to evaluate its potential for use in future studies. The LAJS was judged to have a limited potential for further use in the description of dance classes.

DEDICACE

A Maman,

en remerciement de son support et de son aide à devenir ce que je suis.

ACKNOWLEDGEMENTS

The writer wants to express her special gratitude to Dr. Gay Cheney for her invaluable assistance, stimulation and encouragement rendered during the carrying out of the dissertation. Special thanks are extended to Dr. Thomas Martinek for his constructive evaluations, helpful suggestions and encouragements, and to Dr. Lois Andreasen, Dr. Pearl Berlin, and Dr. Dale Brubaker for their inspiring comments and recommendations.

The writer's thanks are extended to the two teachers and the dance students enrolled in their classes who made her data collection possible and such an interesting experience; to Roberta Graves who was such a devoted and pleasant secondary coder; and finally, to the School of Health, Physical Education and Recreation of the University of North Carolina at Greensboro which provided the audio-visual equipment and facilities that made this study possible.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Today and since the 1960's, the arts have enjoyed a receptive climate in society. This climate has been particularly beneficial to the growth of dance, both as a performing art and as an educational experience (Kraus, 1969). The pleasures of dance are no longer reserved for just a few. Whether spectator, beginner or professional dancer, teacher or choreographer, an important and ever-increasing proportion of the population keeps in contact with this art form and thus stimulates its continuous growth. Among other factors, the inclusion of dance in the curriculum at university, secondary and primary levels of education has played and continues to play an important role in this phenomenon.

As it applies to university instructors, however, the term "dance education" refers not only to the teaching of dance but to teacher preparation as well. A brief examination of the National Dance Association's Dance Directory (Tomam, 1976) reveals that teacher preparation represents a major concern of those involved in the educational setting. In institutions which offer courses in dance education, a great deal of emphasis is placed not only upon

teaching young students the theory and content of dance but upon preparing them in turn to pass these skills on to others.

The qualitative and quantitative improvement of dance education is a constant concern of dance educators, and the teaching of dance is at the center of that concern. Indeed, the endless search for better instructional practices--specifically, teaching activities likely to facilitate more meaningful learning in and about dance-- constitutes a major factor for improvement in dance education. The search for better teaching methods could profit a great deal from the development of a body of knowledge regarding the nature and efficiency of teaching processes appropriate to different types of dance classes. Such a body of knowledge is not currently available.

The dance literature does, on the other hand, provide numerous educational dance theories among which those of Hawkins (1964), Hayes (1964), H'Doubler (1957), Lockhart (1973) and Preston (1963) are generally considered to be most influential. In the development of dance theories, several authors have given special attention to teaching methodologies. In addition to clarifying their views regarding appropriate educational goals and content, some have developed and proposed specific instructional methods or techniques as particularly appropriate for dance. Such

methods as "problem solving" (Hawkins, 1964; Murray, 1953; Winters, 1975), exploration (Murray, 1953; North, 1971) or teacher direction (Murray, 1953; North, 1971), to name a few, have been suggested as guides for the teaching of dance. Clear information regarding the nature of prescribed methods is provided in some cases. However, very little information is offered regarding reliable bases upon which these prescribed methods can be judged "better" or "more efficient". It seems that current recommendations for teaching of dance rest primarily upon experiential bases and are seldom accompanied by explicit empirical analysis. In the light of current educational research which stresses students' growth and learning as the ultimate criterion for evaluating teaching effectiveness, this investigator believes that more empirical evidence regarding the effectiveness of the various teaching processes would be a helpful addition to the literature of dance. Information of this sort would inevitably expand the existing body of knowledge that deals with the teaching of dance and, at the same time, provide sound bases for future improvements in dance education.

Any investigation of teaching methods currently undertaken is necessarily related to the impressive number of studies using different "methods of teaching" as independent variables which were conducted in a variety of academic settings at the beginning of this century. According to

Dunkin and Biddle (1974) and Dussault (1973), this half century of research has yielded no significant research results about methods of teaching. The inconclusiveness of most of these investigations has prompted researches to seriously question "methods" as adequate variables for verifying the effectiveness of teaching. They have come to realize that until recently, very little has been known about the teaching process itself as it occurs daily in classes. An increased awareness among investigators of the extreme complexity of the teaching phenomenon caused the real debate to be defined not in terms of which methods or techniques are better, but in terms of how those methods and techniques might be described (Barrett, 1971). For the most part educational researchers (Brophy and al., 1974; Medley and Mitzel, 1963) agree that umbrella terms such as "methods" or "teaching styles" are inadequate for research purposes. Such terms, they point out, generally include such a variety of separate and perhaps unrelated behaviors that they cannot serve the function of variables. On the other hand, significant process variables have been defined in terms of specific teacher behavior. What the teacher actually says and does in the classroom is recognized as a major influence on a student's growth and learning. In the actual context of research on teaching, the identification of significant variables necessitates the systematic

description of teaching activities as they naturally occur in class. This descriptive approach is frequently referred to as the "analytical-descriptive" trend of research on teaching.

Initiated by the work of Anderson and Brewer (1945), Hughes (1959) and Withall (1949), the descriptive-analytical approach has been further defined and developed through the work of Bellack (1966), Flanders (1974), Gallagher and Ashner (1963), Galloway (1970), Joyce and Harootunian (1967), and Smith and Meux (1963). The present study undertaken here represents this investigator's attempt, certainly among the first, to apply this approach to the teaching of dance.

No descriptive data are available regarding dance classes. On the other hand, very few of the variables identified to date can be considered valid for application to the teaching process of dance. For the purposes of research, it indeed appears inappropriate to use variables related to settings involving primarily verbal subject matters and relatively stable environments to study the dance teaching process which primarily involves non-verbal subject matter and a relatively freer environment (Bookhout, 1967). Very little is known about the teaching process of dance itself as it naturally occurs in daily classes. One of the few endeavors in this direction is Brauer's (1975) study of current teaching approaches in modern dance. This research,

however, did not rely on a systematic and objective observation strategy. The need to gather objective and accurate data describing the teacher-student interaction as it occurs in the dance studio was first acknowledged by Lunt (1974). Influenced by the analytical-descriptive trend of research on teaching, Lunt regarded information of this sort as essential to enabling dance educators to evolve toward a deeper understanding of the teaching phenomenon of dance. A systematic inventory of actualities appropriate to dance instruction is likely to provide more certainty concerning which specific behaviors occur in dance classes and under what circumstances these behaviors occur (Flanders, 1970). An essential first step toward the eventual development of a theory of teaching is the analysis and measure of each individual teaching process as it affects student learning. Gathering and assimilating such information might not only lead to an increased understanding, on the part of the instructor, of the dance teaching process itself, but to a greater degree of control over that process as well. Endeavors of that sort represent a means of more certain identification of variables involved in this phenomenon. In relation to this problem, much can be learned from descriptive-analytical research conducted in movement settings. According to Locke (1978) and Nixon and Locke (1973), a descriptive-analytical trend of research focused

on activity classes has begun to emerge and is well on its way to providing significant information describing such classes.

Influenced and supported, then, by this analytical-descriptive trend of research on teaching, this study is an attempt at systematic description of the dance teaching process as it occurs in two types of dance classes: choreography and technique. By identifying, describing and analyzing the teaching events as they occurred in these two dance settings, the researcher hopes to isolate the characteristics of each and, at the same time, to evaluate the appropriateness of the observational system used in this study for further use in the systematic description of dance classes. Such information may contribute to a better understanding of current teaching practices in the field of dance and, at the same time, provide a broad basis for further analysis of the instructional method as it relates specifically to the teaching of dance.

Statement of the Problem

The purpose of this study was to describe the teaching process as it occurred in two different kinds of dance classes. One of the classes focused on choreography and the other on technique. Both were taught at the university

level. More particularly, the research sought to characterize the behavior of two experienced teachers as they were observed in each setting. Influenced by the works of current educational researchers, specifically Flanders, Cheffers and Joyce, this characterization was done in terms of: (a) the proportion of verbal and nonverbal behaviors, (b) the directness or indirectness of the instructional approach, (c) the instructional flexibility, and (d) the dominant teaching patterns.

A secondary intention of this study was to evaluate the potential of the investigator's adaptation of the Joyce system of teacher behavior analysis for future use in the study of dance classes. The evaluation was made according to three categories of criteria identified by Herbert and Attridge (1975) for judging the appropriateness and practicality of an observational system. These criteria categories are those of identification, validity and practicality.

Definition of Terms

Lord Adaptation of Joyce's System (LAJS) -- A categorical tool, low inference, adapted from Joyce and Harootunian (1967), with additional input from Cheffers et al.

(1974) and Grant and Hennings (1971) for recording teacher-student verbal and nonverbal interaction in movement classes.

Experienced dance teachers -- Dance faculty members having at least the Master's degree in dance, two years of experience teaching dance at the university level, and currently teaching within the graduate or undergraduate dance major programs at the University of North Carolina at Greensboro's Dance Division during the Spring semester, 1978.

Choreography classes -- Choreography and composition classes included in the graduate and undergraduate dance major programs of the Dance Division of the University of North Carolina at Greensboro during the Spring semester, 1978.

Technique classes -- Modern dance technique classes included in the graduate and undergraduate dance major programs of the Dance Division of the University of North Carolina at Greensboro during the Spring semester, 1978.

Teacher behavior -- Any verbal or nonverbal act of the teacher occurring in the context of interaction with dance classes (Flanders, 1970).

Direct teacher behavior -- verbal and nonverbal teacher behavior which "restricts the student's freedom of action by dictating a line of action" (Flanders, 1974: 115). In this study such behavior corresponds to the following verbal and nonverbal categories: imposing a plan or a procedure, imposing a standard of performance, asking questions for precise answers, providing information, providing personal conclusions or opinions (Joyce & Harootunian, 1967).

Indirect teacher behavior -- Verbal and nonverbal teacher behavior which "expands the student's freedom of action by encouraging his participation and initiative" (Flanders, 1974: 115). In this study, such behavior corresponds to the following verbal and nonverbal categories: helping the students to determine a plan or a procedure, helping the students to determine a standard of performance, helping the students to theorize, helping the students toward self-expression (Joyce & Harootunian, 1967).

Nonverbal behaviors -- Conscious or unconscious physical motions (gestures, body movements and body positions) which occur in the context of classroom interaction.

Verbal behavior -- Oral commentary which occurs in the context of classroom interaction.

Interactive process -- The verbal and nonverbal teacher and student behavior occurring mutually or reciprocally in the context of dance classes (Lunt, 1974).

Teaching patterns -- "A short chain of events that can be identified and occurs frequently enough to be of interest" (Flanders, 1970: 4).

Flexibility -- "The extent to which a teacher modifies his teaching strategy in response to student behavior" (Joyce & Harootunian, 1967: 154).

Assumptions Underlying the Research

The study acknowledges the following assumptions:

1. The teacher's leadership role in dance classes is evidenced through overt and observable behaviors which can be systematically recorded.

2. Five recorded teaching samples of 30-minute duration are considered representative of teacher behavior in one specific dance setting over a semester. These samples were randomly distributed both in classes taken from the beginning, middle and end of semester and moments of recording scheduled at the beginning, middle and end of classes.

3. Every class period has a beginning, a middle and an end.

4. Every dance course spread out over a semester has introductory, core, and end lessons.

5. Two classes each of choreography and technique are considered sufficient to provide sufficient information for the study, given its limited scope.

Scope of the Study

This study is limited by the following considerations:

1. It was concerned with only two teachers who were dance faculty members at the University of North Carolina at Greensboro.

2. It examined four dance classes conducted during the Spring semester 1978: one advanced and one intermediate choreography class; two intermediate modern dance technique classes. Each of the classes was scheduled for one hour and a half duration, twice a week.

3. The choreography and the technique classes on which the study focuses dealt with the modern dance idiom.

4. The teacher behavior data were generated by observation and recording of twenty half-hour teaching samples randomly taken at the beginning, the middle and the end of five different teaching periods in each class. The sampling spans the entire fourteen weeks of the semester.

5. The data were recorded in the natural setting of the dance class as conducted by the teacher.

6. One of the choreography classes was taught by two teachers, the second of whom was omitted from the study.

Significance

As an initial analytical descriptive investigation of dance teaching, this study has the potential to make two major contributions. First, it may provide an observational system suitable for use in further studies of the teaching process in dance. This system is an extension and adaptation of the Joyce (1967) model of analysis of teacher behavior, making it consistent with the interactive nature of the teaching process as well as the nonverbal nature of the subject matter of dance.

Second, by analyzing and describing the teaching process as it occurred in two choreography and two technique

classes, this research will provide precise information regarding these two teachers' manipulation of the dance content, organizational strategies and climate in each setting. Such information has the potential to provide a sound basis for identifying some specificities and defining valid variables for each teaching process. Further investigations regarding the similarities and differences between teacher behaviors occurring in choreography classes and teacher behaviors occurring in technique classes at different educational levels, and also between teaching behaviors in dance and those in other disciplines, will perhaps evolve from the present study; in turn, they may contribute to a more precise identification of uniqueness and commonalities of dance teacher behaviors. As an ultimate contribution, it is hoped this study will clarify significant issues in the teaching of dance and eventually, in teacher education.

CHAPTRE II

REVIEW OF LITERATURE

The literature reviewed is divided into two sections: research on teaching and dance education theories. In the first section, the theoretical context of current research in teaching is presented first. It provides a summary of what the literature indicates as changes in educational research theories in the last two decades. It is followed by methodological considerations regarding observational systems used in descriptive analysis of teacher behaviors, and then by a review of observational studies conducted in movement classes. Because it had a particular influence on the development of the category system used in this study, special attention is given to Joyce's system of teacher behaviors analysis and Grant's system for the analysis of nonverbal activity. This part of the review of literature provides a theoretical basis and substantial background for the procedures, methods and analysis of data used in this study.

The organization of the second section on dance education is based on the theoretical framework of the tool of systematic observation used in this study. It includes three parts corresponding to the three frames of reference

comprising Joyce's model of teacher behaviors analysis. This section provides a summary on the basis of which the investigator concluded the appropriateness of Joyce's rationale for the analysis of dance classes. The second section deals with dance education theories and literature on the teaching of dance published since the 1940's.

Research on Teaching

A review of educational research theories published since 1960 was undertaken. Dealing mainly with recent fundamentalists' works published in the field since the emergence of the analytical-descriptive trend of research on teaching, this section not only provides a summary of what current literature regards as the most important changes to occur in the field of research on teaching, but also seeks to clarify the theoretical framework used as a background for this investigation.

Change of Orientation of Research on Teaching

By observing that "teachers and pupils are now being studied in interaction in many classrooms in U.S. and other countries" (p. 15), Dunkin and Biddle (1974) acknowledged the drastic change of orientation witnessed in research on

teaching during the last two decades. From study of the influence of the teacher's personal characteristic and professional training on the student's learning, educational researchers have begun to focus upon the influence of the teaching process itself. There is a common belief among such researchers that teaching is neither mystical nor esoteric. Joyce and Harootunian (1967), in fact, insist that "teaching is understandable and that competence in the profession can be improved by rational effort" (p. vii). What the teacher does in the classroom is at the heart of the matter and is viewed by many researchers as a determinant factor of what the student actually learns (Brophy, Biddle, & Good, 1975; Dunkin & Biddle, 1974; Flanders, 1970).

The teaching process itself, as it occurs naturally, has become the object of study of educational researchers. Considerable amounts of time and energy have been and are currently being applied to the exploration of the variables in the teaching process and to a study of their influence on students' growth. With the introduction of these new investigative priorities, numerous changes have occurred in the traditional approach to research on teaching, among which are changes in the basic research paradigm, in the teaching theory, and in the concept of teaching effectiveness.

Changes in the basic research paradigm. Dussault (1973) illustrated the traditional paradigm of research on teaching with a dyad. According to this view, two groups of variables were considered. The independent group, labeled "What the teacher is", was related to "Success in teaching" as the dependent group of variables. This way of looking at the study of teaching effectiveness elicited much criticism, however, and by the middle of this century was no longer considered appropriate.

Among the numerous critiques of this traditional approach to research on teaching, one of the most severe was that it neglected those crucial classroom events which characterize all teaching activities, such as questioning, lecturing, criticizing, giving directions, etc. (Dunkin & Biddle, 1974). The consideration of such events by researchers eventually made necessary the introduction of a new group of variables as a middle component of the research paradigm. Dussault (1973) illustrated that change by transforming the original dyad into a triad. In the frame of reference of this new paradigm, "What is happening in the classroom" as teacher and students interact was regarded as related to "What the teacher is" in spite of the fact that it constituted a central group of independent variables affecting pupils' learning. Attempts to identify and classify those variables have shed some light on the extreme

complexity of the teaching phenomenon. According to Dussault (1973), three areas of concern characterize the teaching process. These areas include (a) the teacher, (b) the pupils, and (c) other factors such as subject matter, context, physical environment, etc. These in turn, have prompted the current consideration of four types of variables which Dunkin and Biddle (1974) identified as: (a) presage variables, (b) context variables, (c) product variables, and (d) process variables. In speaking of the first type of variables, researchers are generally referring to traits or characteristics most likely to influence the teacher's performance. Personality traits, professional training, physical appearance, and psychological traits constitute examples of variables within this group. The term "context variables", on the other hand, usually refers to the physical, social, behavioral, temporal, and other aspects of the surroundings in which teaching takes place (Herbert & Attridge, 1975). The term "product variables" refers to the growth or learning observed among the students, while "process variables" refers to teacher and student behaviors as they influence one another in the dynamics of teaching and are themselves influenced by the presage and context variables. This impressive number of variables in turn, influence pupils' growth and learning at short- and long-term intervals. It is this extremely complex problem that researchers have to unravel.

A basic plan of action to define, channel and organize researchers' efforts toward that goal was provided by the "descriptive correlational-experimental" loop model. Proposed by Furst and Rosenshine (1973), this paradigm suggests an organization of research on teaching endeavors relying on three kinds of studies. In an unfixed sequence, the loop included (a) descriptive studies as a means of obtaining quantitative information on the teaching process, (b) correlative studies as a means of securing information regarding relations between the descriptive variables and measure of student growth, and (c) experimental studies as a means of testing variables obtained in correlational studies in more controlled situations. By systematic and synchronized endeavors in these three areas, educational researchers are confident that better insight into the teaching process can be gained. The progressive understanding of the teaching process is an aim for researchers whose main goal is the development of a teaching theory.

Changes in theory of teaching and the concept of teaching effectiveness. According to Dunkin and Biddle (1974), early research on teaching relied on very limited theoretical bases which lacked potential implications for teacher education. The absence of material connecting theory with teacher behaviors made it impossible to relate the existing

body of knowledge to professional practice. Educational researchers' current options might be considered more promising in this regard. According to Dunkin and Biddle (1974), students' and teachers' activities are regarded as observable events having discoverable causes and effects. By identifying teachers' and students' activities and studying the relationships between their antecedents and consequences, researchers feel that a theory of teaching can ultimately be elaborated. It is agreed that such a theory would provide teachers with pertinent information regarding ways in which optional conditions for learning can be provided. A theory of teaching would bridge the gap between learning theory and the actual instructional practices of the classroom.

The definition of teaching effectiveness has been reconsidered in the context of such theory. It is agreed by Dunkin and Biddle (1974), Flanders (1970), Medley and Mitzel (1963), that teaching effectiveness must be determined according to the ultimate criterion of changes in pupils' growth. Intermediate criteria such as clarity, warmth or structure, to name a few, must be shown to be relevant, that is, correlated with the above-mentioned ultimate criterion (Medley & Mitzel, 1963). Due to the fact that umbrella terms such as method or teaching style often include a wide variety of separate, and perhaps unrelated behaviors,

Brophy et al. (1975) stressed that effectiveness cannot be measured for a teacher or a method. Effectiveness must instead be measured for specific teacher behaviors. According to Medley and Mitzel (1963), "We judge effectiveness of a behavior in terms of the outcome we choose to study" (p. 85). The relations between behaviors and outcomes are, however, extremely complex. In an attempt to take into account all of the factors involved, Brophy et al. (1975) declare:

> We assume that lawful relationships can be discovered between how the teacher acts and how the student reacts, although we also take for granted that most teaching behaviors will prove to be necessary but not sufficient as antecedents of students' outcomes. (p. 36)

The Study of the Teaching Process

According to Dussault (1973) "Educational researchers have basically attempted to establish what teaching should be without knowing what it is in reality" (p. 6). Dunkin and Biddle (1974) agree that very little is known about teaching. Brophy, Biddle and Good (1975) suggest that "we know more about how to train teachers than about what to teach them" (p. 36).

A first step in gathering information about the teaching process relies on the careful observation and description

of the process "as it can be observed day after day in real classrooms where teacher and students are debating the problems of pedagogy and learning" (Dussault, 1973, p. 6). The undertaking of such a study is considered essential to the evolution of any science (Dussault, 1973) which must forge a language of its own before attempting to explain its primary focus. This type of task requires the researcher to enter into a systematic inventory of the reality to be named, described and classified. In the field of education, such endeavors are regarded as imperative if any degree of certainty is to be given to classroom observation (Flanders, 1970).

Systematic descriptions of "What is happening in the classroom" provide a reasonable degree of assurance about what specific behaviors have occurred and under what conditions. Dunkin and Biddle (1974) suggested that such information is particularly relevant to the establishment of the variations and similarities which exist among the teaching processes in different educational settings (subject matter, grades, etc.). Such information provides a sound basis for further inferences about teaching. Inferring intentions from behaviors is, for Flanders (1970), essential to a more complete understanding of teaching.

> When deductive and inductive reasoning processes are combined and brought into balance, our

> intentions help to set goals for teaching performance and an analysis of behaviors helps to explain what actually occurs. (p. 5)

Systematic Observation of Teaching

According to Herbert and Attridge (1975), "research findings can be no stronger than the weakest link in the methodological chain" (p. 2). The confidence one may put in research is dependent on the stregth of the instrument used. Thus, instrumentation is the cornerstone of research on teaching today. Currently, a multitude of direct observational tools exists, their number having been very conservatively estimated at 120 in 1973 (Furst & Rosenshine, 1973), and increasing daily. Although all of these tools were basically designed for the purpose of describing and analyzing the teaching process, observational systems differ from one another in their format, basic units and focus; even more basically, they differ in their content. Depending on the aspect of teaching an author has chosen to study, different variables need to be considered. This need has generated the emergence of a great variety of observational systems.

Systematic observation procedures actually exist in three main formats: category systems, sign systems, and rating scales. The category systems constitute the most

widely used form, but sign systems and rating scales also represent available alternatives. While sign systems allow for the recording of a few selected variables or events, the category systems and rating scales are meant to encompass the totality of the occurring teaching events. Dunkin and Biddle (1974) stated that category systems and rating scales are thus generally considered as more flexible and able to provide more complete information. Researchers frequently referred to category systems and rating scales as low inference and high inference systems. Although a low degree of inference may mean a more objective representation of the phenomenon under study, criticisms of category systems have been made. Brophy and Good (1975), for example, noted that their short concrete units of observation could result in trivial information gathering with the danger of neglecting important teaching variables. Such a concern is also expressed by Berliner (1976), who pointed out the need to include the qualitative dimension of teaching in the observational strategy.

The high inference systems of rating scales are considered better suited to the observation of the qualitative aspect of teaching (Brophy, Biddle, & Good, 1975). Although they represent higher chances for distortion of the reality under study, the variables of the rating scales often defined in terms of warmth, clariy, enthusiasm and so on, have been

found to be good predictors of students' achievement (Furst & Rosenshine, 1973). This kind of tool, however, does not provide information regarding the teacher behaviors or procedures that have engendered such qualities as warmth, clarity, enthusiasm which, as mentioned previously, are usually taken as rating scales components (Biddle, Brophy, & Good, 1975. Dussault (1973) and Furst and Rosenshine (1973) agreed that, to some extent, all systematic observation systems distort reality and can provide only an incomplete picture of the latter. For some scholars the combination of both formats of category systems and rating scales in the design of the observation strategy is viewed as a way of compensating for the weaknesses of each (Furst & Rosenshine, 1973).

The nature of the observation unit has strong implications for the validity of a system. Three types of units can be used. In the case of a phenomenal one, the unit is defined according to the natural occurrence of the teaching events. A unit lasts until a different event occurs. Because they respect the natural occurrence of the teaching events, such units, according to Biddle, Brophy, and Good (1975), are the most significant ones. A unit may also be determined according to the occurrence of specifically defined elements such as episode, cycle, teaching patterns, etc. Such units are labeled as analytical. Finally, a

unit may be determined according to time. An observation may, for example, be made every three, 10 or 15 seconds, as an arbitrarily imposed unit of time. Although they are highly artificial, arbitrary units provide the means for recording time and for objectively controlling the speed of the recording. One or a combination of units can be used in a single system. The use of a particular type of unit is determined by one's intent to obtain meaningful information and control the rate of observation among observers (Biddle, Brophy, & Good, 1975; Herbert & Attridge, 1975).

A need to keep account of the sequence of the observed events is also emphasized by Biddle, Brophy, and Good (1975), and Furst and Rosenshine (1973). The focus of a system is another aspect which needs to be considered. Some systems have limited their focus to the exclusive observation of the teacher or the students; others have considered both.

Of all the factors affecting the validity of research results, the content of the observation system, that is its category items, certainly represents a most significant one. In selecting an observational tool one must make sure that its constituent categories are representative of the dimension of teaching under study. According to their content, available category systems have been classified in different ways. Dunkin and Biddle (1964), for example,

have classified observational systems into six broad families. These are: (a) the affective domain, (b) the cognitive material, (c) the psycho-motor events, (d) classroom activities, (e) subject matter, and (f) sociological and physical environment of the classroom. Because few systems can belong to only one of these six families, Furst and Rosenshine (1973) prefer to classify observational instruments according to the source of the variables involved. In this frame of reference existing systems are classified as: (a) developed from established theory or empirical research outside of education, or (b) developed from existing classroom category systems. The category items must be clearly defined, mutually exclusive as well as exhaustive in dealing with the problem under study.

The design of an optimal observation strategy relies on two major aspects. Ideally, it should allow for the simultaneous use of a variety of observational tools involving high and low inference systems (Furst & Rosenshine, 1973). In addition to an acceptable degree of objectivity reliability and validity, each system should be carefully selected with regard to the appropriateness of the purpose of the study, of its content items, format, focus and basic observational units (Biddle, Brophy, & Good, 1975; Furst & Rosenshine, 1973). With regard to the assessment of the current use of observational systems in the study of teaching,

major recommendations emerge from the literature. Furst and Rosenshine (1973) as well as Herbert and Attridge (1975) have expressed a need to give more attention to existing tools of systematic observation. According to Anderson (1971), educational researchers must avoid an unnecessary proliferation of observational tools. The inappropriateness of existing tools should be clearly demonstrated before the creation of any new ones.

Few observational tools have been used by persons other than their creators (Furst & Rosenshine, 1973). Greater than the need to identify new variables, there is the need to consider already existing systems. Further refinement of the latter along with their adaptation to the specificity of different subject matter is recommended (Furst & Rosenshine, 1973).

Observational Studies in Movement-Centered Disciplines

A review of related literature revealed only one study in which an observational system had been created for specific applications to the teaching of dance: Lunt (1974). Considering the fact that human movement, the subject matter of dance, is also shared by sport and physical education, the investigator has opted to examine the literature related to observational tools focused on the teaching of movement in general.

Systematic descriptive research on the teaching of movement-centered disciplines is fairly recent and has been conducted mainly in the area of physical education. Although this kind of research was initiated in the gymnasium by Elizabeth Bookhout (1967), its development really got underway in the early 1970's and is quite limited in scope (Anderson, 1971; Locke, 1978; Nixon & Locke, 1973). However, an analytical descriptive trend of research focused on movement classes, according to Locke (1977), is currently underway and gaining momentum. Some of the research accomplished so far has been applied to the "development of standardization of instruments for the systematic observation, recording and analysis of events in the gymnasium" (Locke, 1978, p. 8). Two basic orientations emerge from the literature with regard to instrumentation: (a) the creation of instruments specifically designed for the movement setting, and (b) adaptation of existing systems to make them consistent with the particularities of the movement setting.

Observational systems specifically designed for the teaching of the movement-centered disciplines. Some systematic observation procedures have been developed by physical, sport and dance educators. Underlying their works is the belief that the teacher behaviors occurring in the gymnasium or the dance studio differ from those occurring in the

classroom (Bookhout, 1967; Fishman, 1974). A freer environment and the use of a nonverbal subject matter are conditions regarded as quite conducive to the emergence of teacher behaviors unique to activity classes (Bookhout, 1967). In attempting to capture the uniqueness of the movement setting, researchers have focused on the totality of the teaching process or on some aspects of it. Existing direct observational systems reflect these two options and thus differ in scope.

The totality of the teaching process occurring in movement classes has been encompassed by the analysis of student-teacher interaction. To capture the interactive process of choreography classes, Lunt (1974) devised a multidimensional category system. The system focused on teacher-student verbal and nonverbal interaction and considered the cognitive, affective and motor dimensions of those interactive processes. Existing taxonomies in the cognitive and affective domain served as a base for the content and organization of the cognitive and affective dimension. Most of the kinetic-kinesthetic (motor) dimension was derived from dance literature related to choreographic process and the integrated function of the cognitive, affective and motor domain for the choreographer (Lunt, 1974). The reliability, objectivity and validity of the system were estimated by testing the intrajudge

agreement and interclass correlation, the interjudge agreement and, finally, the content and construct validity. Although the tool satisfied the validity requirements, it did not meet an acceptable level of reliability and objectivity.

The concept of instructional interaction as projected by Hawthorne (1968) led to Barrett's (1969) elaboration of an observation procedure adapted to the uniqueness of movement education classes in primary grades. On the basis of Hawthorne's (1968) idea of action unit, Barrett (1971) defined the interactive process of movement classes as one of "teacher and learners during which time movement tasks focus on the learner's response(s) and content being developed" (p. 25). With this characterization, Barrett (1971) introduced the movement task as a key element of the movement classes. Her category system includes four dimensions: (a) movement task, (b) content, (c) guidance, and (d) movement responses. In general, her system allows for the description of the verbal behaviors of the teacher in relation to student movement responses.

Barrett (1969) estimated the reliability, objectivity, and validity of her category system by testing the interjudge agreement, intrajudge agreement, content, and construct validity. Because it did not meet satisfactory standards for reliability and objectivity set at a percentage

of agreement of 80% or higher, she (1969, 1971) considered her category system as promising but inappropriate for research purposes.

Anderson (cited by Barrette, 1977) created the physical education teachers' professional functions descriptive observational system. This multidimensional system utilizes a natural unit (the function of the teacher) to code teacher behavior in each of the six following dimensions: 1) function -- the purpose of the behavior; 2) subscript -- who carries out the function; 3) mode -- the ways in which messages are transmitted or received; 4) direction -- the person or persons toward whom the behavior is directed; 5) substance -- the subject matter in motor activity terms (e.g., basketball, volleyball, gymnastics); and 6) duration -- the actual elapsed time in seconds, from the beginning to the end of the unit behavior. Anderson's system (1974) was used by Barrette (1977) to describe and analyze the occurrence, duration and distribution of teachers' behaviors in elementary and secondary school physical education classes. Amont other things, Barrette's study (1977) revealed that the observed teachers were doers and talkers (77% of functional units were coded as "does" while approximately 60% of functional units were coded as "talks") and that they displayed a great amount of teacher dominance and control in the gymnasium.

Concerned by the teaching-learning relationship, Fishman (1974) designed a category system intended to describe the ways in which teachers provide augmented feedback in physical education classes. Limiting her focus to teacher behaviors only, the author based her system on the six categories of form, direction, time, teacher intent, general referent and specific referent. Laubach (1975) narrowed the focus of her observation to that of student's behaviors. For the purpose of analysis, she developed a multidimensional system used to measure "What the student is doing" (function), "How" (verbally or nonverbally), "How long" (time), and the content element involved. Laubach's (1975) system was later applied by Costello (1977) to the description of student behaviors in elementary school physical education classes.

On the basis of the preceding information, the researcher concludes that few of the systems specifically designed for objectively describing the unique reality of movement classes have been used. Consequently, very limited descriptive information regarding variables appropriate to the process of teaching movement is available.

Observational systems developed from adaptation of existing category systems. Among category systems designed for any subject matter, the Flanders Interaction Analysis

System (FIAS) has been the most often used of those procedures adapted to the description of movement classes. It is not, however, the only one. In order to study selected teacher behaviors of the physical education setting, Hupé (1974), for example, devised a four-dimensional procedure, the categories of which were influenced by Bellack's (1966) and Openshaw and Cyphert's systems. Interested in the relation between the patterns of teacher behaviors and the climate of physical education classes, Bookhout (1967) added new items to Medley and Mitzel's (1958) Observation Schedule and Record (OSCAR) to "accommodate as many physical education teaching behaviors as possible" (p. 338).

