June 1975

Comparative Analyses of Teacher Verbal and Nonverbal Behavior in a Traditional and an Open-space Setting

Betty L. Hankins
East Tennessee State University

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COMPARATIVE ANALYSES OF TEACHER VERBAL AND NONVERBAL BEHAVIOR
IN A TRADITIONAL AND AN OPEN-SPACE SETTING

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

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

by
Betty LaFollette Hankins
June 1975
APPROVAL

This is to certify that the Advanced Graduate Committee of

_______ BETTY LAFOLLETTE HANKINS ________

met on the

_________ 28th __________ day of ________ May __________ 19 75 ___.

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

__________________________
Chairperson, Advanced Graduate Committee

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Dean, School of Graduate Studies
COMPARATIVE ANALYSES OF TEACHER VERBAL AND NONVERBAL BEHAVIOR
IN A TRADITIONAL AND AN OPEN-SPACE SETTING

An Abstract
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Purpose. The purpose of this study was to observe, analyze, and compare teacher verbal and nonverbal behaviors as they were exhibited toward students in both traditional classrooms and open-space classrooms. Particular emphasis was placed on determining the degree, if any, to which teachers in open-space classrooms were more indirect and encouraging than direct and restricting in their behaviors than teachers in traditional classrooms.

Method. The data compiled for this study were videotaped recordings of verbal and nonverbal behaviors exhibited by teachers toward students in two educational settings, traditional and open-space schools. Data were collected through the medium of a portable videotape recorder, and were quantified, qualified, and analyzed through the use of the IDER system of teacher behavior analysis.

Summary. Distinct patterns of verbal and nonverbal behaviors were found in the number and nature of verbal and nonverbal behaviors exhibited to students in the two classroom settings. The findings related to the teachers, as a group, indicated more encouraging behavior than restricting; they were more direct than indirect, more controlling than motivating and talked more than students in either the traditional or the open-space settings.

Conclusions. It was concluded that entry teachers talked less than students, and were more indirect and more motivating in the open-space setting than they were in the traditional setting. This seemed to imply that the teachers with less experience adjusted easier and benefited more in an open-space setting.

Dissertation prepared under the guidance of Dr. Gem Kate Greninger, Dr. James Howard Bowers, Dr. Roy Dewayne Ikeberry, Dr. Charles Harold Measel, and Dr. Robert Gene Shepard.
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During the pursuit of a degree many people are needed in various ways to insure its successful completion. For this reason, the writer wishes to express her sincere appreciation to the following: Dr. Gem Kate Greninger, committee chairperson and dissertation director, for her help, guidance, and friendship; Dr. James Howard Bowers, Dr. Roy Dewayne Ikenberry, Dr. Charles Harold Measel, and Dr. Robert Gene Shepard for serving as committee members and for their guidance and encouragement during the study. Dr. Thomas Madison Byar and Dr. Russell French gave valuable reactions and encouragement during the study.

The writer is also grateful to her fellow teammates on the First District Management and Planning Team: Mr. Mack Pierce, team leader, Mr. Cecil Boreing, Mr. Jim Counts, Mr. Lorenzo Wyatt, and Mrs. Martha Honaker, secretary, for their understanding and encouragement during the study.

Appreciation is also expressed to those teachers and administrators who were willing to permit the videotaping of their activities for the benefit of promoting research in teacher education.

A special debt of gratitude is expressed to the writer's husband, Ben, and sons, Mark and Eric. Without their help and understanding the study could not have been completed. Finally, the writer is indebted to her mother and other close relatives who have provided understanding and encouragement.
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Chapter 1

INTRODUCTION

The teaching-learning process is essentially a communication event. Teachers and students alike are concerned with obtaining a desired response and the measure of their success is whether they obtain this desired response. With this premise as a basis, many researchers investigated communication behavior in classroom settings. In addition, many teacher preparation programs stressed the importance of communication principles as integral to effective teaching. However, until recently such endeavors were almost exclusively concerned with the spoken and written word.

Another means of communication generally neglected by researchers is nonverbal communication. Nonverbal behavior is only a part of the total process of communication, but in order to understand the total process one must understand all the operating systems.

Concern for nonverbal communication is not new. A survey of social science research yields evidence of some forty-odd years of investigation. However, interest in nonverbal behavior in the educational process has only emerged since 1960.

Andrew Halpin charged that educational preparation programs ignored the entire range of nonverbal communication: the muted language in which human beings speak to one another more eloquently than words.
To avoid this narrow view one must recognize that man communicates to his fellow man with his entire body and with all his behavior.¹

Charles Galloway undertook the first major research of verbal and nonverbal communication in the classroom. Drawing extensively on the evidence provided by anthropologists, sociologists and psychologists, Galloway developed a theoretical rationale in which he concluded that communication occurred when there was agreement regarding the symbols of language, since symbols were the primary means for achieving communicative and social meanings. Symbolisms are not narrowly limited to verbal language. Nonverbal behavior likewise tends to become socially symbolized and to become, along with verbal language, an instrument of communication. In theory, nonverbal expressions are used to check on the fidelity of communicative acts, and are used to obtain a better picture of the self one proposed to be.²

Projecting these tentative inferences about nonverbal communication into a study of classroom interaction, it would seem that the perceptions and meanings assigned to a teacher's nonverbal behavior are paramount considerations for understanding the communicative process in a classroom. Moreover, it would appear that the meanings pupils impute to a teacher's nonverbal behavior have significant implications for teacher-pupil relationships.

Nonverbal cues may be more significant than verbal remarks when a pupil attempts to ascertain the feelings and attitudes of the teacher.

---


From facial expressions and gestural movements the pupil may infer motivation states within the teacher, or the pupil may discern a positive or negative attitude. Finally, a pupil may achieve different information when he continually checks the consistency and congruence between the nonverbal cues and verbal remarks expressed by the teacher. A pupil who "sees" and "hears" kinesthetically may record a message in his mind which contradicts the verbal report rendered by the teacher.  

Since the Galloway effort, several systems for and approaches to the observation and analysis of classroom nonverbal behavior were developed. Representative of the broad range of investigations were the endeavors of Russell French and Galloway who developed a system for observation and analysis of student verbal and nonverbal behavior, while Barbara Grant and Dorothy Hennings assessed patterns of teacher movements. Lewis Hodge concentrated on the significance of eye contact in the classroom and Richard Schusler's primary concern was teacher behavior in elementary classrooms.

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4 Russell L. French and Charles M. Galloway, "A Description of Teacher Behavior: Verbal and Nonverbal" (Ohio State University, 1968), pp. 1-8. (Mimeoographed.)

5 Barbara Grant and Dorothy Hennings, The Teacher Moves (New York: Teachers College Press, 1971).

6 Lewis Hodge, "Interpersonal Classroom Communication Through Eye Contact," Theory Into Practice, X (October, 1971), 264-267.

French\textsuperscript{8} conducted a study which demonstrated the usefulness of the Indirect/Direct--Encouraging/Restricting (IDER) system as a tool for observing and analyzing teacher nonverbal behaviors in the classroom. It proved that teacher verbal and nonverbal behaviors were not necessarily reflective of each other.

Further research using IDER and other available observational systems continually added bits and pieces of information to the growing store of knowledge about nonverbal interactions of teachers and learning as the studies of Wilma Cosper,\textsuperscript{9} Robert Shepard,\textsuperscript{10} and William Fowler\textsuperscript{11} attested. However, many areas, problems, and situations in nonverbal communication remained to be researched in 1975.

Mark Knapp\textsuperscript{12} stated that although there were some data available which suggested that "unattractive" environments negatively affect interpersonal responses, very little empirical research was available which showed the relationship between various kinds of learning environments and student-teacher behavior. Robert Sommer's\textsuperscript{13} study of the effects of


\textsuperscript{12}Mark L. Knapp, "The Role of Nonverbal Communication in the Classroom," \textit{Theory Into Practice}, X (October, 1971), 243-249.

different classroom arrangements on student verbal output or participation was an exception and of particular relevance to this study; therefore, an analyses of the kinds of verbal and nonverbal behavior manifested by teachers in a traditional classroom and in an open-space classroom were needed.

THE PROBLEM

Statement of the Problem

The problem of this study was to determine whether verbal and nonverbal behavior patterns of ten randomly selected teachers differed significantly as a result of moving from a traditional to an open-space classroom setting.

Significance of the Study

The competent teacher, in dealing with the intellectual progress, physical development, and mental health of his students must possess a wide range of knowledge and a wide variety of skills. Imparting subject matter to the class, concern for the physical comfort and development of students, and attention to emotional and psychological tone all involve communication skills.

The verbal skills for helping a student advance in the cognitive domain and in physical development are well defined. However, nonverbal communication has received little attention in teacher preparation and in the American culture generally, yet it is a major part of the affective domain of any classroom.
After 1960, increasing attention was given to the affective atmosphere of classrooms as reflected by Philip W. Jackson and Nina Strattner\(^{14}\) who stated that learning effectiveness was enhanced by the possession of particular psychological strengths, such as positive attitudes toward school, realistic achievement goals, and feelings of self-confidence.

The role of the classroom teacher was reexamined and described by Ester J. Swenson and Daisy Parton\(^{15}\) as becoming less authoritarian than formerly and becoming more accepting of pupil planning activity. The role which was believed to be emerging was that of a teacher who utilizes more teacher-pupil planning.

Herbert Walberg\(^{16}\) found that several kinds of tensions in the teacher's personality appeared to be associated with patterns of classroom climate as perceived by students. The personality patterns of the teacher, his needs, values and attitudes predicted the climate of his classes.

The results of these new emphases were incorporated into higher education, teacher preparation curricula, workshops for inservice preparation of teachers, and educational literature. Programs that focused upon the use of psychological concepts and observational techniques acquainted the teacher with some of the actual behavior aspects of teacher-pupil interaction in the classroom.


\(^{16}\)Herbert J. Walberg, "Teacher Personality and Classroom Climate" (Harvard University, June, 1967), p. 15. (Mimeographed.)
Because of this examination of climates in the classroom conducive to good health, additional skills were demanded of the teacher. Specifically, the contemporary teacher, as compared with the teacher of the fifties, was required to present himself as a friend and facilitator of learning rather than simply as a purveyor of knowledge. These skills centered almost entirely around verbal techniques. However, because more than the sense of hearing was involved in classroom learning, the teacher also presented himself nonverbally.17

Nonverbal communication was important because the cognitive and the affective domains were not considered separate entities but areas which interacted according to the context of the situation. Egon Guba and Jacob Getzels remarked that whatever the teacher taught, it was obvious that the teaching was carried on in the context of an interpersonal setting. It was this factor which, more than any other, accounts for the critical importance of teacher personality in mediating the teaching-learning process. To relieve the teaching process of its affective elements would reduce it to a sterile, highly intellectualized procedure which the pupil would unlikely find encouraging. To view the teaching-learning act as composed only of words would be to deny that pupils were able to see, as well as hear the communicative process which teachers performed as they taught.

The significance of this study can be further illustrated by the need to broaden the perspective of the teaching-learning process to

17Schusler, op. cit., 283.

encompass all of the aspects of teacher behavior and to provide data for new procedures in teacher preparation programs. The primary thrust was to determine whether the change, from a traditional classroom setting to an open-space classroom setting, was a significant variable in the teacher-pupil interaction process with particular emphasis on the encouraging-restricting kinds of verbal and nonverbal behaviors.

HYPOTHESES

The following hypotheses, stated in the null format, provided a frame of reference for statistical analysis. There will be no significant difference:

1. In the indirect-direct behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.

2. In the revised indirect-direct ratios of teachers in a traditional setting and of those same teachers in an open-space setting.

3. In the student-teacher talk of teachers in a traditional setting and of those same teachers in an open-space setting.

4. In the amount of teacher-initiated student talk and student-initiated student talk in the traditional classroom setting and in the open-space setting.

5. In the indirect-direct behaviors of entry teachers and professional teachers in a traditional classroom.

6. In the revised indirect-direct ratios of entry teachers and professional teachers in a traditional classroom.

7. In the student-teacher talk of entry teachers and professional teachers in a traditional classroom.
8. In the indirect-direct behaviors of entry teachers and professional teachers in an open-space setting.

9. In the revised indirect-direct ratios of entry teachers and professional teachers in an open-space setting.

10. In the student-teacher talk of entry teachers and professional teachers in an open-space setting.

11. In the indirect-direct behaviors of primary and intermediate teachers in a traditional setting.

12. In the revised indirect-direct ratios of primary and intermediate teachers in a traditional setting.

13. In the student-teacher talk of primary and intermediate teachers in a traditional setting.

14. In the indirect-direct behaviors of primary and intermediate teachers in an open-space setting.

15. In the revised indirect-direct ratios of primary and intermediate teachers in an open-space setting.

16. In the student-teacher talk of primary and intermediate teachers in an open-space setting.

17. In the indirect-direct behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

18. In the revised indirect-direct ratios of primary teachers in a traditional setting and of those same teachers in an open-space setting.

19. In the student-teacher talk of primary teachers in a traditional setting and of those same teachers in an open-space setting.

20. In the indirect-direct behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.
21. In the revised indirect-direct ratios of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

22. In the encouraging-restricting behaviors of teachers in a traditional classroom setting and of those same teachers in an open-space setting.

23. In the encouraging-restricting behaviors of entry teachers and professional teachers in a traditional setting.

24. In the encouraging-restricting behaviors of primary and intermediate teachers in a traditional setting.

25. In the encouraging-restricting behaviors of entry and professional teachers in an open-space setting.

26. In the encouraging-restricting behaviors of primary and intermediate teachers in an open-space setting.

27. In the encouraging-restricting behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

28. In the encouraging-restricting behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

29. In the encouraging-restricting behaviors of entry teachers in a traditional setting and of those same teachers in an open-space setting.

30. In the encouraging-restricting behaviors of professional teachers in a traditional setting and of those same teachers in an open-space setting.
The basis for accepting or rejecting the null hypotheses was the .05 level of significance as determined by the Chi-square ($X^2$) test.

**ASSUMPTIONS**

The following assumptions were considered pertinent to the study:

1. The technique of selecting teachers would provide representative samples of teacher behavior.

2. The number of observations would be adequate for the purposes of this study.

3. The statistical design for determining reliability between investigator and observer would be acceptable for a study of this nature.

4. The statistical techniques were valid in testing the hypotheses.

5. All hypotheses stated in the study could be tested at an acceptable level of significance.

**LIMITATIONS**

The following limitations were considered pertinent to the study:

1. The study was limited to analyses of behaviors of ten teachers, consisting of two observations of twenty minutes each.

2. The study was limited to five entry teachers and five professional teachers.

3. The study was limited to teachers in grades kindergarten through sixth.

4. The study was limited to two school settings.

5. The study was limited to the actual classroom organization determined by the school.
6. The study was limited to one year: from April, 1973, through April, 1974.