The Flanders Interaction Analysis System (FIAS) served as a basis for the development of observational procedures of the highest number of descriptive studies conducted in the movement setting. Limited to the analysis of the verbal dimension of teacher-student interaction, FIAS consists of ten categories divided into three parts: teacher talk, student talk, and silence or confusion. Teacher talk includes seven categories subdivided into those of direct and indirect influence. Student talk, on the other hand, is composed of two categories defined in terms of student response and student initiation. The third division of silence or confusion is included in order to account for teaching events other than student talk or teacher talk.

To measure specific classroom behaviors in physical education classes, Nygaard (1975) used Flanders' system in its original form. The results of his study showed that physical education teachers at different grade levels

> were a direct verbal influence, they did most of the talking, placed a great deal of emphasis on content, and viewed themselves as an authority figure in the classroom. (p. 351)

The predominant interaction pattern of the classes Nygaard (1975) observed was found to consist of lecture, followed by silence or confusion, followed by lecture.

For the purpose of describing the teaching process of physical education classes, Dougherty (1971) found it necessary to suggest a modification of FIAS in two ways. To account for the meaningful nonverbal activity of movement classes, he proposed the addition of an eleventh category. He focused his second addition on the relationship of the teacher to the class. Dougherty (1971) added some procedures to FIAS to allow for the recording of teacher behaviors directed to specific individuals or to the class as a whole.

The need to account for some nonverbal aspects of the teaching of physical education, was acknowledged by Gasson (1971). To study the management of physical education classes he designed a tri-dimensional system. The latter included teacher talk and student talk as defined by Flanders,

to which the author added the consideration of the location of the teacher and the amount of child activity.

For the purpose of describing the interaction between secondary school physical education teachers and their pupils, Mancuso (1972) fused Flanders' verbal categories and Love and Roderick's (1971) nonverbal categories into one system. Among other things, her study revealed that the observed interaction was predominantly direct and could be described as teacher demonstration, direction and focusing attention. With the same objective as Mancuso's in mind, but at the elementary level, Rankin (1975) designed a bi-dimensional system. Including five categories, the verbal dimension was inspired by Flanders. The nonverbal dimension focused mainly on student's behaviors but accounted also for teacher gesture and nonresponse or confusion.

A most widely used adaptation of FIAS is the one devised by John Cheffers (1974) and his associates. Cheffers Adaptation of Flanders Interaction Analysis System (CAFIAS) is an expansion of FIAS to make it feasible for the description of both verbal and nonverbal interaction, teacher behaviors and pupils' responses. The basic rationale is similar for CAFIAS and FIAS.

Cheffers, Amidon, and Rodgers (1974) modified FIAS by adding a nonverbal category dimension to account for nonverbal communication. On the model of FIAS, verbal categories

were identified by one digit number, and the nonverbal ones were identified as their teen equivalent. For the movement setting, Cheffers et al. (1974) found it necessary to break down Flanders' category "silence or confusion" into two distinct parts. Category 10 was defined as chaos or confusion while category 20 was defined as silence. Cheffers et al. (1974) also found it appropriate to expand the idea of the teacher. Based on the premise that "if learning occurs, then teaching is taking place" (Cheffers et al., 1974, p. 12), the teacher's role in CAFIAS can be assigned to the classroom teacher, other learners or students doing the teaching, or to the environment.

Specific coding procedures were developed by Cheffers et al. (1974) to account for the recording of teaching situations involving the division of the class into small groups. CAFIAS allows for the recording of whole class and group activities as two different events.

To favor a more truthful description of the student's behaviors, Cheffers et al. (1974) added one category to FIAS student categories. Accounting for the students' responses involving convergent thinking, these categories (8\ and 18\) were devised to correct the obligatory coding in FIAS of this type of student behavior as a purely mechanical response.

To serve diverse descriptive purposes, CAFIAS has been used in several studies conducted in a variety of settings,

primarily involving movement or no movement. A recent compilation of descriptive studies (Cheffers & Mancini, 1978) revealed this instrument of systematic observation to have been used in therapeutic or clinical settings, in classrooms as well as in the gymnasium. The compilation also revealed CAFIAS to have been used to describe, analyze and compare different aspects of the teaching process. Among these investigations, Batchelder (1976) conducted a study that offered descriptive information pertinent to this study. She used CAFIAS to compare predictive estimates of classroom process behaviors in Math, English, and Physical Education. Her study showed some teaching patterns to be particularly frequent in physical education classes. "Teacher direction" followed by "student predictable response" was revealed to be the most frequent sequence of behaviors to occur in that setting. The second most frequent sequence of behaviors was identified as "extended teacher lecturing". Batchelder's (1976) study also revealed physical education teacher behaviors to be primarily direct and to involve approximately as many verbal as nonverbal teacher behaviors.

Other Observational Systems Pertinent to this Study

The Manual for Analyzing the Oral Communications of Teachers.

The Manual for Analyzing the Oral Communications of Teachers (Joyce and Harootunian, 1967) was developed for

the purpose of teacher preparation. Based on the authors' belief that the potentially better teacher is the one who can purposefully adjust his teaching behaviors to different goals, students and situations (Joyce & Harootunian, 1967), the manual was devised to help teachers enlarge their repertoire of teaching behaviors. The authors selected three frames of reference as guides for the systematic analysis of teachers' behaviors. These were identified as: social climate, content, and teaching strategies. They respectively served as bases upon which to develop the subcategories of sanction, information and procedure. Joyce's selection of above-mentioned frames of reference was supported by the belief that adequate frames of reference for teacher education are needed

> (a) to provide among them a balanced view of teaching; (b) to provide a terminology that can be communicated effectively to a great many practitioners working at many levels, and (c) to enable practitioners to view teaching in terms of important theoretical positions. (Joyce and Hodges, 1966, p. 410).

With respect to the analysis of the teachers' verbal behaviors, Joyce's model, like FIAS (Flanders, 1974), was intended to quantify direct and indirect teacher behaviors. In Joyce's system (1967), this aspect is specifically related to the handling of content and the development of class procedures. The constituent subcategories of content and

procedures permit the description of a variety of strategies related to the teacher's handling of these two aspects and which are referred to as reflective (indirect) and structured (direct) strategies.

Although this system was mainly devised for teacher education purposes, it has been used for research. With a reliability of .87, Joyce and Hunt (1967) used it to study teacher trainees' initial teaching styles in relation to their personalities. Reporting on descriptive studies and experimental training investigations he and collaborators conducted on novice and "in service" teachers, Joyce (1974) mentioned that the following information was gathered:

> (a) teachers tend to be much more homogeneous in information-processing than they are with respect to feedback style and structuring; (b) they tend to confirm Flanders' "rule of the two thirds"; (c) inductiveness or reflectiveness in the three dimensions of teaching behavior (feedback, structuring, and information-processing) tend to be independent of each other; and (d) very few teachers could be said to produce much variety in learning environments.

With regard to the latter finding, Joyce and Harootunian (1967) specified that:

> The teachers appeared to have stylistic variations on a recitation strategy in which the rules for information processing and for organization are, on the whole, fairly structured, fairly simple and fairly restrictive. (p. 4)

Since Joyce's system provided the basis for the instrument developed for this research, a more complete

description of its basic rationale is provided in the second part of this review of literature.

Grant's system for analyzing the nonverbal activity of teachers. Grant's system for analyzing the nonverbal behaviors of teachers served as a basis for the development of the nonverbal dimension of the system used in this study. It is the purpose of this section to provide further information regarding the conceptual framework of analysis this system offered.

Grant (1977) approached the analysis of teachers' nonverbal activity through the concept of physical motion, that is "movements having bodily orientation gestures and general bodily movement" (p. 201).

As a whole, Grant's conceptual framework of analysis strongly relies on that of Bellack. Grant (1977) classified all teachers' motions as either instructional or personal. Included in the first category of instructional motions were all those which could either serve or facilitate pedagogical functions. Personal motions dealt mainly with teacher humaneness and included primarily self-adjusting motions. The author's framework was chiefly applied to the analysis of the possible combinations of verbal and physical components that can occur in teaching.

Conducting motions referred basically to those motions used to conduct the class. They usually served "to control the participation in an interactive situation or to obtain attending behaviors" (Grant, 1977, p. 201). Acting motions were said to happen when "the teacher uses motions to act out words, concepts or objects for the amplification of meaning. They may emphasize, illustrate or clarify meaning through role playing and pantomime" (Grant, 1977, p. 201). Wielding motions were defined as motions that the teacher uses to wield, directly or indirectly, the classroom environment: objects, material or parts of the room" (Grant, 1977, p. 201). Self-adjusting motions were identified as "those a teacher uses to achieve a more balanced state, to release tension or achieve a more comfortable or relaxed body position or condition" (Grant, 1977, p. 202). Because these motions were believed to confirm the teachers' common human status, they were classified by Grant as personal motions.

The parallel analysis of verbal and nonverbal classroom communications revealed that the teacher's motions could either facilitate or serve the same functions as Bellack's verbal moves. The latter were identified as structuring, soliciting, responding, and reacting.

Grant's (1977) framework for the analysis of teachers' nonverbal activity was used with a high degree of reliability.

A coefficient ranging from .95 to .995 was found for the major categories while one ranging from .80 to 1.00 was achieved for the subcategories.

Dance Education

This section presents current educational dance literature as a basis upon which the observational system of this study was considered appropriate. It gathers together ideas expressed in the works on dance education that correspond to the three frames of reference employed by Joyce to set up the categories of the observational system used in this study. These frames of reference include teaching strategies, content, and social climate.

The Frame of Reference for Teaching Strategy

Teaching strategies are at the core of teaching. The term refers to "the instructional decisions teachers make about organizing people, material and ideas to produce learning" (Joyce and Harootunian, 1967, p. 40). In the dynamics of teaching, teachers continually make decisions to adapt to educational goals and to the students' needs and characteristics. These decisions may have implications for organization, content, or climate. For the purpose of this analysis, the decisions or teaching strategies relating

to organizational matters were defined as "procedure" and those dealing with the handling of the instructional content as "information". The development of the frame of reference for analyzing teaching strategies was dictated by the researchers' desire to enlarge teacher's repertoire of strategies. On the basis of current research, Joyce and Harootunian (1967) assumed that "the greater the range of teaching strategies possessed by the teacher, the better chance he/she has of promoting more desirable learning conditions for a larger number of students" (p. 109).

The multitude of teaching strategies or methodologies provided in the literature regarding the teaching of dance shows that dance educators believe in the necessity of flexibility. The works of Barrett (1977), Hawkins (1964), Murray (1953), North (1971), Preston (1963), and Winters (1975), to name a few, are particularly explicit in this regard. Methods of achieving flexibility in teaching are suggested in terms of variation in the number and kinds of limitations put on movement tasks and in terms of variation of the number and kinds of decisions made by the teacher and the students respectively concerning the creation of the learning environment.

Basic to the frame of reference Joyce developed to study the flexibility of teaching strategies in the

acknowledgement of the interdependence of instructional goals and maneuvers or teacher behaviors in teaching. For Joyce and Harootunian (1967),

> the decisions a teacher makes about instructional goals for particular learners are at the same time decisions about how to induce students to achieve those goals. Maneuvers not guided by decisions about objectives are meaningless, and strategies that do not indicate how they are to be carried out are incomplete. (p. 94)

From current educational trends, Joyce selected four educational goals as basic referents from which the extremes of a spectrum of potential teaching strategies could be determined. The four goals include: productive thinking, mastery of content and achievement of skills, self-direction, and the capacity to follow structured activities. In relation to class organization (procedure category), these goals imply a need for the teacher to create and carry out strategies of varying natures, a critical one being the teacher's capacity for incorporating students' input into the class decision-making as opposed to taking complete responsibility for it himself. In relation to the handling of content (information category), these goals imply the teacher's capacity to provide necessary instructional materials as well as to stimulate the student's thinking process at will.

Further support for the appropriateness of Joyce's system for use in dance classes was provided in statements of dance educators regarding the relevance of productive

thinking, mastery of content and achievement of skills, self-direction, and the capacity to follow structured activities as instructional goals of dance education.

Creative production, mastery of content and achievement of skill in dance. Joyce's (1967) definition of productive thinking includes the student's capacity to generate original ideas as well as artistic products. Dance educators unanimously agree that creative production is the ultimate goal of dance education and, in relation, that mastery of content and achievement of skills are essential to the attainment of this end.

H'Doubler in 1940 indicates that the concern in dance education "should be to develop the power of education through the study of dance" (p. 64). Her philosophy regarding the orientation of dance education is currently accepted and expanded by dance theorists. Creative production in dance is meant to be more than spontaneous natural expression (H'Doubler, 1957; Smith, 1976). According to Hunter (1970), such production must be innovative. Students, she said "must be allowed not only to solve problems but to invent and pose problems of their own as any artist and scientist does" (p. 124). To learn to dance is for Hawkins (1964) to learn to make dances, that is, to learn to organize dance material into an integrated form.

The making of significant artistic work constitutes the kind of production dance educators aim at (Hawkins, 1964; H'Doubler, 1957; Phenix, 1964; Smith, 1976). Such production generally is defined as that of increasing interest, importance, and artistic coherence (Smith, 1976). Understanding dance as an art form is regarded as essential in this perspective.

The literature supports the belief that creative production in dance as well as in any other art form can be facilitated by some basic information and skills (Humphrey, 1959). Knowledge of the dance materials and the means of fashioning them into cohesive forms, is believed to be closely related to the student's growth in creative production (Russell, 1975; Smith, 1976). For Murray (1969), dance classes should provide basic fundamental knowledge which she defined in terms of understanding and exploring the properties of the medium, and of learning and re-creating the traditional combinations.

Redfern (1973) labeled as "an indefensible educational mistake" (p. 18) the failure to provide students with opportunities to develop an increasing range of skills with respect to bodily, rhythmic and spatial aspects of movement, thereby increasing their knowledge and understanding of the standards and techniques particular to dance. Failure to encourage imaginative performance is believed to "lead

at best to repetition and mediocrity, at worst to sloppiness, crudity and sentimentality" (p. 18). The need for mastery of content and achievement of skill is acknowledged by dance educators, yet they insist that these techniques be regarded as a means to an end rather than as an end in themselves. Hawkins states (1964) that mastery of content and achievement of skills "should not be given undue emphasis" and considers them valuable "only insofar as they further the total dance experience" (p. 78). They should constitute a parallel and not a prerequisite component of the creative dance experience (Hawkins, 1964).

Self-direction and the capacity to follow structured activity in dance. The capacity for self-direction is recognized as crucial in the literature on dance education. It was emphasized by H'Doubler (1957) who considered "intelligent stimulation to self-activity" more important than "pedagogical preaching" (p. 60). Boorman (1971) considered essential the student's capacity to become the author and the director of his own effort.

Self-direction is intimately linked to dance authors' views of the choreographic process. Hawkins (1964), for example, characterized the creative process itself as self-direction. Ferdun (1972) described the choreographic process as one in which the student "works through his own

processes, commands and builds his own structures and, most importantly, achieves his own perspective" (p. 196).

Besides being related to the individual's decision-making as it is involved in the creation of a dance, self-direction has also been related to the student's self-evaluation process as well as to the evaluation of his dances. Hawkins (1964) and Turner (1969) agreed that the student must be helped to learn to evaluate his own processes and products.

Less frequently mentioned than self-direction is the student's need to be able to participate effectively in structured activities. It is usually in relation to the study of technique and performance that the concern for the ability to follow structured activities appears. The student's ability to imitate or to reproduce someone else's exact movements was regarded as essential for improvement in basic movement efficiency and formal correctness (Pease, 1976; Murray, 1953). Hawkins (1964) suggested that this ability was important in contributing to the adequacy of the body instrument. Ferdun (1972) considered that ability particularly important in the function of the dancer. Indeed, a dancer must be able to comply with the formal and expressive demands of particular dances or types of dances.

The Frame of Reference for Content

The frame of reference for content was developed to analyze how teachers handle instructional content in the teaching situation. In developing that framework, Joyce and Harootunian were particularly influenced by the contemporary approach to the concept of knowledge as a process of inquiry. In consonance with this overall attitude, they discussed two areas of inquiry identified by J.T. Schwab (1964) as fluid and stable.

The constant evolution of scholarly disciplines they point out relies on fluid areas of inquiry, that is, on those areas where new ideas emerge and where knowledge is changing at an extremely rapid rate. It also relies on more stable areas in which little change occurs throughout time. It is the theoretical position of Joyce and Harootunian (1967) that the teacher must not only understand and deal with the constant making and remaking of knowledge, but must also be able to help the student to approach knowledge with the same orientation. The analytical framework for "content" reflects this position. It considers the teacher's communication of the fluid and stable areas of inquiry as well as the way in which he handles knowledge in helping the student acquire the latter in a scholarly manner.

As the "handling of knowledge" implies strategies which have been covered in the preceding section, the communication of fluid and stable areas will be considered here.

Basic reference for analyzing the teacher's delivery of content were identified as the fluid and stable areas of inquiry proper to each subject matter. These referents served as a base for defining the two categories of "teacher delivers information" (I_4) and teacher "delivers conclusions or opinions" (I_5).

Further support for the appropriateness of Joyce's frame of reference for content was provided from indications in the dance literature which support and define the fluid and stable areas of inquiry in choreography and in technique.

Stable area of inquiry in choreography. Lunt (1974) indicated in her review of literature on choreography that no ambiguity existed regarding the substance of dance. The common belief that movement and motion constitute the essential and unique material of dance emerges quite clearly from the literature. Literature on choreography reveals a consensus regarding the elements of space, time, and dynamics as vital and constant comporents of an acceptable range of movement for dance. They are shown to be accepted as necessary and essential to the unity of a dance (Lunt, 1974).

The concepts of time, space, and dynamics constitute a stable area of knowledge in dance. The stability of these concepts throughout the evolution of choreography was pointed out by Hatch (1969) who declared:

> At the objective end of the spectrum of the "further out than" scene, the compositional materials are the essentially traditional ones of space, time, and dynamics (p. 22).

Further evidence of the stability of these movement concepts as aesthetic components of dances is provided by the literature which shows that all three have been and are currently being used by literal as well as nonliteral choreographers.

Choreographers stress metric and nonmetric notions of time as means of creating continuity in a dance. Hawkins (1964), H'Doubler (1957) and Horst (1973) used time as bound to the meter. Cunningham (Mazo, 1977), Nikolais (Cohen, 1962), and Laban (Thornton, 1973) used time as duration. Humphrey (1959), Smith (1976) and Turner (1971), on the other hand, used both interpretations of time.

From the writings of literal and nonliteral choreographers, design and stage area emerge as overall spatial structures. Most frequently these two main structures encompass such items as direction, level, dimension, floor and air patterns (Hawkins, 1964; Hayes, 1955; Horst, 1973; Humphrey, 1959; Mazo, 1977; McDonagh, 1976; Turner, 1971).

Denoted by a variety of words such as texture, energy, force, and so on, dynamics most frequently refers to the manner of executing movement or to the inner impulse animating it (Hawkins, 1964; H'Doubler, 1957; Laban cited by Thornton, 1973). Dynamics is also revealed as the most determinant factor of communication in dance (Cunningham cited by Tomkins, 1968; Hawkins, 1964; H'Doubler, 1957).

Fluid area of inquiry in choreography. As Abell (1978) mentions, dance is dynamically evolving through continuous cycles of destroying past rules and building new ones. The literature on choreography tends to suggest that the fluid area of inquiry involves the aesthetic use of the stable elements of time, space and dynamics. More particularly the fluid area is shown to be delimited by the notions of "rules of composition" or "rules of forms" as well as by the notion "dance style".

The very individual and unstable nature of some types of knowledge involved in choreography was acknowledged by Lippincott (1970) as follows: "The rules of the new choreographers are those which he sets for himself" (p. 35). Dance evolves as an art form by the constant challenging of its rules of form determined by evolving individual artists and aesthetic tastes. For example, nonliteral choreography has resulted from the negation of the rules of literal choreography.

Rules of literal choreography are recognized to be committed to the function of revealing literal or emotional meaning. Writers on literal choreography, Hawkins (1964), H'Doubler (1957), Horst (1973), and Humphrey (1959) in particular stressed the importance of the logical organization of the dance material so as to clarify its meaning. H'Doubler (1957) and Lockhart (1975) pointed out the necessity of adapting rules of form to the intent and meaning of the dance.

Influenced by the known forms of musical composition, some key forms in which dances could be structured have been identified (Horst, 1968, 1973; Humphrey, 1959; Lockhart, 1975; Smith, 1976) -- the binary, ternary, rondo, theme and variations canon, and fugue forms, to name a few. Some characteristics, principles or rules were identified by this group of writers as contributing to "good" dance, i.e., satisfying the tenets of traditional choreography. Promising characteristics of form have been identified mainly in terms of unity, continuity, sequence, contrast and variety (Lunt, 1974).

Nonliteral choreographers shared convictions that were the antithesis of those held by literal choreographers. They negated the notion that dance was connected to any literal or emotional meaning.

Serving a fundamentally different function, the forms of nonliteral dances are achieved through different and innovative methods. The classic rules of continuity, sequence, contrast and variety are no longer of importance (McDonagh, 1970). Intuitive and subconscious handling of the material is favored (Cohen, 1962). McDonagh characterized the change new choreographers brought to dance in terms of freedom (1970). According to Cohen (1962), some choreographers like Midi Garth have let the dances take their form from the experience of creation itself, or in the case of Alwin Nikolais, from the metamorphosis of the dance theme. Others, Cunningham in particular, have let "chance" determine form. The resulting dances "seem to begin, continue and end without reference to any familial pattern of continuity" (Cohen, 1962, p. 22). In nonliteral choreography, no principles are considered absolute or essential. In this style, to choreograph is to create one's own rules of forming.

The recent evolution of choreography reveals that the concept of "artistic style" also represents an essentially fluid notion. According to Abell (1978, p. 120), "the problem of the 60's in dance was no longer the forging of a new instrument but the problem of what is and what isn't dance". Implicit in the use of the term "nondance" was the expression of a concern over the loss of movement of a special kind, that is "dance looking" movements.

Until the late 1940's the range of acceptable movement for dance was quite stable and relied on gestures as source. Conforming with criteria of traditional aesthetics, this range was soon challenged by Cunningham who broadened it by considering as dance already familiar movement dissociated from its usual function (Abell, 1978, p. 119). The traditional range was exploded when Waring stated that "dance is any aimless movement - any movement without an object in mind" (cited, by Sorell, 1969, p. 3). Naturally, more "found" movements were soon accepted by some choreographers who thought that the sheer act of moving had many interesting characteristics that had not been examined (McDonagh, 1970, p. 287).

Fluid area of inquiry in technique. Fewer references were found in the literature regarding the evolution of modern dance technique as an area of inquiry. On the subject of the training of the dancer, the literature tends to provide some evidence supporting the existence of modern dance technique in general as an essentially fluid area of knowledge. More stable areas, some in which the principles seldom change (Joyce & Harootunian, 1967), seem to be agreed upon for "ballet" and "movement fundamentals".

Choreography is recognized as the essence of dance. Consequently, modern dance techniques tend to be "regarded

as intelligent approaches to movement, approaches designed to contribute to the creation of significant form" (McDonagh, 1971, p. 291). Technique and stylistic requirements are determined, in dance, by the choreographer's creative needs. As a result, modern dance technique has continually been the object of important experimentation and innovation (Cohen, 1962; Mazo, 1977). According to McDonagh (1976) "it has undergone and incorporated a great number of changes in specifics in the last few years" (p. 2). New techniques have emerged as new dance forms have been created. Horst (1973) mentioned that since its birth, modern dance has engendered a bewildering variety of body training techniques. Theoretically there could be as many physical techniques as there are performers and teachers (Horst, 1973, p. 18). This idea was reinforced by McDonagh (1976) who declared "each of the great modern dance choreographers has shaped the human body in a distinctly personal way to frame those creative ideas that he or she wanted to express" (p. 2). Modern dance technique systems have been and are based on a wide variety of movement principles or movement forms. Changes in technique were acknowledged by Cohen (1966) who declared "gone are the movements derived from contraction and release, from fall and recovery and from anything much resembling them" (p. 11).

As a whole, the above statements tend to support McDonagh's (1976) characterization of modern dance as "essentially revolutionary" (p. 2) that is, in a constant state of change.

Stable area of inquiry in technique. According to McDonagh (1971), "there is no technique to modern dance in the sense that ballet has technique" (p. 291). With regard to the training of dancers, a relatively stable area of knowledge tends to be suggested in ballet since it is universally recognized as a classical style of dance, the principles of which have not changed through time. Existing as a completely formed entity, the classical dance vocabulary is generally described as one of "formal correctness resulting from the hundred years of works by teachers and dancers contributing to its possibilities" (McDonagh, 1976, p. 1).

With regard to stable notions of technique, another area is suggested in terms of "movement fundamentals". This area usually refers to general techniques common to many modern dance styles. According to Hayes (1964), such techniques are expected to provide the dancer with skills and knowledge regarding principles of efficient movement. On this aspect, Hawkins (1964) expressed her belief in the "understanding through movement experiences of the energy-

force, gravity-balance and balance-compensation movement principles as essential basic learning to free the creator to control and mould movement in his own image" (p. 64). Cheney and Strader (1975), for their part, related the learning of movement fundamentals to the development of the fullest movement potential of the body. They further clarified the contribution of such basic learning in terms of "greatest range of motion in joints, greatest refinement of movement-producing muscles, adequate strength in the muscles bearing greatest stress and carefully developed sense of rhythm and balance" (p. 29). While Hayes (1964) defined movement fundamentals in terms of relaxation, posture, preparatory techniques, lomocomor techniques, arm exercices and awereness of rhythm, Lockhart (1973) grouped basic technical elements under the two general headings of axial and locomotor techniques.

All above considerations tend to indicate a concern of dance educators for basic technical elements as determinants of movement efficiency in dance. Although not always precisely defined, movement fundamentals appear as a relatively stable area of knowledge in technique of dance.

Frame of Reference for Social Climate

According to Joyce and Harootunian (1967) education "is a cooperative social action among adults and children"

(p. 61). Teaching goes beyond the mere handling of information and carrying out of teaching strategies designed for controlling groups. In teaching,

> one works with groups of people and deals with human relations so that an appropriate interpersonal climate emerges, that is, one in which students feel encouraged to take responsibility for directing their own individual and collective activity. (Joyce & Harootunian, 1967, p. 179)

Joyce and Harootunian (1967), primarily related the creation of an optimal climate for learning to the awareness and control of the teacher's application of sanctions. When a teacher rewards or punishes, they said, "he must do so with full knowledge of the effects he intends" (p. 112).

Joyce and Harootunian's framework for the analysis of sanctioning behavior is influenced by the authors' view of education, of the societal organization of the school and by the critical elements of successful group work as proposed by Clovis R. Shepherd. Four types of student behavior were selected as basis for categorizing teacher's sanctioning behavior. These include (a) search, (b) group relations, (c) attainment, and (d) obedience to direction or rules.

The applicability of this framework to analysis of the social climate of dance classes was inferred from manifestations in the literature of the concern of dance educators for social climate, and for the four above-

mentioned student behaviors as bases for analyzing the application of sanctions in dance classes.

The climate in dance education literature. Dance literature reveals the development of an appropriate climate as an important dimension of the teaching of dance. Using the words "atmosphere", "ambiance", and "climate", dance educators most frequently have revealed a concern with a proper climate for creativity and thus for choreography. Detailed descriptions or definitions of an appropriate climate for dance classes do not abound. Such a climate tends to be described in terms of the conditions an environment propitious to creativity should offer. One of the most developed expositions of this subject was that of Hawkins (1964).

Using Carl Rogers' theory of creativity as a framework, Hawkins (1964) defined an appropriate climate for dance as one providing for external conditions that nourish internal conditions for creativity. Designated as psychological freedom and psychological safety, such internal conditions were intended in her proposition to be nourished by environmental conditions such as freedom, understanding, stimulation and safety. A belief in freedom and safety as optimal external conditions for creativity has been expressed by many writers, including Hunter (1970), Murray (1953), Chaplin (1976), and Ririe (1969).

Discussion related to the emergence of the above-mentioned external conditions reveals many aspects of the dance class to be influential in establishing its climate. As will be shown in the following, the handling of the instructional content, the organization of activities as well as the development of adequate interpersonal relations tend to be regarded as influential factors involved in the creation of an optimal climate in dance.

The amount of structure the teacher provides represents an instructional element frequently mentioned in relation to the climate. Content and organizational matters tend to be implied in dealing with structure. Hawkins (1964) and Koch (1964) considered an adequate amount of structure as a contributing factor to psychological freedom and safety. Sharing this idea, Murray (1969) saw in structure a means of stimulating the student to go beyond "the facile, superficial, shallow and trivial" (p. 25). Structure as a means of control so that students do not take on more than they are capable of handling has been emphasized by Fleming (1969). She recognized a need for the structure to be adaptable to each student's uniqueness.

The fostering of concentration has been recognized as an influence on the climate. Chaplin (1976), North (1971), and Ririe (1969) considered the complete concentration of the person on the movement task as necessary to free the

students from their self-conciousness and to facilitate experimentation in movement. Organizational concerns underlie the fostering of concentration.

Although many writers especially Fleming (1969), Hawkins (1964), Turner (1971), Hunter (1970), Hayes, (1955), and Murray (1969) view an ideal sanctioning strategy in students' self-evaluation, the application of teacher sanctioning behaviors has been discussed in the literature and is considered to affect the climate. The need for a conscious and careful application of sanction emerges from the literature. Different sanctioning strategies have been suggested through expression of preference for the application of sanction to the individual's creative process, the dance product or specific student's behavior.

Hawkins (1964) and Hunter (1970) have emphasized a need to approve the search and growth process rather than the dance product. On this subject Hawkins (1964) declared that

> the teacher, concerned with evaluation primarily as a means of furthering the creative growth of the student, makes aesthetic judgments not in terms of the significance of the work, but rather in terms of the individual's progress and current needs. (p. 107)

Concerned about application of sanctions to the art product, Hayes (1955) and Lockhart (1973) have pointed out

some negative effects generally related to overuse and vagueness in the application of praise and/or criticism. They emphasized a need to relate praise or criticism to specific aspects of the dance product, but Hayes (1955) especially emphasized a need for balance.

Hunter (1970) related well-timed encouragement to a full awareness of possible effects of sanctioning behaviors. While, as she said, "a child will try to repeat that action for which he receives approval" (p. 126), too much encouragement may bring the child to feel "fearful of not being able to measure up" (p. 127).

With the teaching of improvisation in mind, Chaplin (1976) suggested a need to encourage specific kinds of student behavior at specific stages of the improvisional process. She recognized the approval of original behavior as particularly important at the starting or exploration stage while acknowledging that the appropriate selection of material was more important at the forming or final stage.

It appears from the preceding considerations regarding sanctioning strategies that search and attainment tend to be regarded as basic referents affecting the application of sanctions in dance classes. No support was found for the concept of group relation or obedience to directions and rules to be sanctioning concerns of dance educators.

In light of current literary views on the climate of dance classes, it appears that broader concerns than those of interpersonal relations tend to be related to the emergence of an optimal climate (i.e. handling of content and organizational aspects). It was also shown that among Joyce's four basic referents, only those of search and attainment currently were recognized by dance educators as influencing the sanctioning process. On the basis of this information, a limited applicability of Joyce's frame of reference for the analysis of the climate of dance classes was inferred.

CHAPTER III

PROCEDURES

The purpose of this study was to describe the teaching process as it occurred in two different kinds of dance classes. One of the classes focused on choreography and the other on technique. More particularly the research sought to characterize the behavior of two experienced teachers as they were observed in each setting. The characterization was done in terms of: (a) the proportion of verbal and nonverbal behaviors, (b) the directness or indirectness of the instructional approach, (c) the instructional flexibility, and (d) the dominant teaching patterns. This chapter reports the procedures utilized in carrying out the research.

Preliminary Preparation

The preliminary preparation for the study involved the following general procedures: (a) the selection of the data collection instrument; (b) the adaptation of Joyce's model of teacher behaviors analysis, and (c) the pilot testing of the instrument.

The Selection of the Data Collection Instrument

The identification of the three criteria used as guides for selecting the data collection instrument employed in this study grew out of two primary concerns: (a) the investigator's interest in teacher education and (b) her awareness of current educational research dealing with teaching as an interactive process occurring for the purpose of facilitating learning.

In order for the instrument of systematic observation to be appropriate for the purpose of this research, it had to have the potential for reflecting teacher manipulation of the learning environment. This criterion was represented by the analysis of teacher behaviors as key elements in the creation of a learning environment. Secondly, the instrument had to focus on both teacher and student. This was considered essential to the study of the interactive nature of teaching. Finally, to account for the essentially nonverbal nature of the dance subject matter, the instrument had to allow for the recording of both verbal and nonverbal dimensions of the on-going communication process.