7. The study focused on verbal and nonverbal behaviors of teachers as measured by the IDER System of behavioral analysis.

DEFINITION OF TERMS

Communication

Communication refers to the sending of verbal and nonverbal messages by the teacher. This process has five minimum requirements: A sender (the teacher), a channel (nonverbal behavior), a message (content), receiver (the student), and feedback (the student).19

Behavior

Behavior refers to overt actions of kinesics observable to the researcher.20

Verbal Behavior

Verbal behavior refers to the attitudes emitted through the spoken language.21

Nonverbal Behavior

The term nonverbal behavior refers to overt actions, gestures, postures, positions, distance, and expressions exhibited by the teacher.22

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19 Shepard, op. cit., p. 10.
20 Ibid.
21 Fowler, op. cit., p. 13.
22 Shepard, op. cit., p. 11.
Nonverbal Cues

This term is used interchangeably with the terms, kinesics and nonverbal behavior.\(^23\)

Kinesics

The term covers the multi-level approach (physical, physiological, psychological, and cultural) to such phenomena as body motion and nonverbal communication.\(^24\)

Encouraging

Encouraging refers to the verbal and nonverbal behavior exhibited by the teacher which encouraged further interactions.\(^25\)

Restricting

Restricting refers to the type of behavior exhibited by the teacher which was nonverbal and restricting of further interaction.\(^26\)

Entry Teacher

The term entry teacher refers to teachers with less than five years of teaching experience.\(^27\)

Professional Teacher

The term professional teacher refers to teachers who have six or more years of teaching experience.\(^28\)

\(^{23}\)Ibid.


\(^{25}\)Fowler, op. cit., p. 12.

\(^{26}\)Ibid., p. 13.

\(^{27}\)Shepard, loc. cit.

\(^{28}\)Ibid.
Open Classroom

The open classroom is a relatively large instructional area or multiple-classroom space not separated by walls, as is the case in the traditional classroom, in which a variety of groups or classes may be working at the same time. In this study open-space setting and open-space environment will be used interchangeably with the term open classroom.

Self-Contained Classroom

The self-contained classroom is a classroom in which classes are composed of groups of children which remain in one location, with one teacher, for all or nearly all instructional activities. In this study, traditional classroom, traditional setting and traditional environment will be used interchangeably with self-contained classroom.

Interaction Analysis

Interaction analysis refers to Flanders' system of categorization of teachers' verbal interaction with students.

IDER System

IDER refers to the system developed by French and Galloway for analyzing teacher verbal and nonverbal behavior conjointly. The initials IDER are taken from the Flanders' conceptualization of teacher influence.

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30Ibid.

as Indirect or Direct and from the French-Galloway conceptualization of nonverbal cues as Encouraging or Restricting. 32

PROCEDURES

Current issues of indexes and other guides to sources of literature were read in search of titles pertaining to the problem of the study. The guides to Dissertation Abstracts, Educational Research Information Center (ERIC), Current Index to Journals of Education (CIJE), Education Index, and the card catalog were closely scrutinized. Appropriate papers, articles, and books were read for possible inclusion in this study. This was followed by an Educational Research Information Center (ERIC) computer search done by the Tennessee Research Coordinating Unit (RCU) in Knoxville, Tennessee.

A random sample of teachers was selected from one school. These teachers taught in both the traditional self-contained setting and the new open-space setting which replaced it. Teachers were videotaped and data collected from the tapes were coded in the IDER System of teacher behavior analyses on modified matrices, and the information was later transferred to information data sheets from which electronic computer cards were punched.

A more detailed explanation of the procedures is included in Chapter 3.

32French and Galloway, loc. cit.
ORGANIZATION OF THE STUDY

Chapter 1 consists of an introductory statement, the statement of the problem, significance of the study, hypotheses to be tested, assumptions, limitations of the study, definition and clarification of terms used, procedures, and this outline of the total organization of the study.

Chapter 2 presents a review of selected literature.

Chapter 3 provides a description and the theoretical implementation of the procedures of the study and the instruments employed.

Chapter 4 presents an analysis of the data collected. The findings and results of testing the hypotheses are presented.

Chapter 5 includes the summary, conclusions, and implications of the investigation.
Chapter 2

REVIEW OF RELATED LITERATURE

INTRODUCTION

Changes in the field of education within the last decade have opened up a new area of study that focuses on the process of teaching. This area is distinguished from previous efforts which focused on teacher personality traits, on teaching effectiveness, and how people learn.

The shift has been from studying teaching effectiveness and teacher personality to analyzing the teaching process itself with the hope that this approach will yield clues to what constitutes effectiveness. The ultimate aim is still the improvement of student performance (or learning) through the improvement of teaching effectiveness.

Relevant to the study are the processes of communication including verbal and nonverbal behaviors of teachers, classroom interaction in the teaching-learning process, improvement of teaching through clinical supervision and open classrooms as compared to traditional classrooms.

This chapter presents a review of selected literature focusing on those areas considered by the investigator to have relevance to the study.

VERBAL AND NONVERBAL DIMENSIONS OF COMMUNICATION

Communication is a means for breaking down the barrier to interaction, a means for achieving mutual understanding, a means for relating to each other on a more meaningful level, and a means of communion.
Communication comes from the Latin *communis*, common. When people communicate they are trying to establish a "commonness" with each other. That is, they are trying to share information, an idea, or an attitude. The essence of communication is getting the receiver and the sender "tuned" together for a particular message.¹

Aline Eisenberg and Ralph Smith defined human communication as "a process in which a sender, triggered by the perception of a stimulus and controlled by feedback, transmits, through channels, a set of messages which are perceived and responded to by a receiver."² Although this definition describes what happens during interaction, it is too simplistic. A prominent student of human communication, Ray Birdwhistell, noted:

> A human being is not a black box with one orifice for emitting a chunk of stuff called communication and another for receiving it. And, at the same time, communication is not simply the sum of the bits of information which pass between two people in a given period of time.³

All parties involved are in actual communication at the same time, senders and receivers. Everyone is simultaneously exhibiting and interpreting behavior, his own as well as those of others.

The study of communication should by no means be confined to meaningful interactional events which are verbal. Many messages are simultaneously sent during the course of an interaction. Most of these messages are conveyed through nonverbal forms, such as gestures, body


movement, spacing, voice, and the environmental setting in which any interaction occurs. "To study communication," Eisenberg and Smith stated, "is to examine all the ways in which human beings send information and integrate their actions and feelings."  

Although the verbal message is the most complex form of communication, it is not necessarily the most common. Verbal messages may carry far less impact than other message forms. One researcher, Albert Mehrabian, estimated that in the situations which he examined, only 7 percent of the total impact of a communication was verbal. Another 38 percent of impact he attributed to the ways in which the words were said, and the remainder, 55 percent of impact, came from facial expressions.  

These numerical proportions unfortunately belie the obvious. The factors which contribute to the total impact of any given message depend upon the purpose and context of the interaction and upon the perceptions of the interactants. If one takes into account these variables, Mehrabian's basic contention can still be tentatively accepted: there is far more to communication than the sending and receiving of verbal messages.

Teacher Behavior: Verbal

Observation of elementary and secondary classrooms suggests that what goes on there might be described as communication events which are institutional (those which relate to managing the classroom and meeting

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4Eisenberg and Smith, loc. cit.

5Albert Mehrabian, "Communication Without Words," Psychology Today, II (September, 1968), 53.
the expectations of the institution), task-oriented (those which focus on the teaching and learning of subject matter content whether cognitive, affective, or skill-oriented), personal (those in which personal needs, goals, and emotions of a pupil, or group of pupils and/or the teacher provide the central focus) or mixed in nature (those which contain elements of more than one of the event types previously described).

Any of these event types can involve the teacher with a single pupil or with a group of pupils. Since any attempt to identify the focus and intent of interaction in the classroom at any given time must include clarification of the number of participants involved, institutional, task, personal or mixed events must be classified as individual (interaction between the teacher and one pupil) or group (interaction between the teacher and several pupils). 6 Thus communication events are basic in the learning situation. Therefore, a teacher's effectiveness in the classroom depends on that teacher's ability to communicate both verbally and nonverbally.

Verbal language assumes the primary burden for the exchange of information and ideas between teachers and pupils. It is now recognized that teachers vary considerably in their ability or in their willingness to communicate effectively in verbal language. Observational techniques have been developed to determine the direction and amount of verbal communication occurring in the classroom between the teacher and pupil.

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One observational technique is called interaction analysis. The system of interaction analysis as developed by Flanders is a technique for capturing quantitative and qualitative dimensions of teacher verbal behavior in the classroom. It was developed to test the effect of social-emotional climate on student attitudes and learning. The assumption was made that teaching behavior and pupil responses are expressed primarily through the spoken word as a series of verbal events which occur one after another. These events are identified, coded so as to preserve sequence, and systematically tabulated so as to represent a sample of spontaneous teacher influence. In its original form the interaction analysis system contained ten categories. The first seven categories, designed to measure teacher behavior along a continuum from indirect to direct, consisted of the following:

1. Accepts feelings
2. Praises or encourages
3. Accepts or uses student ideas
4. Asks questions
5. Lectures
6. Gives directions
7. Criticizes or justifies authority

Of the seven, the first four are considered indirect-influence categories, while five through seven are direct-influence categories. Categories eight and nine, described below, provide for student talk:

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8Ned A. Flanders, "Interaction Analysis and Inservice Training" (Minneapolis: University of Minnesota, 1966), p. 11. (Mimeographed.)
8. Student talk-response
9. Student talk-initiated

The tenth category provides for all other types of classroom behavior which cannot be classified by the first nine categories:

10. Silence or confusion

The Flanders System of Interaction Analysis categories is described in Appendix A.

**Review of Some Research Based on Interaction Analysis**

Do the kinds of teacher-pupil interactions change as the student progresses through school? Data obtained by Furst and Amidon\(^9\) indicated that the preceding question can be answered in the affirmative. From an interaction analysis of teachers and students from six grade levels (Grades 1-6), they concluded that teachers tend to be more indirect in the lower grades and become more direct in the fifth and sixth grades. They found that first grade teachers asked more questions than teachers at any other grade level, while sixth-grade teachers lectured more than teachers at lower grade levels. In terms of teacher influence excluding subject matter or content, however, fifth and sixth grade teachers showed more indirect patterns than did teachers at lower levels. Student talk was highest in the first and second grades and lowest in the fifth and sixth grades. Teacher talk showed the same general trend but was less pronounced. The use of the lecture gradually increased throughout

elementary school while the time spent in questioning by teachers
decreased. It also appeared that upper grade teachers felt that it was
important for pupils to spend much of their time in independent work
since the tally of category 10 (silence or confusion) was second only to
that of category 5 (lectures).

Furst and Amidon found in their study of third grade students that:

(1) amount of teacher talk begins to increase, becoming
greater than in the first and second grades, (2) amount of praise
is lowest, (3) acceptance of student ideas is lowest, (4) amount
of time spent in giving directions increases, (5) use of extended
indirect influence is lowest, (6) extended direct influence is
highest, (7) teachers begin to use ways of responding to student
talk other than praising and questioning, and (8) amount of
student initiated response is lowest.10

These findings provided insight as to why students talk less and
become progressively less enthusiastic about school experiences and their
teachers as they move from grade to grade.

The findings also indicate that teachers have different techniques
of interacting with students at different grade levels. Apparently
teachers believe that different teaching styles are required at various
grade levels. Whether or not these beliefs are substantiated by
evidence remains to be seen.

Amidon and Michael Giammatteo11 undertook a study to determine
whether differences existed in the verbal behavior of superior and
average elementary teachers. The Flanders system of interaction analysis
was used in assessing the verbal behaviors of 33 superior teachers (as
identified by supervisors and administrators) and 120 teachers selected

10 Furst and Amidon, op. cit., p. 174.

11 Edmund J. Amidon and Michael M. Giammatteo, "The Verbal Behavior
at random. They found that the verbal behavior patterns of superior teachers differed substantially from those of average teachers with the former talking approximately 40 percent of the time while the latter group talked about 52 percent of the time. Superior teachers tended to encourage students ideas more, were more accepting of student ideas, and showed more effort toward developing or building on these ideas than did average teachers. They also dominated their classes less, used more indirect verbal behavior, and used less direction giving and criticism. In addition, superior teachers asked broader questions and had their lectures interrupted more frequently by students asking questions.

As Amidon and Giammatteo suggested, these findings might indicate only that administrators and supervisors tend to favor the kind of teaching behavior which they attributed to "superior" teachers. But they proceeded to summarize the findings of a study by Flanders in which he found teachers of high-achieving classes accepted, clarified, and made more use of student ideas while, at the same time, criticized less and encouraged more student-initiated talk. Furst and Amidon proceeded to describe Flanders "rule of two thirds" in this manner:

This rule states that in the average classroom someone is talking two-thirds of the time; two-thirds of that time the person talking is the teacher; and two-thirds of that time the teacher talks, he is using direct influence (lecture, direction-giving, criticism). However, the rule of two-thirds was modified for teachers of the high-achieving children and teachers of low-achieving children. The first part of the rule, that two-thirds of the time someone is talking, held for both groups, but the teachers of the low-achieving groups talked about 80% of the time, while the teachers of the high-achieving groups talked about 55% of this time. In the low-achieving groups, teachers used direct influence about 80% of the time, while the teachers of the high-achieving groups used direct influence about 50% of the time.12

12Furst and Amidon, op. cit., p. 188.
Results of these kinds of studies demonstrate that it is possible to identify the verbal patterns of superior teachers.

Robert Soar hypothesized that reading and vocabulary would be hampered by stress in the classroom, and that stress could be created by both direct teacher control and by a negative emotional climate. As a result of his findings, he concluded that indirect teaching produced greater growth in vocabulary and reading than did direct teaching and that classrooms possessing a greater expression of hostility produced less learning than did those with a "warmer emotional climate." Greatest gains of all occurred with indirect teaching and low hostility.

Raymond Davidson found that children in grades two through six reached higher levels of critical thinking under the influence of indirect teachers. Walter A. Weber's study of third and fourth graders showed that students under indirect teachers had higher scores on verbal creativity than students under direct teachers.

James Campbell and Cyrus Barnes, after reviewing the recent research on interaction analysis, concluded that their research seemed to indicate that explicit methodologies exist at elementary, junior, and senior high levels. They foresaw the possibility that different ratios

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and combinations will turn out to be most productive for each grade level. In any event, the process of interaction analysis is changing the global and subjective methods of evaluating teachers. Campbell and Barnes expressed it this way:

... We can now give a teacher something definite, both in the form of diagnosis and subsequent prognosis to utilize in improving his teaching, and perhaps we can move away from the hopelessly vague folklore which has come to be known as education.

In the twenty-first century, when the historians of education speak of the present era of supervision, they will doubtless be astounded that any individual could observe a class, see so much, the process, and the content in so short a time. The resulting superficiality has become apparent both to teachers and their militant spokesmen.17

The Flanders' system of interaction analysis can be used only when there is verbal interaction between teacher and pupils, and its descriptions of verbal interactions are by no means faultless. As a result, research continues in the verbal dimension.