Joyce and Harootunian's model (1967) for the analysis of teacher behavior appeared to be an attractive option because of its capacity to meet the first selection criterion. This system was perceived to possess the potential

for reflecting the teacher's manipulation of three essential components of any learning environment: organization, information and sanction. Joyce's model was specifically devised as a means of helping teachers increase awareness and control of their teaching behavior, as well as helping them enlarge their teaching repertoire. It was thus selected for use in this study.

Because it was limited in consideration of the teacher's verbal communication, Joyce's system was modified to meet the first and second criteria. These modifications of the original system were influenced by two existing category systems: those of the Cheffers Adaptation of Flanders Interaction Analysis (Cheffers et al., 1974), and Grant and Hennings' system for the analysis of nonverbal teacher activity (1971).

The Adaptation of Joyce's Model of Teacher Behaviors Analysis

Modifications which were introduced to Joyce's system can be summarized as follows. First, five categories of CAFIAS (Cheffers et al., 1974) were added. They correspond to the three verbal and nonverbal student categories and those of silence and confusion. These additions made the system feasible for the description of the teacher-student interaction, and for the recording of those events other than student or teacher behaviors. Second, to allow for

the recording of the teacher's nonverbal communications, a nonverbal equivalent was added to each of Joyce's verbal categories. The latter modification was derived from Cheffers (1974) but was based on Grant and Hennings' (1971) idea of categorizing teacher's nonverbal activity as physical motions serving the function of the verbal communication.

As a whole, the investigator's adaptation included 22 subcategories, each (excepting silence and confusion) being defined in terms of verbal and nonverbal communication. The complete description of the category system and of its instructions for coding and analyzing the coded information is provided in Appendix A. The teacher's communication is analyzed through four teacher categories, which are divided into a total of 17 subcategories. The four main categories include: (a) sanction, (b) procedure, (c) information, and (d) maintenance. The student's communication was analyzed in three categories: "entirely predictable student responses", "predictable student responses requiring some measure of evaluation and synthesis", and "unpredictable student behavior".

Instructions used for coding are those suggested by Cheffers et al. (1974). In the course of this report "LAJS" refers to the Lord Adaptation of Joyce's system.

Pilot Testing of the Instrument

The procedure for establishing the reliability and objectivity of the LAJS include: (a) description of the background of the main coder; (b) the selection of a secondary coder; (c) the training of the coders, and (d) the testing of the tool.

Description of the background of the main coder. The investigator was the main coder. She was introduced to Joyce's system of teacher behavior analysis at Laval University (Québec, Canada) when she served as a coder in Turcotte's (In Dussault, 1973) study in 1970. A total of 40 hours was devoted to the mastery of that observational tool.

Later, as part of a graduate seminar at the School of Health, Physical Education and Recreation at the University of North Carolina at Greensboro, the investigator was introduced to the CAFIAS system (Cheffers et al., 1974). A total of approximately fifteen hours were devoted to applying this tool to the systematic observation of live movement classes (dance, swimming, gymnastics, tennis).

Selection of a secondary coder. To test the objectivity and reliability of the LAJS, a second coder and to be trained to its use. The criteria for selection of a coder included:

competence in dance, in both areas of technique and choreography; teaching experience in dance; willingness to make a time commitment of approximately 90 hours during the spring semester of 1978; and an expression of interest in the study of teacher behavior in dance.

The coder selected was a dance specialist with a Master's degree in dance who held a part-time teaching position in dance in the city of Greensboro.

The training of the coders. A 10-week training program was completed between January 27th and March 30th, 1978. Two-hour training sessions were scheduled twice a week until March 20th, 1978. Three meetings a week were held for the last two weeks. A total of 40 training hours was thus attained. The training program was focused on choreography, technique and improvisation classes and was devoted primarily to the coding of audio-video tapes.

The first meeting was used for general information purposes. During this period, further information regarding the nature of the work to be undertaken was provided. A copy of Joyce's "Manual for Analyzing the Oral Communications of the Teachers", the investigator's adaptation of that manual, and the outline of the training program were given to the coder. The remainder of the session was

devoted to the presentation and explanation of the basic rationale of Joyce's system and to the verbal description of its constituent categories with verbal illustrations of each.

The general pattern used in training included a verbal orientation to the categories on the program of the session followed by practice coding session emphasizing these particular categories. Immediately after the coding of each selected short interval of the training tape, the coder and the investigator compared the observations recorded and discussed and clarified points of confusion. Replay of the training tape and the setting up of ground rules were effected as necessary.

The training program, which was planned by the investigator and approved by an expert in teacher behavior before it began, followed a simple-to-complex progression. An outline of the program is illustrated in Figure 1. As shown in that figure, attention was given first to the teacher's four basic verbal categories of sanction, procedure, information, and maintenance. These were subsequently studied in their direct verbal subcategories, nonverbal subcategories and students' responses which these teacher behaviors elicited. An identical progression was repeated for the indirect subcategories. This progression was followed from January 29th until March 17th, 1978, the

Date	Purpose	Material teaching samples from
Jan 30	To discriminate teachers' categories	Technique and choreography classes
Feb 1	To discriminate teachers' categories	Technique and choreography classes
Feb 6	To discriminate subcategories (V)	Technique classes
Feb 8	To discriminate direct subcategories (V NV)	Technique classes
Feb 13	To discriminate direct subcategories (V NV Stud)	Technique classes
Feb 15	To discriminate direct subcategories (V NV Stud)	Technique classes
Feb 20	To discriminate indirect subcategories (V)	Choreography classes
Feb 22	To discriminate indirect subcategories (V NV)	Choreograpny classes
Feb 27	To discriminate indirect subcategories (NV Stud)	Choreography classes
March 1	To discriminate indirect subcategories (V NV Stud)	Choreography classes
March 13	To discriminate all categories (V NV); all sanctions	Technique and choreography classes
March 15	Work on all categories and timing	Technique and choreography classes
March 17	1 test	Technique and choreography classes
March 20	Work according to needs	Technique and choreography classes
March 22	Work according to needs	Technique and choreography classes
March 24	Work according to needs	Technique and choreography classes
March 27	Work according to needs	Technique and choreography classes
March 29	Work according to needs	Technique and choreography classes
Jan 27	(Information meeting)	Technique and choreography classes

Figure 1. Outline of the Training Program

date of the first test of the objectivity of the system. At this time, a Spearman's rank correlation coefficient between the top ten cells of each coder was found to be significant (rho = .79). However, since there was greater disagreement between the coders on the teacher categories of "delivering information" (I_4) and "delivering personal conclusions or opinions" (I_5), the last six training sessions following the test focused primarily on these two categories.

The testing of the LAJS. The procedures undertaken for the testing of the LAJS included: the selection of the material to be coded; the first coding of the selected material; the second coding of the selected material; the compilation of the results of the testing.

The selection of the material to be coded during the testing sessions sought to include a wide range of teaching material to insure a better representation of the teacher behavior to be studied in the present investigation. A total of 30 minutes of teaching was selected for each of the two teacher-subjects involved in this study. Fifteen minutes were focused on the teaching of choreography and the remaining 15 on technique. Each 15-minute time period consisted of three five-minute intervals randomly selected from video tapes of the beginning, middle, and end of dance

classes. Except samples number one and number two which were used at the beginning of the program, none of the material selected had been used for training. The tapes selected for testing purposes are identified in Figure 2.

The first coding session was conducted on April 4 and 6, 1978. The six teaching samples of teacher number one were coded on the first day and those of teacher number two on the second. An identical schedule which included morning and afternoon sessions was followed each day.

On the basis of the coders' preferences, the three five-minute samples of choreography were coded during the morning session while those dealing with technique were coded during the afternoon. The general pattern for the coding of each five minutes was as follows. First, the coders viewed the tape without coding. This was done to obtain an idea of the material to be coded as well as to verify the audibility of the communication. Second, the coders agreed on a cue for the starting point for coding. Third, the coders began coding, each one recording her observations independently. The recording of each five minutes was made on a separate sheet, clearly identifying the name of the coder, the date, the teacher, the content (technique or choreography) and the moment of recording (beginning, middle or end of the class). At

	Moment of recording	Tape	Location
TEACHER # 1			
Choreography			
1° 5 minutes	Beginning	Sample # 3	Min 25 - 30
2° 5 minutes	Middle	Familiarization tape	Min 5 - 10
3° 5 minutes	End	Familiarisation to sample # 4	Min 25 - 30
Technique			
1° 5 minutes	Beginning	Sample # 3	Min 0 - 5
2° 5 minutes	Middle	Familiarization tape	Min 5 - 10
3° 5 minutes	End	Sample # 4	Min 15 - 20
TEACHER # 2			
Choreography			
1° 5 minutes	Beginning	Familiarization tape	Min 0 - 5
2° 5 minutes	Middle	Familiarization tape	Min 15 - 20
3° 5 minutes	End	Sample # 3	Min 15 - 20
Technique			
1° 5 minutes	Beginning	Sample # 3	Min 15 - 20
2° 5 minutes	Middle	Sample # 4	Min 0 - 15
3° 5 minutes	End	Sample # 1	

Figure 2. Teaching Samples Selected for the Testing of Lord's Adaptation of Joyce's System of Analysis of Teacher Behaviors

any time during the coding any of the coders was free to stop the tape and replay a sequence as many times as required.

The second coding session followed a design similar to the first. It was held on April 11 and 12, 1978 in the same setting as the first session.

The data gathered from the two coding sessions were used to estimate the objectivity and reliability of the system. For the purpose of analysis they were organized by computer into four matrices. The computer program for interaction analysis data developed by Ken Rodgers (Cheffers et al., 1974) was implemented, using the Academic Computer Center at UNC-G.

Both aspects of interjudge agreement and intrajudge agreement over occasion were estimated to establish the degree of confidence that could be placed in the LAJS. In the context of this study, the interobserver agreement is referred to as "objectivity" while the intraobserver agreement is referred to as "reliability". Based on the recommendation of the literature, a coefficient of agreement of .80 or better was selected as an acceptable standard for both objectivity and reliability (Anderson & Fishman, 1971; Barrett, 1969).

In order to determine the objectivity of the LAJS, a Spearman rank correlation technique was applied to the first

top ten cells of each coder's matrices. The recorded observations gathered during the first recording session were the data from which these two matrices were built. An objectivity coefficient of .81 was obtained. This coefficient was considered satisfactory. Raw data used for calculation of the rho are shown in Appendix B.

The estimation of the reliability of the system was accomplished by the same procedures used to test objectivity. A reliability coefficient was calculated for each coder. Each coder's matrices built from her coded observations in the first and second coding sessions provided the data. A correlation between the rank order of the first top ten cells of each coder's matrices was calculated. A reliability coefficient of .94 was obtained for coder one and one of .89 was obtained for coder two. Raw data used for the calculation of these two coefficients are shown in Appendix B.

Collection of data

The procedures undertaken for the collection of data for the present study are subsequently described. These procedures include the selection of the teachers and classes to be observed, the video-taping of the classes, and the systematic recording of teacher behavior from the taped samples.

Selection of Teachers and Classes

The selection of the teachers and classes to be videotaped was guided by the purpose of the study.

Two teachers were selected on the basis of three criteria: (a) the teachers had to be involved in the teaching of dance classes offered within the programs of the Dance Division of the School of Health, Physical Education, Recreation and Dance at the University of North Carolina at Greensboro; (b) each teacher had to possess at least a Master's degree in dance and teaching experience of at least two years at the university level; and (c) each teacher had to be concomitantly involved in the teaching of technique and choreography classes. The last criterion was added in an attempt to minimize the number of factors affecting the two settings to be studied. More information regarding the two teachers involved in this study is provided in Appendix C.

Since only two teachers met the above three criteria, the selection of the classes was primarily dependent on the teachers. After considering the focus and schedule of the classes available, the investigator selected two classes of choreography and modern dance technique. For teacher number one, these classes included "Intermediate Dance Choreography" and "Low Intermediate Modern Dance";

for teacher number two, "Choreography for Large Groups and Long Dances" and "High Intermediate Modern Dance". Both technique classes and one choreography class, "High Intermediate Modern Dance", were at the undergraduate level, while the "Choreography for Large Groups and Long Dances" class was a graduate course. More information regarding the classes involved in this study is provided in Appendix C.

Procedures for Video-Taping

The establishment of the video-taping schedule. Because it was important to sample teaching representative of teacher behavior occurring in the choreography and technique settings over the course of a semester, the video-taping was scheduled over a 15-week interval. During the spring semester, 1978, five 30-minute audio-visual recordings were made in each of the four dance classes selected. The recording schedule was established according to the following procedures.

The semester was divided into the three basic units: introduction, core, and end. The introduction and end units were arbitrarily fixed as the first and last three weeks of the spring semester while the core unit covered the 11 intermediate weeks. One recording session was arbitrarily drawn from each introductory and end unit while three more were randomly drawn from the core unit. Due to an unpredictable

absence of teacher number one, the recording of her technique and choreography classes could not be made within the time limit of the introductory unit. Instead, these recordings were made during the first week of the core unit. This was acknowledged to be a weakness in the representativeness of her teacher behaviors over the entire semester.

The recording times were randomly determined to be at the beginning, middle, or end of the scheduled periods. Each class lasted one hour and a half. The beginning was arbitrarily determined as the first half-hour; the middle as the second; and the end as the last half-hour. Altogether, samples were recorded according to this basic design. Each teacher received a copy of the schedule developed for the 20 sessions and the recording times. The latter is shown in Figure 3.

The overall recording strategy. In order to control for the "Hawthorne effect", the following procedures were followed during the course of this investigation.

The investigator met each teacher prior to the beginning of the recording period when the nature and purpose of the study was explained. Also, each teacher was offered the service of the investigator as an audio-visual

Units	Week	Monday		Tuesday		Wednesday		Thursday	
		Date	Moment	Date	Moment	Date	Moment	Date	Moment
Introduction	1								
	2								
	3					[1]Jan 25 T	End	[1]Jan 26 C	Beg.
Core	4			[1]Jan 31 C [1]Jan 31 T	Mid. End				
	5								
	6	[2]Feb 13 T	Mid.	[2]Feb 14 T [2]Feb 14 C	Mid. Beg.				
	7								
	8			[2]Feb 28 C	Mid.				
	9	← - -	- - - -	- - - - - -	- → Spring break		← - -	- - - - - - - -	→
	10								
	11			[3]Mar 21 C	Beg.			[3]Mar 23 T [3]Mar 23 C	Beg. End
	12					[3]Mar 29 T	Beg.	[4]Mar 30 C [4]Mar 30 C [4]Mar 30 T	End End End
	13	[4]Apr 3 T	Mid.						
	14								
End	15					[5]Apr 19 T	End	[5]Apr 20 T [5]Apr 20 C [5]Apr 20 C	Mid. Mid. End
	16								
	17								

Figure 3. Schedule of the Recording Sessions and Moment of Recording

assistant. The teachers could take advantage of the audio-visual equipment in any way and at any time they liked except at the time of the data collection. At least one visit called "familiarization" preceded the recording of each teaching sample. Unless special requests were made by teacher or students, the familiarization recording was made in the same manner and time as the filming for data collection.

The video-taping technique. The audio-visual equipment was displayed in the dance studio so that minimal interference with the class occurred and maximum visibility and audition were obtained. Camera placement varied according to the choreography and technique working spaces. A front corner of the studio was the fairly consistent choice for placement of the camera in the technique setting. Placement variations were necessary, however, in the choreography setting. The most frequent camera locations were: (a) center of the studio, behind the group and facing the stage; (b) front center of the studio, in front of the group. A nondirectional microphone was suspended from the ceiling fixtures in the area most likely to be used by the teacher, generally the center of the dance studio. All equipment was installed prior to the beginning of each class. The camera was most frequently focused on the teacher and the students immediately surrounding her.

A Sony camera (model 2400 AVC) with Comisar television lens 12.5 mm, and 1.19 zoom television lens was used for recording the teaching samples. The camera was fixed on a Samson tripod (model 7201). A Sony-Matic portable video recorder (model AV-3400) was also used with a Sony power adapter (model AC-3400). No monitor was used during the video-taping sessions.

A Sony monitor television receiver with a 21-inch screen was used during the training and testing of the observation system as well as during the coding of the 20 recorded teaching samples. The equipment used was the property of the University of North Carolina at Greensboro, School of Health, Physical Education and Recreation.

The Systematic Coding of Teacher Behaviors

The systematic coding of the dance teacher behaviors provided by the video-taped teaching samples was accomplished between April 24th and May 12th, 1978. The 20 teaching samples were observed and described by the two trained coders according to the LAJS. One coder was assigned eleven tapes and the other assigned nine. Each tape was coded according to the procedures established for the testing sessions already described. The raw data drawn from each sample were recorded on sheets specifically prepared for that purpose. Clear information regarding the

sample number, class, teacher, time of recording and coder was noted on each recording sheet used for each sample. No specific schedule for coding work was followed, as each coder worked individually according to her personal schedule and the availability of the audio-visual equipment.

Procedures for Data Analysis

It was the purpose of this study to characterize dance teacher behaviors as observed in two types of classes, one of which focused on choreography, the other on technique. The characterization was made in terms of: (a) the proportion of verbal and nonverbal behaviors, (b) the directness or indirectness of teaching approach, (c) instructional flexibility, and (d) dominant teaching patterns. This section provides a description of the procedures undertaken in the analysis of the data. These procedures include those related to the organization of the data and those followed to achieve each characterization described above.

Organization of the Data

The raw data provided by the coding of the ten teaching samples of the choreography and technique classes served as the basis for characterizing dance teacher behavior.

Prior to any characterization, these raw data were organized by computer into six matrices. These matrices included two master matrices resulting from the combination of the total number of observations recorded in each setting and four submatrices resulting from the combination of the observations recorded for each individual teacher in each setting. The computer program used for this purpose was the one designed for CAFIAS (Lock, Martinek, & Phelps, 1978).

Each characterization was made from the master matrix for each setting and each of the four submatrices. Different aspects of the same basic data were used for each type of characterization.

Procedures Followed for the Characterization in Terms of Proportion of Verbal and Nonverbal Behaviors

The characterization of dance teacher behavior in terms of their verbal and nonverbal proportion was obtained from analysis of frequencies recorded for both dimensions. Total frequencies recorded for the verbal dimension, the nonverbal dimension, and the composite dimension (verbal and nonverbal) of all teacher categories were derived from each matrix. Subsequently, a percentage of verbal and nonverbal behaviors and a ratio of verbal to nonverbal behaviors was calculated.

A more specific characterization in terms of verbal and nonverbal behaviors was also made for each category of teacher behavior. The frequencies of verbal, nonverbal, and total dimensions (verbal and nonverbal) were calculated for each of the sanction, procedure, information and maintenance categories. Specific information regarding the use of the verbal and nonverbal communications throughout these four types of teacher behavior was thus provided.

Procedures Followed for the Characterization in Terms of Directness and Indirectness of Teaching Approaches

Operational definitions of directness and indirectness in teaching originated mainly from the work of Flanders (1974). He referred to teacher influence as "a series of acts along a time line" (p. 113) and defined these two terms as follows: (a) direct teacher influence corresponds to teacher behaviors "which restricted a student's freedom of action by focusing attention on a problem or interjecting teacher authority, or both" (p. 115); (b) indirect teacher influence refers to teacher behavior "which expanded a student's freedom of action by encouraging his verbal participation and initiative" (p. 115). In providing these definitions, Flanders (1974) emphasized the idea that both types of approaches are necessary in teaching, that they should not be considered as good or bad but rather as coherent or not with the teacher's beliefs and intentions.

Joyce and Harootunian (1967) based the identification of the procedure and information subcategories on a reflective-structured dichotomy. Consistent with Flander's position, these subcategories were defined as either reflective (indirect) or structuring (direct). A summary of Joyce's definition of procedure and information subcategories is provided in Figure 4.

To determine how direct or indirect teacher behaviors relate to procedure and information categories, Joyce and Hodges (1966) and Flanders and Amidon (1967) proposed the use of I/D ratio. In most recent form, such a ratio is expressed as the number of indirect behaviors recorded for one category divided by the number of direct behaviors recorded for one category divided by the number of direct behaviors recorded for the same category. Considering that the LAJS allows for the recording of the verbal and nonverbal dimensions of the communication taking place, the I/D ratio was expressed by the following formula for the information category:

$$I/D = \frac{I_1 + i_1 + I_2 + i_2}{I_3 + i_3 + I_4 + i_4 + I_5 + i_5}$$

and by the following one for the procedure category:

$$I/D = \frac{P_1 + p_1 + P_2 + p_2}{P_3 + p_3 + P_4 + p_4}$$

Information		Procedure	
Direct	Indirect	Direct	Indirect
I_3: Questions for precise answers	I_1: Helps student to theorize	P_4: Imposes standards of performance	P_1: Helps students to determine standards of performance
I_4: Delivers information	I_2: Helps students toward self-expression	P_3: Imposes a plan or a procedure	P_2: Helps students to develop a plan or a procedure
I_5: Delivers conclusions or opinions			

Figure 4. Joyce's Definition of Procedure and Information Subcategories

Information regarding the interpretation of such a ratio was provided by Flanders and Amidon (1967) who suggested typifying teacher behavior as either direct or indirect according to the part of the ratio which included more than half of the behaviors.

Because a direct/indirect dichotomy was presented only in the definition of the information and procedure category the characterization of directness and indirectness of teacher behaviors studied was based on the total value of the I/D ratio calculated for each of these categories. The ratios were obtained from the number of tallies recorded under the total dimension of the indirect subcategories of information and procedure and the number of tallies recorded under the total dimension of their direct subcategories.

More particularly, the number of tallies recorded in the master matrices of the choreography and technique classes under the direct and indirect subcategories of information and procedure was expressed in two I/D ratios. The characterization in terms of directness or indirectness of approach was made for each category according to the values of their respective ratios.

Procedures Followed for the Characterization of Instructional Flexibility

On the basis of the two types of strategies that Joyce and Harootunian (1967) identified for the information and procedure categories, flexibility was defined as the teacher's shifts from reflective to structuring or structuring to reflective strategies. Borrowing the Flanders' idea, Joyce and Harootunian used a ratio of reflective over structuring teacher behaviors recorded in the information or procedure category as an indicator of flexibility in teaching. Instead of the value of the ratio, the degree of discrepancy between the ratio components was used. The higher the discrepancy, the lower the flexibility and vice-versa. A reflective/structured strategies ratio procedure was thus used to characterize dance teacher behaviors in terms of their flexibility. However, in order to account for shifts in strategies only the number of one-way transitions (pairs of teacher behaviors that were not composed of identical symbols) for each of information and procedure subcategory was used in the calculation of the ratios.

Prior to the establishment of the reflective/structured strategies ratios, the number of steady state cells was parceled out from the matrices. A steady state cell refers to a pair of behaviors composed of identical symbols of behaviors (Flanders, 1970). It indicates that the behavior

was maintained long enough to necessitate the recording of several units. The parceling out of the steady state cells enabled the researcher to identify the transition cells for each subcategory of procedure and information. The number of one-way transitions for each subcategory was used to calculate reflective/structured strategy ratios for information and procedure. The dance teacher behaviors were characterized as flexible or inflexible on the basis of the degree of discrepancy between each ratio component.

Procedures Followed for the Characterization in Terms of Dominant Teaching Patterns

According to Flanders (1970), teaching patterns are short chains of events an observer can identify which occur frequently enough to be of interest. In this study, major teaching patterns were identified as the short chains of events which emerged from the five top cells of each matrix. They were established by locating the five top cells along with the behaviors which most frequently preceded and followed those of the top cell. This was done according to Flanders' (1970) principle of flow chart development. The following event was located as the "unmarked cell with the highest frequency" (p. 117) in the row which was designated by the second symbol in the address of the starting cell. The preceding event was located as the unmarked cell with

highest frequency in the column which was designated by the first symbol in the address of the starting cell. The characterization of the observed dance teacher behaviors in terms of their major teaching patterns was made according to the general characteristics which emerged from the examination of these dominant teaching patterns.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to characterize dance teacher behaviors in two types of classes, one of which focused on choreography, the other on technique. The characterization was made in terms of: (a) the proportion of verbal and nonverbal behaviors; (b) the directness or indirectness of instructional approach; (c) the flexibility of strategy; and (d) the dominant teaching patterns.

The research purpose was achieved from the data provided by two master matrices, built from the observations gathered in choreography and technique classes, respectively, which included 8,179 tallies for choreography and 14,659 tallies for technique. In order to see how general characteristics compared with those of each teacher, individual teacher behaviors were characterized. The two submatrices built from the observations of each teacher in each setting were used for this purpose.

The data provided by the choreography classes are presented first. They are followed by those provided by the technique classes.

Results from Choreography Classes

Proportion of Verbal and Nonverbal Behaviors

The percentage of verbal and nonverbal behaviors and the ratio of verbal to nonverbal behaviors calculated for all categories and each individual category of sanction, procedure, information and maintenance served as bases for characterizing teacher behaviors observed in choreography classes.

According to the data provided by the master matrix, 72% of all behaviors used in the teaching of choreography were verbal and 28% were nonverbal. The total value of the ratio of verbal to nonverbal behaviors was 2.53.

The first and second most frequent teacher behavior categories were information (2,711) and procedure (677), respectively. Teacher behaviors of the maintenance category were third (256) and those of the sanction category were the least frequently used (74).

Choreographic information-giving was 67% verbal and 33% nonverbal. A total value of 1.99 was found for the ratio of verbal to nonverbal behavior of that category. The procedure category behaviors were 83% verbal and 17% nonverbal with a value of 5.04 for the ratio of verbal to nonverbal behaviors. Maintenance behaviors were 87% verbal

and 13% nonverbal. A value of 7 was found for the ratio of verbal to nonverbal behaviors, sanctioning behaviors in choreography classes were 97% verbal and 3% nonverbal. The value of the ratio of verbal to nonverbal behaviors was found to be 36. The results indicated that verbal behaviors were primarily used in choreography classes. The most evident nonverbal contributions were related to the handling of information and the least evident ones were related to the application of sanction. A summary of the data analysis for the total number of behaviors recorded in choreography classes is provided in Part I of Table 1.

According to the data provided by the two submatrices of choreography, the percentages of verbal behaviors for teacher number one and teacher number two were 76% and 70%, respectively. The percentages of nonverbal behaviors for both were 24% and 30% respectively. The ratios of verbal to nonverbal behaviors for each teacher was 3.15 and 2.34.

The highest total number of frequencies for each teacher was recorded for the information category (644 for teacher number one and 2,068 for teacher number two). The percentage of verbal and nonverbal behaviors of that category were 70% and 30% respectively for teacher number one, and 65% and 35% for teacher number two. The value of the ratios of verbal to nonverbal behaviors were 2.39

TABLE 1

Teachers' Verbal and Nonverbal Behaviors
in the Teaching of Choreography

Part I: Data Provided by the Master Matrix

	Teacher total dimension	Teacher verbal dimension	Teacher nonverbal dimension	Percentage of verbal behaviors	Percentage of nonverbal behaviors	Ratio of verbal to nonverbal behaviors
all categories	3718	2665	1053	72%	28%	2.53
information	2711	1804	907	67%	33%	1.988
procedure	677	565	112	83%	17%	5.044
sanction	74	72 -	2	97%	3%	36
maintenance	256	224	32	87%	13%	7

Part II: Data Provided by Teacher Number 1's Matrix

all categories	1038	788	250	76%	24%	3.152
information	644	454	190	70%	30%	2.389
procedure	291	238	53	82%	18%	4.49
sanction	31	30	1	97%	3%	30
maintenance	72	66	6	92%	8%	11

Part III: Data Provided by Teacher Number 2's Matrix

all categories	2681	1878	803	70%	30%	2.3387
information	2068	1351	717	65%	35%	1.8842
procedure	386	327	59	85%	15%	5.5423
sanction	43	42	1	98%	2%	42
maintenance	184	158	26	86%	14%	6.07

and 1.88 respectively. The second highest number of frequencies was found for the procedure category (291 for teacher number one and 386 for teacher number two). Each teacher's behaviors for the procedure category were shown to have respectively involved 82% (teacher number one) and 85% (teacher number two) of verbal behaviors and 18% (teacher number one) and 15% (teacher number two) of nonverbal behaviors. A value of 4.49 found for the ratio of verbal to nonverbal behaviors of teacher number one and one of 5.54 for teacher number two, with a total of 72 frequencies for teacher number one and one of 184 for teacher number two.

The maintenance category was the third most frequently used behaviors. The percentages of verbal behaviors for that category were 92% for teacher number one and 86% for teacher number two. The percentages of nonverbal behaviors were 8% for teacher number one and 14% for teacher number two. A value of 11 (teacher number one) and one of 6.07 (teacher number two) was found for the ratio of verbal to nonverbal behaviors.

The lowest total of frequencies for each teacher was recorded in the sanction category (31 for teacher number one and 43 for teacher number two). The percentage of verbal sanctioning behaviors were 97% (teacher number one) and 98% (teacher number two) with a corresponding 3% (teacher

number one) and 2% (teacher number 2) of nonverbal behaviors in that same category. The values of the ratios of verbal to nonverbal behaviors respectively were 30 (teacher number one) and 42 (teacher number two).

The results provided by the data describing each individual teacher's behaviors are similar to the information provided by the master matrix which indicated (a) that primarily verbal behaviors were used in choreography, (b) that the highest number of nonverbal contributions was related to the handling of information, and (c) that the lowest number of nonverbal contributions was related to the category of sanction.

A summary of the data analysis for each individual teacher's behaviors recorded in choreography classes is provided in Parts II and III of Table 1.

Directness and Indirectness of the Instructional Approach

Characterization in terms of directness or indirectness of teaching approach was made for each of the information and procedure categories. It was based on the value of the I/D ratio calculated for each of these teacher categories.

According to the data provided by the master matrix of choreography classes a value of .0292 was found for the

I/D ratio of the information category and one of .244 was found for the procedure category. Both ratios were considered low.

A summary of the data analysis for the total number of behaviors recorded in choreography classes is provided in Part I of Table 2.

According to the data provided by the two submatrices of the choreography setting, the values of the I/D ratio calculated for the information category was .0645 (teacher number one) and .0187 (teacher number two). The values of those calculated for the procedure category were .2763 (teacher number one) and .2215 (teacher number two). The results provided by the data of each individual teacher were found to reflect the results provided by the master matrix.

A summary of the data analysis for each individual teacher's behaviors recorded in choreography classes is provided in Parts II and III of Table 2.

Instructional Flexibility

The characterization of dance teacher behaviors in terms of instructional flexibility was made for both the information and the procedure category. This characterization was based on the degree of discrepancy found to

TABLE 2

I/D Ratio Calculation for Information
and Procedure Categories in Choreography Classes

Part I: Data Provided by the Master Matrix

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	1	$P_1 + p_1$	0
$I_2 + i_2$	76	$P_2 + p_2$	133
$I_3 + i_3$	291	$P_3 + p_3$	505
$I_4 + i_4$	383	$P_4 + p_4$	39
$I_5 + i_5$	1960		
I/D ratio = .0292		I/D ratio = .244	

Part II: Data Provided by the Matrix of Teacher Number 1

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	0	$P_1 + p_1$	0
$I_2 + i_2$	39	$P_2 + p_2$	63
$I_3 + i_3$	182	$P_3 + p_3$	220
$I_4 + i_4$	102	$P_4 + p_4$	8
$I_5 + i_5$	321		
I/D ratio = .06446		I/D ratio = .2763	

Part III: Data Provided by the Matrix of Teacher Number 2

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	1	$P_1 + p_1$	0
$I_2 + i_2$	37	$P_2 + p_2$	70
$I_3 + i_3$	109	$P_3 + p_3$	285
$I_4 + i_4$	281	$P_4 + p_4$	31
$I_5 + i_5$	1639		
I/D ratio = .01873		I/D ratio = .2215	

exist between the components of the reflective/ structured strategy ratio respectively established for each teacher category.

According to the data provided by the master matrix of choreography classes, a reflective/structured strategy ratio of 41:693 was found for the teacher behaviors of the information category. A ratio of 97:356 for the teacher behaviors of the procedure category. In a simplified form, these ratios respectively became 1:4 (procedure) and 1:21 (information). Discrepancy was observed between the two ratio components of the information category while one of a lower degree was shown to exist between those of the ratio components of the procedure category.

A summary of the data analysis for the total number of behaviors recorded in choreography classes is provided in Part I of Table 3.

According to the data provided by the two submatrices of the choreography setting, each individual teacher's reflective/structured strategy ratio established for the information were 30:290 (teacher number one) and 21:502 (teacher number two). Those obtained for the procedure category were 46:155 (teacher number one) and 51:201 (teacher number two). The tendency of each teacher's reflective/structured strategy ratio followed that of the ratios provided by the data of the master matrix.