**Teacher Behavior: Nonverbal**

Communication has both verbal and nonverbal dimensions.

Communication research suggests that the message received and interpreted by an individual is largely a product of the nonverbal cues in the situation.18

Any message sent or received, independent of the written or spoken word is an instance of nonverbal language. Many different ways have been proposed for classifying the major kinds of human expressions

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17Campbell and Barnes, op. cit., 589.

which do not involve the use of words. Galloway,19 French,20 Edward Hall,21 and Julius Fast22 suggested that there are both human and nonhuman elements.

Human elements or carriers include:
1. facial expression (also eye contact)
2. posture and positions of the body
3. actions and gestures
4. vocal characteristics (pitch, tone, volume, etc.)

Nonhuman carriers incorporate:
1. utilization of time
2. utilization of space
3. other environmental factors (light and dark, furnishings, color, general decor)

Facial expression (eye contact). The importance of facial communication in general has been borne out by psychoanalysts and communication researchers. Studies by Albert Mehrabian and Susan Fereis23 revealed that facial expression received approximately three and one-half times


the weight given vocal communication when 62 students were given
information through verbal and nonverbal channels. The eyes appear to
be an effective transmitter of information within the framework of the
face.

The eyes can be used effectively to communicate not only awareness
but more important, personalized attention. The resulting interpersonal
communication helps to personalize group instruction. Teacher-student
eye contact can also help in classroom management, individual motivation,
and the prevention of disciplinary problems. Eye contact is a vital and
indispensable nonverbal function of the wholly communicative teacher.

Body movements, positions, and gestures. Body movement has been a major
area of nonverbal communication research, although its specific mani-
festations in classrooms have been neglected. Body positions and
movements help indicate liking and disliking for other communicators.
Mehrabian found that the arms akimbo position by standing communicators
seems to be used with greater frequency when interacting with disliked
persons than with liked. Both males and females felt that a person
leaning backward from them had a more negative attitude than the same
person leaning forward. Howard Rosenfield found that smiles, head
nodding, and a generally higher level of gestural activity characterized
those trying to win the approval of others. According to Michael Reee

24 Albert Mehrabian, "Significance of Posture and Position in the
Communication of Attitude and Status Relationships," Psychological

25 Howard Rosenfield, "Instrumental Affiliative Functions of
Facial and Gestural Expressions," Journal of Personality and Social
and Robert Whitman\textsuperscript{26} a "warm" person's nonverbal behavior was perceived as a shift in posture toward the other person, a smile, direct eye contact, and hands remaining still.

Status also seems to be associated with certain body movements and positions. In standing positions, shoulder orientation seems to be more direct when facing a high status addressee, regardless of the attitude toward him. Again, the arms akimbo position is more likely to be used when one is talking to a person seen as having a lower status than one's own.\textsuperscript{27}

The voice and learning. Voice seems to be verbal, but interwoven around and among words are tone, intonation, volume, pitch, hesitations, quivering, and silence. Emotions such as anger, fear or enthusiasm come through. Although the study of vocal cues has been mainly concerned with judgements of personality and emotions, perhaps the most pertinent body of literature for teachers concerns the influence of vocal cues on listener comprehension and attitude change.

Several studies indicated that moderately poor vocal behavior (hoarseness, nasality, stuttering) does not interfere significantly with a listener's comprehension. Other evidence indicated that if variety in volume, pitch, and rate are used, it will increase the chances of achieving audience comprehension of one's speeches or lectures. Lack of fluency does not seem to affect attitude, but listeners appear to make


\textsuperscript{27}Mark L. Knapp, "The Role of Nonverbal Communication in the Classroom," \textit{Theory Into Practice}, X (October, 1971), 245.
some decisions about a speaker's credibility solely on the basis of wordless samples, and credibility can have a profound effect on teaching effectiveness.  

Utilization of time. Another component of nonverbal language is time and the way it is handled. Discussing the significance of time in sending messages, the noted anthropologist Edward T. Hall emphatically stated: "Time talks. It speaks more plainly than words. The message it conveys comes through loud and clear. Because it is manipulated less consciously, it is subject to less distortion than the spoken language. It can shout the truth where words lie." An example will clarify Hall's point. To Americans, keeping a person waiting for a conference while finishing up a paper-work task may suggest that the paper is more important than the person.

Hall made the point that the messages sent by time are cultural derivatives; that is, people who have grown up in one culture draw inferences about time that may differ from inferences drawn by peoples of another cultural background. Interpretation of nonverbal cues must be based on knowledge of the cultural background of an individual.

Utilization of space. Space speaks too. The manipulation of space to send messages from one person to another has been called proxemics by Hall, who founded the scientific study of space language.

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28Knapp, op. cit., 246.


30Hall, The Hidden Dimension, op. cit., pp. 110-120.
The classroom is a unique kind of space. It is a contrived human setting in which teacher and students are expected to live together for many hours each day and to learn certain competencies and acquire specific information.

The teacher has the task of creating an environment conducive to learning in this unique space. This task is most difficult to perform successfully since it involves an operational knowledge of human behavior and its meaning in the classroom. It is to this aspect of teaching that proxemics may offer some new insights.

People use space as a buffer between themselves and other people and things in the environment. When individuals encounter someone or something pleasant, they reduce the space between themselves and the object. If the encountered person or thing is not pleasant, they increase the space. It is this addition and subtraction of space that gives observers cues and clues to making inferences about people's attitudes at any particular moment. 31

An important point for the teacher to consider is that human space barriers should not be violated indiscriminately. Crowded rooms, halls, tables and benches where students are forced to rub against each other continuously must surely inhibit learning. There is too much body heat, too much noise, too many odors, too much to see and to touch. To expect students to concentrate in the midst of this sensory bombardment may be impossible.

Crowding, jostling, and lack of elbow room induce stress and anxiety. Many classrooms may be stress-inducing because students are not

provided with adequate space in which to gather the information they need to perform comfortably.

When conversing with co-workers or acquaintances, adult Americans tend to keep four to seven feet of distance between them; they function within a space that Hall\(^{32}\) termed *close social* distance. Moving closer than four feet implies a less formal, warmer relationship, for now people are functioning within *personal space*, a space reserved for chatting with friends. Moving nearer to about eighteen inches between brings one into another's *intimate space* which is reserved almost exclusively for loved ones, for children, and for people performing a service function. Strangers who move in this close tend to make the average American feel uncomfortable and wonder what is going on.

Moving away sends the opposite kind of message from the one sent by moving together. Moving away may also signal a desire to keep the relationship formal and impersonal.

Touch is a way to cut across distance. Touch breaks through social and personal space and establishes a more intimate relationship. Touch is often used to assure, to console, to say "I understand, I care."\(^{33}\)

Other environmental factors. According to Thompson,\(^{34}\) the world would certainly be a drab and dreary place without color. Yet color does more than decorate. It is part of an individual's microspace that shapes him,

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\(^{32}\) Hall, *The Hidden Dimension*, loc. cit.


\(^{34}\) Thompson, op. cit., pp. 81-82.
and which he manipulates to reach a better accommodation with his own
environment. Color is a silent language, a unique and subtle symbol
system used by humans, consciously and subconsciously, to send each other
information. Teachers who try to understand this language and use it
creatively and intelligently will help students to be more productive.

The situations and findings presented here are a few of many,
but they should be sufficient to underscore the fact that nonverbal
communication factors are crucial to student involvement.

Combining Verbal and Nonverbal Dimensions

The need to describe and analyze the effects of teacher verbal
and nonverbal messages and pupil response is of paramount concern. Such
an analysis demands a useful observational system designed to provide
data relevant to both aspects of teacher behavior.

French and Galloway35 attempted to develop a system of complete
behavioral analysis by combining the verbal categories of the Flanders
system with relevant dimensions of nonverbal behavior. The French and
Galloway approach was based on a theoretical continuum ranging from
encouraging to restricting interaction. Because the verbal interaction
was classified as Indirect-Direct and the nonverbal interaction was
classified as Encouraging-Restricting, this method was referred to as the
IDER system.

French and Galloway believed that category one of the Flanders'
system (accepts student feeling) suggested both verbal and nonverbal

35Russell L. French and Charles M. Galloway, "A Description of
Teacher Behavior: Verbal and Nonverbal" (Ohio State University, 1968),
pp. 1-8. (Mimeographed.)
phenomena. The verbal and nonverbal behaviors employed by the teacher in accepting student feelings are so closely related that any specification of particular cues which distinguish either the verbal or nonverbal aspect becomes exceedingly difficult. Indeed, the verbal characteristics are more elusive and hazardous to predict and defend than the nonverbal aspect. It is not difficult to determine whether the teacher does or does not accept student feeling, but an observer is pushed to make an observation solely on the basis of verbal information. The teacher behavior of accepting student feeling is a cojoint verbal and nonverbal activity.

Each of the verbal categories of the Flanders system was further subdivided on the basis of nonverbal communication in the IDER system. Following is a somewhat detailed explanation of the arguments of French and Galloway in promoting the IDER system.

Flanders category two (praises and encourages) implied a nonverbal dimension which can be classified as congruent or incongruent. When congruency occurs between the teacher's nonverbal cues and his verbal message, the fidelity of teacher intent is clear and believeable. Nonverbal cues can reinforce and further clarify the credibility of a verbal message so that no ambiguity in interpretation is present. When a discrepancy or contradiction appears between verbal and nonverbal cues, the appearance of an incongruity can be observed.

The nonverbal consequences of category three (uses student idea) was related to the question of whether a teacher actually uses an idea or merely acknowledges it, which differentiates it as either an implementing or perfunctory behavior. Although Flanders made no distinction within this category, there are two ways in which teachers may respond to
student ideas or thoughtful contributions. In one way, he may merely recognize or acknowledge student expression by automatically repeating or restating it. A teacher's use of student ideas in this way is perfunctory. Conversely, a teacher may respond by using a student's ideas in subsequent discussion; he may react to an idea by reflecting on it, or he may turn the idea to the class as worthy of consideration. Teacher response of this nature can be distinguished from perfunctory acknowledgement of student ideas and can be understood as truly using or implementing ideas.

Teacher question-asking (category four of the Flanders system) may be either personal or impersonal. Essentially, the difference between personalized and impersonalized questions is the difference between a face-to-face confrontation and a verbal interchange in which mutual glances and intimate, physical expressions of feelings are avoided. Nonverbal cues which personalize questions carry warmth, a sense of nearness or proximity, the implication that the teacher has a personal involvement in meaningful interactions. Impersonal question-asking will convey detachment, aloofness, and a sense of distance. In both instances, nonverbal cues provide the basis for the distinction.

Lectures or giving information (category five) may be observed in light of teacher ability or willingness to use pupil nonverbal responses as cues to guide teacher talk. A teacher may be responsive or unresponsive to student behavior, and the key factor of this dimension is the teacher's sensitivity to his own behavior when talking to students. If pupils indicate that they are restless, bored, disinterested, or inattentive, the teacher may change the pace or direction of his own talk which is responsive behavior. Teachers are frequently unable or
unwilling to alter the pace or direction of their talk. They also have difficulty in detecting the meaning and relationship of pupil nonverbal behavior to their verbal performance. Teacher talk which continues with unreceptive student behavior is categorized as unresponsive.

Category six (gives direction) was viewed as behaviors that involve or dismiss students. Teacher directions can involve students either in a clarification or maintenance of learning tasks, or they can dismiss or control student behavior. While involving behaviors facilitate further pupil-teacher interactions, controlling behaviors restrict interaction and tend to be punitive.

The dimension firm or harsh helps to qualify category seven (criticizes or justifies authority). Firm criticisms or justifications of authority have their use in the classroom. Such criticisms evaluate a situation cleanly and crisply and clarify expectations for the situation. They lack the hostility, severity, and indignity of harsh criticisms, and they are devoid of the aggressive or defensive behaviors which criticisms can sometimes yield.

Flanders separated student talk into two categories, response to teacher (category eight), and student-initiated talk (category nine). One nonverbal dimension is appropriate to both categories, for teacher behavior during student talk is almost entirely the nonverbal activity of being receptive or inattentive. Receptive teacher behaviors involve attitudes of listening and interest, facial involvement and eye contact, and suppression of teacher distraction and egoism. Inattentive teacher behaviors during student talk generally involve a lack of attending, eye contact, and teacher travel or movement.
Category ten (silence or confusion) in the Flanders system was used as a "catch-all" category and possesses little inherent value. Yet, there are different kinds of silence or confusion which can exist in a classroom. The dimension of comfort or distress is useful for recording the distinction. Comfortable silences are characterized by times of reflection, thought, or work; distressing instances are produced by embarrassment or tension-filled moments. Comfortable periods of confusion are those in which students are stimulated or exhibit excitement, while distressing instances of confusion reflect disorganization and disorientation. It is primarily the nonverbal cues provided by the teacher which set the stage for either comfortable or distressful classroom occurrences.

French and Galloway regarded the IDER system as a complete interaction analysis, including both verbal and nonverbal components. The IDER system permits teacher-student interactions to be classified and categorized as follows:

<table>
<thead>
<tr>
<th>Indirect-Direct (verbal)</th>
<th>Encouraging-Restricting (nonverbal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepts student feeling</td>
<td>Congruent-Incongruent</td>
</tr>
<tr>
<td>Praises or encourages</td>
<td>Congruent-Incongruent</td>
</tr>
<tr>
<td>Uses student idea</td>
<td>Implement-Perfunctory</td>
</tr>
<tr>
<td>Asks questions</td>
<td>Personal-Impersonal</td>
</tr>
<tr>
<td>Lectures-Gives information</td>
<td>Responsive-Unresponsive</td>
</tr>
<tr>
<td>Gives directions</td>
<td>Involve-Dismiss</td>
</tr>
<tr>
<td>Criticizes or justifies authority</td>
<td>Firm-Harsh</td>
</tr>
<tr>
<td>Student talk (response)</td>
<td>Receptive-Inattentive</td>
</tr>
<tr>
<td>Student talk (initiated)</td>
<td>Receptive-Inattentive</td>
</tr>
<tr>
<td>Silence or confusion</td>
<td>Comfort-Distress</td>
</tr>
</tbody>
</table>
See Appendix B for descriptive additions to the IDER system chart. They are listed so as to correspond with the encouraging-restricting continuum, with the single-digit number representing "encouraging" responses and the two-digit numbers representing "restricting" responses in six of the ten categories which make up the system.

This system was designed to enable an observer to use the categories, time intervals, and ground rules of the original Flanders system, while also recording nonverbal dimensions. By marking a slash (encouraging) or a dash (restricting) to the right of recorded tallies, an observer can record both the verbal and nonverbal dimensions of teacher behavior within the three-second time intervals. A circled number is used to enclose the category frequency when teacher behavior is solely nonverbal. After a coding lesson, the observer plots his tallies onto a matrix, obtains column totals and percentages, calculates ratios, and analyzes apparent behavioral flow patterns.

Research using the IDER system. French\textsuperscript{36} conducted a study to test, among other things, the relevancy of the IDER system as a tool for providing useful, descriptive teacher-behavior data. Classes were videotaped and these tapes were studied in the analysis of teacher-student interaction. It was felt that the taping offered opportunity for the application of several research techniques.

The population of French's study consisted of twelve junior high school teachers, seven males and five females, selected from a single junior high school. All participants were experienced teachers. Three periods of classroom interaction in each subject's classroom were videotaped and analyzed by several observational tools including the IDER system.

French drew several conclusions based on his investigation. Some of these are listed below. Because of the limited population and the sampling procedures, French stated that generalized conclusions should not be made to all classrooms. Nevertheless, these findings do provide empirical information which did not previously exist.

1. The data clearly show that what teachers do is as important as what they say, and that there is no direct relationship between verbal and nonverbal influence. The nature of one cannot be presumed from knowledge of the content of the other. Furthermore, certain kinds of teacher behavioral influence can be carried out either verbally or nonverbally. Verbal utterance is not always essential to teacher praise, encouragement, acceptance of student feeling or ideas, question-asking, direction-giving, or criticism.

2. There is a lack of emphasis placed upon personalized communications (those focusing on personal interests, needs, and expectations) in junior high school classrooms.

3. Instructional procedures in the junior high school classroom, at least those dependent upon communication and interaction between teachers and students tend to focus more upon the group than upon the individual within the group. French feels that findings such as these point up the need for theory and research exploring the relationship between communication elements and the individualization of instruction.

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Cosper used the IDER system of behavior analysis to investigate possible sex differences in teacher-student interaction. Four female fifth and sixth grade teachers and 105 gifted students (53 males and 52 females) participated in the study. Videotapes were made of class sessions and the analysis of teacher-student interaction was made by observers viewing the tapes.

Cosper found that female teachers of the fifth and sixth grade students (1) initiated significantly more talk with male than with female students, (2) tended to exhibit more restricting behavior toward female than toward male students, and (3) exhibited more indirectness than directness and more encouraging than restricting behavior toward both male and female students. Male students initiated talk with the female teacher significantly more often than did female students.

These results indicated that at these particular grade levels female teachers discriminated between students on the basis of sex, interacting to a significantly greater degree with the male students. Whether or not these findings can be replicated is not known at this time. Shepard sought to analyze nonverbal behaviors of teachers to determine what numbers of encouraging and restricting behavior cues were exhibited to pupils within a particular social class. He was also interested in determining if patterns of discrimination were evident in the behaviors exhibited by teachers toward students from different social classes.

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Shepard selected eleven teachers, each in a self-contained classroom, with each classroom containing students from the upper, middle, and lower classes. Six of the teachers were male and five were female. Videotapes were made of the behavior of each teacher, and the tapes were utilized to analyze teacher behaviors. Following are some of the conclusions drawn from this study:

1. Teachers exhibited more nonverbal behaviors toward students in the upper socio-economic class while the middle-class students received the smallest percentage of nonverbal behaviors. The number of nonverbal behaviors directed at lower-class group students was less than that of upper-class students but greater than the middle class. It was also found that teachers were more encouraging than restricting in all social classes.

2. With respect to the sex of the teacher, when they interact with the upper social class, male teachers were found to exhibit more nonverbal behaviors than female teachers, but female teachers were found to be more encouraging in the nonverbal behaviors which they did exhibit. When interacting with middle- and lower-class students, however, no difference in the nonverbal behaviors exhibited by male and female teachers was found, although both were more encouraging than restricting.40

Shepard concluded that "a definite pattern of discrimination against the middle-class student did exist." No explanation for this unusual finding was offered. He suggested that teacher-preparation institutions needed to incorporate the findings of this research in a curriculum that will provide experiences prior to student teaching; that will include practical exercises in observing, analyzing, and interpreting nonverbal behaviors; and develop testing devices which enable students to learn about their social-class structure, so that some of their preferences and biases in interaction with students can be altered.

40Shepard, loc. cit.
The term "clinical supervision" may mean many things to various supervision and instructional leaders. Jerry Bellon\(^4^1\) defined clinical supervision as "the improvement of the teaching act through diagnosis, observation, analysis and assessment of teacher-pupil interaction."

Classroom Observation: The Clinical Approach

The direct supervision of teaching through observation, feedback, and conferences should be the most vital aspect of supervision. It holds much promise for effecting the improved performance of teachers and, as a result, the improved performance of students. A recent study by James Huffman\(^4^2\) revealed that Tennessee social studies teachers were rarely observed by a supervisor and that they received little supervisory assistance for the purpose of improving instruction. The study further indicated that, contrary to popular belief, teachers are desirous of supervisory observation and feedback. Teachers were generally not opposed to supervisory classroom visitation, but were resentful, and rightly so, when it was poorly done. Teachers in general preferred no supervision to poor supervision. They were not opposed however, to supervisory observation and feedback when they believed that such practices positively affected their performance.

\(^{41}\)Jerry J. Bellon, "Clinical Supervision" (Knoxville, Tennessee: Department of Curriculum and Instruction, College of Education, University of Tennessee, Fall, 1971), p. 1. (Mimeographed.)

Clinical supervision provides a supervisory process through which the supervisor can assist the teacher in reviewing classroom interaction and instruction analytically and in making decisions about future instruction based on the analysis. It is an approach through which detailed observational data are cooperatively analyzed by the teacher and supervisor. Thus, clinical supervision facilitates planning future instruction and improves teacher performance and classroom interaction.

Basic Assumptions

According to Huffman, four basic assumptions underlie the clinical process. First, it is assumed that teaching is composed of a set of identifiable patterns of behavior. Clinical supervision is, therefore, based upon the observation, categorization, and analysis of teaching behavior. The second assumption is that instructional improvement can be achieved by changing or modifying selected teaching patterns or behaviors. Clinical supervision makes it possible for the teacher to identify and analyze teaching patterns and then make decisions for improving instruction. The third assumption is that in the clinical model the supervisor-teacher relationship must be built on mutual trust. The teacher and supervisor need to have faith in both their own and each other's ability and competence so that they do not act defensively toward one another. Communication must be open and honest. The final assumption serves as a basis for clinical supervision and relates to the basic purpose of the supervision of instruction. The clinical approach assumes that the primary goal of supervision is the improvement of instruction.

It is not the purpose of clinical supervision to evaluate teaching performance as a basis for rating teachers. Rather, its purpose is to provide for cooperative evaluation of teaching and learning aimed at the improvement of actual classroom instruction and student learning.

**Structural Components**

Huffman stated that the process of clinical supervision may be broken into three sequential phases which can be identified as: (1) the pre-observation conference; (2) classroom observation; and (3) the post-observation conference.

**Pre-observation.** The pre-observation conference is important as a means of establishing or re-establishing communication between the teacher and supervisor. The development of good rapport between the teacher and supervisor is essential. A relationship based on mutual trust is imperative to the maximum efficiency of the clinical process.

It is necessary that both the supervisor and teacher reach agreement as to the roles each will play during observation and post-observation. The supervisor should come away from the conference with a thorough understanding of what the teacher will attempt to do in the class to be observed.

The supervisor should also know the instructional strategies that the teacher will utilize in attempting to achieve the objectives. The teacher, by familiarizing the supervisor with his objectives and strategies, will be conceptually rehearsing his instructional plans, at least at a rudimentary level.

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44 Huffman, "Clinical Supervision," 13-14.
Once the supervisor has a clear understanding of the teacher's plans it is important that the teacher know what the supervisor will do during the observation period. The supervisor should explain that his function during observation is to collect objective data centering on selected behaviors occurring in the classroom. These data may include student physical and/or verbal behavior, teacher physical and/or verbal behavior, or some combination of teacher and student behavior. The teacher may then inform the supervisor of those aspects of classroom behavior on which he should concentrate during the observation period. Neither the supervisor nor the teacher should go into the observation stage without mutual understanding of the roles that each will play.

Observation. While observing actual classroom instruction, the supervisor will record, as objectively as possible, the student or teacher behaviors that the teacher has directed him to. His objective is to provide the teacher with a thorough and complete record of what actually occurs in the classroom during the instructional period. General descriptions of what occurs are insufficient. The observer should record verbatim what is happening in the classroom setting. It is crucial that the data recorded constitute a true, accurate, and complete representation of what occurred. A written record should be available at the post-observation conference if effective analysis is to take place. If the observer is recording verbal behavior, he should write down everything said, or as much as possible. A tape recorder may be used to record verbal interaction if it is transcribed at a later time. The observer may utilize self-developed diagrams and charts for recording nonverbal behavior.
Post-observation. The major purpose of the post-observation conference is analysis of data, providing a basis for decision-making about future instruction. The teacher and supervisor will jointly reconstruct what took place during the instructional period and reach agreement as to the accuracy of the recorded data. Agreement must be reached before proceeding. The next step is to identify patterns from the recorded data. A pattern may be thought of as any recurrent action or behavior. It may be a student pattern or a teacher pattern, verbal or nonverbal. Once patterns have been identified they can be assessed in relation to the objectives that were developed for the class. The teacher and supervisor can then cooperatively make judgements and generalizations and draw conclusions regarding the efficacy of identified patterns to the achievement of the pre-established objectives. Congruence and lack of congruence between patterns and objectives should be determined. The teacher and supervisor can apply their conclusions in planning for future instruction. Patterns that are highly congruent with instructional objectives should be continued and strengthened. Behavior patterns that show lack of congruence with specified objectives should be modified or eliminated. The teacher might choose to utilize such tools as micro-teaching and interaction analysis in an attempt to improve instructional behavior patterns. If so, the supervisor should be skilled enough in the use of such techniques to provide the proper assistance.

The post-observation conference provides an opportunity for the teacher and supervisor to discuss the value of the clinical process as it relates to instructional improvement and to determine if it merits
further utilization in the supervisor's and teacher's cooperative quest for instructional improvement. 45

The assumptions as well as the clinical process require that the supervisor have techniques of analysis or systems available to him with which to record teacher behaviors. Barak Rosenshine found that, "Category systems have become very popular in descriptive educational research and in teacher training because they offer greater low inference specificity and because an 'objective' count of a teacher's encouraging statements to students appears easier for a teacher to accept than a 'subjective' rating of his warmth." 46

If clinical supervision is to be effective in helping the classroom teacher to develop and control his behavior for the inducement of student learning, then the systems of recording teacher behavior must be valid reflections of interaction in the classroom. The central question for the clinical supervisor would then be whether helping a teacher control his teaching behavior will make him a better teacher. Flanders believes it will.

So far, at least, there has been no mention of good and bad teaching, making ratings of teaching performance, or suggesting a particular way to teach. We can anticipate, however, that neutrality with regard to teaching behavior is not likely to last . . . . Preferences about teaching behavior should arise rapidly as our understanding of its consequences improves. 47

Flanders seems to be saying that the use of interaction analysis techniques in supervision will provide the teacher and supervisor with an

45 Huffman, "Clinical Supervision," 15.
understanding of the choice of events that constitute the learning situation. This understanding of the consequences of teaching will in turn improve one's ability to know what to observe. He does not go so far as to claim that the use of interaction analysis in supervision will improve students' learning, but he does believe his categories to be important and central in good teaching. If one believes that a teacher's verbal and nonverbal behavior influences the learning of his pupils then one must conclude that interaction analysis and the IDER system have some value for the improvement of instruction through the analysis of teacher behavior.

OPEN CLASSROOM SETTINGS AS COMPARED WITH TRADITIONAL CLASSROOM SETTINGS

Open education is a promising alternative in a period of educational upheaval in America in which the very system of education is under serious attack. Open education however, should not be viewed as being the opposite of traditional education. The English primary schools, which have had such a strong influence in the development of open education in America, moved toward the informal teaching styles and learning over a forty-year period. The success of these practices in the infant school then brought about changes in the junior school, and the informal approaches became more common in the 1960's. In American schools the movement toward open education should be viewed as a process in which teachers and students move gradually in more open directions. Consequently, teachers and students advance, generally irregularly, from traditional levels to more open levels of independence and experience with active learning. The rate and quality of progress varies in different situations.
There are many common attributes of the open-space elementary classroom. The basic assumption behind open education is that both the teacher and the children are at many different stages in their development and have different levels of experience and personal interests. Thus the open classroom is designed to develop desirable qualities and meet student needs. The organization of the classroom into a variety of learning areas broken up by dividers or movable screens with no "front of the room" allows for the mobility of the children. Desks are arranged in clusters allowing several children to be working in the same learning area. At any given time some children may be drawing, others reading, playing musical instruments, working math, or acting out a play. This decentralized organization is most conducive to small group and individual endeavors. It allows the teacher to respond to the children individually and converse naturally with them about their work. It also provides children a setting in which they can learn from each other while providing them with a broader range of learning activities. Initially, the learning areas are prepared by the teacher but are changed and added to throughout the school year as the children add to them as interests change.  

The teacher in the open classroom like the students is quite active. To help each student to grow the teacher must know him individually. This is done through the observation of individual students noting their learning choices and their interaction with materials and other students. Another major task is that of record keeping. Since the students are working at many different levels and on different topics,

careful records become most important in planning and helping the
individual student. The teacher in the open classroom might write some­
thing about each child each day. This makes it necessary for the
teacher to converse often with the children, listen well to them, and be
willing to accept their ideas. Lauren Resnick's\(^49\) study of four teachers
in the British Infant School produced relevant data on the frequency and
initiation of teacher-child contacts in the open classroom.

On the whole, children's demands for attention are met quickly,
particularly when interruptions of more extended conversations are
permitted and when frequency of contact with children is maintained at
a high rate. Resnick estimated that if each interaction involved a single
child (many of the extended ones actually involved small groups), and if
a new child were contacted with each new interaction, then about six
different children would experience direct teacher contact in each three-
minute interval. At this rate of contact, the teacher could speak at
least briefly with every child in a class of forty once every 20 minutes,
if he distributed his attention fairly evenly among the children present.

The teacher in the open classroom finds his role to be quite
different from a teacher in the traditional classroom. As the organizer
of learning activities for students, the teacher may begin each day with
a planning session with the students. After completing any activities
from the previous day or starting new activities, everyone comes together
to devise a personal plan for the day. At this time the teacher may call
attention to new items in the learning centers or new outside resources.

\(^{49}\)Lauren B. Resnick, "Teacher Behavior in an Informal British
He also arranges a time to meet with certain groups of children to work on skills. These groups are a direct result of his observations and talks with the children. Thus groups change from week to week. In most open classrooms the teacher will establish some expectations for the students to include in their planning. For example, it might be required that each student work in the reading, math, and writing areas at least twice a week. After planning their activities the students move into various learning areas and the teacher moves about the room working with groups and individuals, asking questions, suggesting resources, encouraging, listening, and learning. The class then comes together at the end of the day to evaluate and share what they have learned.