TABLE 3

Reflective/Structure Ratios Calculated for Behaviors of Information and Procedure Categories in Choreography Classes

Part I: Data Provided by the Master Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	1	0	1	$P_1 + p_1$	0	0	0
$I_2 + i_2$	76	36	40	$P_2 + p_2$	133	36	97
$I_3 + i_3$	291	55	234	$P_3 + p_3$	505	165	340
$I_4 + i_4$	383	219	164	$P_4 + p_4$	39	23	16
$I_5 + i_5$	1960	1665	295				
Reflective/Structure Ratio: 41/693 = .0592				Reflective/Structure Ratio: 97/356 = .2725			

Part II: Teacher Number One Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	1	0	0	$P_1 + p_1$	0	0	0
$I_2 + i_2$	39	19	20	$P_2 + p_2$	63	17	46
$I_3 + i_3$	182	28	154	$P_3 + p_3$	220	68	152
$I_4 + i_4$	102	48	54	$P_4 + p_4$	8	5	3
$I_5 + i_5$	321	239	82				
Reflective/Structure Ratio: 30/290 = .1034				Reflective/Structure Ratio: 46/155 = .2968			

Part III: Teacher Number Two Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	1	0	1	$P_1 + p_1$	0	0	0
$I_2 + i_2$	37	17	20	$P_2 + p_2$	70	19	51
$I_3 + i_3$	109	27	82	$P_3 + p_3$	285	97	188
$I_4 + i_4$	281	174	207	$P_4 + p_4$	31	18	13
$I_5 + i_5$	1639	1426	213				
Reflective/Structure Ratio: 21/502 = .0418				Reflective/Structure Ratio: 51/201 = .2537			

A summary of the data analysis for each individual teacher's behaviors recorded in choreography classes is provided in Parts II and II of Table 3.

Dominant Teaching Patterns

The characterization of choreography teacher behaviors in terms of dominant teaching patterns represented small chains of events which emerged from the five top cells of the master matrix. According to the data provided by the master matrix, the five dominant patterns of choreography classes can be described as follows:

The most frequent pattern of behaviors constituted a succession of students' verbal and nonverbal unpredictable behaviors (R_3 - r_3 - r_3 - R_3). The second most frequent pattern was initiated by teacher's verbal and nonverbal presentation of conclusions or opinions (I_5 - I_5 - i_5 - R_3) which elicited a student's unpredictable verbal behavior. The third most frequent pattern was initiated by a student's unpredictable verbal behavior (R_3 - I_5 - I_5 - i_5) which was followed by a teacher reaction in terms verbal and nonverbal extended presentation of conclusions or opinions. The fourth and fifth most frequent chain of events essentially constituted a succession of student's verbal and nonverbal unpredictable behaviors (R_3 - R_3 - r_3 - R_3 - r_3). A summary of the data analysis for the total

number of behaviors recorded in choreography classes is provided in Part I of Table 4.

According to the data provided by the two submatrices built for the choreography setting, teacher number one's dominant teaching patterns can be described in the following way: the first and second most frequently occurring patterns included student's verbal and nonverbal unpredictable behaviors (r_3 - r_3 - r_3 - R_3 and r_3 - R_3 - r_3 - R_3). The third most frequently occurring teaching pattern was initiated by a succession of student's verbal and nonverbal unpredictable behaviors (R_3 - r_3 - R_3 - 10) followed by a period of confusion. The fourth most frequent pattern consisted of alternation of confusion and student's nonverbal unpredictable behaviors (10 - r_3 - 10 - r_3). The pattern occurring next in line was initiated by a student's verbal unpredictable behaviors followed by a teacher's reaction in terms of extended verbal and nonverbal communication of personal conclusions or opinions (R_3 - I_5 - i_5 - I_5).

Teacher number two's major teaching patterns can be described as follows: her most frequent teaching pattern was composed exclusively of verbal and nonverbal communications of conclusions or opinions (I_5 - i_5 - I_5 - i_5). Her second most frequent teaching pattern was initiated by the teacher's extended verbal and nonverbal communication of

TABLE 4

Dominant Teaching Patterns
of Choreography Classes

Part I: Data Provided by the Master Matrix

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cells	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
R_3	$r_3 - r_3$	1 592	R_3
I_5	$I_5 - i_5$	727	R_3
R_3	$i_5 - I_5$	574	I_5
R_3	$R_3 - r_3$	426	r_3
R_3	$r_3 - R_3$	299	r_3

Part II: Data Provided by the Matrix of Teacher Number One

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cells	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
r_3	$r_3 - r_3$	1 194	R_3
r_3	$R_3 - r_3$	289	R_3
R_3	$r_3 - R_3$	214	10
10	$r_3 - 10$	144	r_3
R_3	$I_5 - i_5$	125	I_5

Part III: Data Provided by the Matrix of Teacher Number Two

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cells	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
i_5	$I_5 - i_5$	602	I_5
I_5	$i_5 - I_5$	495	R_3
R_3	$r_3 - r_3$	398	R_3
i_5	$I_5 - I_5$	324	R_3
r_3	$R_3 - R_3$	149	r_3

opinions or conclusions (I_5 - i_5 - I_5 - R_3), which elicited a student's verbal unpredictable behaviors. The third most frequent teaching pattern was composed of students' verbal and nonverbal unpredictable behaviors (R_3 - r_3 - r_3 - R_3). The fourth one consisted of extended verbal and nonverbal communication of conclusions or opinions (i_5 - I_5 - I_5 - R_3) which elicited a student's verbal unpredictable behavior. A succession of student's verbal and nonverbal unpredictable behaviors (R_3 - r_3 - r_3 - R_3) formed the fifth most frequent teaching pattern of teacher number two.

The components of the two teachers' dominant teaching patterns of choreography classes differed from each other and from those found for the total number of behaviors recorded. A summary of the data analysis for each individual teacher's behaviors recorded in choreography classes is provided in Parts II and III of Table 4.

Results from Technique Classes

Proportion of Verbal and Nonverbal Behaviors

The percentage of verbal behaviors, the percentage of nonverbal behaviors and the ratio of verbal to nonverbal behaviors calculated for all categories and each individual

category of sanction, procedure, information and maintenance served as bases for characterizing teacher behaviors observed in technique classes.

According to the data provided by the master matrix, 54% of all behaviors used in the teaching of technique were verbal and 46% were nonverbal. The value of the ratio of verbal to nonverbal behaviors was 1.18.

The first and second most frequent teacher behavior categories were information (6,044) and procedure (3,780), respectively. Teacher behaviors dealing with maintenance were third (401) and those dealing with sanction were the least frequently used (331).

Information giving about technique was 51% verbal and 49% nonverbal. A value of 1.05 was found for the ratio of verbal to nonverbal behavior of that category. The procedure category behaviors were 52% verbal and 48% nonverbal with a ratio of verbal to nonverbal behaviors which had a value of 1.08. The maintenance behaviors were 83% verbal and 17% nonverbal behaviors. A value of 4.81 was found for the ratio of verbal to nonverbal behaviors. Sanctioning behaviors in technique classes were 96% verbal and 4% nonverbal. The value of the ratio of verbal to nonverbal behavior was found to be 24.5. These results indicate that, in technique classes, a high number of both verbal and nonverbal communications were involved in the

handling of information and the development of procedure. Primarily verbal communications were involved in maintenance and sanction categories of teacher behavior. A summary of the data analysis for the total number of behaviors recorded in technique classes is provided in Part I of Table 5.

According to the data provided by the two submatrices of technique, the percentages of verbal behaviors for teacher number one and teacher number two were 52% and 56% respectively. The percentage of nonverbal behaviors for both were 48% and 44% respectively. The value of the ratios of verbal to nonverbal behaviors for each teacher was 1.08 and 1.29.

The highest total number of frequencies, for each teacher, was recorded under the information category (3,071 for teacher number one and 2,973 for teacher number two). The percentages of verbal and nonverbal behaviors of that category were 50% and 50% for teacher number one respectively and 53% and 47% for teacher number two, while the values of the ratios of verbal to nonverbal behaviors were .98 and 1.12. The second highest number of frequencies was found for the procedure category (2,193 for teacher number one, and 1,587 for teacher number two). Each teacher's behaviors in that category were shown to have respectively involved 49% (teacher number one) and 56% (teacher

TABLE 5

Teachers' Verbal and Nonverbal Behaviors
in the Teaching of Technique

	Teacher total dimension	Teacher verbal dimension	Teacher nonverbal dimension	Percentage of verbal behaviors	Percentage of nonverbal behaviors	Ratio of verbal to nonverbal behaviors
Part I: Data Provided by the Master Matrix						
all categories	10556	5704	4832	54%	46%	1.18
information	6044	3091	2953	51%	49%	1.05
procedure	3780	1963	1817	52%	48%	1.08
sanction	331	318	13	96%	4%	24.5
maintenance	401	332	69	83%	17%	4.81
Part II: Data Provided by the Teacher Number 1's Matrix						
all categories	5589	2905	2684	52%	48%	1.08
information	3071	1522	1549	50%	50%	1
procedure	2193	1075	1118	49%	51%	.96
sanction	161	161	0	100%	0%	161
maintenance	164	147	17	90%	10%	8.64
Part III: Data Provided by Teacher Number 2's Matrix						
all categories	4967	2799	2168	56%	44%	1.29
information	2973	1569	1404	53%	47%	1.12
procedure	1587	888	699	56%	44%	1.27
sanction	170	157	13	92%	8%	12.07
maintenance	237	185	52	78%	22%	3.55

number two) of verbal behaviors and 51% (teacher number one) and 44% (teacher number two) of nonverbal behaviors. A value of .96 was found for the ratio of verbal to nonverbal behaviors of teacher number one and one of 1.27 for that of teacher number two.

With a total of 164 frequencies for teacher number one and one of 237 for teacher number two, the maintenance category was the third most frequently used behavior. The percentages of verbal behaviors for that category were 90% for teacher number one and 78% for teacher number two. The percentages of nonverbal behaviors were 10% for teacher number one and 22% for teacher number two. Values of 8.64 (teacher number one) and 3.55 (teacher number two) were found for the ratio of verbal to nonverbal behaviors.

In the technique classes, the lowest total of frequencies for each teacher was recorded under the sanction category (161 for teacher number one and 170 for teacher number two). The percentages of verbal sanctioning behaviors were 100% (teacher number one) and 92% (teacher number two). Those of the nonverbal behaviors were 0% (teacher number one) and 8% (teacher number two). The value of the ratios of verbal to nonverbal behaviors respectively were ∞ (teacher number one) and 12.07 (teacher number two).

In addition to supporting the general pattern of verbal and nonverbal proportions provided by the data of the master matrix of technique, the comparison of the data provided by the two submatrices revealed that, for the information and procedure categories, teacher number one's communication was more nonverbal than that of teacher number two. A summary of the data analysis for each individual teacher's behaviors recorded in technique classes is provided in Parts II and III of Table 5.

Directness and Indirectness of Teaching Approach

The characterization of dance teacher's behaviors in terms of directness or indirectness of approach was made for each of the information and procedure categories. It was based on the value of the I/D ratio calculated for each of these teacher categories.

According to the data provided by the master matrix of technique classes, a value of .00033 was found for the teacher behavior of the information category and one of .0183 was found for that of teacher behaviors of the procedure category. The value of both ratios were very low. A summary of the data analysis for the total number of behaviors recorded in technique classes is provided in Part I of Table 6.

According to the data provided by the two submatrices built for the technique setting, each individual teacher's

TABLE 6

I/D Ratio Calculated for Behaviors
of Information and Procedure Categories
in Technique Classes

Part I: Data Provided by the Master Matrix

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	0	$P_1 + p_1$	0
$I_2 + i_2$	2	$P_2 + p_2$	68
$I_3 + i_3$	67	$P_3 + p_3$	3704
$I_4 + i_4$	5908	$P_4 + p_4$	8
$I_5 + i_5$	67		
I/D Ratio = .00033		I/D Ratio = .0183	

Part II: Data Provided by the Matrix of Teacher Number 1

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	0	$P_1 + p_1$	0
$I_2 + i_2$	0	$P_2 + p_2$	30
$I_3 + i_3$	25	$P_3 + p_3$	2163
$I_4 + i_4$	3036	$P_4 + p_4$	0
$I_5 + i_5$	10		
I/D Ratio = 0		I/D Ratio = .0138	

Part III: Data Provided by the Matrix of Teacher Number 2

INFORMATION		PROCEDURE	
Total Dimension	Number of Tallies	Total Dimension	Number of Tallies
$I_1 + i_1$	0	$P_1 + p_1$	0
$I_2 + i_2$	2	$P_2 + p_2$	38
$I_3 + i_3$	42	$P_3 + p_3$	1541
$I_4 + i_4$	2872	$P_4 + p_4$	8
$I_5 + i_5$	57		
I/D Ratio = .000673		I/D Ratio = .02453	

I/D ratio for the teacher behaviors of the information category had a value of 0 (teacher number one) and .00067 (teacher number two). Those calculated for the teacher behaviors of the procedure category had a value of .0138 (teacher number one) and .0245 (teacher number two). The results provided by the data of each individual teacher were found to reflect those provided by the data of the master matrix.

A summary of the data analysis for each individual teacher's behaviors recorded in technique classes is provided in Parts II and III of Table 6.

Instructional Flexibility

The characterization of dance teacher behaviors in terms of instructional flexibility was made for both the information and the procedure categories. It was based on the degree of discrepancy found between the components of the reflective/structured strategy ratio respectively established for each teacher category.

According to the data provided by the master matrix of technique classes, a reflective/sturctured strategy ratio of 2:2,581 was found for the teacher behaviors of the information category and one of 58:2,539 for the teacher behaviors of the procedure category. In a simplified version these ratios respectively became 1:1,291 (information) and

1:44. Much discrepancy was evidenced between the ratio components of both information and procedure categories. A lower one was shown to exist between those of the reflective/structured stragegy ratio of the procedure category. A new degree of strategic flexibility was indicated. A summary of the data analysis for the total number of behaviors recorded in technique classes is provided in Part I of Table 7.

According to the data provided by the two submatrices built for the technique setting, each individual teacher's reflective/structured strategy ratio established for the information category were 0:1,374 (teacher number one) and 2:1,221 (teacher number two). Those obtained for the procedure category were 29:1,525 (teacher number one) and 29:1,025 (teacher number two). The tendency of each teacher's ratio followed that of the ratios provided the master matrix.

A summary of the data analysis for each individual teacher behavior recorded in technique classes is provided in Parts II and III of Table 7.

Dominant Teaching Patterns

The characterization of technique teacher behaviors in terms of dominant teaching patterns presented small

TABLE 7

Reflective/Structure Ratios Calculated for Behaviors of Information and Procedure Categories in Technique Classes

Part I: Data Provided by the Master Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	0	0	0	$P_1 + p_1$	0	0	0
$I_2 + i_2$	2	0	2	$P_2 + p_2$	68	10	58
$I_3 + i_3$	67	7	62	$P_3 + p_3$	3704	1172	2532
$I_4 + i_4$	5908	3409	2499	$P_4 + p_4$	8	1	7
$I_5 + i_5$	67	47	20				
Reflective/Structure Ratio: 2/2581				Reflective/Structure Ratio: 58/2539			

Part II: Data Provided by Teacher Number One's Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	0	0	0	$P_1 + p_1$	0	0	0
$I_2 + i_2$	0	0	0	$P_2 + p_2$	30	1	29
$I_3 + i_3$	25	2	23	$P_3 + p_3$	2163	639	1524
$I_4 + i_4$	3036	1688	1348	$P_4 + p_4$	0	0	0
$I_5 + i_5$	10	7	3				
Reflective/Structure Ratio: 0/1374				Reflective/Structure Ratio: 29/1524			

Part III: Data Provided by Teacher Number Two's Matrix

INFORMATION				PROCEDURE			
Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells	Sub-Category	Total Column	Steady State Cells	One-Way Transition Cells
$I_1 + i_1$	0	0	0	$P_1 + p_1$	0	0	0
$I_2 + i_2$	2	0	2	$P_2 + p_2$	38	9	29
$I_3 + i_3$	42	5	38	$P_3 + p_3$	1541	523	1018
$I_4 + i_4$	2877	1721	1156	$P_4 + p_4$	8	1	7
$I_5 + i_5$	57	30	27				
Reflective/Structure Ratio: 2/1221				Reflective/Structure Ratio: 29/1025			

chains of events which emerged from the five top cells of the master matrix. According to the data provided by the master matrix, the five dominant teaching patterns of technique classes can be described as follows: The most frequent teaching pattern of technique classes was composed of teacher's communication of verbal and nonverbal information (I_4 - i_4) preceded and followed by teacher's nonverbal imposition of a plan or procedure (P_3 - I_4 - i_4 - P_3). The second most frequent pattern was initiated by an extended teacher's verbal and nonverbal communication of information (i_4 - i_4 - I_4 - r_1) which elicited a student nonverbal predictable behavior. The third most frequent pattern originated in a student's predictable nonverbal behavior which was followed by a teacher's reaction in terms of verbal and nonverbal imposition of a plan or procedure and then by another student's nonverbal behavior (r_1 - P_3 - p_3 - r_1). Evolving from a teacher's verbal communication of information, the fourth most frequent pattern was continued by a student's nonverbal predictable behavior which in turn was followed by a teacher's reaction in terms of verbal presentation of information and then by a nonverbal imposition of plan or procedure (I_4 - r_1 - I_4 - p_3). The fifth most frequent chain of teaching events was initiated by a teacher's nonverbal communication of information and nonverbal imposition of a plan or procedure which elicited a student's nonverbal predictable behavior which in turn elicited a teacher's

reaction in terms of nonverbal communication of information (i_4 - P_3 - r_1 - i_4). A summary of the data analysis for the total number of behaviors recorded in technique classes is provided in Part I of Table 8.

According to the data provided by the two submatrices built for the technique setting, teacher number one's dominant teaching patterns can be described in the following way: Her most frequent teaching pattern started with her nonverbal imposition of a plan or procedure, combined with a verbal and nonverbal communication of information which elicited a student's nonverbal predictable behavior (p_3 - I_4 - i_4 - r_1). The second most frequent pattern of information and imposition of a plan or procedure to which students responded by nonverbal predictable behavior and which, in turn, was followed by a teacher's reaction in terms of nonverbal communication of information (i_4 - P_3 - r_1 - i_4). The third most frequent teaching pattern originated in teacher's nonverbal imposition of a plan or procedure and communication of information which elicited a student's nonverbal predictable behavior, itself followed by a teacher's reaction in terms of verbal presentation of information (p_3 - i_4 - r_1 - I_4). Evolving from teacher's nonverbal communication of information which elicited a student nonverbal predictable behavior, the fourth pattern was continued by a teacher's reaction in terms of verbal

TABLE 8

Dominant Teaching Patterns
of Technique Classes

Part I: Data Provided by the Master Matrix

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cell	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
P_3	$I_4 - i_4$	2 292	P_3
i_4	$i_4 - I_4$	983	r_1
r_1	$P_3 - P_3$	940	r_1
I_4	$r_1 - I_4$	502	P_3
i_4	$P_3 - r_1$	431	i_4

Part II: Data Provided by the Matrix of Teacher Number One

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cell	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
P_3	$I_4 - i_4$	1 124	r_1
i_4	$P_3 - r_1$	820	i_4
P_3	$i_4 - r_1$	732	I_4
i_4	$r_1 - I_4$	728	P_3
P_3	$r_1 - P_3$	699	I_4

Part III: Data Provided by the Matrix of Teacher Number Two

Teacher Behavior Most Frequently Preceding the Top Cell	Top Cell	Frequencies	Teacher Behavior Most Frequently Following the Top Cell
P_3	$I_4 - i_4$	1 168	P_3
i_4	$r_1 - I_4$	774	P_3
P_3	$i_4 - r_1$	643	I_4
i_4	$P_3 - r_1$	611	i_4
P_3	$r_1 - P_3$	540	I_4

communication of information and imposition of a plan or procedure (i_4 - r_1 - I_4 - P_3). The fifth most frequent teaching pattern started with teacher's verbal imposition of a plan or procedure which elicited a student's nonverbal predictable behavior which was itself followed by a teacher's reaction in terms of verbal imposition of a plan or procedure and communication of information (P_3 - r_1 - p_3 - I_4).

Teacher number two's dominant teaching patterns can be described as follows: Her most frequent teaching pattern was composed solely of teacher behaviors. These behaviors took the forms of verbal imposition of plan or procedure, followed by a verbal and nonverbal communication of information, followed in turn by nonverbal imposition of plan or procedure (P_3 - I_4 - i_4 - p_3). Her second most frequent pattern was initiated by her nonverbal communication of information which elicited a student nonverbal predictable behavior, itself followed by a teacher's reaction in terms of verbal communication of information and imposition of plan or procedure (i_4 - r_1 - I_4 - P_3). Starting with that teacher's nonverbal imposition of plan or procedure and communication of information, which elicited a student's predictable nonverbal behavior, the third most frequent teaching pattern was concluded by the teacher's reaction in terms of verbal communication of information (p_3 - i_4 - r_1 - I_4). The fourth most frequent teaching pattern involved the teacher's nonverbal

communication if information and verbal imposition of plan and procedure which elicited a predictable student behaviors and then a teacher reaction in the form of the nonverbal communication of information ($i_4 - P_3 - r_1 - i_4$). The fifth one originated from a teacher's verbal imposition of a plan or procedure which elicited a student's nonverbal predictable behavior. The latter then elicited a teacher's reaction in terms of a verbal imposition of a plan or procedure and verbal communication of information ($P_3 - r_1 - P_3 - I_4$).

The components of the dominant teaching patterns used by each individual teacher in conducting technique classes differed from one another and from those found for the total number of behaviors recorded in that setting. A summary of the data analysis for each individual teacher's behaviors recorded in technique classes is provided in Parts II and III of Table 8.

Discussion

Proportion of Verbal and Nonverbal Behaviors

The results of the preceding characterization showed verbal teacher behaviors predominating in choreography classes. Considering that choreography is a nonverbal subject matter, the value of 2.53 found for the verbal to nonverbal ratio and the small amount of nonverbal activity (28%) might be considered

unexpected. One cause of the relatively small number of nonverbal behaviors found in the choreography setting is that the results reflected only teacher behaviors. When student behaviors were also accounted for, the percentage of nonverbal behaviors was 52%. On this basis, the number of nonverbal behaviors found in choreography classes can be said to compare with Batchelder's (1976) findings for "physical activity" setting.

The overall teacher communication in technique classes was shown to contain as many verbal as nonverbal behaviors. When student behaviors were also accounted for, the percentage of nonverbal behaviors was 47%. This quantity of nonverbal activity can be said to compare with that Batchelder (1976) found for "physical activity" classes. The findings pertaining to the overall communication in technique and choreography classes support Cheffers (1974) and Grant's (1977) points of view regarding the need to consider the teaching process as consisting of more than verbal communication alone.

In the choreography setting, the largest quantity of nonverbal teacher behaviors was found to be related to the handling of information. In the technique setting, the largest number of nonverbal teacher behaviors involved the handling of information and the development of procedure. Considering that dance is essentially a nonverbal subject

matter, this higher concentration of nonverbal activity for handling the instructional content suggests that the teaching of choreography and technique are dependent on the teacher's mastery of highly specialized nonverbal communication. Such nonverbal communication of the technique and choreography content necessitates a nonverbal professional competency in dance. Although the teaching of "academic" subject matter might involve an amount of nonverbal activity equal to that of choreography, for example, these nonverbal behaviors do not imply the mastery of an articulated body language. Indeed, to write on the blackboard, to point at a student, to provide equipment, are not highly developed skills in themselves and do not usually require a nonverbal competency of the kind required of an instructor who is demonstrating a movement. Potential implications for the dance teacher's preparation, suggest a need to further investigate means of accounting for specific types of nonverbal behaviors. More precise implications for dance teacher preparation might evolve as a result of acknowledging a distinction between specialized and non specialized teacher behaviors in future research.

In the technique setting, the great quantity of nonverbal behaviors found related to procedure might also suggest a need for the dance teacher to master another type of specialized nonverbal teaching skill: accompaniment -- that

is, the use of percussion instruments to support and guide the students' movements. The number of frequencies found for each procedure subcategory show that they were primarily recorded for the "impose a procedure" (p_3) subcategory which mainly corresponded to accompaniment. Considering that the "student's active learning time" currently tends to be recognized as a most important variable affecting student's learning (Berliner & Tikunoff, 1976; Hall, Delquadri, & Harris, 1977; Siedentop, 1976), and that organizational and managerial teacher behaviors are strongly related to that aspect, these results may suggest a need, in teacher preparation, to give special attention to the teacher's ability to accompany movement.

As a whole, the number of nonverbal procedural behaviors found in this study was influenced by characteristics of the setting of the choreography and technique classes. According to the information gathered regarding each of these classes (see Appendix C), an accompanist was present at all times in both choreography classes and was present in two out of the ten technique class periods. The overall verbal and nonverbal characterization must be regarded with this limitation in mind. The constant presence of an accompanist in choreography classes may have contributed to the more verbal overall communication found for that setting. If the accompanist had been present in all technique classes,

the overall characterization might have been more verbal; however, the information category might have been shown as that necessitating the highest quantity of nonverbal communications. Without the accompanist, on the other hand, the overall characterization might have been more nonverbal.

The teaching of choreography was suggested to be more verbal than that of technique. The fact that each individual teacher's behaviors reflected this characteristic and that the percentage of nonverbal behaviors found in the nonverbal information category was lower in choreography than in technique might indicate that this use of more verbal communication in choreograpby is related more to the instructional content than to the teacher's personal teaching style. However, since this study involved a small representative sample of dance teachers, the results of the characterization of dance teacher behaviors in terms of verbal and nonverbal behaviors need to be supported by further descriptive research.

Directness and Indirectness of the Instructional Approach

The results of this investigation demonstrated that the teaching behaviors observed in technique classes were direct. This might be expected since dance technique generally involves precise skill and the literature tends to stress the instructional goals of mastery of content and achievement

of skills, as well as the capacity to follow structured activities as concerns of technique classes (Ferdun, 1972; Hawkins, 1964).

In choreography classes, the emphasis is on creativity. Accordingly, the dance education literature tends to regard the goals of creative production and of self-direction as generally strong concerns in the teaching of choreography (Hawkins, 1964; H'Doubler, 1957; Smith, 1976). Therefore, an indirect approach was expected. The finding of very low I/D ratios for both aspects of information and procedure might be surprising. Tentative explanation is provided later in this discussion.

Another finding relating to the directness and indirectness of teacher behaviors in choreography classes is the higher degree of indirectness for procedural matters. A value of .224 was found for the I/D ratio of the procedure category while one of .0292 was found for that of the information category. Considering that the dance literature stresses both the number and kind of limitations on the movement task as means of providing flexibility in the teaching of dance, one might have expected indirect teaching strategies to be used for the handling of information as well as for the development of procedure. The results of this study, however, showed that while the two observed teachers more frequently used indirect procedural strategies

(133 tallies), they made less frequent use (76 tallies) of the indirect information subcategories. This finding may be due to the fact that the teachers tended to place a high value on experiential learning. In a preliminary interview (see Appendix C), both teachers emphasized learning experience more than content as key elements of the teaching-learning process for choreography classes. These feelings parallel those of the current philosophers of humanistic education (Barth, 1969; Hellison, 1973). Therefore, this may indicate a more significant indirectness in the teaching of choreography to be related to procedure.

A factor which might have contributed to the lowering of the I/D ratio found for the information category, on the other hand, was the discrepancy between the time factor inherent in direct teaching behaviors as compared to those of the indirect type. It was observed that the information-giving behaviors were typically continuous as compared to those indirect or solliciting behaviors. For example, it generally takes less time to ask a question than to provide an explanation or a description pertaining to the subject matter. This general time pattern is reflected in the relatively small number of pairs of behaviors of identical subcategories (steady state cells) recorded for the indirect subcategories (respectively 26 and 0) as compared to the

high number recorded for the direct ones (respectively 1,246 and 319). This finding would perhaps account for the higher frequencies of direct behaviors as opposed to indirect.

While the "eliciting" nature of the indirect information and procedure subcategories tends to involve short periods of time on the teacher's part, it also tends to encourage creative behaviors among students. Students' reactions may represent additional information pertaining to the directness or indirectness of teacher behaviors. Considering that a very large number of creative behaviors among students was recorded in the choreography setting, the very low I/D ratios that were found for both information and procedure categories suggest a need to account for students' behaviors in characterizing teacher behaviors as direct or indirect. A measure of pupil initiation (Flanders, 1970) could serve as an additional index of a teacher's directness or indirectness.

Instructional Flexibility

The reflective/structured strategy ratios established as a basis for the characterization of instructional flexibility showed much discrepancy between their respective components. They indicate little flexibility for technique and choreography classes. The discrepancy was higher for the ratios found in technique classes than for those found

in choreography classes. According to Joyce (1974), flexibility in teaching is dependent upon sets of conditions under which different teacher behaviors appear appropriate. The preceding findings thus indicate more potential flexibility in the teaching of choreography than in that of technique.

The degree of discrepancy found between the reflective/structured components of the ratios was shown to be higher for the information category than for the procedure category, in both types of classes. This finding supports that of Joyce and Harootunian (1974) regarding flexibility to be independent for different categories of behaviors.

In choreography classes, the data showed that the low degree of flexibility found for the handling of the instructional content was caused by a major emphasis on structuring strategies. This may appear somewhat contradictory with the ultimate goal of creative production. The relatively low number of frequencies recorded in the reflective part of the potential spectrum of strategies might be interpreted as a need in the teaching of choreography to give more attention to strategies that could "help students to

theorize" (I_1) and those that could "help students toward self-expression" (I_2).

With regard to their value, the reflective/structured strategy ratios are similar to the I/D ratios found for the two types of classes. They were higher for the procedure than for the information category. Although the information provided by the reflective/structured strategy ratios paralleled those already provided by the value of the I/D ratios, it is interesting to see that the control of the duration of occurrence for the behaviors accomplished by statistical analysis affected the obtained value of the ratios. In other words, the parceling out of the steady state cells affected the value of the I/D ratios, indicating a higher degree of indirectness. This was especially evident for the information category. In the choreography setting the value of the reflective/structured strategy ratio was .06 (41/693) as compared to .03 (77/2,634 - I/D) for the information category, and was .28 (97/356) as compared to .244 (133/1,544 - I/D) for the procedure category. In the technique setting, the value of the reflective/structured strategy ratio was .008 (2/2,581) as compared to .00033 (2/6,044 - I/D) for the information category, and

was .023 (58/12,539) as compared to .018 (68/3,712 - I/D) for the procedure category. This information may be interpreted as a need to account for the time factor in assessing the amount of directivity or flexibility among teacher behaviors.

Dominant Teaching Patterns

The description of the major teaching patterns of technique classes tends to support Batchelder and Cheffers' (1975) findings that teacher lecture ("teacher delivers information - I_4", and "teacher delivers conclusions or opinions - I_5" can be considered teacher behaviors of the lecture type) is the most prevalent behavior in teaching. Unlike those authors who found "teacher direction - student unpredictable response" to be the first top cell of physical education classes, in the present study, the investigator found this type of behavior (e.g. teacher imposes a plan or procedure) to occur as the fifth top cell and as the third dominant teaching pattern of technique classes. The researcher further observed that it did not appear among the five dominant teaching patterns of choreography classes.

Recent research findings showed the student's active learning time to be an important variable affecting student learning (Berliner & Tikinoff, 1976; Hall, Delquadri & Harris, 1977; Siedentop, 1976). Therefore, there is a need for future research to identify which specific teacher behaviors were most frequently eliciting student activity in technique and choreography classes. The dominant teaching patterns of technique classes showed that the verbal and nonverbal communication of information (I_4, i_4) and the verbal and nonverbal imposition of procedure (P_3, p_3) were teacher behaviors most frequently preceding students' predictable behaviors. The dominant teaching patterns of choreography classes showed that the verbal and nonverbal opinions or conclusions (I_5, i_5) were the teacher behaviors most frequently preceding student creative behaviors (R_3). According to the results of this study, the above-mentioned teacher behaviors might be regarded as interesting variables to consider for future studies.

Both the I/D ratios and the dominant teaching patterns characterized teacher behaviors of technique classes as direct. These patterns were shown to have a strong tendency toward teacher domination (I_4 - P_3 - r_1).

The dominant teaching patterns of choreography classes showed behaviors that encouraged student participation (R_3). Since an indirect teacher behavior was defined as one which encourages students' initiative, the substantial number of creative student behaviors (R_3) showed in the dominant teaching patterns is indicative of indirectness. An I_5 - R_3 pattern tends to contradict Joyce's operational definition of the subcategory "teacher delivers conclusions or opinions" as a structuring or direct behavior.

In explaining this phenomenon, it is interesting to note that in the context of choreography classes, "teacher communication of conclusions or opinions" (I_5) might have served other functions than that of structuring by providing fluid information. A major portion of teacher behaviors of the category were comments or critiques immediately following student creative responses. In other words, the R_3 - I_5 pattern showed that they may often have served as feedback. According to Fishman (1978) feedback can be evaluative, descriptive, comparative, prescriptive and affective. Therefore, it could be assumed that in choreography classes "teacher presentation of conclusions or opinions often was descriptive or comparative feedback. The fluidity or personal nature of the teacher behavior of the I_5 sub-

category might have also served the function of provoking or at least encouraging students' comments or reactions.