Resnick stated these conclusions in comparing the teacher behavior in the open classroom and in the traditional classroom:

Although the recording system used in the present study does not exactly match the systems used in studying conventional classrooms, it is possible, by combining categories, to make some rough comparisons with data collected using the Flanders system of interaction analysis. Abstracting from the data given by Furst and Amidon for a large number of first- and second-grade American classrooms, one can estimate that approximately 36 percent of teacher remarks were questions. The comparable figure for the four teachers observed in the present study is exactly the same (36 percent) when all interactions are considered, but substantially higher (56 percent) when only extended interactions, which carry the bulk of the instructional load, are considered. Unfortunately, Furst and Amidon do not report different questioning figures for substantive and management types of interactions, so that it is difficult to evaluate the comparative significance of the higher figure for extended interactions. Probably the most important differences between the informal and the conventional settings will lie in the type rather than the quantity of questions; but the data available do not permit such a comparison at the present time.

A sharp difference between the Furst and Amidon classrooms and those observed in this study does emerge when the ratios of "indirect" to "direct" influence are compared. Flanders' system of interaction analysis treats questioning, praising, and accepting student ideas and feelings as indirect forms.
of teacher influence. Direct forms of influence include lecturing, giving directions, and criticizing or justifying authority. Furst and Amidon report an average ratio of direct to indirect categories of influence of between 1 and 1.4 for first- and second-grade classrooms, when all teacher talk is considered; the ratio is even lower when talk concerned with management and control, as opposed to substantive matters, is considered separately. A roughly comparable statistic can be computed for our data by treating the questioning (Q and Wh), permission (P), and praise (Pr) and general response to child (R) categories as indirect influence and all other categories as direct forms of influence. The ratios obtained are 2.4 for extended interactions, 1.4 for brief interactions, and 1.8 for all interactions combined. Thus, the general style of the teachers observed here is clearly more indirect than in the typical classroom studied by Furst and Amidon.\(^5\)

Ronald G. Schnee and Joe Park\(^5\) reported that the open school concept improves elementary reading achievement scores significantly; however, gains were not the same at every grade level, and the same testing data indicated the open school had little effect on math scores for the same pupils.

In an Oklahoma City school system, testing indicated that team teaching had a significantly positive effect on the reading gains of students in grades two, four, and six. In grade two, open spacing was an additional factor influencing reading. The reading means of students in open spacing were numerically larger than the other groups in all three grades.

No significant differences in means in arithmetic achievement were found between any groups in grades two and six. In grade four, the control group had significantly greater growth in arithmetic than the

\(^5\)Resnick, op. cit., pp. 79-80.

experimental groups. The reason given for this difference was that
elementary teachers have had more experience in individualizing learning
and grouping students for reading instruction than for arithmetic.

Robert B. Carson, Frank T. Johnson, and Fredric D. Olivia surveyed 212 elementary school teachers and found that teachers in open-area schools perceived that they worked more extensively with fellow teachers than did teachers in other types of school environments. The data did not indicate why the open-area teachers responded as they did. Whether their response was the result of the type of school, the type of teachers teaching in open-area schools, or the result of other unidentified factors was not determined.

Studies by Van J. Kennedy and Michael W. Say, Jack B. Warner, and Kyle Killough directly attacked the question of cognitive achievement by comparing academic achievement of students in open classrooms with that of students in traditional classrooms. The Warner study also analyzed the techniques, methods, and groupings used by teachers.

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Gene H. Brody and Barry Zimmerman\textsuperscript{56} found that low-income Chicano elementary school children (third and fourth graders) who were in open classrooms were willing to interact with potential visitors to the school within closer interpersonal distances than were comparable pupils in traditional classrooms. From this it could be generalized that open classrooms improve social interactions of students.

Other studies by Joseph P. Carbonari,\textsuperscript{57} Herman E. LaForge,\textsuperscript{58} and Jean P. Wren\textsuperscript{59} were concerned with psychological and sociological areas of development. Each approached the question of whether there were differences in affective reactions of students.

These studies indicated that students in the open schools did at least as well as those in traditional schools in measured cognitive achievement; that there may be some tendency for boys to benefit from the open environment more cognitively than girls; and that achievement in the open classroom does improve dramatically over that of traditional classes in a long-term evaluation.

\textsuperscript{56}Gene H. Brody and Barry J. Zimmerman, "The Effects of an Open Education Classroom Arrangement on Children's Interpersonal Affective Behavior" (paper presented at the 1974 Conference of the American Educational Association, Chicago).


\textsuperscript{58}Herman Eugene LaForge, "The Effect of Open-Space Design of an Elementary School Upon Personality Characteristics of Students" (unpublished Doctoral dissertation, University of Houston, 1972).

Concerning affective factors, evidence in these studies showed favorable attitudinal development on the part of teachers, parents, and pupils during open area school experience. The fear that an open area learning situation causes anxiety was not justified by these comparisons.

The evidence of these studies indicated that the claimed advantages of open schools over traditional self-contained classrooms can be supported by empirical evidence and that the recommendations of educators and architects favoring the open-school trend are justified. These open schools were effective.

Criteria for an Effective Learning Environment

Excellence in education demands thoughtful planning of programs and places for people. As in all educational endeavors, human needs must govern programs and facilities in the creation of an environment for learning.

The physical environment should be comfortable, spacious, and stimulating, enhancing the relationships among children, teachers, parents, administrators, and the community. The facilities should not obstruct teaching and learning but should provide the proper setting and the necessary tools to encourage each child to do his best.

Dwayne Gardner stated that quantitative and qualitative factors, as well as the organization of space, constitute the physical learning environment. Space of sufficient size and with appropriate

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dimensions is the quantitative requirement. The environmental treatment of the space and the proper use of equipment and materials make the qualitative factor.

The child's living-learning experience will be more meaningful when his environment responds to his needs. Physically and psychologically, children are quick to react to environmental conditions. Because of the influence upon children's attitudes, space and color, texture and light should be used to provide an appropriate learning atmosphere and guide the behavior of children.

According to Gardner, the educational environment should be a place of freedom, freedom for the child to be himself, yet to achieve self-discipline; freedom to experiment and investigate; freedom to try many things, to do them poorly, and to make mistakes at least once.

An effective learning environment should provide a place for playing and space for contemplation; space for groups of differing sizes and space for privacy. The facility might include many shapes and spaces, tall, low, large and small, and with this spatial variety, a variety of finishes and materials. Materials will not all be durable, antiseptic and unyielding. Some messiness may be desirable, for an obsession on the part of an adult for orderliness may inhibit initiative and kill creativity. The facilities must be relaxed and comfortable.

Such qualitative conditions as illumination, heating, cooling and ventilating and acoustics should be of greater concern. Gardner stated

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61 Gardner, op. cit., p. 4.

62 Ibid.
that research is continually providing relevant information about good climate control for children.

Surroundings should inspire, please and satisfy their occupants. Since most occupants are children, the physical environment should be child-oriented and child-sized. According to Gardner a quality learning environment should include:

**Space.** The primary ingredient for a quality learning environment is space. Space with appropriate dimensions, not the brick and mortar, is the heart of a good living-learning environment. The organization of the space, the placement within of centers of interests, dictates the flow of the learning activities. A well-organized and efficient space reduces confusion, disorder and discipline problems. Thus, sufficient areas are program-organized to accommodate the learning activities in a functional manner.

**Flexibility.** The physical environment should support and enhance, not restrict, all learning activities. Since the activities will change frequently, flexibility in the design and organization of the space is needed to permit easy adjustment to these changes. Flexibility means more than just being able to move some partitions or visual screens; the mechanical services--heating, cooling, ventilating, lighting, plumbing--also must be subject to alteration. Too much flexibility, however, leads to a lack of commitment and character.

**Versatility.** Versatility of spatial and environmental factors is inherent in all good architecture. Variations in scale, volume and texture not only

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63 Gardner, op. cit., pp. 5-6.
guide attitudes but channel enthusiasm along appropriate paths. Thus
the child is made aware of, and responds to, these variations. He feels
free to skip and laugh in permissive open areas where floors respond to
the beat of feet; yet he is quick to adjust to the quiet and contemplative
activities of individuals and small clusters of children.

Adaptability. Adaptability is a highly valued characteristic of the
physical environment. The educational program requires that the site and
the space, as well as the furniture and equipment, be so adaptable as to
permit activities to expand, shrink, disappear completely or even move
outdoors. Portable or movable furniture permits rapid changes. Likewise,
when space is designed to facilitate movement, carts, cabinets, screens,
bookcases, and work tables can all be made part of an easily modified
setting that takes on new dimensions as new demands are met.

Accessibility. Space and its contents should be accessible, the design
of space must be versatile and flexible and the furniture and equipment
within it adaptable to changing needs, but, most important, the principal
learning resources must be immediately available for use, with
objects and materials displayed to invite use and spark interest and
curiosity. Overly complicated objects or those things in bad repair, or
things simply out of reach are likely to frustrate the child; an over-
abundance of materials in one location tends to overwhelm rather than to
stimulate him. An independent, self-stimulating environment can be
achieved only when children are able to reach objects of choice and
spontaneously commence their activity.
**Beauty.** A learning environment wherein it is recognized that simplicity and beauty are compatible with functional use of space, and that they are important in contributing to the emotional fulfillment of each child, permits both educational utility and aesthetic satisfaction. The fluid quality of space with an appropriate use of color and texture becomes a learning tool.

**Safety.** Safety measures are more than the basic protection from harm by fire, protection from traffic and other modern hazards. Those who design and organize space should give due consideration to the health and safety of each occupant. The requirements of the physically handicapped should receive particular attention so that these children may be comfortable and independent.

**Acoustics.** Many acoustical problems may be anticipated because of the great variety of activities that take place simultaneously within the same space. It should be possible to determine, within reasonable limits, those materials, shapes and conditions that produce good acoustics. Much of the unwanted noise can thus be dissipated at its point of origin by using materials with good acoustical properties.

**Thermal control.** The human body does not adjust readily to extreme variations in temperature. Proper balance, uniformity, and control of the physical environment through good heating and cooling devices increase the physical comfort of the occupants. There is reason to believe that good temperature and humidity control increases the productivity level of children. Since it costs more to cool air, there is a tendency to close in the space, make it more compact, increase the insulation,
reduce the perimeter, and reduce the amount of window area. Cooling of the space should not be bought at the expense of other amenities and human needs.

Illumination. Visual comfort, compatible with the task, results from many factors other than the quality of footcandles and the level of illumination. Although the use of artificial illumination has become more prevalent, it is considered important still to have controlled daylight. The ability to see outdoors may have some effect on the emotional and psychological development of children. One should not be too quick to separate himself from the natural environment. Nor should one avoid the variation in lighting and temperature which may be necessary for the best results in the learning process. Wherever possible, space should be arranged to permit simultaneous indoor-outdoor use where the teacher can supervise groups of children in both areas.

The physical environment of any educational setting must contain both quality and quantity of site, facilities, equipment and materials which serve the neighborhood as a whole.

Problems Posed by Open-Space Facilities

An open-space building is not the same as the traditional school building of the past thirty years. Open-space facilities pose some interesting problems which must be considered because of their very existence. According to Russell French these problems are:

64 Russell French, "What's Different About Open-Space Schools?" (Knoxville: The University of Tennessee, 1972), pp. 1-4. (Mimeographed.)
A unique communication environment. Teachers cannot talk to learners in the same way in an open-space school. To whatever degree lecture is an effective instructional tool in an enclosed classroom, it is so because of the isolated nature of the setting. In open-space, lecturing to a group of twenty-five or thirty students is ineffective, unimaginative and chaos-producing. Imagine six teachers and their "classes" spread around a huge room with lecture going in each group.

A significant aspect of communication is the nonverbal dimension. The uses one makes of time, space, color, decor and light all communicate to people. In an open-space situation, many environmental messages are sent to learners (and staff) which might go unnoticed or which might not be present in a traditional classroom setting. In addition, human elements of nonverbal communication (facial expression, eye contact, gestures, postures, vocal characteristics) are changed significantly in the open-space structure. Some are lost in the vastness of the open-space. Others are intensified in this environment.

People (staff and students) are all open to inspection in the open-space setting. Communication behaviors are observable by everyone even at a distance. The demands of communication in the open-space setting may be the most significant problem of all.

Need for an "active" curriculum. Everything about the open-space facility tells learners that they can and should move about, talk to each other, be actively engaged rather than respond passively to teacher, situation and environment. An "active" classroom will result whether one builds such a program or not.
Concern for "character-development" versus "content-emphasis." Open-space suggests socialization, social relationships, independence and other character-development considerations. For a content-oriented teacher or staff, a problem of emphasis, focus, evaluation may soon surface. The problem of content versus character emphasis should be dealt with early.

Need for cooperative learning rather than competitive. Open-space suggests to learners dialogue, interaction, cooperation. Traditional classrooms have been built on a strategy of competition rather than cooperation-competition for the grade, for advancement, for status, for reward. Traditional approaches and concepts will not work in open-space. Cooperative planning, cooperative study and cooperative measurement schemes are crucial in this setting, and cooperation among staff is mandatory.

SUMMARY

A survey of the literature clearly indicated that nonverbal dimensions of teacher behavior were a vital part of communication and play an important part in the overall success in the classroom interaction with students. An adequate amount of research using the IDER system has indicated the plausibility and reliability for its use in this study.

Specific teacher behaviors and the resulting effects on the behavior and academic performance of students were being studied. One approach to the problem was through interaction analysis. The Flanders system was the most widely used research tool for the study of verbal student-teacher interaction. This process of categorizing made it possible to determine the amount of teacher talk (direct and indirect)
and student talk. Through a careful analysis, much valuable information can be extracted. A great deal of research has been conducted using this approach.

French and Galloway were interested in nonverbal classroom interaction. They developed a system, incorporating the Flanders approach, in which both verbal and nonverbal interaction can be observed simultaneously. Each of the ten categories in the Flanders system was further subdivided into two categories with each pair representing opposite ends of a continuum.

Findings of the literature indicated that clinical supervision can be a helpful process for the instructional leader in his effort to improve classroom instruction. However, the ultimate goal should be to help the teacher develop an analytical approach about his own classroom behavior. Instructional improvement will take place when teachers help each other observe, analyze, and assess their teaching strategies and classroom interaction.

According to the literature reviewed, there was considerable evidence that the teacher has the task of creating an environment conducive to learning. This task becomes difficult to perform successfully since it involves an operational knowledge of human behavior and its meaning in the classroom. The situations and findings presented were sufficient to underscore the fact that nonverbal communication factors were crucial to student involvement, whether in an open-space environment or a traditional environment.
Chapter 3

METHOD AND PROCEDURES

INTRODUCTION

The primary purpose of this study was to determine whether verbal and nonverbal behavior patterns of ten randomly selected teachers differed significantly as a result of moving from a traditional building to an open-space facility. This purpose was accomplished by collecting, analyzing, and comparing the verbal and nonverbal behavior data of teachers who taught in both a traditional and an open-space facility.

Chapter 3 provides a description of and the rationale for the methods used and the procedures employed in the conduct of the research. In order to achieve the purpose of the study, it was necessary to:

1. Select an instrument capable of and appropriate for measuring teacher verbal and nonverbal behaviors and collecting relevant data.
2. Select subjects representative of a population appropriate for the study.
3. Obtain appropriate approval for classroom observations.
4. Observe at specific periods for the purpose of eliminating undesirable variables.
5. Videotape observations of teacher verbal and nonverbal behaviors in the two settings for coding and analyzing.
6. Apply the instrument for measuring verbal and nonverbal teacher behaviors to the raw data collected on videotape.
7. Make analysis of data via an observation instrument.
SELECTION OF INSTRUMENT

The IDER System of Behavioral Analysis

The French and Galloway\(^1\) IDER system of simultaneously categorizing verbal and nonverbal behaviors was used for this study. French and Galloway concluded that this system proved to be a useful, valid, and reliable tool for providing descriptive teacher behavior data.

The Matrix

Tallies were recorded at three-second intervals on a ten-by-twenty matrix designed by French and Galloway\(^2\) for use with their IDER system of behavior analysis. For ease and simplicity of coding modifications of the matrix were made by Cosper\(^3\) and by Shepard\(^4\). The modifications in the matrix, as illustrated in Figure 1, page 66, consisted of a diagonal line to facilitate tallying the data to make interpretation easier. The diagonal line also permitted a smooth transition from one behavior to another without the need for pairing the behaviors and transferring them to the matrix. The information on the matrix sheets was recorded in a way which allowed the investigator to transfer recorded information directly to the Fortran sheet more easily.

\(^1\)Russell L. French and Charles M. Galloway, "A Description of Teacher Behavior: Verbal and Nonverbal" (Ohio State University, 1968). (Mimeographed.)

\(^2\)Ibid.


### Figure 1

**Observation Matrix**

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
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<th>5</th>
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</tbody>
</table>

- Percent of Teacher Talk
- Percent of Student Talk
- S/T Ratio
- Percent of Silence or Confusion
- Percent of Student Talk (Teacher initiated)
- Percent of Student Talk (Student initiated)
- Ti/Si Ratio
- Percent of Encouraging Behavior
- Percent of Restricting Behavior
- E/R Ratio
- Percent of Indirect Behavior
- Percent of Direct Behavior
- I/D Ratio
- Revised i/d Ratio
Videotape

The verbal and nonverbal behaviors exhibited by the teachers were recorded on one-half inch videotape. With the use of the videotape medium, the tapes could be replayed, used for establishing inter- and intra-observer reliability, re-analyzed for specific patterns of behavior, and stored for further study. A portable one-half inch unit was used because of its capability of being moved easily, and to facilitate the taping without being overly conspicuous.

Selection of Subjects

It was necessary to identify a setting which would provide opportunity for comparing teacher verbal and nonverbal behavior in a traditional school and in an open-space school. As a result a school was selected which was to be vacated and the teachers moved to a new open-space school.

Teachers within the traditional school were randomly selected to participate in the study. Randomization included selecting five teachers in grades 1-3 while the other five teachers selected were teaching in grades 4-6. Teaching experience ranged from one year to forty years. After the selection the teachers were apprised of the study and asked for their cooperation.

To avoid questions of active bias, the teachers were not told of the specific purpose of the study or what was to be observed. They were told of the importance of the study for possible use in implementing a teacher education program and that the data were being used for a dissertation. Specifically, they were told:
1. They would be videotaped on two occasions, the first taping would be done in the traditional building and the second taping would be done one year later in the new open-space facility.

2. The videotaping would last a minimum of fifteen minutes and not more than twenty.

3. They should not plan for the taping session nor alter their usual practices and teaching techniques.

4. Neither the teachers' names nor the names of the school in which they taught would be referred to in the study, but the videotapes would be kept on file for possible future in-service work.

5. The tapes would be available to participating teachers for viewing upon their request.

Since videotaping equipment and a new face in the classroom create excitement and cause distractions, the investigator made several preliminary visits to each classroom prior to the planned videotaping for the purpose of orientation and familiarization.

It was anticipated that each videotaping session would yield approximately 300 tallies or 600 total tallies for the two sessions with each teacher. This method of observation and recording, then, for ten teachers would produce an approximate total of 6,000 observable teacher verbal and nonverbal cues.

Reliability of Observers

The reliability of the investigator was determined through the following procedures. First, a correlation of inter-rater reliability of at least .80 was determined as adequate for this study. Shepard,5

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5Shepard, loc. cit.
who established similar inter-rater reliability in coding and recording
teacher behaviors in the IDER categories, and Fowler,\(^6\) who also verified
observer reliability in the IDER system, concluded that a minimum
correlation of .80 was acceptable as being an adequate degree of
reliability.

Second, an experienced observer in the IDER system of verbal and
nonverbal categorizations was selected for determining inter-rater
reliability. The experienced observer assisted in the training of this
investigator prior to any attempts in a correlation of codings.

Third, two kinds of reliability coefficients were computed from
three randomly selected videotapes of teachers in the traditional setting
and three randomly selected videotapes of teachers in an open-space
setting. These tape selections were made from tapes gathered for this
study. The two reliability coefficients were:

1. The Scott coefficient\(^7\) is an index of inter-coder agreements
that corrects for the number of categories in the code and the frequency
with which each is used. In the practical coding situation it varies
from 0.00 to 1.00 regardless of the number of categories in the dimension
and is thus comparable with the percentage agreement figure. The coding
dimensions used in this research were composed of nominal scales, where
the categories could not be ordered along a dimension of "more-or-less"
of some attribute. For such case \(\tau\) was selected as a test of reliability.

\(^6\)William B. Fowler, "Comparative Analyses of Teacher Verbal and
Nonverbal Behavior in Public School and Adult Basic Education Classrooms"

\(^7\)William A. Scott, "Reliability of Content Analysis: The Case of
Thus:

\[
\varphi = \frac{Po - Pe}{1 - Pe}
\]

Po (observed percent agreement) represents the percentage of judgements on which two analysts agree when coding the same data independently, and Pe is the percent agreement to be expected on the basis of change. The Scott coefficient \( \varphi \) is the ratio of the actual difference between obtained and chance agreement.

2. The second type of reliability coefficient for coder agreement consisted of a percentage of observer agreement regarding only tallies demonstrating restricting nonverbal behaviors:

\[
P_- = \frac{N - Neophyte}{N - Expert} \quad \text{or} \quad P_- = \frac{N - First\; Observation}{N - Second\; Observation}
\]

When \( N - \) represents the number of negative nonverbal behaviors recorded.

The correlations between the codings made by the investigator and an observer ranged from .89 to .94 as measured by the Scott coefficient and from .83 to .91 as measured by the P- method. (See Table 1.)

To achieve a correlation of .80 or greater was difficult since the verbal dimension was more prominent than the nonverbal and often had a tendency to momentarily influence the opinions of the investigator and observer. In the training phase, the observer and investigator had a tendency to score higher correlations on the verbal dimensions than nonverbal.
Table 1
Investigator Reliability/Consistency in the Use of the IDER System

<table>
<thead>
<tr>
<th>Observers</th>
<th>Pi</th>
<th>Pi</th>
<th>Pi</th>
<th>Pi</th>
<th>Pi</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Tape 1</td>
<td>Tape 2</td>
<td>Tape 3</td>
<td>Tape 1</td>
<td>Tape 2</td>
</tr>
<tr>
<td>Observers(^a)</td>
<td>.93</td>
<td>.89</td>
<td>.94</td>
<td>.87</td>
<td>.83</td>
</tr>
<tr>
<td>Observers(^b)</td>
<td>.82</td>
<td>.83</td>
<td>.92</td>
<td>.84</td>
<td>.85</td>
</tr>
</tbody>
</table>

\(^a\)Coefficients of correlation between the investigator's coding and the observer's coding.

\(^b\)Coefficients of correlation between the investigator's first and second codings.
Fourth, to insure continuity and consistency of coding the verbal and nonverbal behavior displayed by the participants, an intra-rater reliability was established. This was accomplished by the investigator re-coding the same randomly selected videotapes used for establishing inter-rater reliability one week after the first coding was completed. The results were computed using the reliability coefficients used in establishing inter-rater reliability. Correlation between the codings made by the investigator in his first and second codings ranged from .82 to .92 with the Scott Pi coefficient, and from .84 to .93 as measured by the P-method.

PROCEDURES FOR COLLECTING DATA

Once the subjects for the research were identified and an acceptable schedule for videotaping established, the investigator videotaped two periods of classroom interaction involving the same teacher for periods of at least fifteen to twenty minutes each.

The procedure for videotaping was basically the same in each classroom since the recording equipment was completely portable. The camera, equipped with a zoom lens and a built-in microphone, made it possible to maneuver easily and quietly in the vicinity of a rear corner of the room and complete the videotaping process.

As the data were collected through the IDER system, the investigator and observer developed the matrices and later transferred the information to data sheets from which computer cards could be punched and machine read. Procedures were developed to:

1. Compare the indirect-direct behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.
2. Compare the revised indirect-direct ratios of teachers in a traditional setting and of those same teachers in an open-space setting.

3. Compare the student-teacher talk of teachers in a traditional setting and of those same teachers in an open-space setting.

4. Compare the amount of teacher-initiated student talk and student-initiated student talk in the traditional classroom setting and in the open-space setting.

5. Compare the indirect-direct behaviors of entry teachers and professional teachers in a traditional classroom.

6. Compare the revised indirect-direct ratios of entry teachers and professional teachers in a traditional classroom.

7. Compare the student-teacher talk of entry teachers and professional teachers in a traditional classroom.

8. Compare the indirect-direct behaviors of entry teachers and professional teachers in an open-space setting.

9. Compare the revised indirect-direct ratios of entry teachers and professional teachers in an open-space setting.

10. Compare the student-teacher talk of entry teachers and professional teachers in an open-space setting.

11. Compare the indirect-direct behaviors of primary and intermediate teachers in a traditional setting.

12. Compare the revised indirect-direct ratios of primary and intermediate teachers in a traditional setting.

13. Compare the student-teacher talk of primary and intermediate teachers in a traditional setting.

14. Compare the indirect-direct behaviors of primary and intermediate teachers in an open-space setting.
15. Compare the revised indirect-direct ratios of primary and intermediate teachers in an open-space setting.

16. Compare the student-teacher talk of primary and intermediate teachers in an open-space setting.

17. Compare the indirect-direct behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

18. Compare the revised indirect-direct ratios of primary teachers in a traditional setting and of those same teachers in an open-space setting.

19. Compare the student-teacher talk of primary teachers in a traditional setting and of those same teachers in an open-space setting.

20. Compare the indirect-direct behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

21. Compare the revised indirect-direct ratios of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

22. Compare the encouraging-restricting behaviors of teachers in a traditional classroom setting and of those same teachers in an open-space setting.

23. Compare the encouraging-restricting behaviors of entry teachers and professional teachers in a traditional setting.

24. Compare the encouraging-restricting behaviors of primary and intermediate teachers in a traditional setting.

25. Compare the encouraging-restricting behaviors of entry and professional teachers in an open-space setting.
26. Compare the encouraging-restricting behaviors of primary and intermediate teachers in an open-space setting.

27. Compare the encouraging-restricting behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

28. Compare the encouraging-restricting behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

29. Compare the encouraging-restricting behaviors of entry teachers in a traditional setting and of those same teachers in an open-space setting.

30. Compare the encouraging-restricting behaviors of professional teachers in a traditional setting and of those same teachers in an open-space setting.

Statistical Design Used in Computing Data

In computing the data collected, a variety of formulas was used and will be described in detail in Chapter 4 along with the results and the hypotheses tested. Tests used in this investigation were:

1. The Chi-Square Test for Two Independent Samples. The chi-square statistic, $X^2$, was selected because it tells the researcher whether the observations differ from what is expected by chance, when chance is defined according to a particular set of rules. Another reason for using the $X^2$ statistic was the fact that there are no assumptions which need to be made concerning the underlying distributions of the variables. Also, the variables may be either discrete or continuous, and data of the nominal level are appropriate for analysis.
2. **Percent.** In some observations where a relative position was all that was needed, a percentage was determined.

3. **Ratio.** The ratio of measurement was used in some cases to reflect the relative position of one dimension to another.

**SUMMARY**

A rationale and description of the procedures utilized in this study were discussed. The population of the study consisted of ten teachers, five who taught in the primary grades and five who taught in the intermediate grades. Their teaching experience ranged from one year to forty.

All the teachers were videotaped on the same day of the week. The first set of videotapes was made in the traditional building and the second set of tapes was made one year later in the new open-space facility.

The primary instruments used in gathering the data were a one-half inch videotape recorder, the IDER system of teacher verbal and nonverbal behavioral analysis, and a modified matrix for plotting the categories and arranging data for transfer to electronic data cards. An IBM 1130 computer was used to read and analyze the data cards.

The following chapter will present an analysis of the data, statements supporting or rejecting the hypotheses, and the total results of the study.
Chapter 4

PRESENTATION OF THE DATA AND RESULTS OF THE INVESTIGATION

INTRODUCTION

The purpose of this study was to observe, analyze, and compare teacher verbal and nonverbal behaviors as they were exhibited toward students in both traditional classrooms and open-space classrooms. Particular emphasis was placed on determining the degree, if any, to which teachers in open-space classrooms were more indirect and encouraging than direct and restricting in their behaviors than teachers in traditional classrooms.

ANALYSIS OF DATA FOR INDIVIDUAL PARTICIPANTS

The data compiled for this study were videotaped recordings of verbal and nonverbal behaviors exhibited by teachers toward students in two educational settings, traditional and open-space schools. Data were collected through the medium of a portable videotape recorder, and were quantified, qualified, and analyzed through the use of the IDER system of teacher behavior analysis.

Where applicable the Chi-square statistical process was used to test for significance of recorded differences in observed frequencies of behaviors. The .05 level of significance was used to reject null hypotheses. The data were analyzed through the use of the Fortran program by the Computer Center at East Tennessee State University. Separate compilations of tallies of observed teacher behaviors in both
traditional and open-space classrooms comprised the data to reflect the following possible differences in teacher behaviors in traditional and open-space classrooms:

1. The indirect-direct behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.

2. The revised indirect-direct ratios of teachers in a traditional setting and of those same teachers in an open-space setting.

3. The student-teacher talk of teachers in a traditional setting and of those same teachers in an open-space setting.

4. The amount of teacher-initiated student talk and student-initiated student talk in the traditional classroom setting and in the open-space setting.