The four categories of behaviors Bellack (1966) identified as basic components of the classroom communication process (structuring, solliciting, responding and reacting), offer support for that contention. About reacting, Bellack (1966) pointed out that any type of behavior can provide opportunities for reactions on the student's part as well as on the teachers, although such behaviors do not necessarily elicit a reaction. Considering that the role of the dance teacher, particularly in choreography classes, was defined as one of inspirer (Lippincott, 1970; Lockhart & Pease, 1973; Moore, 1974; Ririe, 1969; Lewitsky cited by Moore, 1974), it might be interesting to refer to that phenomenon as "choreographic inspiration". In such cases the I_5 subcategory would not tend to structure but rather to encourage or to provoke students' initiative culminating in creative production.

The results of the characterization of dominant teaching patterns tend to confirm the need to account for both teachers' and students' behaviors in classifying teacher behaviors as direct or indirect. While both types

of ratios, I/D and pupil initiative, can be taken as indication of directness or indirectness, the dominant teaching patterns which show teacher-student interaction, provide more complete and more accurate information.

CHAPTER V

CRITIQUE OF THE LORD ADAPTATION OF JOYCE'S SYSTEM - LAJS

A secondary purpose of this research was to evaluate the potential of the investigator's adaptation of Joyce's system of teacher behaviors analysis for further use in the study of dance classes. The addition of this project was motivated by the investigator's belief that an accurate evaluation of the appropriateness of any instrument can only be made after the latter has been used in the field. Although, the LAJS featured the characteristics which were considered essential for an accurate description of dance classes, the investigator believed that a more accurate evaluation of the tool's possibilities and limitations could be gained through its use in the present study. The purpose of this chapter is to provide an "after use" critique of the potential of the system for further study of dance classes.

The framework developed by Herbert and Attridge (1975) for judging the appropriateness of an instrument of systematic observation for practical purposes was used as a basis for the critique. The framework includes 33 criteria identified and sorted into three main categories: identification, validity, and practicality criteria. These categories of

criteria served as bases for the formulation of three questions asked of the system. The answer to each question was formulated according to the way in which the system met the most pertinent criteria proposed by the authors for evaluating the identification, validity and practicality of a tool of systematic observation. The critique will thus include three parts corresponding to the three basic questions.

Question One

Is the instrument identified clearly enough to enable the potential user to consider it appropriate for the description of dance classes?

According to Herbert and Attridge (1975), the information provided for the identification aspect can be considered appropriate if it facilitates a quick and accurate screening and selection of an observation technique. Identifying information is primarily related to the title of the instrument, the statement of its purpose, the presentation of its basic rationale and the identification of its focus.

The purpose of the instrument was identified as describing the teacher's manipulation of the content, teaching strategies, and climate components of the learning environment as he/she verbally and nonverbally interact with students. This specifies the focus of observation to be on the teacher and the students as well as on the verbal and nonverbal dimentions of the communication taking place. The rationale underlying Joyce's instrument is made clear. However, when referred to as "The Lord Adaptation of the Joyce System of teacher Behavior Analysis", the title given to the instrument used in this study may mislead the reader by suggesting a focus on the teacher only. Therefore, the title does not provide information regarding the nature of the modifications made in the original system.

Identifying information provided for the system can thus be considered appropriate except for the title. A modification of the title so that it clearly represents what the system does would be desirable and could be formulated as follows: "The Lord Adaptation of Joyce System to Systematically Describe Teacher and Student Verbal and Nonverbal Interaction in Movement Classes".

Question Two

Does the instrument accurately and consistently represent the events it claims to describe, that is, the teacher's manipulation of the content, teaching strategies, and climate components of the learning environment as he/she verbally and nonverbally interacts with students?

The problem of judging the accuracy with which an observational tool represents the observed event is, for Herbert and Attridge (1975), related to different aspects of the instrument. Accuracy pertains to the observability of behaviors, to the objectivity of the instrument and the related problem of inference, to context and observer effect, to the representativeness of the categories constituting the system, to the determination and reporting of reliability and validation procedures.

Pertinent information regarding the objectivity of the instrument and the related problem of inference as well as the determination and reporting of reliability procedures was previously described. The satisfactory degree of objectivity and reliability achieved and reported in this section was taken as an indication of appropriateness of the LAJS on these specific aspects. Information pertaining to the control of the Hawthorne effect is referred to in the above section entitled "The Overall Recording Strategy", found in Chapter III.

The term "observability of behaviors" refers to the degree to which those behaviors included in the instrument are capable of being perceived by any trained observer (Herbert and Attridge, 1975). The fact that the instrument was used with a satisfactory degree of objectivity and reliability was considered an indication that indeed the behaviors comprising the instrument were perceivable. However, it seems necessary to specify that due to the increased complexity of the adapted version of the system, an audio-visual recording of the teaching performances under investigation is essential. An accurate perception of those behaviors is improbable in the immediacy of the live situation. The taping technique employed in this study was considered satisfactory for the visual part of the investigation, but less satisfactory for the audio part. The use of one multidimensional microphone was at times inadequate for a clear recording of dyadic student-teacher conversations when they were rendered in a normal tone of voice. Although few in number, such situations occurred in the choreography classes. The combined use of a suspended multidimensional microphone and a wireless microphone worn by the teacher would appear as an alternative recording technique, the implementation of which could be considered in further

studies. The teacher's communication to the whole class, as well as to individual students, might be more perfectly recorded.

The term "context" refers to the physical, social and behavioral, temporal, and other surroundings in which the act or event under observation takes place. According to Herbert and Attridge (1975), to account for context may, at times, be necessary for valid coding of teacher behaviors. They emphasized that, "to ignore context may well leave a study open to criticism about the adequacy of the judgment about the events taking place. When is a grimace a smile and when an expression of pain?" (p. 13). Nevertheless, they also point out that the consideration of context is likely to increase the amount of subjectivity brought into coding and consequently reduce both reliability and validity of the observation. For Herbert and Attridge, the problem of context must be recognized, and the degree and kind of context brought to bear on the instrument must be explicated.

The LAJS was developed to account for the contextual aspects of students' reaction and nonverbal dimensions of the teacher behaviors. Since teacher behaviors are usually related to what is occurring in the setting as a whole,

these additions were believed to contribute to a more valid coding of the teacher behaviors. The satisfactory coefficients of objectivity and reliability achieved for the system were considered indicative that contextual elements was appropriately controlled. However, the objectivity coefficient of .81 was taken as an indication that the addition of more contextual elements might endanger the objectivity of the system.

The term "representativeness" pertains to how the items of the instrument represent, in quantity and kind, the behaviors which constitute the universe under study (Herbert and Attridge, 1975). With regard to the study of the dance teacher's manipulation of the learning environment, the representativeness of the items comprising the instrument was judged to be limited. Defined in terms of four categories of teacher behaviors -- namely, those of sanction, procedure, information and maintenance -- divided into 17 subcategories, the items allowed quite detailed descriptions of the teacher's manipulation of the content (information category), strategies (procedure category) and climate (sanction category) components of the learning environment. These items taken to be indicative of structured or reflective, supportive or defensive environments. Due to the detailed description they provided, the items comprising the information, procedure, and sanction categories were particularly interesting.

However, they showed indications of possible limitations in fully reflecting the teacher's manipulation of the content. With regard to the definition of the direct-indirect dichotomy of the information category, some indications were given of a possibility, in the choreography setting, that the I_5 subcategory (delivers personal conclusions or opinions) did not necessarily radiate a structured learning environment. In further research, special care would need to be given to "teacher delivers personal conclusions or opinions" (I_5) in referring to it as direct or indirect. The relatively small number of frequencies recorded for the subcategories defined as reflective or indirect was taken as an indication of a possibility of limited representativeness of these two types of behaviors to fully account for the teacher's handling of content in creating a reflective environment.

The representativeness of the nonverbal categories, especially the information category, was considered adequate but lacking in specificity. The nonverbal items did not account for the specificity of the dance teacher's nonverbal competency. The definition of the nonverbal category as serving or facilitating the function of the verbal equivalent requires that different nonverbal behaviors, such as writing on the blackboard and demonstrating a dance exercise, be coded in the same way. Considering the degree of nonverbal competency that many nonverbal behaviors imply, in the case

of dance classes, it might be desirable to further investigate the possibilities of qualifying and differentiating those teacher behaviors implying a nonverbal competency in dance from those that do not. Because of the high complexity such a differentiation would involve, a more detailed study of the nonverbal teacher behaviors in dance would require the development of instruments focused on that aspect only. The analysis and description of the nonverbal activities unique to the dance teacher appears as a significant avenue for further research.

The representativeness of the "sanction" items appeared weaker for the climate component of the learning environment. This judgment derives from two main observations. First, it seemed that of all teacher behaviors affecting the climate of dance classes, the sanctions did not necessarily affect it more than the other types of behaviors. In addition to sanctions, dance educators have recognized the "amount of structure" (Koch & Shriner, 1969; Hawkins, 1964), the fostering of concentration (Chaplin, 1976; North, 1971; Ririe, 1969), the aesthetic quality of the environment (Teacher number one, Appendix C) and many other factors as influencing the climate. In considering only the sanction category, a fragmented picture of the climate is provided. Moreover, the setting of a ground rule limiting the sanction category to the teacher behaviors that have an explicit sanctioning statement or

connotation was necessary to maintain an acceptable degree of objectivity among the coders. The application of this ground rule lowered the number of possible recordings for the sanction category. The identified limitations would be important to consider in the designing of studies focused on the climate of dance classes if the LAJS were to be used.

Another and final weakness regarding the representativeness of the instrument items had to do with the recording of the sequence of the teaching events. The tabulation of the recorded teacher behaviors became successive once they were entered into the matrix. This was perceived as a limitation in the technique setting where combinations of behaviors such as $(I_4)\,p_3$ (verbal and nonverbal information on a dance exercise while the teacher is accompanying) or $(P_3)\,i_4$ (nonverbal information regarding a dance exercise while the teacher is providing a verbal and nonverbal accompaniment) were frequently recorded as sequential rather than simultaneous. Further exploration of this phenomenon and the eventual development of a means of tabulating which would allow the investigator to maintain an accurate representation of the behavioral sequence would be more desirable.

The items which comprised the system were exhaustive of the dance teacher behaviors. In the choreography, as well as in the technique classes, all behaviors could be classified under one of the 22 items.

Question Three

Is the instrument easy to use and are the results easily disseminated?

The ease of implementation is for Herbert and Attridge (1975) related to the codes identifying categories, the qualifications of the observers, the training procedures for observers, and the description of procedures for analyzing data. As suggested in Chapters III and IV, the potential user of the system will find appropriate information regarding the training procedures for observers as well as information regarding the procedures of data analysis, and the dissemination of results.

The use of the instrument does not require special qualifications for observers, although as previously mentioned, competency in dance, time available, and interest for the analysis of dance teacher behaviors are essential qualifications for potential observers. Many dance teachers can be expected to adequately meet these criteria.

With regard to the codes identifying categories, the use of the proposed coding symbols revealed the latter to be simple, easy to remember, and convenient to record. However, ambiguities occurred at times regarding the symbols referring to the verbal and nonverbal dimensions of the procedure (P, p) and Maintenance M, m) categories. That is,

in hurried coding, a capital P and a small p are easily confused. To overcome these ambiguities in further use of the system, the use of a capital letter accompanied by a one digit number for the verbal subcategories (ex.: P_3) is recommended. The use of a capital letter with the teen number for the nonverbal subcategories (ex.: P_{13}) is suggested. As a whole the system was considered easy to use and the results were easily disseminated.

CHAPTER VI

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Among the trends which have emerged in the field of education in the last two decades, the analytical-descriptive approach to research on teaching represents an important one. Influenced and supported by that trend, the present study grew out of a recognition of the paucity of analytical-descriptive information regarding the dance teaching process. It was a basic premise of this study, that through a systematic observation of dance classes, a further understanding of the dance teaching process could be gained and that eventually its efficiency could be improved. As an ititial investigation into the systematic description of dance classes, this study was further designed to identify basic characteristics of the dance teaching process. Moreover, it was hoped that such information, in turn, might be regarded as groundwork for further descriptive studies in dance, particularly in that the research gathered here provides a potential instrument for use in the systematic observation system as an instructional tool.

The purpose of this study was to characterize dance teacher behaviors as observed in two choreography and two

technique classes at the university level. The characterization was made in terms of the proportion of verbal and nonverbal behaviors used by the teachers, their directness or indirectness of approach, their strategic flexibility, and their dominant teaching patterns. It was assumed that two classes of both choreography and technique were sufficient to provide significant information, given the limits of this case study.

Selected literature from two areas was reviewed. The first area dealt with recent developments in research on teaching. More particularly, it dealt with the theoretical context of current research on teaching, with discussions of observational systems used in the descriptive analysis of teacher behaviors; finally, it dealt with observational studies conducted in movement settings. This part of the review of literature was intended to provide a theoretical basis and substantive background for the procedures, methods, and analyses of data used in this study.

The second area focused on dance literature. It gathered supportive material regarding the appropriateness of Joyce's category system for use in the analysis of dance classes. This part of the review of literature included three parts corresponding to the three frames of reference used as a base for defining the constituent

categories of the system. These are the frames of reference for content, for teaching strategies, and for climate.

Prior to data collection, some procedures related to instrumentation were carried out. The LAJS was modified to account for the nonverbal and verbal communications as well as the teacher-student interactions taking place in dance classes. Subsequently, a 40-hour training program using the modified system was planned and carried out by two coders. The investigator's adaptation was then tested by estimating the objectivity and reliability of the coders' recording. Based on the principle of matrix cell loading, the reliability and objectivity of the coders was estimated using Spearman's Rho (rank order correlation). Satisfactory standards of objectivity and reliability were met.

Data were collected for the study in the form of 20 audio-video recordings of technique and choreography classes. It was assumed that five 30-minute samples alternately taken at the beginning, the middle, and the end of five different class periods were sufficient to provide a representation of the teacher behaviors in that setting. The schedule of the recording sessions was designed so that teaching samples could be recorded during the introductory, core, and end parts of the semester. The tape

recordings of the lessons were then coded by the two trained coders. The recorded observations were subsequently tabulated by computer into 50 x 50 matrices. For each of the choreography and technique classes, three matrices were built. They corresponded to a master matrix inclusive of the combined data of the two teachers, to a matrix for teacher one and another for teacher two. The data provided by the master matrices served as a basis for the characterization of the dance teacher behaviors in each type of class.

In the process of analyzing the data, different aspects of the master matrices were used for each characterization. The analyses of the data provided by the master matrices of the choreography and technique classes were done separately. The characterization in terms of the proportion of verbal and nonverbal behaviors relied on the analysis of the verbal, nonverbal and total dimensions of teacher's categories. The characterization in terms of directness and indirectness of approach relied on the analysis of I/D ratios calculated for the procedure and information category while that of instructional flexibility relied on the analysis of reflective structured strategy ratios calculated for the same categories. The characterization in terms of dominant teaching patterns relied on the analysis of five patterns emerging

from the five top cells of the master matrix. Following the investigator's use of the system as adapted from Joyce, a critique based on the model of Herbert and Attridge was carried out to evaluate its potential for use in future studies.

Conclusions

Within the limitations of this study, several conclusions were drawn:

1. Characterization of the teaching process:

   a) In terms of the proportion of verbal and nonverbal behaviors, the teacher behaviors observed in the choreography classes are 2.53 times more verbal than nonverbal. The most frequent nonverbal communications are associated with teacher behaviors dealing with the handling of the instructional content (information). The most frequent verbal communications are associated with behaviors dealing with sanctions.

   b) In terms of the proportion of verbal and nonverbal behaviors, the teacher behaviors observed in the technique classes are 1.17 times more verbal than nonverbal. The most frequent nonverbal behaviors are

associated with the handling of the instructional content (information) and with the organization of the learning environment (procedure). The most frequent verbal communications are associated with those dealing with sanctions.

2. a) In terms of directness and indirectness of teaching approach, the teacher behaviors observed in the choreography classes were characterized as moderately direct when dealing with the organization of the learning environment (procedure), and indirect when dealing with the handling of instructional content (information). Although the analysis of the I/D ratio of the information category revealed that more than half of the teacher behaviors were indicative of a direct instructional approach, the dominant teaching patterns tended to confuse the interpretation of the finding. Indeed, they were, in that setting, characterized as being student dominated. According to Flanders (1965) and Joyce and Harootunian (1967), indirect teacher behaviors would be those who tend to encourage students' initiative and/or productive thinking. The higher frequency of unpredictable student behaviors as an element of the dominant teaching pattern would tend to indicate that an indirect approach had occurred.

b) In terms of directness and indirectness of teaching approach, the teacher behaviors observed in the technique classes were characterized as very direct when dealing with both technique content and organization of the learning environment. The directness of the teacher behaviors of the information category was confirmed by the dominant teaching pattern of that setting. Teacher behaviors of the latter category were shown to be more direct than those related to the organization of the learning environment (procedure).

3. a) In terms of the flexibility of instructional approach, the teacher behaviors observed in the choreography classes were characterized as inflexible when dealing with the handling of information. They were characterized as having a tendency toward flexibility when dealing with the organization of the learning environment.

b) In terms of the flexibility of instructional approach, the teacher behaviors observed in the technique classes were characterized as inflexible when dealing with both the handling of the instructional content and the organization of the learning environment.

4. a) With regard to dominant patterns, the teacher behaviors observed in the choreography classes were characterized as: (a) most frequently evoking unpredictable student behaviors through the communication of the teacher's conclusions or opinions; (b) most frequently providing feedback in the form of the teacher's conclusions or opinions; and (c) dominated by unpredictable student behaviors.

   b) In terms of dominant patterns, the teacher behaviors observed in the technique classes were characterized as: (a) most frequently eliciting predictable student behaviors through imposing a plan or a procedure or delivering information; (b) most frequently providing feedback in the form of information or imposition of plan or procedure; (c) dominating the interaction process.

5. Evaluation of LAJS:

   Because of the limitations of the system in fully reflecting the teacher's manipulation of the content and climate components of the learning environment of dance classes, which in turn might affect the validity of data, the LAJS system of systematically describing teacher and student verbal and nonverbal

interaction in movement classes was judged to have a limited potential for further use in the description of dance classes.

Implications

Two implications of this study are (a) further use be made of LAJS to collect more data regarding specific aspects of teacher-student interaction in different types of dance classes; and (b) further refinements be made in the system.

It is the hope of the investigator that the description and analysis of teaching behaviors included in the present study will provide a beginning "data bank" which describe the dance teaching process.

Further investigation of the proportion of verbal and nonverbal behaviors involved in the teaching of dance appears to be a promising area for further research. In relation to this concern, a more refined analysis of the nonverbal dimension of teacher behavior is desirable. In addition, a distinction should be made between behaviors implying a nonverbal competency in dance (an articulated body language) and those that do not. Such information appears necessary for gathering evidence regarding the quantity of nonverbal behaviors unique to the dance

teacher. More precise implications regarding dance teacher preparation might be formulated from such empirical bases.

The study of dominant teaching patterns suggests another promising area for further research. The study of teacher behaviors in relation to those of students provided a more complete and probably more accurate description of the occurring teaching process. Dominant teaching patterns were shown to have the capacity to reflect similarities and differences between teaching processes used in different types of dance classes (choreography and technique) and with different types of individuals. They showed evidence, too, of an interesting potential for more certain identification of valid variables proper to choreography and technique classes.

Directness or indirectness of teaching approach and instructional flexibility should be regarded as less promising vantage points for further studies. Several observations support that contention. First, some evidence tended to support the belief that Joyce's operational definition of the direct/indirect or reflective/structured dichotomy of the information category may not be applicable to dance classes. "Teacher communication of conclusions or opinions" (I_5) which Joyce and Harootunian (1967) defined as a direct behavior tended to be shown as an indirect one

in the context of choreography classes. Second, in the light of the information provided by the dominant teaching patterns, it appears hazardous to judge the directness/indirectness or flexibility of teacher behaviors independent of the consideration of student behaviors. On that aspect, the study of dominant teaching patterns was revealed to be more encompassing and informative of the teaching methodology than the mere consideration of I/D or reflective/structured.

Finally, because of limitations perceived regarding the representativeness of the sanction category as a frame of reference for climate, sanction should be regarded as a less promising area for further use of the investigator's adaptation of Joyce's model of teacher behaviors analysis.

No generalization regarding choreography and technique teachers' behaviors can be made on the basis of observations gathered solely from two teachers working at the university level.

In order for the potential data from further use of the LAJS in movement classes to be useful to those involved in dance teacher preparation, it is suggested that future studies include a wider sampling of teachers at different educational settings. It should include teachers

who are working with all levels of students as well as differentiate among programs oriented toward general dance education, professional preparation of dance educators, and professional preparation of dancers. Considering the specificity of the choreography and technique teaching processes, future investigations should be conducted for specific settings, namely those of technique, improvisation and choreography classes.

Finally, considering the time and energy needed to carry out further research, the investigator of this study considers the following two suggestions to be appropriate: (a) future investigators should give more attention to possibilities of team work rather than individual work in this area; (b) as suggested by Furst and Rosenshine (1973), they might consider examining possibilities for the development of a central data bank focused on the dance teaching process. The implementation of these two research practices and services might contribute to a more rapid gathering of descriptive data which in turn might contribute to more controlled testing of the efficiency of dance teachers' specific behaviors.

BIBLIOGRAPHY

Abeel, E. The new new dance. In M.H. Nadel, & C.M. Nadel (Eds.), The dance experience: Readings in dance appreciation. New York: Universe Books, 1978.

Amidon, E., & Flanders, N. The role of the teacher in the classroom (Rev. ed.). Minneapolis: Association for Productive Teaching, Inc., 1971.

Anderson, H.H., & Brewer, H. Studies of teachers' classroom personalities, I. Dominative and socially integrative behavior of kindergarten teachers. Applied Psychological Monograph, 1945, 6 .

Anderson, W.G. Descriptive-analytic research on teaching. Quest, 1971, 15, 1-9.

Anderson, W.G., & Fishman, S. Developing a system for describing teaching. Quest, 1971, 15. 9-16.

Anderson, W.G., & Barrette, G.T. (Eds.). What's going on in gym: Descriptive studies of physical education classes. Newton, C.T.: Motor skills: theory into practice, 1978.

Barrett, K. A procedure for systematically describing teacher-student behavior in primary physical education lessons implementing the concept of movement education. Unpublished doctoral dissertation, University of Wisconsin, 1969.

Barrett, K. The structure of movement tasks: A means for gaining insight into the nature of problem-solving techniques. Quest, 1971, 15, 22-31.

Barrett, K. Educational dance. In B. Logsdon et al. (Eds.), Physical education for children: A focus on the teaching process. Philadelphia: Lea and Febiger, 1977(a).

Barrett, K. Studying teaching: A means for becoming a more effective teacher. In B. Logsdon et al. (Eds.), Physical education for children: A focus on the teaching process. Philadelphia: Lea and Febiger, 1977(b).

Barrette, G.T. A descriptive analysis of teacher behavior in physical education. Unpublished doctoral dissertation, Teachers College, Columbia University, 1977.

Barth, R.S. Open education: Assumptions about learning. Educational Philosophy and Theory, 1969, 1, 29-39.

Batchelder, A.S. Process objectives and their implementation in elementary Math, English and Physical Education classes. Unpublished doctoral dissertation, Boston University, 1976.

Batchelder, A.S., & Cheffers, J. Predicting process objectives in elementary Math, English and Physical Education. Unpublihsed paper, 1975.

Bellack, A.A., Khibard, H.M., Hyman, R.G., & Smith, F.L. The language of the classroom. New York: Teachers College Press, 1966.

Berliner, D.C., & Tikunoff, W.J. The California beginning teacher evaluation study: Overview of the ethnographic study. The Journal of Teacher Education, 1976, 27(1), 24-30.

Bookhout, E.C. Teaching behavior in relation to the socio-emotional climate of physical education classes. Research Quarterly, 1967, 38, 336-347.

Boorman, J. How children learn through systematized dance instruction. In R.Priddle (Ed.), Dance: verities, values, visions. Binational Dance Conference, Waterloo, Ont., Canadian Association for Health, Physical Education, and Recreation Press, 1971.

Brauer, L. Teaching approaches in modern dance. Unpublished doctoral dissertation, Rutgers University, 1975.

Brophy, J.E., Biddle, B.J., & Good, T.F. Teachers make a difference. New York: Holt, Rinehart and Winston, 1975.

Brown, B.B., Mendenhall, W., & Beaver, R. The reliability of observations of teachers' classroom behavior. The Journal of Experimental Education, 1968, 36(3), 1-10.

Bussis, A.M., & Chittenden, E.A. Open education: Research and assessment strategies. In E.B. Nyquist, & G. Haves (Eds.), Open education: A source book for parents and teachers. New York: Bantam Books, 1972, 360-375.

Chaplin, L. Teaching dance improvisation creatively. Journal of Physical Education and Recreation, April 1976, pp. 42-44.

Cheffers, J.T., Amidon, E.J., & Rodgers, K.D. Interaction analysis: An application to nonverbal activity. Minneapolis: Association for Productive Teaching Inc., 1974.

Cheffers, J.T.F., & Mancini. Teacher-student interaction. In W.G. Anderson, G.T. Barrette (Eds.), What is going on in gym: Descriptive studies of physical education classes. Newton, C.T.; Motor Skills: Theory into practice, 1978.

Cheney, G., & Strader, J. Modern dance (2nd ed.). Boston: Allyn & Bacon, Inc., 1975.

Chilkowsky, N. Dance in secondary education. In M. Haberman, & T. Meisel (Eds.), Dance: An art in academe. New York: Teachers College Press, 1970.

Cohen, S.J. Avant-garde choreography (Pt. 1). Dance Magazine, June 1962, pp. 22-24; 57 (a).

Cohen, S.J. Avant-garde choreography (Pt. 2). Dance Magazine, July 1962, pp. 29-30; 58 (b).

Cohen, S.J. Avant-garde choreography (Pt. 3). Dance Magazine, August 1962, pp. 45; 54-56 (c).

Cohen, S.J. (Ed.). The modern dance: Seven statements of belief. Middletown, CT: Wesleyan University Press, 1966.

Costello, J.A. A descriptive analysis of student behavior in elementary school physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1977.

Dimondstein, G. Children dance in the classroom. New York: MacMillan, 1971.

Dougherty, N.J. A plan for the analysis of teacher-pupil interaction in physical education. Quest, 1971, 15, 39-49.

Dunkin, M., & Biddle, B. The study of teaching. New York: Holt, Rinehart & Winston, 1974.

Dussault, G. et al. L'analyse de l'enseignement. Montréal: Les Presses de l'Université du Québec, 1973.

Erdman, J. Four statements. In M. Van Tuyl (Ed.), Impulse Dance: A projection for the future, 1968.

Ferdun, E. Dance. In J. Felshin (Ed.), More than movement: An introduction to physical education. Philadelphia: Lea and Febiger, 1972 (a).

Ferdun, E. Considerations for revised dance curriculum. In J. Felshin (Ed.), More than movement: An introduction to physical education. Philadelphia: Lea and Febiger, 1972 (a).

Fishman, S. A procedure for recording augmented feedback in physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1974.

Fishman, S., & Tobey, C. Augmented feedback. In W.G. Anderson & G.T. Barrette (Eds.), What's going on in gym: Descriptive studies of physical education classes. Newton, Ct; Motor skills: Theory into practice, 1978.

Flanders, N.A. The problem of observer training and reliability. In E. Amidon, & J. Hough (Eds.), Interaction analysis: Theory, research and application. Reading, P.A.: Addison-Wesley, 1967.

Flanders, N.A. Analyzing teacher behavior. Reading, P.A.: Addison-Wesley, 1970.

Flanders, N.A. Influence, pupil attitudes and achievement. In R.T. Hyman (Ed.), Teaching: Vantage points for study (2nd ed.). New York: J.B. Lippincott Co., 1974.

Fleming, G.A. The scene: With children. In M. Gray (Ed.), Focus on dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Fowler, C.B. Dance as education. Washington: American Alliance for Health, Physical Education and Recreation, 1977.

Furst, N., & Rosenshine, B. The use of direct observation to study teaching. In R.M.W. Travers (Ed.), Second handbook of research on teaching. Chicago: Rand McNally, 1973.

Gallagher, J.J., & Ashner, M.J. A preliminary report on analysis of classroom interaction. Merrill Quarterly of Behavior and Development. July 1963, 9: pp. 183-194.

Galloway, C.M. Teaching is communicating: Nonverbal language in the classroom. Washington: National Education Association, 1970.

Gasson, I.E.H. The development of an observation instrument to record selected teacher-pupil behaviors in primary school physical education. Unpublished doctoral dissertation, Ohio State University, 1971.

Good, T., Biddle, B., & Brophy, J. Teachers make a difference. New York: Holt, Rinehart &Winston, 1975.

Grant, B.M. Analyzing teacher nonverbal activity. Theory into Practice, 1977, 16(3), 200-207.

Grant, B.M., & Hennings, D.G. The teacher moves: An analysis of nonverbal activity. New York: Teachers College Press, 1971.

Hall, R.V., Delquadri, J.C., Harris, J.W. Opportunity to respond: A new focus in the field of applied behaviors analysis. Paper presented at Midwest Association of Applied Behaviors Analysis. Chicago, May 1977.

Hallman, R.J. Principles of creative teaching. In R.T. Hyman (Ed.), Teaching: Vantage points in study (2nd ed.). New York: J.B. Lippincott Co., 1974.

Hatch, F. The theatre of nondance. In M. Gray (Ed.), Focus on dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Hawkins, A. Creating through dance. Englewood Cliffs, N.J.: Prentice Hall, 1964.

Hawthorne, R.D. A model for the analysis of teachers' verbal pre-instructional curricular decisions and verbal instructional interaction. Unpublished doctoral dissertation, The University of Winconsin, 1968.

Hayes, E. Dance composition and production for high schools and colleges. New York: The Ronald Press Co., 1955.

Hayes, E. An introduction to the teaching of dance. New York: Ronald Press Co., 1964.

Hayes, J. Creative movement exploration. Journal of Physical Education and Recreation, January 1973, pp. 95-96.

H'Doubler, M. Dance: A creative art experience. Madison, University of Wisconsin Press, 1957.

Hecht, R.S. Reflections on the career of Yvonne Rainer and the value of minimal dance. Dance Scope, 1973-1974, 8(1), 7-15.

Hellison, D.R. Humanistic Physical Education. Englewood Cliffs, N.J.: Prentice Hall, 1973.

Herbert, J., & Attridge, C. A guide for the developers and users of observation systems and manuals. American Educational Research Journal, 1975, 12(1), 1-20.

Hughes, M. et al. The assessment of the quality of teaching. Cooperative research project # 353, U.S. Dept. of Health, Education & Welfare; Office of Education, University of Utah, 1959.

Humphrey, D. The art of making dances. New York: Grove Press, Inc., 1959.

Hunter, J. An artist's view of teaching. In M. Haberman & T.Meisel (Eds.), Dance: An art in academe. New York: Teachers College Press, 1970.

Hupé, A.S. The development of a system for coding teacher behaviors in physical education. Unpublished doctoral dissertation, Teachers College, Columbia University, 1974.

Hyman, R.T. Introduction. In R.T. Hyman (Ed.), Teaching: Vantage points for study (2nd ed.). New York: J.B. Lippincott Co., 1974.

Joyce, B. The "models of teaching" community: What have we learned. Paper presented at the Booksend Foundation, California, 1975.

Joyce, B., & Harootunian, B. The structure of teaching. Chicago: Science Research Associates, Inc., 1967.

Joyce, B., & Hodges, R. Instructional flexibility training. The Journal of Teacher Education, 1966, 17(4), 409-415.

Joyce, B., & Hunt, D. Teacher trainee personality and initial teaching style. American Educational Research Journal, 1967, 4(3), 253-258.

Joyce, B., & Weil, M. The teacher-innovator: Models of teaching as the core of teacher education. Interchange, 1973, 4 (2-3), 47-60.

Kerlinger, F.N. Foundations of behavioral research (2nd ed.). New York: Holt, Rinehart & Winston, Inc., 1973.

Koch, N., & Shiner, R.P. Keynotes to modern dance. Minneapolis: Burgess Pub. Co., 1969.

Kraus, R. History of the dance in art and education. Englewood Cliffs, N.J.: Prentice Hall, 1969.

Laban, R. Modern educational dance (2nd ed.). London: MacDonald and Evans, Ltd., 1963.

Laban, R. Choreutics. London: MacDonald and Evans, 1966.

Laubach, S.A. The development of a system for coding student behavior in physical education classes. Unpublished doctoral dissertation, Teachers College, Columbia University, 1975.