5. The indirect-direct behaviors of entry teachers and professional teachers in a traditional classroom.

6. The revised indirect-direct ratios of entry teachers and professional teachers in a traditional classroom.

7. The student-teacher talk of entry teachers and professional teachers in a traditional classroom.

8. The indirect-direct behaviors of entry teachers and professional teachers in an open-space setting.

9. The revised indirect-direct ratios of entry teachers and professional teachers in an open-space setting.

10. The student-teacher talk of entry teachers and professional teachers in an open-space setting.

11. The indirect-direct behaviors of primary and intermediate teachers in a traditional setting.
12. The revised indirect-direct ratios of primary and intermediate teachers in a traditional setting.

13. The student-teacher talk of primary and intermediate teachers in a traditional setting.

14. The indirect-direct behaviors of primary and intermediate teachers in an open-space setting.

15. The revised indirect-direct ratios of primary and intermediate teachers in an open-space setting.

16. The student-teacher talk of primary and intermediate teachers in an open-space setting.

17. The indirect-direct behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

18. The revised indirect-direct ratios of primary teachers in a traditional setting and of those same teachers in an open-space setting.

19. The student-teacher talk of primary teachers in a traditional setting and of those same teachers in an open-space setting.

20. The indirect-direct behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

21. The revised indirect-direct ratios of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

22. The encouraging-restricting behaviors of teachers in a traditional classroom setting and of those same teachers in an open-space setting.

23. The encouraging-restricting behaviors of entry teachers and professional teachers in a traditional setting.
24. The encouraging-restricting behaviors of primary and intermediate teachers in a traditional setting.

25. The encouraging-restricting behaviors of entry and professional teachers in an open-space setting.

26. The encouraging-restricting behaviors of primary and intermediate teachers in an open-space setting.

27. The encouraging-restricting behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

28. The encouraging-restricting behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

29. The encouraging-restricting behaviors of entry teachers in a traditional setting and of those same teachers in an open-space setting.

30. The encouraging-restricting behaviors of professional teachers in a traditional setting and of those same teachers in an open-space setting.

**IDER Matrices for Teacher Observations**

The IDER matrices present an analysis of total observations of teacher verbal and nonverbal behaviors which include S/T, Ti/Si, E/R, I/D, and the revised i/d ratios. The S/T ratio indicates the difference between student and teacher talk; the Ti/Si ratio indicates the difference between student talk that is teacher-initiated (Ti) and student talk that is student-initiated (Si); the E/R ratio indicates the difference between encouraging and restricting verbal and nonverbal
teacher behaviors; the I/D ratio indicates the difference between
indirect and direct verbal and nonverbal teacher behaviors; and the
revised i/d ratio indicates the difference between motivation and
control of student behaviors by the classroom teacher.

Teacher One

The analysis of the data collected for teacher one is presented
in Tables 2 and 3. This female professional teacher taught primary
children in both the traditional and open-space environments. There
were 590 total tallies recorded in both IDER matrices, of which 267 were
exhibited in the traditional setting and 323 in the open-space setting.

Table 2 provides the results of verbal and nonverbal behaviors
for teacher one in the traditional setting. Of the 267 tallies, 146 (55
percent) were encouraging, while 121 (45 percent) were restricting
behaviors. The I/D ratio for teacher one was .46 which indicated that
she exhibited 1.17 more direct behaviors than indirect behaviors.
The revised i/d ratio was .20 which further indicated that teacher one
was controlling her students four times more than she was motivating
them.

Teacher talk was 41 percent, student talk was 51 percent, while
8 percent of the time was spent in confusion since all responses in
column 10 were restricting. Student talk was 36 percent teacher-
initiated (column 8) and 64 percent student-initiated (column 9) which
indicated that student-initiated talk was 1.78 times greater than
student talk which was teacher-initiated.
Table 2
IDER Analysis of Total Observations of Teacher One in a
Traditional Environment (Professional) (Primary)

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Percent of Teacher Talk 41
Percent of Student Talk 51
S/T Ratio (1.24 times more student talk)

Percent of Silence or Confusion 8
Percent of Student Talk (Teacher initiated) 36
Percent of Student Talk (Student initiated) 64
Ti/Si Ratio (1.78 times more student initiated talk)

Percent of Encouraging Behavior 55
Percent of Restricting Behavior 45
E/R Ratio (1.22 times more encouraging)

Percent of Indirect Behavior 46
Percent of Direct Behavior 54
I/D Ratio (1.17 times more direct)

Revised i/d Ratio (4 times more controlling)
Table 3
IDER Analysis of Total Observations of Teacher One in an Open-Space Environment (Professional) (Primary)

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Percent of Teacher Talk: 76%
Percent of Student Talk: 24%
S/T Ratio (3.20 times more teacher talk)
Percent of Silence or Confusion: 0%
Percent of Student Talk (Teacher initiated): 73%
Percent of Student Talk (Student initiated): 27%
Ti/Si Ratio (2.70 times more teacher initiated talk)

Percent of Encouraging Behavior: 94%
Percent of Restricting Behavior: 6%
E/R Ratio (15.67 times more encouraging)
Percent of Indirect Behavior: 71%
Percent of Direct Behavior: 29%
I/D Ratio (2.45 times more direct)
Revised i/d Ratio (2.33 times more motivating)
The behaviors of teacher one in the open-space setting are shown in Table 3. Of the 323 tallies, 305 (94 percent) were encouraging while 18 (6 percent) were restricting behaviors. The I/D ratio for teacher one in the open-space setting was .29 which indicated that she was 2.45 times more direct than indirect. The revised i/d ratio was .70 which further indicated that this teacher was 2.33 times more motivating than controlling.

Teacher talk was 76 percent while student talk was only 24 percent. Of the total student talk, 73 percent was teacher-initiated with only 27 percent being student-initiated, which indicated that teacher-initiated talk was 2.70 times greater than student-initiated talk.

In summary, teacher one was more encouraging than restricting in both the traditional and open-space settings, but was more encouraging in the traditional setting. She was also more direct than indirect in both settings, but was more direct in the open-space setting. Teacher one was more motivating in the open-space setting and more controlling in the traditional setting. She talked a greater percentage of the time in the open-space setting than she did in the traditional setting. Teacher-initiated student talk was greater in the open-space classroom than in the self-contained classroom, while student-initiated talk was greater in the traditional classroom.

Teacher one lectured more in the open-space setting with less student talk than she did in the traditional setting, but exhibited more student praise in the open-space setting.
Teacher Two

The IDER analysis of teacher two, Tables 4 and 5, indicates a female entry teacher who taught primary children in both the traditional and open-space classrooms. There were 683 total tallies recorded in both IDER matrices, of which 358 were in the traditional setting and 325 in the open-space setting.

Table 4 shows the tabulation of verbal and nonverbal behaviors for teacher two in the traditional environment. Of the 358 tallies, 333 (93 percent) were encouraging, while only 25 (7 percent) were restricting behaviors. The I/D ratio for teacher two in the traditional school was .52 which indicated that she was 1.08 times more indirect than direct. The revised i/d ratio for teacher two was .50 which indicated that she exhibited as many motivating behaviors as controlling behaviors.

Teacher talk comprised 57 percent of the total behaviors observed for teacher two, while only 43 percent was student talk. Of the student talk 26 percent was teacher-initiated while 74 percent was student-initiated, which indicated that student-initiated talk was 2.85 times greater than teacher-initiated student talk.

The tallies of the behaviors of teacher two in the open-space environment are shown in Table 5. Of the 325 tallies, 323 (99 percent) were encouraging, while only 2 (1 percent) were restricting behaviors. The I/D ratio for teacher two in the open-space classroom was .75 which indicated she was 3 times more indirect than direct. The revised i/d ratio was .68 which indicated she was 2.13 times more motivating than controlling in her behavior.

Teacher talk for teacher two was 42 percent, student talk was 57 percent, while silence made up only 1 percent of the total behaviors.
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IDER Analysis of Total Observations of Teacher Two in a Traditional Environment (Entry) (Primary)

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Percent of Teacher Talk 57
Percent of Student Talk 43
S/T Ratio (1.27 times more teacher talk)

Percent of Silence or Confusion 0
Percent of Student Talk (Teacher initiated) 26
Percent of Student Talk (Student initiated) 74
Ti/Si Ratio (2.85 times more student initiated talk)

Percent of Encouraging Behavior 93
Percent of Restricting Behavior 7
E/R Ratio (13.29 times more encouraging)

Percent of Indirect Behavior 52
Percent of Direct Behavior 48
I/D Ratio (1.08 times more indirect)

Revised i/d Ratio (equal in motivating and controlling) 86
Table 5
IDER Analysis of Total Observations of Teacher Two in an
Open-Space Environment (Entry) (Primary)

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Percent of Teacher Talk 42
Percent of Student Talk 57
S/T Ratio (1.36 times more student talk)

Percent of Silence or Confusion 1
Percent of Student Talk (Teacher initiated) 29
Percent of Student Talk (Student initiated) 71
Ti/Si Ratio (2.45 times more student initiated talk)

Percent of Encouraging Behavior 99
Percent of Restricting Behavior 1
E/R Ratio (99 times more encouraging)

Percent of Indirect Behavior 75
Percent of Direct Behavior 25
I/D Ratio (3 times more indirect)

Revised i/d Ratio (2.13 times more motivating)
observed. Student talk was 29 percent teacher-initiated and 71 percent student-initiated which indicated student-initiated talk was 2.45 times greater than student talk which was teacher-initiated.

In summary, teacher two was more encouraging than restricting in both environmental settings, but was even more encouraging in the traditional setting. She was also more indirect in both settings, but more indirect in the traditional setting. The revised i/d ratio revealed that teacher two was more motivating in the open-space setting than in the traditional setting.

Teacher two talked 60 percent of the time in the traditional environment while she only talked 40 percent in the open-space environment. Student talk was greater in the open-space setting. Teacher-initiated student talk and student-initiated talk were both greater in the open-space environment.

**Teacher Three**

The data presented in the matrix for teacher three, Tables 6 and 7, indicates a female entry teacher who taught primary children. There were 612 tallies recorded in both her IDER matrices, of which 294 were in the traditional setting and 318 in the open-space setting.

Table 6 provides a record of verbal and nonverbal behaviors of teacher three in the traditional setting. Of the 294 tallies, 293 were encouraging, while only 1 was restricting behavior. The I/D ratio for teacher three in the traditional setting was .65 which indicated that she was 1.86 times more indirect than direct. The revised i/d ratio was .80 which further indicated that she was 4 times more motivating than controlling in her behavior.
Table 6
IDER Analysis of Total Observations of Teacher Three in a
Traditional Environment (Entry) (Primary)

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Percent of Teacher Talk 46
Percent of Student Talk 50
S/T Ratio (1.09 times more student talk)
Percent of Silence or Confusion 4
Percent of Student Talk (Teacher initiated) 22
Percent of Student Talk (Student initiated) 78
Ti/Si Ratio (3.55 times more student initiated talk)

Percent of Encouraging Behavior 100
Percent of Restricting Behavior 0
E/R Ratio (All encouraging)
Percent of Indirect Behavior 65
Percent of Direct Behavior 35
I/D Ratio (1.86 times more indirect)
Revised i/d Ratio (4 times more motivating)
Table 7
IDER Analysis of Total Observations of Teacher Three in an
Open-Space Environment (Entry) (Primary)

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| Percent  | 1 | 0 | 11| 0 | 4 | 0 | 22| 0 | 2 | 1 | 100   |

Percent of Teacher Talk 45
Percent of Student Talk 54
S/T Ratio (1.20 times more student talk)

Percent of Silence or Confusion 1
Percent of Student Talk (Teacher initiated) 35
Percent of Student Talk (Student initiated) 65

Percent of Encouraging Behavior 99
Percent of Restricting Behavior 1
E/R Ratio (99 times more encouraging)

Percent of Indirect Behavior 83
Percent of Direct Behavior 17
I/D Ratio (4.88 times more indirect)

Ti/Si Ratio (1.86 times more student initiated talk)
Revised i/d Ratio (3.35 times more motivating)
Teacher talk was 46 percent, student talk 50 percent, while only 4 percent of the total behaviors observed for teacher three were silence. Of the student talk, 22 percent was teacher-initiated while 78 percent was student-initiated, which indicated that student-initiated talk was 3.55 times greater than student talk which was teacher-initiated.

A tabulation of the behaviors of teacher three in the open-space setting are shown in Table 7. Of the 318 tallies, 315 (99 percent) were encouraging, while only 3 (1 percent) were restricting behaviors. The I/D ratio for teacher three was .83 which indicated that she was 4.88 times more indirect than direct. The revised i/d ratio was .77 which further indicated that she was 3.35 times more motivating than controlling in her behavior toward students in the open-space setting.

Teacher talk for teacher three in the open-space setting was 45 percent, student talk was 54 percent, while only 1 percent was silence. Of the student talk, 35 percent was teacher-initiated and 65 percent was student-initiated, which indicated that student-initiated talk was 1.86 greater than student talk which was teacher-initiated.

In summary, teacher three was more encouraging in both environmental settings, but was more encouraging in the open-space setting. Teacher three was also more indirect than direct in both settings, but was more indirect in the open-space setting. The revised i/d ratio indicated that teacher three was more motivating in both settings than controlling, but was more motivating in the open-space setting.

Student talk was greater than teacher talk in both settings, but there was more student talk in the open-space classroom. In both settings there was more student-initiated talk than student talk which was teacher-initiated, but there was a greater percentage of student
talk which was teacher-initiated in the open-space setting with equal amounts of student-initiated talk in both settings. Teacher three exhibited a very high percentage of praise in both settings which might account for the high percentage of student-initiated talk.

Teacher Four

The IDER analysis of teacher four, Tables 8 and 9, presents a female professional teacher who taught intermediate children. There were 552 total tallies recorded in both IDER matrices, of which 249 were in the traditional setting and 303 were in the open-space setting.

Table 8 displays tallies of verbal and nonverbal behaviors for teacher four in the traditional setting. Of the 249 tallies recorded, 226 (91 percent) were encouraging, while only 23 (9 percent) were restricting behaviors. The I/D ratio for teacher four was .50 which indicated that she exhibited one direct behavior for ever indirect behavior. The revised i/d ratio was .61 which indicated that she was 1.56 times more motivating than controlling in her behavior.

Teacher talk comprised 68 percent of the behaviors observed for teacher four and student talk was 30 percent, with only 2 percent silence. Of the total student talk 61 percent was teacher-initiated while only 39 percent was student-initiated which indicated that teacher-initiated talk was 1.56 greater than student-initiated talk.