Lewis, A, & Miel, A. Supervision for improved instructions: New challenge, new responses. Belmond, CA: Wadsworth Pub Co., 1972.

Lippincott, G. Out of old contexts into new: The schools and the new dance. Dance Scope, Spring 1970, pp. 26-38.

Lock, R., Martinek, T., & Phelps, J. CAFIAS, A prototype PL/I program for interaction analysis. University of North Carolina at Greensboro, 1978.

Locke, L.F. Research on teaching physical education: New hope for a dismal science. Quest, 1978, 28, pp. 2-17.

Lockhart, A., & Pease, E. Modern dance: Building and teaching lessons (4th ed.). Dubuque, Co.: Wm. C. Brown Co. Pub., 1973.

Love, A.M., & Roderick, J.A. Teacher nonverbal communication: The development and field testing of an awareness unit. Theory into Practice, 1971, 10(4).

Lunt, J.M. A procedure for systematically describing teacher-student verbal and nonverbal interaction in the teaching of choreography. Unpublished doctoral dissertation. The University of North Carolina at Greensboro, 1974.

Mazo, J. Prime movers: The makers of modern dance in America. New York: William Morrow and Co. Inc., 1977.

McDonagh, D. The rise and fall and rise of modern dance. New York: New American Library, 1970.

McDonagh, D. The complete guide to modern dance. New York: Doubleday and Co., Inc., 1976.

McGraw, B., Wardrop, J.L., & Bunda, M.A. Classroom observation schemes: Where are the errors. American Educational Research Journal, 1972, 9(1), 13-27.

Medley, D.M., & Mitzel, H.E. A technique for measuring classroom behavior. Journal of Educational Psychology, 1958, 49, 86-92.

Medley, D.M., & Mitzel, H.E. Measuring classroom behavior by systematic observation. In N. Gage (Ed.), Handbook of research on teaching. Chicago: Rand McNally Co., 1963 (a).

Medley, D., & Mitzel, H. The scientific study of teacher behavior. In A. Bellack (Ed.), Theory and research in teaching. New York: Teachers College Press, 1963 (b).

Melatic, V. The process is the purpose. Dance Scope, 1967, Fall-Winter, pp. 11-19.

Moore, E. The performer-teacher: An interview with Bella Lewitsky. Dance Scope, 1973-1974, pp. 7-11.

Moore, H. Dance technique through problem solving. Journal of Physical Education and Recreation, June 1974, p. 53.

Murray, R. Dance in elementary education. Harper & Row, 1953

Murray, R. (Ed.) Designs for dance. Washington: American Alliance for Health, Physical Education and Recreation, 1968.

Murray, R. The scene: In school and college. In M. Gray (Ed.), Focus on Dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Murray, R. Guidelines for children's dance. Washington: American Alliance for Health, Physical Education and Recreation, 1974.

Murray, R. Dance in elementary education (2nd ed.). New York: Harper & Row, 1975.

Nikolais, A. Four statements. In M. Van Tuyl (Ed.), Impulse II: Dance a projection for the future, 1969.

Nikolais, A. No man from Mars. In S.J. Cohen (Ed.), Seven statements of belief. Middletown, CT.: Wesleyan Unisity Press (3rd ed.), 1975.

Nixon, J.E., & Locke, L. Research on teaching physical education. In R.M.W. Travers (Ed.), Second handbook on research on teaching. Chicago: Rand McNally, 1973.

North, M. Body movement for children: An introduction to movement study and teaching. Boston: Plays Inc., 1971.

Nygaard, G.A. Interaction analysis of physical education classes. Research Quarterly, 1975, 46, 351-357.

Pease, E. Modern Dance (2nd ed.). Dubuque, IO.: Wm. C. Brown Co., 1976.

Phenix, P.H. Realms of meaning. New York: McGraw Hill, 1964.

Preston, V. A handbook for modern educational dance. London: MacDonald and Evans, 1963.

Rankin, K.O. Verbal and nonverbal interaction analysis of student teachers in elementary physical education. Unpublished doctoral dissertation, University of Kansas, 1975.

Redfern, B.H. Concepts in modern educational dance. London: Henry Kimpton Pub., 1973.

Ririe, S. Selection as a process. In M. Gray (Ed.), Focus on dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Rosenshine, B. Research in teacher performance criteria. In B.O. Smith (Ed.), Research in teacher education. Englewood Cliffs, N.J.: Prentice-Hall, 1971.

Rosenshine, B., & Furst, N. The use of direct observation to study teaching. In R.M.W. Travers (Ed.), Second handbook on rearch on teaching. Chicago: Rand McNally, 1973.

Rowley, G. The reliability of observation measure. American Educational Research Journal, 1976, 13(1), 51-59.

Russell, J. Creative movement and dance for children. Boston: Plays Inc., 1975.

Schurman, N., & Clark, S.L. Modern dance fundamentals. New York: MacMillan, 1972.

Schwab, J.J. Problems, topics and issues. In S. Elam (Ed.), Education and the structure of knowledge: Fifth Annual Phi Delta Kappa Symposium on Educational Research. Chicago: Rand McNally, 1964.

Siedentop, D. Developing teaching skills in physical education. Boston: Houghton Mifflin, 1976.

Smith, J.M. Dance composition: A practical guide for teachers. London: Lepus Book, 1976.

Smith, B.O., & Meux, M.O. A study of the logic of teaching. Urbana, Illinois: Bureau of Educational Research, 1962.

Sorell, W. (Ed.). The dance has many faces. New York: Columbia University Press, 1966.

Sorell, W. Twentieth Century trends. In M. Gray (Ed.), Focus on Dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Terry, W. The dance in America (Rev. ed.). New York: Harper & Row, 1971.

Thornton, S. Laban's theories: A new perspective. Boston: Plays, Inc., 1971.

Tomam, B. Dance directory. Programs of professional preparation in American colleges and universities (9th ed.). Washington: American Alliance for Health, Physical Education and Recreation, 1976.

Tomkins, C. The bride and the bachelors. New York: Penguin Books, 1968.

Turner, M. Choreographing contemporary dance. In M. Gray (Ed.), Focus on Dance V: Composition. Washington: American Alliance for Health, Physical Education and Recreation, 1969.

Turner, M.J. New dance approaches to nonliteral choreography. Pittsburgh: Pittsburgh Press, 1971.

Winters, S.J. Creative rhythmic movement in children of elementary school age. Dubuque, IO.: Wm. C. Brown Co., 1975.

Withall, J. The development of a technique for the measurement of social emotional climate in classroom. The Journal of Experimental Education, 1949, 17, 347-361.

Yamamoto, K., Jones, J., & Ross, M. A note on processing of classroom observation records. American Educational Research Journal, 1972, 9(1), 29-42.

A P P E N D I C E S

APPENDIX A

LORD'S ADAPTATION OF JOYCE'S SYSTEM OF TEACHER BEHAVIORS ANALYSIS

Lord's Adaptation of Joyce's System of Teacher Behaviors Analysis

The Application of Sanction

A communication should be classified as a sanction if, in the judgment of the observer, it is likely to have a rewarding or punishing effect on one or more students. The basis for classification is the intended effect of the communication. If one infers that the teacher is attempting to reward or punish, that is sufficient. The communication does not have to be judged to have a rewarding or punishing effect, for we are looking at the teacher's behaviors, not the child's (Joyce & Harootunian, 1967, p. 231).

Symbol for coding	Verbal sanction subcategory	Nonverbal sanction subcategory
S_1: Verbal s_1: Nonverbal $\textcircled{S_1}$: Verbal & Nonverbal	Sanctioning search behaviors Teacher rewards or punishes the student's attempts to do (or not to do) creative and/or productive thinking (to solve a problem, to evaluate information, opinion or reasoning, to express himself in literature, art or opinion, or to suggest a way for organizing an activity, etc.). The seeking, not the finding is being sanctioned.	Sanctioning search behaviors Any physical motions serving the function of sanctioning, exhibited in relation to student's attempts to do or not to do creative and/or productive thinking. These motions can be mainly supportive or disapproving. Ex.: Supportive motions (s^+): claps hands; pats shoulders; places hands on head of student, wrings student's hands, ...

Symbol for coding	Verbal sanction subcategory	Nonverbal sanction subcategory
	Ex.: Interesting, that is different from all that you have done so far (S_1^+) -you have not been searching very hard (S_1^-) -that sure would be worth trying (S_1^+).	Disapproving motions (s^-): drops head, throws head back in derisive laughter, hits, pushes away, pinches, grapples with, drops hands in disgust, bangs table, throws things down, etc.
S_2: Verbal s_2: Nonverbal (S_2): Verbal & Nonverbal	Sanctioning group relations Teacher rewards or punishes the student's relation with others in the dance studio. His attempts to improve group relations or failure to do so. Ex.: Remind people that you are not the only one in the studio (S_2^-). Ex.: To a group: Everything seems to be working just fine here (S_2^+).	Sanctioning group relations Any physical motions serving the function of sanctioning, exhibited in relation to student's relations with others in the dance studio. These motions can be mainly supportive or disapproving. Ex.: Supportive motions: see subcategory s_1. Disapproving motions: see subcategory s_1.
S_3: Verbal s_3: Nonverbal (S_3): Verbal & Nonverbal	Sanctioning attainment Teacher rewards or punishes the student's ability to perform or not to perform a skill correctly or to state or not to state correct information and/or concept. The student has presumably learned something (+) or failed to do so (-).	Sanctioning attainment Any physical motions serving the function of sanctioning, exhibited in relation to the student's activity to perform or not to perform a skill correctly or to state or not to state correct information and/or concept. The motions can be mainly supportive or disapproving.

Symbol for coding	Verbal sanction subcategory	Nonverbal sanction subcategory
	Ex.: This is correct here (S_3^+) -you see you can do it (S_3^+) -exactly (S_3^+); yes (S_3^+) -no that certainly is not a cabriole (s_3^-) -no (S_3^-); wrong (S_3^-); not quite (S_3^-).	Ex.: Supportive motions: see subcategory s_1. Disapproving motions: see subcategory s_1.
S_4: Verbal s_4: Nonverbal (S_4): Verbal & Nonverbal	Sanctioning the ability to obey directions or rules Teacher rewards or punishes the student's ability to conform to procedures and rules. The directions or rules may have been formulated either by the student or by the teacher. The standards may or may not have been stated before the sanction is applied. Ex.: you are late Sally (S_4^-) -you see how easily it works when each row starts on one (S_4^+).	Sanctioning the ability to obey directions or rules Any physical motions serving the function of sanctioning, exhibited in relation to the student's ability to conform to procedures and rules. Ex.: Supportive motions: see subcategory s_1. Disapproving motions: see subcategory s_1.
S_5: Verbal s_5: Nonverbal (S_5): Verbal & Nonverbal	Offering general support Teacher approves, appreciates or encourages the whole class's general behaviors.	Offering general support Any physical motions serving the function of sanctioning exhibited in relation to the approval, appreciation or encouragement of the class as whole.

Symbol for coding	Verbal sanction subcategory	Nonverbal sanction subcategory
	Ex.: That was an excellent class today (S_5^+) -it is so nice to work with you all (S_5^+).	These motions can be mainly supportive. Ex.: Supportive motions: see sub-category s_1.

The development of Procedures

A communication should be classified as procedural whenever the teacher is trying to arrange or organize the students, develop rules for procedure, make plans, or determine standards or goals. The procedures or standards may apply to work tasks or to play activitives. Sometimes the plans are long term, but sometimes they are short term, simple, and uncomplicated (Joyce & Harootunian, 1967, p. 234).

Symbol for coding	Verbal procedure subcategory	Nonverbal procedure subcategory
P_1: Verbal p_1: Nonverbal $\textcircled{P_1}$: Verbal & Nonverbal	Helps students to determine a standard of performance Teacher invites student's input in the decisions on how their progress or performance should be appraised. At best he gets students to decide for themselves whether their work is progressing well. Ex.: What major qualities do you think your next dance should have (P_1) -are you satisfied with that or do you think you should be able to do it without losing your balance (P_1) -set for yourself how well you want to perform that phrase (P_1).	Helps students to determine a standard of performance Any physical motion serving the function of helping students to determine a standard of performance (see verbal subcategory). These motions can be mainly soliciting but they can also be providing activity. Ex.: Soliciting motions: places hands in air, waves fingers to and fro anticipating answer; stares, awaiting answer, scratches head; cups hands to ear, stands still half turned toward person. Ex.: Providing/acting motions: gesticulates, emphasizes, illustrates, draws, writes, demonstrates and/or role plays.

Symbol for coding	Verbal procedure subcategory	Nonverbal procedure subcategory
P_2: Verbal p_2: Nonverbal (P_2): Verbal & Nonverbal	Helps students to develop a plan or a procedure Teacher invites student's input in the decisions related to selection of content, plan of action and/or procedure. The student's desires are taken into account in determining some study topic or some group arrangement. They share responsibilities. Ex.: Do you want to repeat this exercise again (P_2) -in what order to you want to present your dances (P_2) -find a space anywhere in the studio (P_2) -find a partner (P_2).	Helps students to develop a plan or a procedure Any physical motions serving the function of helping students to develop a plan or a procedure (see verbal subcategory). These motions can be mainly soliciting but they can also be conducting and/or providing/acting. Ex.: Soliciting motions: see subcategory P_1. Ex.: Providing/acting motions: see subcategory P_1. Ex.: Conducting motions: points fingers or head in a direction; shows an area of the dance studio...
P_3: Verbal p_3: Nonverbal (P_3): Verbal & Nonverbal	Imposing a plan or a procedure Whether pleasantly and tactfully or sternly and peremptorily, the teacher gives firm directions, sets the lines of study, establishes a routine or arranges students for an activity. Ex.: Commands related to the execution of movement: preparation (P_3); ready! (P_3); counts 1-2-3-4 while students execute an exercise (P_3)	Imposing a plan or a procedure Any physical motion serving the function of imposing a plan or a procedure. These motions can be mainly conducting but can also be providing/acting. Ex.: Conducting motions: points fingers or head, shows hands as stop signal, gives sign to repeat, pushes a child in a given direction, holds tempo with gesture, gives an accompaniment.

Symbol for coding	Verbal procedure subcategory	Nonverbal procedure subcategory
	-start on each set of 8's (P_3) -I give you five minutes to work on that (P_3) -whose turn is it now, Sharon (P_3).	Ex.: Acting/Providing motions: see subcategory P_1.
P_4: Verbal p_4: Nonverbal (P4): Verbal & Nonverbal	Imposing a standard of performance The teacher decides and states how the performance of students will be evaluated or improved, or he adopts some scale of measurement found in a testing manual or a guide book. Ex.: I expect your dance to be 3 minutes long and something new for you (P_4) -I don't care if you miss one count, I want you to dance it (P_4) -I don't care about the height of your battement, I want you to control it (P_4).	Imposing a standard of performance Any physical motions serving the function of imposing a standard of performance (see verbal subcategory). These motions can be mainly providing/acting. Ex.: Providing/acting motions: see subcategory P_1.

Handling of Information

A communication should be classified as informational whenever the teacher is presenting facts or ideas or demonstrating or explaining some skill, or whenever he is inducing the students to give information, collect facts, develop ideas or practice some skill (Joyce & Harootunian, 1967, p. 235).

Symbol for coding	Verbal information subcategory	Nonverbal information subcategory
I_1: Verbal i_1: Nonverbal (I_1): Verbal & Nonverbal	Helps students to theotize Teacher invites students to assume the responsibility of the thinking in the class (to collect data, raise hypotheses, make inferences, evaluate information, define or advance problem, justify his opinion or creation). The study involved may range from pursuing an explanation of a scientific event to appraising the qualities of a choreography. Very often the students are asked to defend or justify a position or a judgment. Ex.: Why do you think that dance works (I_1) -take three dancers and see how you can manipulate them to project different dimensions of space (I_1)	Helps students to theorize Any physical motion serving the function of helping students to theorize (see verbal subcategory). These motions can be mainly soliciting but can also be providing/acting and/or inducting. Ex.: Soliciting motions: see subcategory p_1. Ex.: Providing/acting motions: see subcategory p_1. Ex.: Conducting motions: see subcategory p_3.

Symbol for coding	Verbal information subcategory	Nonverbal information subcategory
	-why did you choose that music (I_1).	
I_2: Verbal i_2: Nonverbal $\textcircled{I_2}$: Verbal & Nonverbal	Helps students towards self-expression The teacher invites students to express themselves creatively or originally in movement or asks them some opinion on an issue for which there are no precise answers. No justification is expected. Ex.: Teacher presents a movement task which implies creative decision making for the student: -fill the last four counts anyway you want (I_2) -see if you can vary this movement without changing its shape (I_2); take these three movements and find different ways to put them into a phrase (I_2) -how did you feel while you were dancing (I_2) -any comments on Sue's dance (I_2).	Helps students towards self-expression Any physical motion serving the function of helping students toward self-expression (see verbal subcategory). These motions can be mainly soliciting but can also be providing/acting and/or conducting. Ex.: Soliciting motions: see subcategory p_1. Ex.: Providing/acting motions: see subcategory p_1. Ex.: Conducting motions: see subcategory p_3.
I_3: Verbal i_3: Nonverbal $\textcircled{I_3}$: Verbal & Nonverbal	Questioning students for precise answer Teacher invites students to seek one possible answer, one requiring no analysis, hypothesis, or justification. The student is merely asked to retrieve some memorized fact or idea or to recall some observation.	Questioning students for precise answer Any physical motions serving the function of questioning students for precise answer (see verbal subcategory). These motions can be mainly soliciting but can also be providing/acting and/or conducting.

Symbol for coding	Verbal information subcategory	Nonverbal information subcategory
	Ex.: What is the name of that movement (I_3) -can anybody show me what a "tour en l'air" is (I_3) -how can we stretch a limb (I_3).	Ex.: Soliciting motions: see subcategory p_1. Ex.: Providing/acting motions: see subcategory p_3.
I_4: Verbal i_4: Nonverbal (I_4): Verbal & Nonverbal	Delivering information Teacher gives information or demonstrates or describes a skill. The kind of information he delivers comprises either data or relatively stable theory or knowledge in Schwab's sense. The teacher can be reading stories, poems, or passages from a book or he can be lecturing, demonstrating or showing a film or commenting on it. Ex.: Teacher describes and explains dance exercise (I_4) -presents facts: Cunningham believes that anything can follow anything (I_4) -teacher repeats part of the exercise while the students are executing (I_4): extend your legs completely (I_4) -teacher repeats a statement made by a student (I_4).	Delivering information Any physical motions serving the function of delivering information (see verbal subcategory). These motions can be mainly providing/acting. Ex. Providing/acting motions: see subcategory p_1.

Symbol for coding	Verbal information subcategory	Nonverbal information subcategory
I_5: Verbal i_5: Nonverbal (I_5) Verbal & Nonverbal	Delivering conclusions or opinions Teacher delivers an opinion or conclusion, explains a criterion or a measure of evaluation or defines an issue or a problem. Unlike the subcategory I_4, this subcategory involves more fluid knowledges in Schwab's sense or even the teacher's personal judgment or point of view. The teacher is doing original thinking. Ex.: Teacher evaluates a student's dance, the work of the class on a specific task or for an entire lesson: -I feel that the impulse was a very important part of the choreography (I_5); you still need to work on that, you do not have enough strength yet (I_5) -teacher gives an opinion: if you were studying with X, you would be told to do it that way (I_4), but I believe that this way is better for your level (I_5) -make synthesis: all this to show you that there are as many choreographic styles as there are choreographers (I_5).	Delivering conclusions or opinions Any physical motions serving the function of delivering information (see verbal subcategory). These motions can be mainly providing/acting. Ex.: Providing/acting motions: see subcategory p_1.

The Maintenance of the Class as a Social System

Because the teacher is an important member of a complex organization of people - namely, the shcool and his own classroom - many of his communications are inevitably directed at and maintaining this organization. Thus, in this general category the teacher attends to routine relations with students, sometimes giving his own personal direction or comment, and sometimes merely transmitting directions or rules handed down to him from higher authorities in the school or school system (Joyce & Harootunian, 1967, p. 237).

Symbol for coding	Verbal maintenance subcategory	Nonverbal maintenance subcategory
M_1: Verbal m_1: Nonverbal (M_1): Verbal & Nonverbal	Providing transition Teacher refrains from comments, kills time, recognizes student's contribution by merest approval. Ex.: mmm ah! yes.	Providing transition Any physical motions serving the function of providing transition (see verbal subcategory). These motions can be mainly personal. Ex.: Personal motions: plays with earrings, nods heads, scratches head, etc.
M_2: Verbal m_2: Nonverbal (M_2): Verbal & Nonverbal	Making small talk Teacher discusses, makes observations or asks questions about topics that are personal in nature and not directly related to the business of the school, although the communication may	Making small talk Any motion serving the function of making small talk (see subcategory). These motions can be mainly delivering/acting. Ex.: Delivering/acting motions: see subcategory p_1.

Symbol for coding	Verbal maintenance subcategory	Nonverbal maintenance subcategory
	effect rapport with the students. Ex.: My, it's warm (M_2) -when I was studying with Graham... (M_2) -sorry, I don't feel very well today (M_2).	
M_3: Verbal m_3: Nonverbal (M_3): Verbal & Nonverbal	Discussing routine Whether as an agent of the school or dealing with his own classroom arrangement, the teacher is concerned with routine organizational matters not directly related to instruction. Ex.: There will be a master class tomorrow (M_3) -to the accompanist: give me something stronger (M_3) -would you open a window (M_3).	Discussing routine Any motion serving the function of discussing routine (see verbal subcategory). These motions can be of any type: acting/providing, conducting, soliciting, etc. Ex.: Acting/providing motions: see subcategory p_1. Ex.: Conducting motions; see subcategory p_3. Ex.: Soliciting motions: see subcategory p_1.

Student's Reactions

Symbol for coding	Verbal student category	Nonverbal student category
R_1: Verbal r_1: Nonverbal (R_1): Verbal & Nonverbal	Student's responses that is entirely predictable, such as obedience to order, response not requiring thinking beyond the comprehension plan or knowledge (after Bloom). Ex.: To the question: how do we stretch a limb? The student answers: by making an extension (R_1) -to the question: what quality does this movement have? The student answers: percussive (R_1).	Students move mechanically to questions or directions, respond to any actions with minimal nervous activity, robot like. Ex.: The students execute the exercises as told (r_1) -the students mark an exercise with the teacher (r_1) -the students close the door according to the teacher's request (r_1) -the students form four columns as asked (r_1).
R_2: Verbal r_2: Nonverbal (R_2): Verbal & Nonverbal	Predictable student responses requiring some measure of evaluation and synthesis from the student, but must remain within the province of predictability. The initial behavior was in response to teacher initiation. Ex.: To the question: what is wrong in Ann's plié? The student answers: she lets her pelvis go backward as she goes down (R_2(.	Students add movement to those given or expected, try to show some arrangement requiring additional thinking (idea of executing a task in his/her personal way). Ex.: The students rearrange a movement phrase -the students vary a movement according to a structure given.

Symbol for coding	Verbal student category	Nonverbal student category
R_3: Verbal r_3: Nonverbal (R_3): Verbal & Nonverbal	Unpredictable student behaviors that is purely the result of their own initiative and that could not be predicted. Ex.: Would you please do that again, I didn't have time to see (R_3) -student comments on a dance (R_3).	Student puts hands up to ask questions, gets up and walks around without provocation; begins creative movement, makes up own dances, makes up own movements, shows initiative in supportive movement, etc.

Other Categories

10 confusion: chaos, disorder, noise, much noise...

20 silence: children sitting doing nothing, noiselessly awaiting teacher...

Instructions for Coding

1. The basic unit of analysis is three seconds. One tally is recorded every three seconds, or less in case of shorter communication.

   (The sound of a metronome set at one second intervals has been found very helpful in setting a recording pace.)

2. A tally is recorded by writing down the symbol corresponding to the appropriate verbal and/or nonverbal category or subcategory. Whenever the teacher or student's verbal and nonverbal communication serves the same function and happens simultaneously, the observer codes the verbal symbol and encircles it.

3. The original sequence of the class interaction is preserved by recording the category symbols in columns.

4. Whenever the teacher and students are simultaneously offering information to be coded, the symbol /‾ with the appropriate students' response symbol (ex.: r, /‾) is placed in the column as a means of indicating the beginning of students' response. The coder subsequently continues as usual the recording of teacher's communications as they occur. Should the teacher stop talking and/or demonstrating, the students' response is then coded as usual. The symbol _ is placed to indicate the

end of students' response. After the recording sessions, the coder adds the appropriate students' response symbols in between each tally recorded for the teacher inside the bracketed area.

5. Rule five applies when more than half of the students that can be seen are engaged in the activity.

An example of a coding sheet is provided in the following page.

Agreement Rules Developed for the Coding of Dance Classes

1. When the teacher starts a comment and is interrupted before he makes sense, the comment is coded as the previoysly coded statement, unless it is evident that he/she was about to start something new, in which case the comment is coded as 10 (confusion).

2. If a student stops during the presentation of a dance and nothing else happens, a 10 is recorded until he/she begins dancing again.

3. Inaudible parts of the students' or teacher's talk are coded as 10 (confusion).

4. To be classified as a sanction, a communication should include explicit sanctioning behaviors.

5. Any sanction following students' reactions to teacher solicitation of students' input regarding standards of

EXAMPLE OF A CODING SHEET

Teacher number 2 Technique

Sample number 1 (30 minutes)

10	I_3	P_3	I_3	I_4	I_4	r_1	P_2
I_3	R_1	r_1	R_1	r_1	M_1	I_4	r_1
P_3	M_1	I_4	M_1	P_3	R_3	r_1	P_3
P_3	10	r_1	r_1	r_1	I_4	R_3	20
P_3	M_2	P_3	I_4	S_3^+	I_4	r_1	I_4
P_3	P_3	r_1	r_1	r_1	M_1	P_3	I_4
I_4	P_3	P_3	I_4	P_3	I_4	r_1	I_4
I_4	r_1	r_1	r_1	r_1	I_4	I_4	I_3
I_4	P_3	P_3	P_3	P_3	I_4	r_1	I_4
I_4	r_1	r_1	r_1	r_1	M_1	I_4	M_1
I_4	P_3	P_3	P_3	M_1	P_3	r_1	I_4
I_4	r_1	r_1	r_1	r_1	10	I_4	I_4
I_4	S_3^+	P_3	P_3	I_4	S_3^+	r_1	r_1
I_4	r_1	r_1	r_1	r_1	15	I_4	I_4
I_4	P_3	P_3	I_4	P_3	r_1	r_1	r_1
I_4	r_1	r_1	r_1	r_1	I_4	I_4	I_4
I_4	I_4	P_3	P_3	P_3	r_1	r_1	r_1
I_4	r_1	r_1	r_1	r_1	i_4	I_4	M_1
I_4	P_3	P_3	I_4	I_4	r_1	r_1	r_1
I_4	r_1	r_1	r_1	I_5	I_4	I_4	S_3^+
20	S_3^+	P_3	S_3^+	I_4	r_1	r_1	r_1
M_1	r_1	r_1	r_1	I_4	M_1	M_1	I_4

performance or development of a plan or procedure, of students' thinking, students' self-expression is coded as S_1^+ or S_1^-.

6. Teacher's and students' applause after the presentation of a dance is coded as s_1^+ (nonverbal).

7. Teacher's comments such as "Pardon me?" or "What?" are coded as P_3 (meaning, "repeat your question").

8. Teacher's comments such as, "I am sorry" are coded M_2.

9. Any teacher's communication directed to the accompanist is coded M_3.

10. Demonstration and/or explanation of an exercise is coded as I_4 or i_4; comments and/or motions made regarding the posology (number of repetitions, etc.) is coded P_3 or p_3.

11. Teacher's repetitions of students' responses or behaviors are coded I_4 or i_4.

12. When in doubt about a teacher' comment being I_4 or I_5 the comment is considered I_5 unless an objective referent has been mentioned. Verbal cues such as "I feel", "I think", "It seems to me", etc. are indicative of I_5.

13. An individual student's reaction is coded only if the teacher takes account of it.

14. Because of the team teaching situation in one of the classes, it was agreed that the second teacher would be coded as a student unless invited by the teacher to take the responsibility of teaching.

Instructions for Analyzing the Coded Information

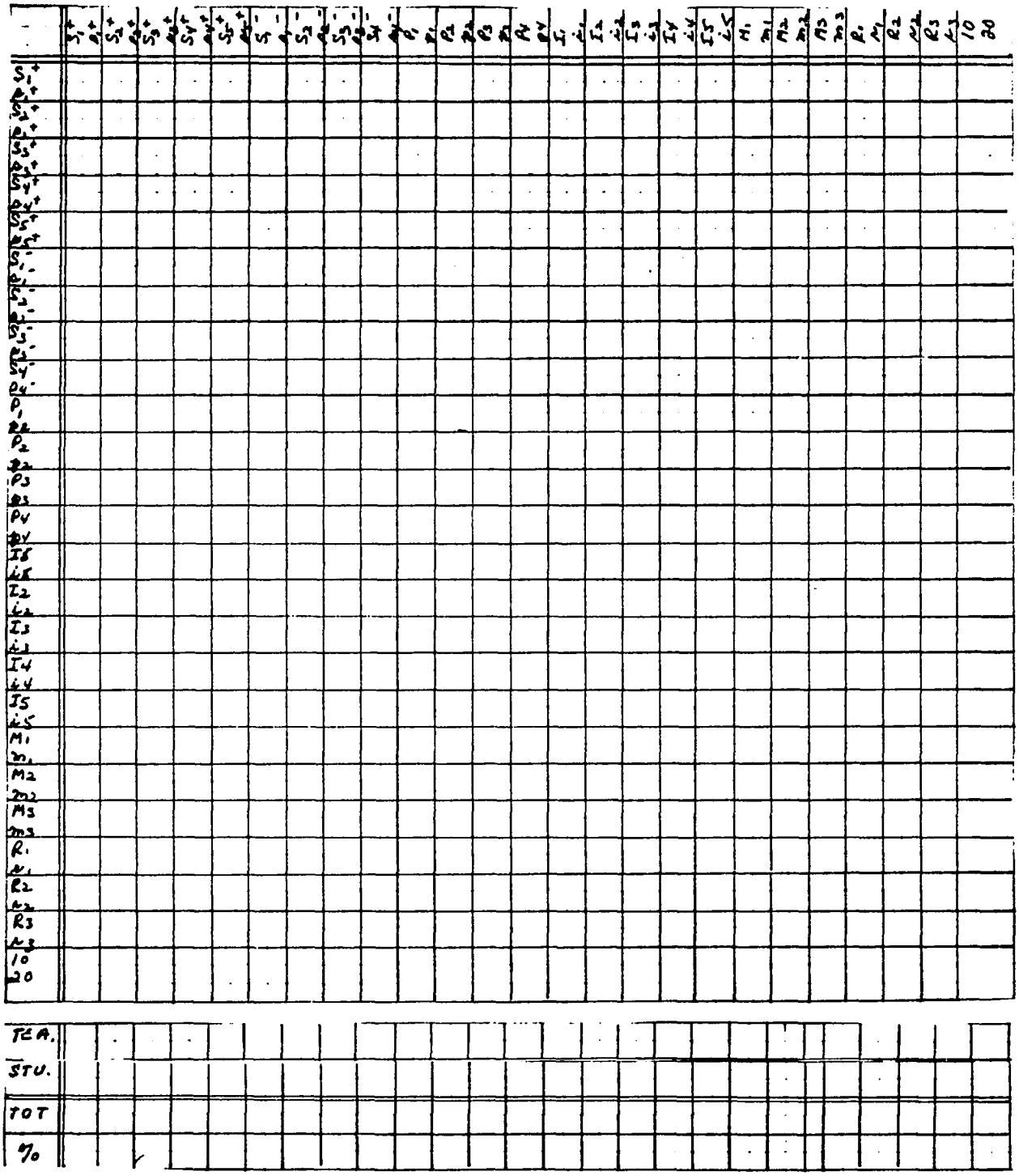
For purposes of analysis, the information recorded according to the Lord's adaptation of Joyce's system is compiled on a 50 x 50 matrix. The latter was built according to the procedures developed by Cheffers et al. (1974). An example of the 50 x 50 matrix representing the verbal and nonverbal dimensions of the system is given in Figure 5.

When the computer is used, tallies are entered in the matrix according to the procedures developed by Rodgers (Cheffers et al., 1974) for CAFIAS. The reader can find the description of these procedures in Chapter X of Interaction Analisis: An Application to Nonverbal Activity (Cheffers et al., 1974, p. 55-63).

For each of CAFIAS' categories, the position assigned to the teacher can be used to enter the verbal dimension and that assigned to the student to enter the nonverbal dimension of the Lord's adaptation of Joyce's system of teacher behaviors analysis. The categories 10 and 20 can be entered under the positions reserved for the environment in the

Figure 5

Example of the Matrix



Teacher: _____ Sample #: _____

Class : _____ Date: _____

Time : _____ Recording moment: _____

categories 10 and 20 of CAFIAS. The appropriate symbol coresponding to the aspect entered under each position can be placed on the computer data sheet after computation.

APPENDIX B

RELIABILITY DATA

Raw Data Used for the Calculation of the Coefficient of Objectivity of the Two Coders in Using the LAJS

First coding session

CODER NUMBER ONE

Ten Top Cells	Number of Tallies	Ranking Order
$I_4 - i_4$	225	1
$r_3 - 10$	140	2
$r_1 - I_4$	136	3.5
$r_1 - P_3$	136	3.5
$i_4 - r_1$	125	5
$p_3 - r_1$	118	6
$P_3 - p_3$	99	7
$10 - r_3$	98	8
$i_4 - I_4$	96	9
$10 - 10$	94	10

CODER NUMBER TWO

Ten Top Cells	Number of Tallies	Ranking Order
$I_4 - i_4$	230	1
$r_3 - 10$	140	2
$r_1 - I_4$	128	3
$r_1 - P_3$	99	7
$i_4 - r_1$	102	5.5
$p_3 - r_1$	119	4
$P_3 - p_3$	95	8.5
$10 - r_3$	95	8.5
$i_4 - I_4$	102	5.5
$10 - 10$	66	11

Raw Data Used for the Calculation of Coder Number One's Coefficient of Reliability in Using the LAJS

FIRST CODING SESSION

Ten Top Cells	Number of Tallies	Ranking Order
$I_4 - i_4$	225	1
$r_3 - 10$	140	2
$r_1 - I_4$	136	3.5
$r_1 - P_3$	136	3.5
$i_4 - r_1$	125	5
$P_3 - r_1$	118	6
$P_3 - p_3$	99	7
$10 - r_3$	98	8
$i_4 - I_4$	96	9
$10 - 10$	94	10

SECOND CODING SESSION

Ten Top Cells	Number of Tallies	Ranking Order
$I_4 - i_4$	228	1
$r_3 - 10$	136	3
$r_1 - I_4$	140	2
$r_1 - P_3$	116	6
$i_4 - r_1$	135	4
$P_3 - r_1$	117	5
$P_3 - p_3$	88	9
$10 - r_3$	96	7
$i_4 - I_4$	92	8
$10 - 10$	86	10

Raw Data Used for the Calculation of Coder Number Two's Coefficient of Reliability in Using the LAJS

FIRST CODING SESSION

Ten Top Cells	Number of Tallies	Ranking Order
I_4 - i_4	230	1
r_3 - 10	140	2
r_1 - I_4	128	3
r_1 - P_3	99	7
i_4 - r_1	102	5.5
P_3 - r_1	119	4
P_3 - P_3	95	8.5
10 - r_3	95	8.5
i_4 - I_4	102	5.5
10 - 10	66	11

SECOND CODING SESSION

Ten Top Cells	Number of Tallies	Ranking Order
I_4 - i_4	243	1
r_3 - 10	141	2
r_1 - I_4	120	5
r_1 - P_3	135	4
i_4 - r_1	130	3
P_3 - r_1	110	6
P_3 - P_3	96	7.5
10 - r_3	85	9
i_4 - I_4	96	7.5
10 - 10	76	10

APPENDIX C

ADDITIONAL RELATED INFORMATION

Additional Related Information

Further information regarding the University of North Carolina at Greensboro, the Dance Division of the School of Health, Physical Education and Recreation, the teachers and classes selected for the study is provided in this section. This information was gathered through the review of pertinent literature (University of North Carolina at Greensboro Bulletin, course outlines, teacher's vitae), a personal interview with each teacher involved in the study, and finally, through the compilation of a short questionnaire filled out by the students enrolled in the dance classes selected for that study. A copy of that questionnaire is shown in Appendix D.

Description of the University Setting

The University of North Carolina at Greensboro is a state-supported, coeducational institution with a current enrollment of about 9,800 students, with over 50,000 living alumni.

About 6,900 students are currently involved in programs leading to eight different undergraduate degrees in 89 fields of study. Most of the degrees require 120 semester hours, 24 to 36 of them being applied in the major

field. The university counts about 2,850 graduate students.

With about 610 full-time faculty members, 62% of whom hold doctorate degrees, the university has a student-faculty ratio of 14.5 to 1.

The Dance Division of the University of North Carolina at Greensboro's School of Health, Physical Education and Recreation

The Dance Division was created in 1972 as a part of the School of Health, Physical Education and Recreation. It actually counts five full-time faculty members and also uses the services of three part-time graduate assistants.

Physical dance facilities include three dance studios, one of which is currently used as a stage area. All the classes selected for the present study occurred in the "lower dance studio". This studio offers a 39 x 50 feet wood floor, has about 90 feet of ballet barres attached to three walls, and about 285 square feet of mirrors fixed to the front and to one side wall. The large glass door and eight windows at the back wall allow good natural lighting during the day time. The studio is connected to an "upper studio" which becomes a large lighted stage area when sliding doors that divide the two studios are opened.

One graduate and two undergraduate dance major programs are offered by the Dance Division. The Bachelor of Fine Arts

is offered as a preparation for a professional career as a dancer or choreographer, while the Bachelor of Science is offered as a professional preparation for dance teachers. The Master's of Fine Art program is offered as an opportunity for further study in the dance discipline.

The Teachers

Teacher number one. Teacher number one was responsible for the "Undergraduate Intermediate Choreography" class and for the "Low Intermediate Modern Dance" class. She is a well-known dance educator who has numerous professional contributions and publications to her credit. Her teaching experience includes two years at the high school level and about seventeen years distributed among four different universities, before she came to the University of North Carolina at Greensboro in 1976. She has been teaching and choreographing at this university since that time.

According to teacher number one's curriculum vitae, her formal educational background consists of a Bachelor of Science in Education with a major in Physical Education (1955), a Master of Science in Physical Education-Dance (1964) and a Ph.D. in Physical Education-Dance (1969). Her doctoral dissertation dealt with the choreographic process. Numerous opportunities to work with a variety of dance

artist-choreographers -- Nikolais, Redlick, Hoving, in particular -- along with dance therapy workshops can also be added to a description of her formal training in dance.

During a short interview, teacher number one defined her role as that of a guide. Each student represents for her a unique individual and potential artist. She thus deems it her educational responsibility to start where the students are in order to help them to go their own way. The teacher, she believes, must be a resource person who helps students to experience and to learn from their experience. She is convinced of the necessity of letting the student take the responsibility for his/her own learning.

She considers the development of an appropriate learning climate to be an important aspect of the teaching of dance. For both technique and choreography settings, she refers to such a climate in terms of "stimulating artistic environment". Informality, as well as physical and psychological well-being, is what she specifically intends to create in technique classes, while freedom, as well as students' participation and interaction, constitutes specific concerns that she relates to the climate of choreography classes.

At this point in her career, teacher number one attributes first priority to her teaching responsibilities. She considers her professional contributions to the promotion

and recognition of the art of dance as secondary, though still of considerable importance. Her own artistic development and personal growth constitute her third professional priority.

Teacher number two. Teacher number two was responsible for the "Graduate Choreography for Large Groups and Long Dances" class and for the "Undergraduate High Intermediate Modern Dance" class. As a dance educator, she is relatively new for the field. Her introductory teaching experience was provided in 1973 in the context of a dance theatre and cultural arts program. She subsequently taught in two different American universities before she came to the University of North Carolina at Greensboro where she has been teaching and choreographing since the fall of 1975.

According to teacher number two's curriculum vitae, her formal educational background consists of a Bachelor of Science in Education with a major in dance (1973), and a Master of Science in Education with a major in dance (1975). A relatively diversified informal dance background can also be added to the latter. In the areas of technique and choreography, she had opportunities to work with Cliff Keuter, Elizabeth Bergman, Gay Delange, Phyllis Lamhut, Viola Faber, Merce Cunningham and Company, Maggie Black and Taya Bergman. Her dance background also includes experiences in the area of dance therapy.

During a short interview, teacher number two revealed that the idea of "interaction" is at the core of her conception of teaching and education. She believes that the learning and growth process can be at its best only when both teacher and students fulfill their mutual responsibilities. Viewing the students as unique individuals possessing unique talents and needs, she regards it as the teacher's responsibility to offer multiple alternatives, and at the same time the students' obligation to take from the instructor what they need. She refers to the teacher alternately as guide, stimulator and interpreter. In technique as well as in choreography classes she aims at the development of holistic dancers, choreographers and artists.

The climate of the dance class is a major concern of this teacher. She describes an appropriate climate for both choreography and technique as warm, secure and permissive, yet "professional" and challenging. Openness and respect for individuality constitute climate characteristics she assigns more particularly to the choreography setting, while structure and firmness she applies more frequently to that of technique.

Descriptions of the Classes

Intermediate dance choreography. This class met in the "lower dance studio" twice a week (on Tuesday and

Thursday) from 9:30 to 11:00 A.M., It enjoyed the constant presence of an accompanist who worked in close collaboration with teachers and students. Under the direction of teacher number one, the class was taught by a team of two teachers; however, teacher number one was the main focus for this study.

The class was an undergraduate course, a follow-up to a beginning course in choreography. Its major objectives are defined in terms of individual creative growth and development of basic skills in the craft of making dances. The content is focused on content and form motivations for dance. Throughout the semester the students were actively involved in designing dances for groups according to their subject matter interest and aesthetic taste. Doris Humphrey's The Art of Making Dances was the basic textbook for this course.

The class numbered 15 female students and one male student. They were all currently involved in getting a Bachelor of Fine Arts or a Bachelor of Science degree in dance. Among these students, four had not completed the prerequisite, the beginning choreography class. They were, however, allowed to take the course rather than be held up in graduation. As a result, an important disparity in the students' ability levels existed.

The student questionnaire revealed that most students enrolled in that class with a desire for personal creative growth. Acquisition of knowledge and skills in choreography was the second most widely shared purpose. In general, the second purpose tended to be more fulfilled than the first one at the end of the semester. Group work and freedom was particularly appreciated by that group.

Choreography for Large Groups and Long Dances. The class met in the "lower dance studio" twice a week (on Tuesday and Thursday) from 11:00 A.M. to 12:30 P.M. In addition to the regular space of the studio, the stage area was often used for dance presentations. The services of an accompanist were always available to the teacher as well as to the students.

Major objectives for this graduate course were defined in terms of development of choreographic skills, understanding of and experimentation with a variety of approaches to choreography and sharpening of the aesthetic sense. The content was focused on four major aspects: (a) exploration of basic choreographic concepts and movement analysis specific to large groups and long dances; (b) experimentation with "task dances"; (c) exploration of a variety of sources of movement and ideas for dances, and (d) practice of the technique of developing phrases. Class activities primarily

took the forms of exploration workshops, improvisation and observation, appreciation, criticism and presentation of individual student's works in progress.

The class numbered 11 female students and one male student. All were involved in getting a Master of Fine Arts in Dance. Important discrepancies existed in the students' choreographic knowledges and skills; not all had essential undergraduate level experience.

The student questionnaire revealed a desire for knowledge and skill acquisition in choreography to be almost unanimously shared by the members of that group whose desire appeared to be fairly well satisfied at the end of the semester. A variety of experiences was particularly appreciated: (a) improvisation, (b) observation of others' works, (c) development of a piece over a whole semester, and (c) teacher-students' appreciation and criticism.

Intermediate Modern Dance Technique II. This class met in the lower dance studio twice a week (Monday and Wednesday) from 2:30 to 4:00 P.M. The services of a percussionist were available during the first five weeks of the semester. The task of accompaniment was taken over by the teacher after the accompanist's departure.

This course was of high intermediate level. Its major goals were related to expanding the students' possibilities for moving in a richer and more complete way as well as assuring their personal integration and interpretation of these new possibilities. The content relied mainly on the teacher's integration of three different technical styles: (a) Cunningham, (b) Humphrey - Weidman, and (c) Nikolais. The basic structure of the lesson generally included: (a) an introductory warm-up, (b) techniques and specifics, (c) sequence, (d) large motor/space pattern, (e) improvisation, and (f) centering.

About 25 students were currently enrolled in this class. All but one were female and possessed varied skills levels. These students were involved in a variety of dance programs, primarily the Bachelor of Fine Arts, the Bachelor of Science and the Master's degree. Many students were auditing.

Responses to the student questionnaire indicated the improvement of their individual technical abilities to be the common purpose shared by most of the students who tended to be highly satisfied at the end of the semester. The variety and challenge provided by the end of class combinations was particularly appreciated by the class members.

Intermediate Modern Dance Technique I. The class met in the lower dance studio twice a week (Tuesday and Thursday)

from 2:oo to 3:30 P.M. The services of a percussionist were available during the first five weeks of the semester. The accompaniment was provided by the teacher after the accompanist's departure.

This course was of low intermediate level. Its major goals were defined in terms of improving students' movement possibilities as well as freeing them from motor stereotypes. The development of a sense of motion was strongly emphasized. Many technical styles formed the content of that class, but that of Nikolais predominated. A progression from relatively stable work to extensive use of space and time was generally followed.

About 14 students, three of whom were male, were currently taking that class. These students possessed varied dance skills levels and were mainly involved in a Bachelor of Fine Arts, Bachelor of Science, or Master's degree in Dance. A few were auditing.

According to the results of the student questionnaire, the improvement of students individual dance technical abilities was the common purpose shared by most of the class members who tended to be fairly satisfied at the end of the semester. The teacher's emphasis on flow and quality of movement was particularly appreciated by the class members.

APPENDIX D

STUDENT QUESTIONNAIRE

STUDENT QUESTIONNAIRE

TITLE OF THE COURSE: _____

NAME OF THE TEACHER: _____

DATE : _____

1. What was your purpose in enrolling in this course (beyond obtaining credits)?

_____

_____

_____

2. To what extent was your purpose fulfilled?

1) a great deal; 2) moderately; 3) a little;
4) not at all.

3. What did you like most about your experience in that class?

_____

_____

_____

4. What did you like least about your experience in that class?

_____

_____

_____

APPENDIX E

SUMMARY OF OBSERVED LAJS DATA

MASTER MATRIX

CHOREOGRAPHY

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

CAFIAS COMPUTER ANALYSIS

REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO

TEACHER CHOREO SCHOOL TOTAL CLASS ALL SAMP DATE

GRADE SETTING TIME

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

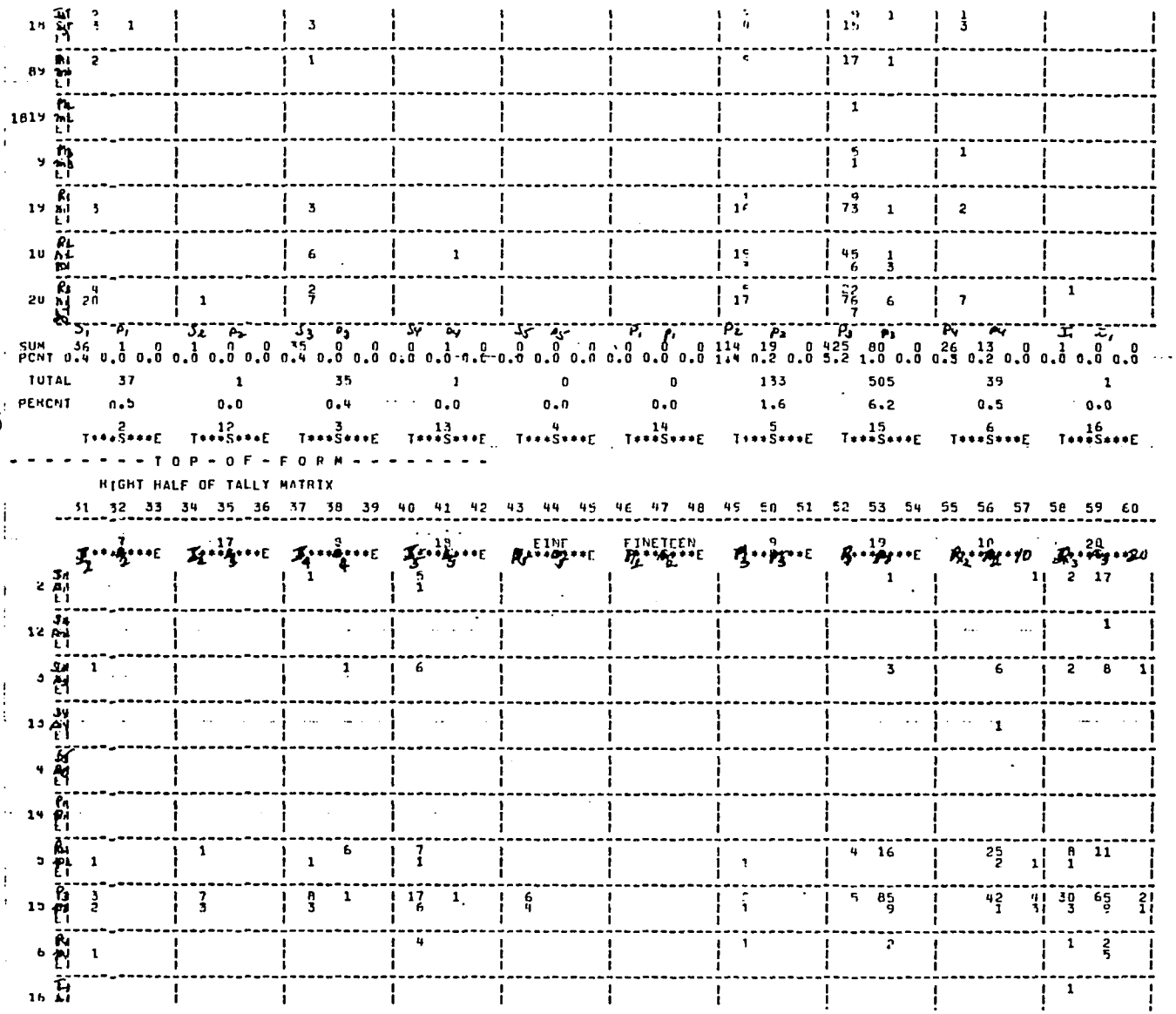
TOTAL OF ALL DATA

LEFT HALF OF TALLY MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	2 J_1…D_1…E			12 J_2…D_2…E			3 J_3…D_3…E			13 J_4…D_4…E			4 J_5…D_5…E			14 P_1…p_1…E			5 P_2…p_2…E			15 P_3…p_3…E			6 P_4…p_4…E			16 I_1…I_1…E		
2	1						1												2			4			1					
12																														
3																			1			6								
13																														
4																														
14																														
5							1												5	19		7								
							1												8			2								
15							6												8			71	61		1					
																			2			20	5							
6																									3	13				
																									7					
16																														
7	1																					1								
																						1								
17																			2			6								
																			1			1								

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

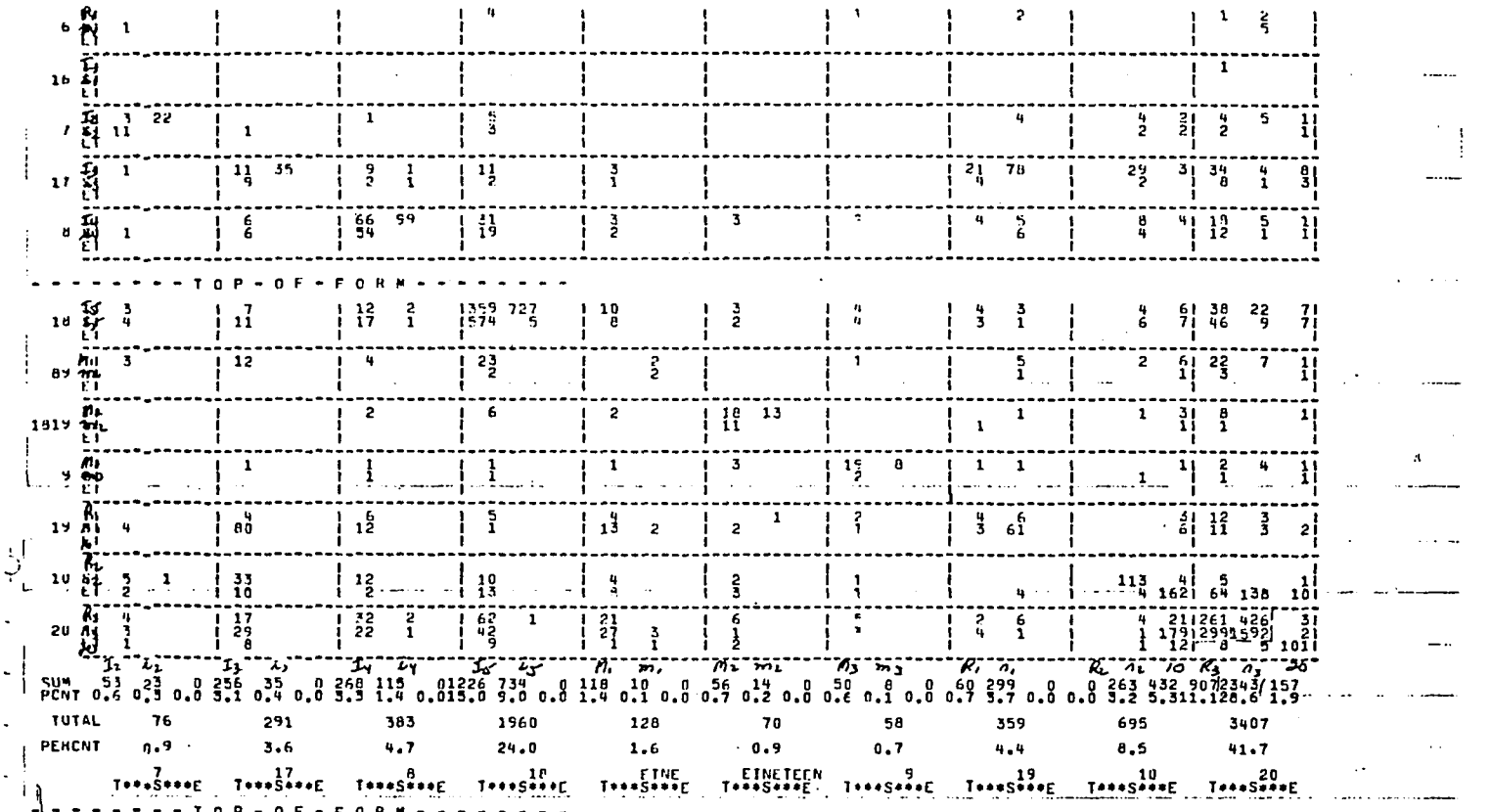
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
8							3												1			8	1							
							1												4			4								
18	2																		2			9	1		1					
	3	1					3												4			15			3					
89	2						1												5			17	1							



- - - - - - - - T O P - O F - F O R M - - - - - - - -

RIGHT HALF OF TALLY MATRIX

51 52 53 54 55 56 57 58 59 60



- - - - - - - - T O P - O F - F O R M - - - - - - - -

	I_1	i_1		I_3	i_3		I_4	i_4		I_5	i_5		R_1	r_1		R_2	r_2	10	R_3	r_3	20
SUM	53	23	0	256	35	0	268	115	0	1226	734	0	118	10	0	56	14	0	50	8	0	60	299	0	0	263	432	907	234	3/157
PCNT	0.6	0.3	0.0	3.1	0.4	0.0	3.3	1.4	0.0	15.0	9.0	0.0	1.4	0.1	0.0	0.7	0.2	0.0	0.6	0.1	0.0	0.7	3.7	0.0	0.0	3.2	5.3	11.1	28.6	1.9

TOTAL	76			291			383			1960			128			70			58			359			695			3407		
PERCNT	0.9			3.6			4.7			24.0			1.6			0.9			0.7			4.4			8.5			41.7		

	7			17			8			10			FINE			EINETEEN			9			19			10			20		
	T	*	*	S	*	*	E	T	*	*	S	*	*	E	T	*	*	S	*	*	E	T	*	*	S	*	*	E	T	*	*	S	*	*	E

- - - - - - - - T O P - O F - F O R M - - - - - - - -

PARENT CELL PERCENTAGES

	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.05	0.01	0.00	0.00	0.00	0.01	0.07	0.00	0.00	0.00	0.01	0.01	0.23
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.00	0.01	0.00	0.01	0.07	0.00	0.00	0.00	0.04	0.07	0.13
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.02	0.00	0.00	0.00	0.44	0.11	0.00	0.00	0.01	0.01	0.05	0.10	0.00	0.00	0.01	0.24	0.34	0.24
15	0.00	0.00	0.07	0.00	0.00	0.00	0.12	2.02	0.01	0.00	0.06	0.12	0.15	0.29	0.12	0.00	0.04	1.21	0.61	1.34

SUB-MATRIX

CHOREOGRAPHY

Teacher number one

CAFIAS COMPUTER ANALYSIS
REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO

TEACHER #1 C   SCHOOL CHORED A   CLASS LL   DATE
GRADE   SETTING   TIME

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

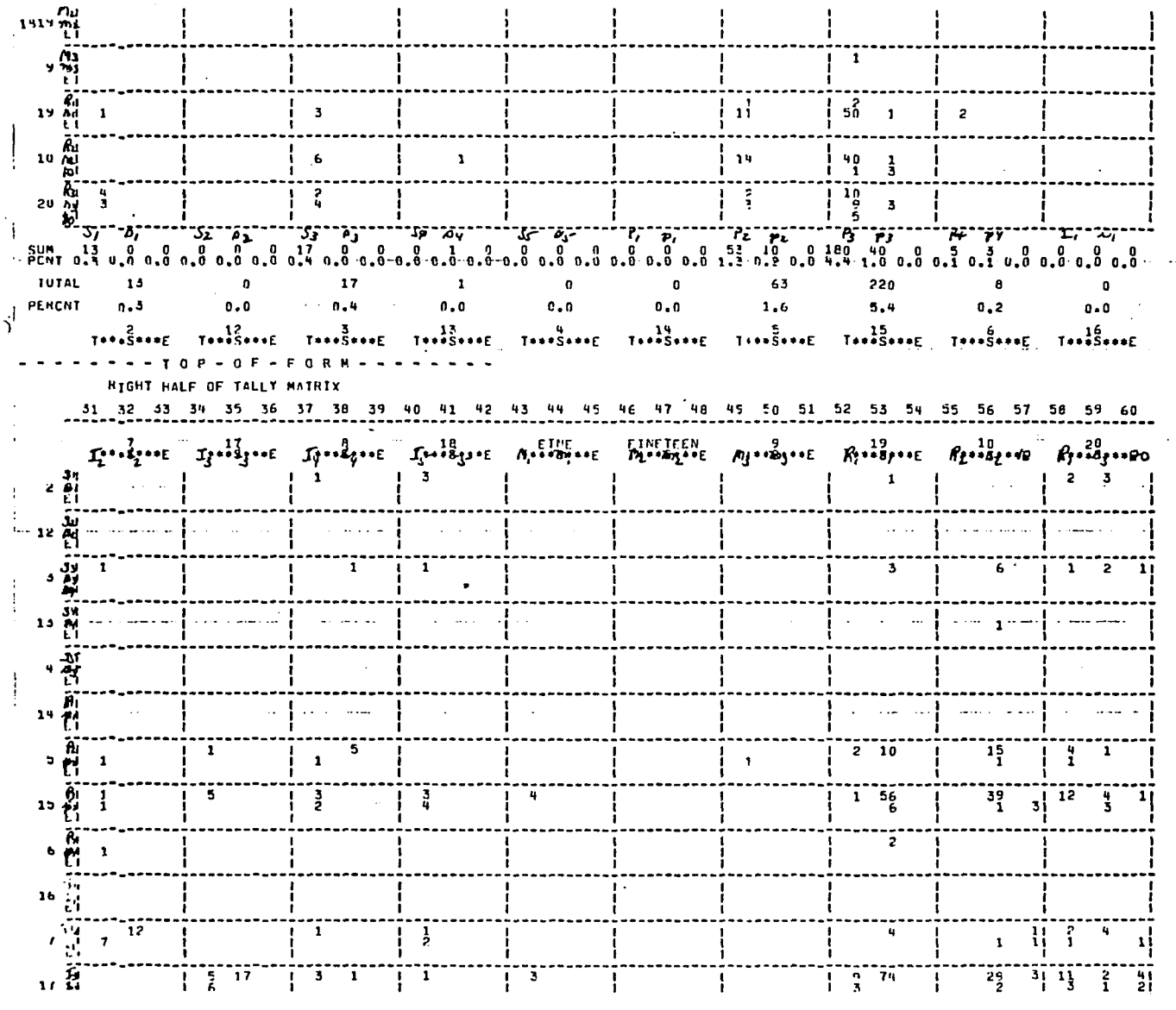
TOTAL OF ALL DATA

LEFT HALF OF TALLY MATRIX

	2 (1–3)	12 (4–6)	3 (7–9)	13 (10–12)	4 (13–15)	14 (16–18)	5 (19–21)	15 (22–24)	6 (25–27)	16 (28–30)
2							1	2		
12										
3								1		
13										
4										
14										
5							2 10	3		
15							2 1	22 27 14 5		
6									3 2	
16										
7	1									
17							2	1		

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

	2 (1–3)	12 (4–6)	3 (7–9)	13 (10–12)	4 (13–15)	14 (16–18)	5 (19–21)	15 (22–24)	6 (25–27)	16 (28–30)
8			1				1 4	2 3		
18	2						1	2 6	1	
89	2		1				[illegible]	6		
1819										



SUM 13 0 0 0 0 0 17 0 0 0 1 0 0 0 0 0 0 0 53 10 0 180 40 0 5 3 0 0 0 0
PCNT 0.3 0.0 0.0 0.0 0.0 0.0 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.2 0.2 0.0 4.4 1.0 0.0 0.1 0.1 0.0 0.0 0.0 0.0

TOTAL 13 0 17 1 0 0 63 220 8 0

PERCNT 0.3 0.0 0.4 0.0 0.0 0.0 1.6 5.4 0.2 0.0

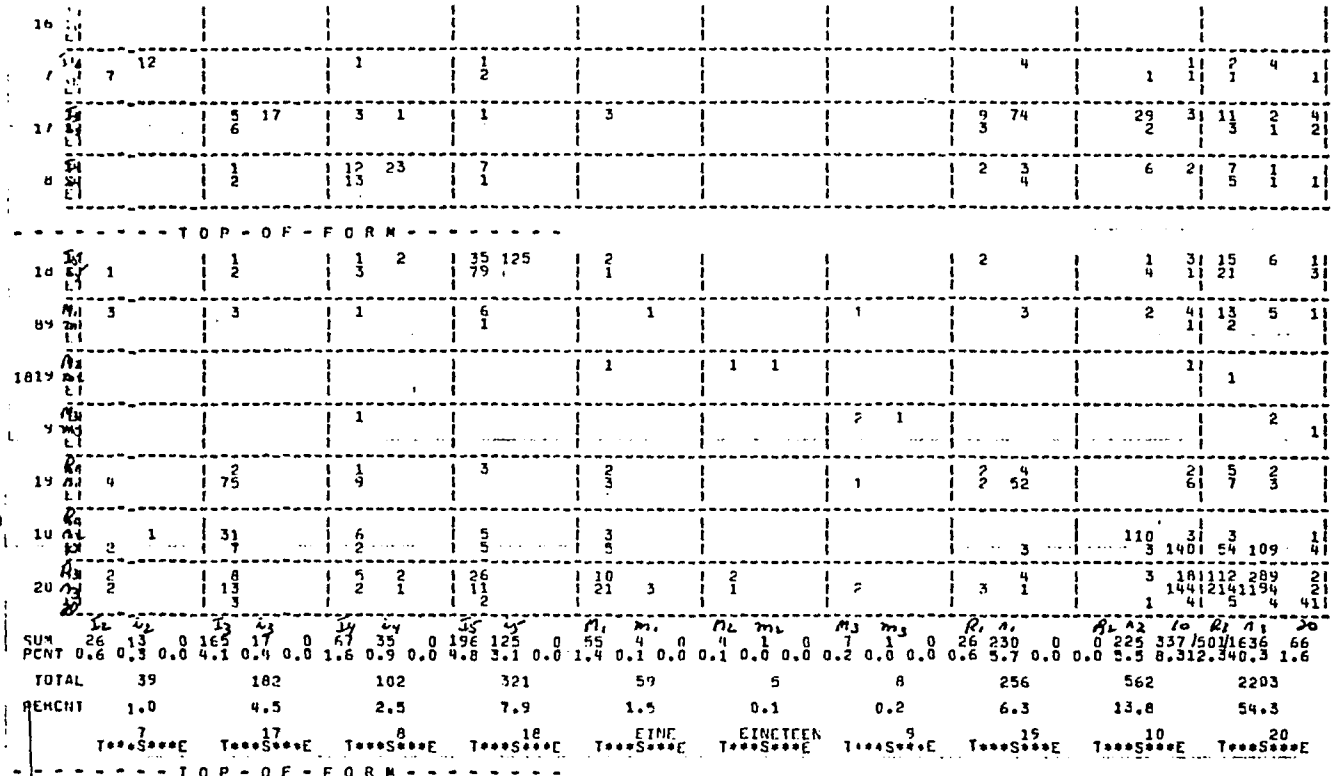
T***S***E 2 T***S***E 12 T***S***E 3 T***S***E 13 T***S***E 4 T***S***E 14 T***S***E 5 T***S***E 15 T***S***E 6 T***S***E 16

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

RIGHT HALF OF TALLY MATRIX

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 45 50 51 52 53 54 55 56 57 58 59 60

T***S***E 7 T***S***E 17 T***S***E 8 T***S***E 18 EIGHT T***S***E FIFTEEN T***S***E 9 T***S***E 19 T***S***E 10 T***S***E 20 T***S***E



- - - - - - - - T O P - O F - F O R M - - - - - - - -

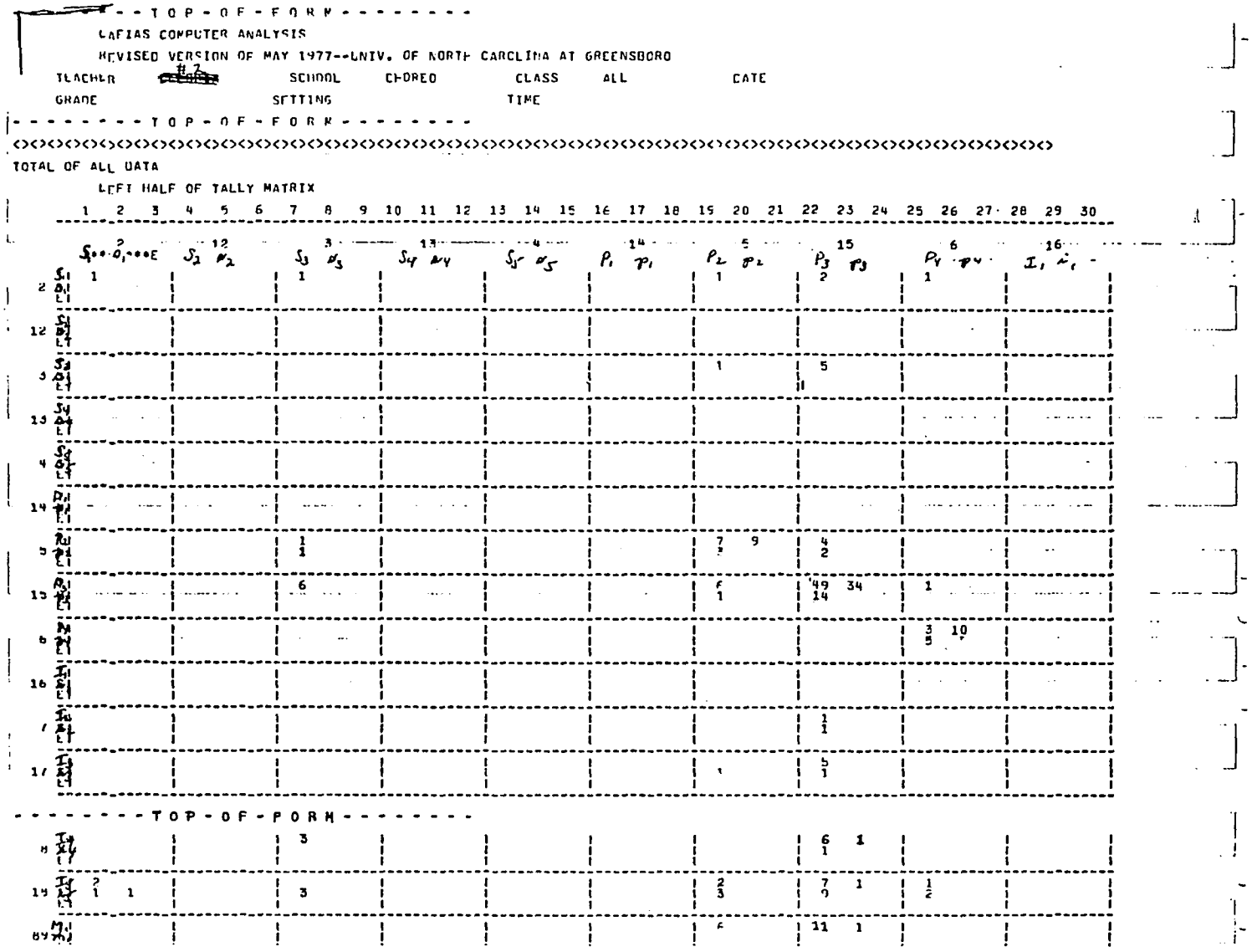
PARENT CELL PERCENTAGES

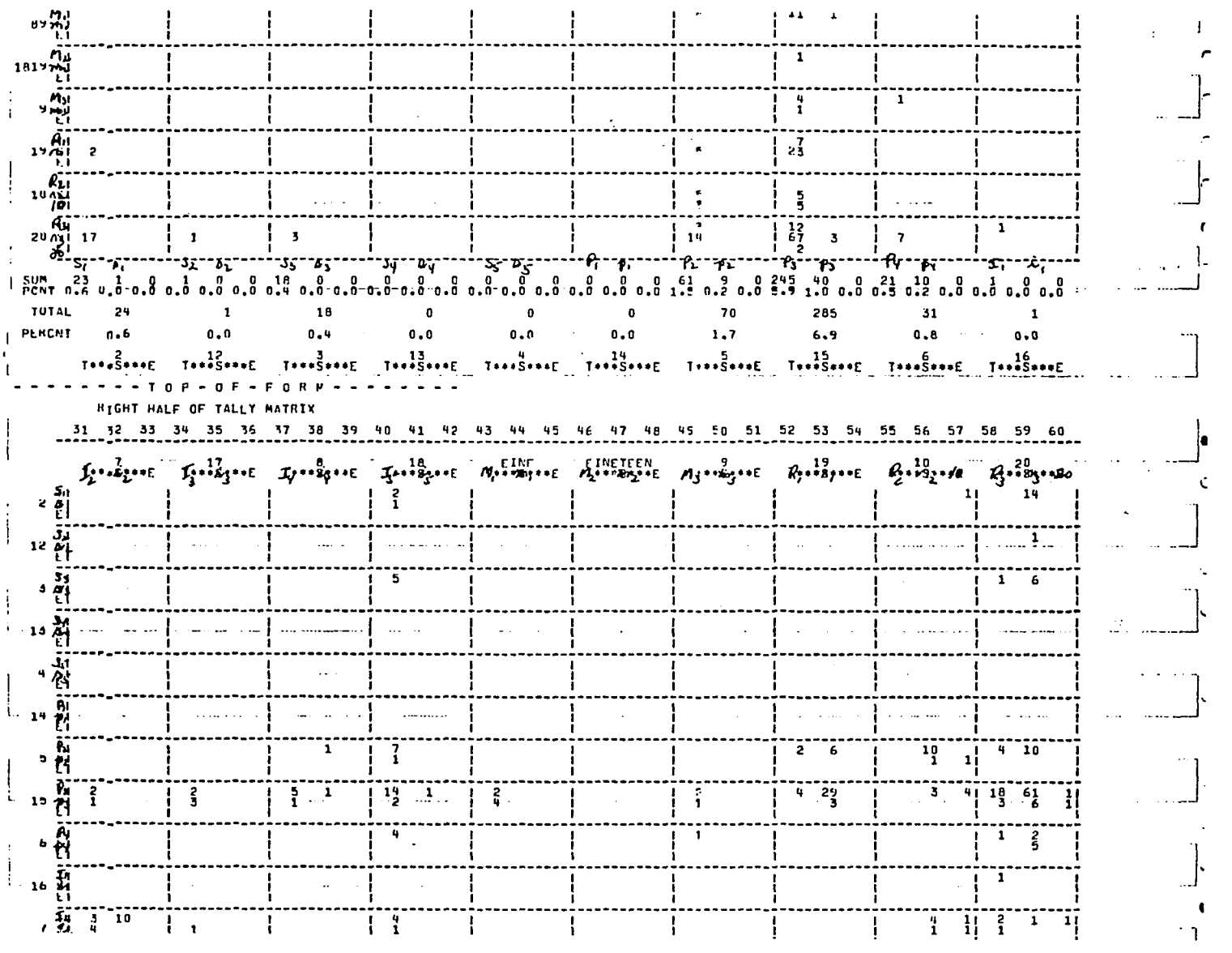
	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.02	0.00	0.12
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.07	0.15	0.10
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.97	0.00	0.00	0.02	0.02	0.15	0.00	0.00	0.00	0.02	0.20	0.29	0.15
15	0.00	0.00	0.00	0.00	0.00	0.00	0.07	1.68	0.00	0.00	0.05	0.12	0.12	0.17	0.10	0.00	0.00	1.55	1.06	0.49
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUB-MATRIX

CHOREOGRAPHY

Teacher number two


- - T O P - O F - F O R M - - - - - - - -
LAFIAS COMPUTER ANALYSIS
REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO
TEACHER #7
SCHOOL CHOREO
CLASS ALL
DATE
GRADE
SETTING
TIME
- - - - - - - - T O P - O F - F O R M - - - - - - - -
TOTAL OF ALL DATA
LEFT HALF OF TALLY MATRIX
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
- - - - - - - - T O P - O F - F O R M - - - - - - - -



SUM 23 1 0 1 0 0 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 61 9 0 245 40 0 21 10 0 1 0 0
PCNT 0.6 0.0 0.0 0.0 0.0 0.0 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.4 0.2 0.0 5.9 1.0 0.0 0.5 0.2 0.0 0.0 0.0 0.0

TOTAL 24 1 18 0 0 0 70 285 31 1

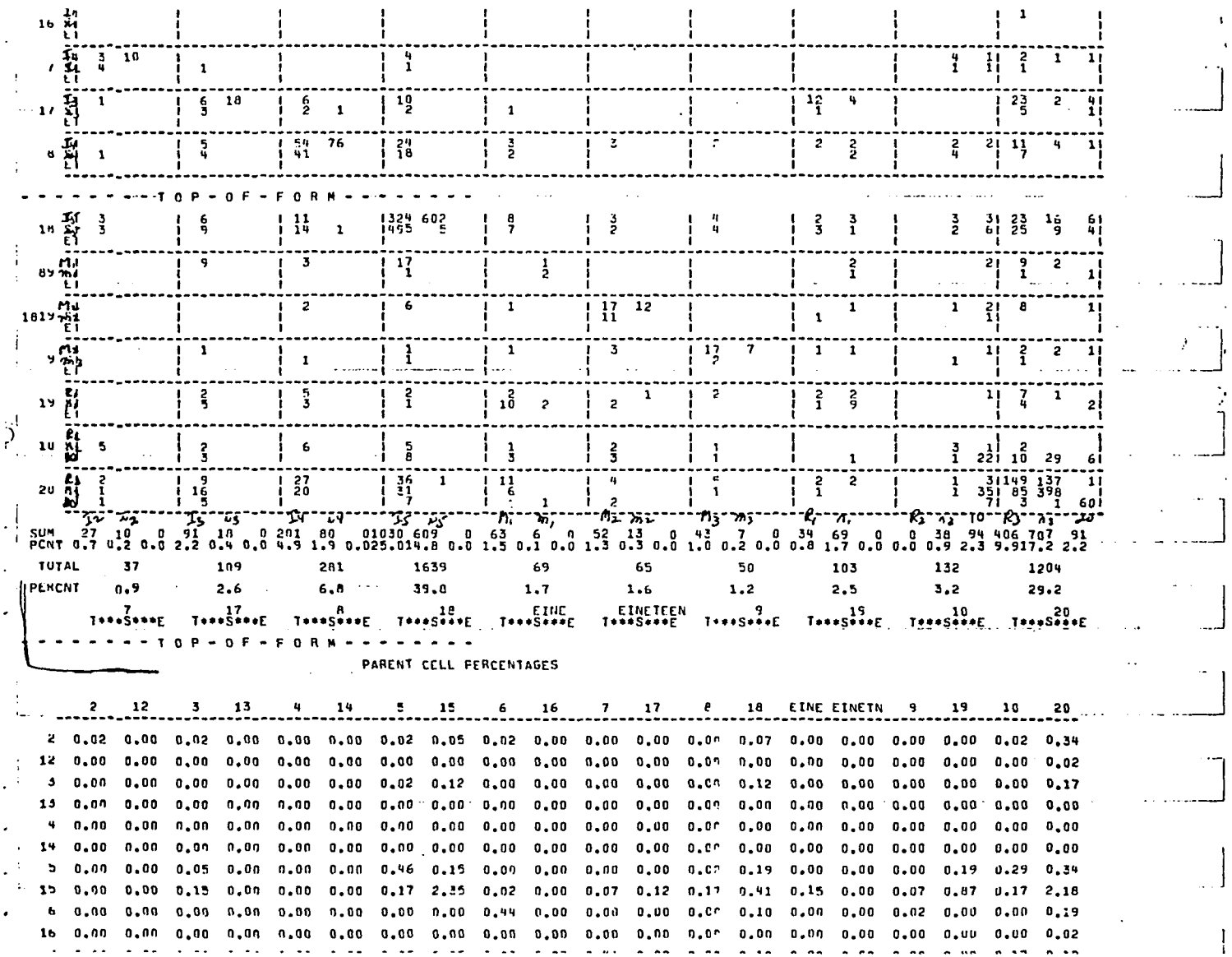
PERCENT 0.6 0.0 0.4 0.0 0.0 0.0 1.7 6.9 0.8 0.0

- - - - - - - - T O P - O F - F O R M - - - - - - - -

RIGHT HALF OF TALLY MATRIX

EIGHT

NINETEEN



PARENT CELL PERCENTAGES

	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.02	0.00	0.02	0.00	0.00	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.02	0.34
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
3	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.17
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.05	0.00	0.00	0.00	0.46	0.15	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.19	0.29	0.34
15	0.00	0.00	0.15	0.00	0.00	0.00	0.17	2.35	0.02	0.00	0.07	0.12	0.17	0.41	0.15	0.00	0.07	0.87	0.17	2.18
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.02	0.00	0.00	0.19
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02

MASTER MATRIX

TECHNIQUE

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

CATIAS COMPUTER ANALYSIS

REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO

TEACHER [illegible] SCHOOL TECH CLASS ALL SAMP DATE

GRADE SETTING TIME

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

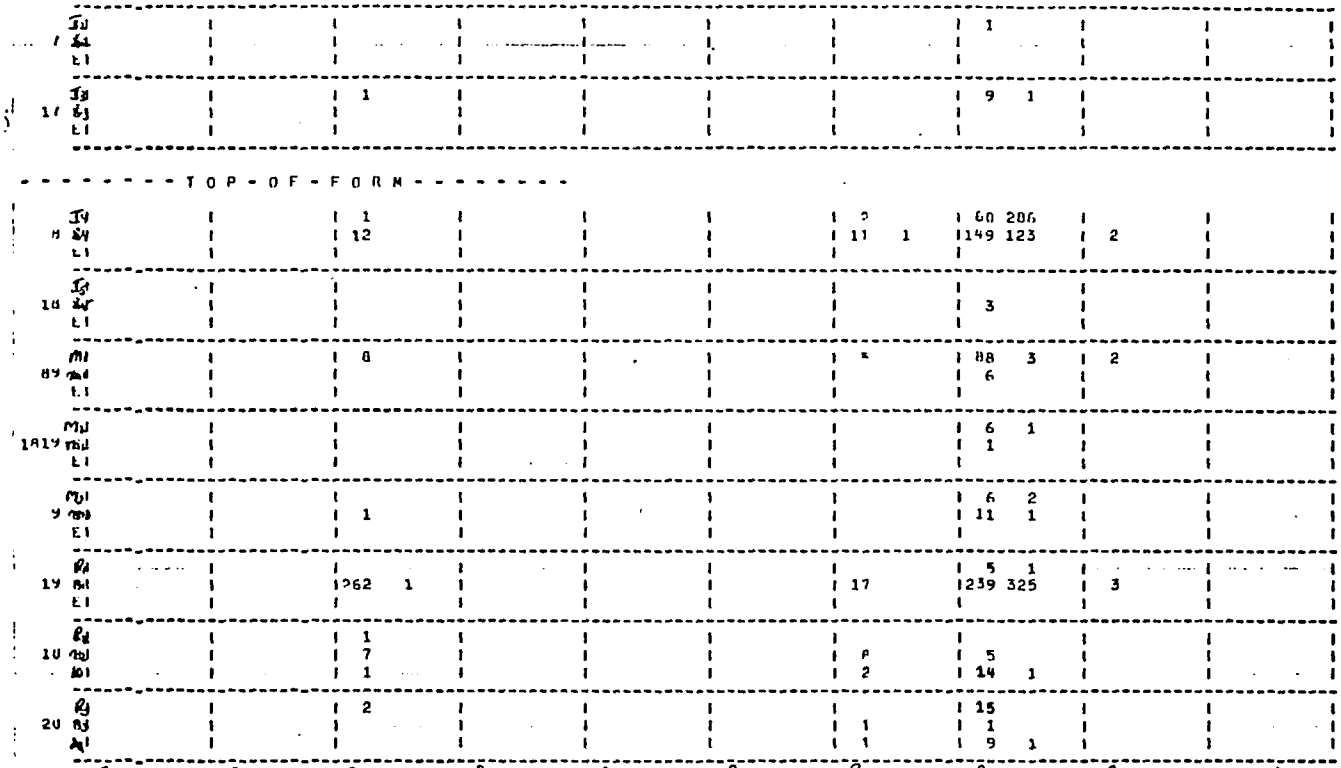
TOTAL OF ALL DATA

LEFT HALF OF TALLY MATRIX

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

	2	12	3	13	4	14	5	15	6	16
2										
12										
3			2 12					28 108		
13										
4										
14										
5							[illegible] 5 [illegible]	8 13 1		
15			9 11				10	184 940 44 4		
6								1	1	
16										
[illegible]								1		

231



- - - - - - - - T O P - O F - F O R M - - - - - - - -

RIGHT HALF OF TALLY MATRIX

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

	7	17	8	18	EINF	FINETEEN	9	19	10	20
2										
12										
3	1	2	26 8 1	2	17 1		1 2	101 12	1 1	3 2
13										
4										
14										
5			6 12 1 1		1 1		1	1 7	2 1	2
15	1	7	141 232 32 231	1 1	19 1 22 1	2 1	6 1	6 289 41431	1 1 151 14 6	20 1 31 3 11
6			1		2			2 1		
16										
7									1	
17		1 6	11 3 1		1			16 3 2		8 1 3
8		6 17	832292 1983 51	2 7	12 83 3	2 1	1 4 1	2 213 51375	2 41 57 21	14 41 29 2 31

T O P - O F - F O R M

18			3 6	7 26 14	2 1			1		1 11 1 11

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

Row										
18 I5			3	7 26	2			1		1 1
δ5			6	14	1					1 1
EI										
89 M1		5	70 4	1	3 10	1	1 2	13	1 13	11 4
m1		1	6	1	2 1	1			1	1
EI										
1819 M2			3 .1			4 14		1 .6		2
m2					1 1	12	1			
EI										
9 M3			4 3	1	1		14 11	5	1	1
m3			3 1		3	1	3 4	1		3 1
EI										
19 R1		1	14		6	1	1	7	1	1
r1		13	502 27	1	48 1	9	8 2	128	11	12 4
EI										
10 R2										
r2			8 49		3					
10		5	10 1		6 1	2	2 1	1 9	7	2 10
20 R3		2	51 3	2	7	1 1	3	7	1	15 25 1
r3		1	14		1	1	1	2	1	5 2
20			8 1	1	3		2		10	94

	I2	i2		I3	i3		I4	i4		I5	i5		M1	m1		M2	m2		M3	m3		R1	r1		R2	r2	10	R3	r3	20
SUM	2	0	0	61	6	0	2987	2921	0	41	26	0	245	20	0	38	16	0	45	33	0	383/	613	0	1	80	74	136	30	131
PCNT	0.0	0.0	0.0	0.4	0.0	0.0	20.4	19.9	0.0	0.3	0.2	0.0	1.7	0.1	0.0	0.3	0.1	0.0	0.3	0.2	0.0	0.3	24.6	0.0	0.0	0.5	0.5	0.9	0.2	0.9

TOTAL	2	67	5908	67	265	54	82	3651	155	297
PERCNT	0.0	0.5	40.3	0.5	1.8	0.4	0.6	24.9	1.1	2.0
	7	17	8	18	EINE	EINETEEN	9	19	10	20
	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

PARENT CELL PERCENTAGES

	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.01	0.01	0.24	0.01	0.12	0.00	0.02	0.77	0.01	0.03
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.01	0.07	0.00	0.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.15	0.00	0.00	0.00	0.00	0.14	0.00	0.01	0.00	0.01	0.05	0.02	0.01

SUB-MATRIX

TECHNIQUE

Teacher number one

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

CAFIAS COMPUTER ANALYSIS

REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO

TEACHER ~~[illegible]~~ #1 SCHOOL TECH CLASS ALL DATE

GRADE SETTING TIME

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

TOTAL OF ALL DATA

LEFT HALF OF TALLY MATRIX

	2	12	3	13	4	14	5	15	6	16
2										
12										
3			1					22 54		
13										
4										
14										
5							1	5 13		
15			3 4				4	87 521 28 3		
6										
16										

LI										
I1										
/ S4										
LI										
I3								1 1		
17 A3										
LI										

- - - - - - - - T O P - O F - F O R M - - - - - - - - -

I4								23 177		
8 S4			9				.	05 104		
LI										
I5										
18 S5								2		
EI										
M1			3					61 2		
89 m1								2		
LI										
M2								3		
1819 m2										
LI										
M3								1		
9 m3								3		
LI										
R1								1 1		
19 A1			131				12	699 240		
E1										
R4			1							
10 A4			7				0	4		
D1							1	6 1		
R3			2					8		
20 A3							1			
D3								5		

	S_1 P_1	S_2 D_2	S_3 D_3	S_4 D_4	S_5 D_5	P_1 p_1	P_2 p_2	P_3 P_3	P_4 p_4	I_1 i_1
SUM	0 0 0	0 0 0	161 0 0	0 0 C	0 0 0	0 0 0	25 1	010461117 0	0 0 0	0 0 0
PCNT	0.0 0.0 0.0	0.0 0.0 0.0	2.1 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.4 0.0	0.013.514.4 0.0	0.0 0.0 0.0	0.0 0.0 0.0
TOTAL	0	0	161	0	0	0	30	2163	0	0
PERCNT	0.0	0.0	2.1	0.0	0.0	0.0	0.4	27.9	0.0	0.0
	2 T***S***E	12 T***S***E	3 T***S***F	13 T***S***E	4 T***S***I	14 T***S***E	5 T***S***E	15 T***S***E	6 T***S***E	16 T***S***E

- - - - - - - - T O P - O F - F O R M - - - - - - - - -

RIGHT HALF OF TALLY MATRIX

31 32 33	34 35 36	37 38 39	40 41 42	43 44 45	46 47 48	49 50 51	52 53 54	55 56 57	58 59 60
7 I_1***i_2***T	17 I_2***i_2***T	8 I_3***i_3***T	18 I_4***i_4***T	FIVE M_1**m_1***	FIFTEEN M_2**m_2***T	9 M_3***m_3***E	19 R_1**n_1***L	13 R_2**n_2***O	23 R_3**n_3***O

	7	12	8	16	FIVE	FIFTEEN	9	19	10	20
2										
12										
3			6 7		12 1		1	53	1	3
13										
4										
14										
5			1 3 1		1			2	1	2
15		3	78 174 24 197		11 16 1	1 1	2 1	4 135 1 820	1 1 7 14 51	13 1 2
6										
16										
7										
17		2	7					7 1		4 2
8		7	381124 508 18	1 1	5 46	1	1	1 106 3 732	2 21 8 11	10 21 16 21

- - - - - - - - T O P - O F - F O R M - - - - - - - -

18				1 4 2	1					
	4 1		33 2 4		1 4		1	7	1 61	6 31

	I2	i2		I3	i3		Iy	iy		I5	i5		h1	m1		M2	m2		M3	m3		R1	r1		R2	r2	10	R3	r3	20
M4							1									1							3					2		
1019 m2																														
E1																														
Mx																														
9 m3							1						2						1	2			1							
E1																														
R1				1			7						1			1							4				1			
19 A1				5			1729	12		1			26	1		3				1			35				4	9		2
E1																														
R2																														
10 A2							8						2																	
P3				2			6	1					3			1						1	4				2	2		5
R3							35	3					6			1							4				1	8	12	
20 A3				1			6																2			1		1		
2d							2	1												1							5			53
SUM	0	0	0	23	2	0	1493	1543	0	6	4	0	133	7	0	10	0	0	4	10	0	17	1909	0	1	29	34	80	12	68
PCNT	0.0	0.0	0.0	0.3	0.0	0.0	19.3	19.9	0.0	0.1	0.1	0.0	1.7	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.2	24.7	0.0	0.0	0.4	0.4	1.0	0.2	0.9

TOTAL	0	25	3036	10	140	10	14	1926	64	160
PERCENT	0.0	0.3	39.2	0.1	1.8	0.1	0.2	24.9	0.8	2.1
	7 TaaaSaaaE	17 TaaaSaaaE	8 TaaaSaaaE	18 TaaaSaaaE	EINE TaaaSaaaE	EINETEEN TaaaSaaaE	9 TaaaSaaaE	19 TaaaSaaaE	10 TaaaSaaaE	20 TaaaSaaaE

- - - - - - - - T O P - O F - F O R M - - - - - - - - -

PARENT CELL PERCENTAGES

	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.01	0.68	0.01	0.04
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.23	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.03	0.01	0.03
15	0.00	0.00	0.09	0.00	0.00	0.00	0.05	0.26	0.00	0.00	0.00	0.04	6.11	0.00	0.36	0.03	0.04	12.40	0.36	0.21
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
8	0.00	0.00	0.12	0.00	0.00	0.00	0.04	5.03	0.00	0.00	0.00	0.09	21.61	0.03	0.66	0.01	0.01	10.88	0.17	0.39

SUB-MATRIX

TECHNIQUE

Teacher number two

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

CAFIAS COMPUTER ANALYSIS

REVISED VERSION OF MAY 1977--UNIV. OF NORTH CAROLINA AT GREENSBORO

TEACHER ~~GEORGIA~~ #2   SCHOOL TECH   CLASS ALL   DATE

GRADE   SETTING   TIME

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

TOTAL OF ALL DATA

LEFT HALF OF TALLY MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	2			12			3			13			4			14			5			15			6			16		
	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E	S	A	E
2 S																														
A																														
E																														
12 S																														
A																														
E																														
3 S							1	12														6	54							
A																														
E																														
13 S																														
A																														
E																														
4 S																														
A																														
E																														
14 S																														
A																														
E																														
5 S																			7	4		3								
A																			7			1								
E																														
15 S							6												6			97	419							
A							7															16	1							
E																														
6 S																						1				1				
A																														
E																														
16 S																														
A																														
E																														

Row		2	12	3	13	4	14	5	15	6	16
	I1										
16	S1										
	E1										
	I2								1		
	S2										
	E1										
	I3		1						8		
17	S3										
	E1										

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

Row		2	12	3	13	4	14	5	15	6	16
	I4		1					[illegible]	37 109		
5	S4		3					8 1	64 19	2	
	E1										
	I5										
18	S5								1		
	E1										
	M1		5					5	27 1	2	
89	m1								4		
	E1										
	M2								3 1		
1819	m2								1		
	E1										
	M3								5 2		
9	m3		1						8 1		
	E1										
	R1								4		
19	A1		131 1					5	540 85	3	
	E1										
	R2										
10	A2								1		
	E1		1					1	8		
	R3								7		
20	A3								1		
	E1							1	4 1		

	S_1	a_1		S_2	a_2		S_3	a_3		S_4	a_4		S_5	a_5		P_1	p_1		P_2	p_2		P_3	p_3		P_4	p_4		I_1	i_1	
SUM	0	0	0	0	0	0	157	13	0	0	0	0	0	0	0	0	0	0	32	5	0	849	693	0	7	1	0	0	0	0
PCNT	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	12.3	10.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

TOTAL	0	0	170	0	0	0	38	1541	8	0
PERCNT	0.0	0.0	2.5	0.0	0.0	0.0	0.5	22.3	0.1	0.0
	2	12	3	13	4	14	5	15	6	16
	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E	T***S***E

- - - - - - - - - T O P - O F - F O R M - - - - - - - - -

RIGHT HALF OF TALLY MATRIX

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

		7	17	8	10	FIVE	FIFTEEN	9	19	10	20
2											
12											
3		1	2	20 1 1	2	5		1 1	48 12	1	2
13											
4											
14											
5				5 9 1		1		1	1 5	1 1	
15		1	4	63 58 8 34	1 1	8 1 6	1	4 4 1 1	2 154 3 611	8 1	7 1 2 1 1
6				1		2			2 1		
16											
7										1	
17			1 4	4 3 1		1			9 2 2		4 1 1
8			6 10	451168 475 33	1 6	7 37 3	1 1	1 4 1	1 107 2 643	2 49 1	4 2 13 2 1
		TOP-OF-FORM									
18				3 6	6 22 12	1 1			1		1 1 1 1
45			2	37 2 2	1 1	2 6 2 1	1 1	2	6	7 1	5 1

```
   M1  |  2    | 37   2  |  1      |  2   6  |  1      |      2  |     6   |       71|  5    11|
85 m1  |       |  2      |  1      |  2   1  |  1      |         |         |       11|       11|
   E1  |       |         |         |         |         |         |         |         |         |
------------------------------------------------------------------------------------------------
   M2  |       |  2   1  |         |         |  3  14  |         | 1   3   |         |         |
1819 m2|       |         |         |  1   1  | 12      |     1   |         |         |         |
   E2  |       |         |         |         |         |         |         |         |         |
------------------------------------------------------------------------------------------------
   M3  |       |  4   3  |  1      |  1      |         | 14   8  |     5   |     1   |  1      |
9  m3  |       |  2   1  |         |  1      |     1   |  2   2  |         |         |  3    11|
   E3  |       |         |         |         |         |         |         |         |         |
------------------------------------------------------------------------------------------------
   R1  |       |  7      |         |  5      |         |  1      |     3   |         |  1      |
19 r1  |  8    |1774  15 |         | 22      |  6      |  8   1  |    93   |       71|  3    21|
       |       |         |         |         |         |         |         |         |         |
------------------------------------------------------------------------------------------------
   R2  |       |         |         |         |         |         |         |         |         |
10 r2  |       |      49 |         |  1      |         |         |         |         |         |
   10  |  3    |  4      |         |  3   1  |  1      |  2   1  |     5   |       51|       51|
------------------------------------------------------------------------------------------------
   R3  |  2    | 16      |  2      |  1      |     1   |  7      |     3   |         |  7 13 11|
20 r3  |       |  8      |         |  1      |  1      |  1      |         |         |  4  2   |
   20  |       |  6      |  1      |  3      |         |     1   |         |       41|      41|
------------------------------------------------------------------------------------------------
      I2  i2     I3  i3      I4  i4     I5  i5     M1  m1     M2  m2     M3  m3     R1  r1         R2  r2  10  R3  r3  20
SUM    2   0   0  38   4   01494|1378  0  35  22   0 112  13   0  20  16   0  45  23   0  211704   0   0  51  39  56  18  63
PCNT 0.0 0.0 0.0 0.5 0.1 0.021.619.9 0.0 0.5 0.3 0.0 1.6 0.2 0.0 0.4 0.2 0.0 0.7 0.3 0.0 0.324.6 0.0 0.0 0.7 0.6 0.8 0.3 0.9

TOTAL      2         42        2872        57        125        44         68        1725        90        137

PERCNT   0.0        0.6        41.5        0.8        1.8       0.6        1.0        24.9        1.3        2.0

           7         17          8         18        EINE    EINETEEN       9         19         10         20
       T***S***E  T***S***E  T***S***E  T***S***E  T***S***E  T***S***E  T***S***E  T***S***E  T***S***E  T***S***E
```

- - - - - - - - T O P - O F - F O R M - - - - - - - - -

PARENT CELL PERCENTAGES

	2	12	3	13	4	14	5	15	6	16	7	17	8	18	EINE	EINETN	9	19	10	20
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.87	0.00	0.00	0.01	0.03	0.3[illegible]	0.03	0.07	0.00	0.03	0.87	0.01	0.03
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.06	0.00	0.00	0.00	0.00	0.22	0.00	0.01	0.00	0.01	0.09	0.03	0.00
15	0.00	0.00	0.19	0.00	0.00	0.00	0.09	7.70	0.00	0.00	0.01	0.06	2.36	0.03	0.22	0.01	0.17	11.13	0.13	0.17
6	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.41	0.00	0.00	0.00	0.[illegible]	0.00	0.03	0.00	0.00	0.04	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00