Behaviors of teacher four in the open-space setting are shown in Table 9. Of the 303 tallies, 298 (98 percent) were encouraging, while only 5 (2 percent) were restricting behaviors. The I/D ratio for teacher four in the open-space setting was .38 which indicated that she was 1.63 times more direct than indirect. The revised i/d ratio was .76
Table 8
IDER Analysis of Total Observations of Teacher Four in a Traditional Environment (Professional) (Intermediate)

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Percent of Teacher Talk 68
Percent of Student Talk 30
S/T Ratio (2.27 times more teacher talk)
Percent of Encouraging Behavior 91
Percent of Restricting Behavior 9
E/R Ratio (10.11 times more encouraging)
Percent of Silence or Confusion 2
Percent of Student Talk (Teacher initiated) 61
Percent of Indirect Behavior 50
百分比 of Direct Behavior 50
I/D Ratio (equal amounts of direct and indirect)
Percent of Student Talk (Student initiated) 39
Revised i/d Ratio (1.56 times more motivating)
Ti/Si Ratio (1.56 times more teacher initiated talk)
### Table 9
IDER Analysis of Total Observations of Teacher Four in an Open-Space Environment (Professional) (Intermediate)

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- Percent of Teacher Talk: 68%
- Percent of Student Talk: 32%
- S/T Ratio (2.13 times more teacher talk)
- Percent of Silence or Confusion: 1%
- Percent of Student Talk (Teacher initiated): 34%
- Percent of Student Talk (Student initiated): 66%
- Ti/Si Ratio (1.94 times more student initiated talk)
- Percent of Encouraging Behavior: 98%
- Percent of Restricting Behavior: 2%
- E/R Ratio (49 times more encouraging)
- Percent of Indirect Behavior: 38%
- Percent of Direct Behavior: 62%
- I/D Ratio (1.63 times more direct)
- Revised i/d Ratio (3.07 times more motivating)
which indicated that teacher four was 3.07 times more motivating than controlling in her behavior.

Teacher talk was 68 percent while student talk was only 32 percent of all the observed behaviors for this teacher. Of the student talk, 34 percent was teacher-initiated while 66 percent was student-initiated talk, which indicated that student-initiated talk was 1.94 times greater than teacher-initiated student talk.

In summary, teacher four was more encouraging than restricting in both settings, but was more encouraging in the open-space setting. She was more direct in the open-space setting than in the traditional setting; she was also more motivating than controlling in both settings but was more motivating in the open-space environment.

Teacher four talked more than students in both the traditional and open-space settings, but talked a greater percentage of the time in the open-space setting. Students also talked more in the open-space setting than the traditional setting. In the traditional setting student talk was more teacher-initiated while student-initiated talk was greater in the open-space setting.

Teacher Five

The data presented in the matrix for teacher five, Tables 10 and 11, indicates a female entry teacher who taught primary children. There were 556 total tallies recorded in both IDER matrices, of which 216 were in the traditional setting and 340 in the open-space setting.

Table 10 includes tallies of verbal and nonverbal behaviors for teacher five in the traditional setting. Of the 216 tallies, 198 (92 percent) were encouraging while 18 (8 percent) were restricting behaviors.
Table 10
IDER Analysis of Total Observations of Teacher Five in a Traditional Environment (Entry) (Primary)

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Percent of Teacher Talk 39
Percent of Student Talk 59
S/T Ratio (1.51 times more student talk)

Percent of Silence or Confusion 2
Percent of Student Talk (Teacher initiated) 9
Percent of Student Talk (Student initiated) .91
Ti/Si Ratio (10.11 times more student initiated talk)

Percent of Encouraging Behavior 92
Percent of Restricting Behavior 8
E/R Ratio (11.50 times more encouraging)

Percent of Indirect Behavior 15
Percent of Direct Behavior 85
I/D Ratio (5.67 times more direct)

Revised i/d Ratio (13.29 times more controlling)
Table 11
IDER Analysis of Total Observations of Teacher Five in an Open-Space Environment (Entry) (Primary)

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Percent of Teacher Talk 38
Percent of Student Talk 61
S/T Ratio (1.56 times more student talk)

Percent of Silence or Confusion 1
Percent of Student Talk (Teacher initiated) 24
Percent of Student Talk (Student initiated) 76
Ti/Si Ratio (3.17 times more student initiated talk)

Percent of Encouraging Behavior 96
Percent of Restricting Behavior 4
E/R Ratio (24 times more encouraging)

Percent of Indirect Behavior 68
Percent of Direct Behavior 32
I/D Ratio (2.12 times more indirect)

Revised i/d Ratio (2.03 times more motivating)
The I/D ratio for teacher five in the traditional setting was .15 which indicated that she was 5.67 times more direct than indirect. The revised i/d ratio was .07 which further indicated that she was 13.29 times more controlling than motivating in her behaviors toward students.

Teacher talk was 39 percent, student talk was 59 percent, and only 2 percent was silence. Of the student talk, 9 percent was teacher-initiated while 91 percent was student-initiated talk, which indicated that student-initiated talk was 10.11 times greater than student talk which was teacher-initiated.

Tallies of behaviors for teacher five in the open-space setting are shown in Table 11. Of the 340 tallies, 326 (96 percent) were encouraging while only 14 (4 percent) were restricting behaviors. The I/D ratio for teacher five in the open-space setting was .68 which indicated that she was 2.12 times more indirect than direct. The revised i/d ratio was .67 which indicated that she was 2.03 times more motivating than controlling of student behavior.

Teacher talk was 38 percent as compared to 61 percent for student talk. Of the student talk, 24 percent was teacher-initiated while 76 percent was student-initiated talk, which indicated that student-initiated talk was 3.17 times greater than teacher-initiated student talk.

In summary, teacher five was more encouraging than restricting in both settings, but was more encouraging in the open-space setting. She was more direct in the traditional setting and more indirect in the open-space setting. The revised i/d ratio indicated that teacher five was more controlling of student behavior in the traditional setting and more motivating in the open-space setting.
Teacher five talked less than the students in both settings, but talked more in the open-space setting. Student talk was greater in both settings than teacher talk, but was greater in the open-space setting. Of the student talk, student-initiated talk was greater than teacher-initiated in both settings, but teacher-initiated and student-initiated talk was greater in the open-space setting. The fact that students were motivated more in the open-space school could account for the greater amount of student-initiated talk.

Teacher Six

The data collected for teacher six, Tables 12 and 13, indicated a female professional teacher who taught intermediate children. There were 505 total tallies recorded in both of her IDER matrices, of which 231 were in the traditional setting and 274 were in the open-space setting.

Table 12 provides a record of verbal and nonverbal behaviors for teacher six in the traditional setting. Of the 231 tallies, 203 (88 percent) were encouraging while 28 (12 percent) were restricting behaviors. The I/D ratio for this teacher was .46 which indicated that she was 1.17 times more direct than indirect. The revised i/d ratio was .25 which indicated that she was 3 times more controlling than motivating.

Teacher talk for teacher six was 66 percent while student talk was 23 percent. Of the student talk, 96 percent was teacher-initiated while only 4 percent was student-initiated. Silence and confusion made up the other 11 percent of this teacher's total observed behaviors in the traditional setting. Over half of the silence was in the restricting category, which indicates a great deal of confusion.
### Table 12
IDER Analysis of Total Observations of Teacher Six in a Traditional Environment (Professional) (Intermediate)

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Percent of Teacher Talk 66
Percent of Student Talk 23
S/T Ratio (2.87 times more teacher talk)

Percent of Silence or Confusion 11
Percent of Student Talk (Teacher initiated) 96
Percent of Student Talk (Student initiated) 4
Ti/Si Ratio (24 times more teacher initiated talk)

Percent of Encouraging Behavior 88
Percent of Restricting Behavior 12
E/R Ratio (7.33 times more encouraging)

Percent of Indirect Behavior 46
Percent of Direct Behavior 54
I/D Ratio (1.17 times more direct)

Revised i/d Ratio (3 times more controlling)
Table 13
IDER Analysis of Total Observations of Teacher Six in an Open-Space Environment (Professional) (Intermediate)

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Percent of Teacher Talk 75
Percent of Student Talk 14
S/T Ratio (5.36 times more teacher talk)

Percent of Silence or Confusion 11
Percent of Student Talk (Teacher initiated) 46
Percent of Student Talk (Student initiated) 54
Ti/Si Ratio (1.17 times more student initiated talk)

Percent of Encouraging Behavior 94
Percent of Restricting Behavior 6
E/R Ratio (15.67 times more encouraging)

Percent of Indirect Behavior 21
Percent of Direct Behavior 79
I/D Ratio (3.76 times more direct)

Revised I/d Ratio (4 times more controlling)
The tallies of the behaviors of teacher six in the open-space environment are shown in Table 13. Of the 274 tallies, 257 (94 percent) were encouraging while only 17 (6 percent) were restricting behaviors. The I/D ratio for teacher six in the open-space setting was .21 which indicated that she was 3.76 times more direct than indirect. The revised i/d ratio was .20 which indicated that she was 4 times more controlling than motivating.

Teacher talk for teacher six was 75 percent, student talk was only 14 percent, while silence made up 11 percent of total observed behaviors in the open-space setting. Independent study accounted for much of this silence since all of the behaviors in this category were encouraging. Student talk was 46 percent teacher-initiated and 54 percent student-initiated talk, which indicated that student-initiated talk was 1.17 times greater than student talk which was teacher-initiated.

In summary, teacher six was more encouraging than restricting in both environments but was more encouraging in the open-space setting. She was more indirect in the traditional school and more direct in the open-space setting. Teacher six was more controlling than motivating in both settings, but was more controlling in the open-space setting.

Teacher talk was greater than student talk in both settings for teacher six but teacher talk was greater in the open-space setting. Although student talk was greater in the traditional classroom, there was 10 times more student-initiated talk in the open-space classroom.

Teacher Seven

Tables 14 and 15 present an analysis of the IDER matrices for teacher seven, a female professional teacher who taught intermediate
Table 14
IDER Analysis of Total Observations of Teacher Seven in a
Traditional Environment (Professional) (Intermediate)

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Percent of Teacher Talk 65 %
Percent of Student Talk 32 %
S/T Ratio (2.03 times more teacher talk)

Percent of Silence or Confusion 3 %
Percent of Student Talk (Teacher initiated) 36 %
Percent of Student Talk (Student initiated) 64 %
Ti/Si Ratio (1.78 times more student initiated talk)

Percent of Encouraging Behavior 100 %
Percent of Restricting Behavior 0 %
E/R Ratio (All encouraging)

Percent of Indirect Behavior 31 %
Percent of Direct Behavior 69 %
I/D Ratio (2.23 times more direct)

Revised i/d Ratio (2.03 times more motivating)
Table 15
IDER Analysis of Total Observations of Teacher Seven in an
Open-Space Environment (Professional) (Intermediate)

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Percent of Teacher Talk                                  68
Percent of Student Talk                                    29
S/T Ratio (2.34 times more teacher talk)                  
Percent of Silence or Confusion                           3
Percent of Student Talk (Teacher initiated)               90
Percent of Student Talk (Student initiated)               10
Ti/Si Ratio (9 times more teacher initiated talk)         

Percent of Encouraging Behavior                           95
Percent of Restricting Behavior                           5
E/R Ratio (19 times more encouraging)                     
Percent of Indirect Behavior                              66
Percent of Direct Behavior                                34
I/D Ratio (1.94 times more indirect)                      

Revised i/d Ratio (4.88 times more motivating)
children. There were 575 total tallies recorded in both IDER matrices, of which 202 were in the traditional setting and 273 were in the open-space setting.

Table 14 shows the tabulation of verbal and nonverbal behaviors for teacher seven in the traditional classroom. Of the 202 tallies, 201 were encouraging and only 1 was restricting. The I/D ratio was .31 which indicated that teacher seven was 2.23 times more direct than indirect. The revised i/d ratio was .67 which indicated that she was 2.03 times more motivating than controlling in her behaviors toward students.

Teacher talk accounted for 65 percent of the total behaviors exhibited by teacher seven in the traditional setting, student talk was 32 percent, while only 3 percent was silence. Teacher-initiated talk was 36 percent while student-initiated talk was 64 percent which indicated that student-initiated talk was 1.78 times greater than teacher-initiated student talk.

The tallies of the behaviors of teacher seven in the open-space setting are shown in Table 15. Of the 273 tallies, 257 (95 percent) were encouraging while only 14 (5 percent) were restricting behaviors. The I/D ratio for teacher seven in the open-space setting was .66 which indicated that she was 1.94 times more indirect than direct. The revised i/d ratio was .83 which indicated that teacher seven was 4.88 times more motivating than controlling in her behaviors toward students.

Teacher talk was 68 percent, student talk was 29 percent, while silence made up only 3 percent of the total teacher behaviors for teacher seven in the open-space setting. Student talk which was teacher-initiated was 90 percent while student-initiated talk was only 10 percent, which
indicated that teacher-initiated student talk was 9 times greater than student-initiated talk.

In summary, teacher seven was more encouraging than restricting in both settings, but was more encouraging in the open-space setting. She was more direct in the traditional classroom and more indirect in the open-space classroom. Although she was more motivating than controlling in both environments, she was more motivating in the open-space setting.

Teacher talk was greater than student talk in both settings, but teacher talk was even greater in the open-space setting. Student talk was also greater in the open-space setting. Of the student talk, more teacher-initiated talk was exhibited in the open-space school and more student-initiated talk was exhibited in the traditional school.

**Teacher Eight**

Tables 16 and 17 present the IDER analysis of teacher eight, a female professional teacher who taught primary children. There were 575 total tallies recorded in both IDER matrices, of which 271 were in the traditional setting and 304 were in the open-space setting.

Table 16 shows the tabulation of verbal and nonverbal behaviors for teacher eight in the traditional setting. Of the 272 tallies, 263 (97 percent) were encouraging while only 8 (3 percent) were restricting behaviors. The I/D ratio for teacher eight in the traditional setting was .69 which indicated that she was 2.23 times more indirect than direct. The revised i/d ratio was .61 which indicated that she was 1.57 times more motivating than controlling.
Table 16
IDER Analysis of Total Observations of Teacher Eight in a Traditional Environment (Professional) (Primary)

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- Percent of Teacher Talk: 61
- Percent of Student Talk: 35
- S/T Ratio (1.74 times more teacher talk)
- Percent of Silence or Confusion: 4
- Percent of Student Talk (Teacher initiated): 75
- Percent of Student Talk (Student initiated): 25
- Ti/Si Ratio (3 times more teacher initiated talk)

- Percent of Encouraging Behavior: 97
- Percent of Restricting Behavior: 3
- E/R Ratio (32.33 times more encouraging)
- Percent of Indirect Behavior: 69
- Percent of Direct Behavior: 31
- I/D Ratio (2.23 times more indirect)
- Revised i/d Ratio (1.57 times more motivating)
Table 17
IDER Analysis of Total Observations of Teacher Eight in an Open-Space Environment (Professional) (Primary)

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Percent of Teacher Talk 60
Percent of Student Talk 36
S/T Ratio (1.67 times more teacher talk) 1.67
Percent of Silence or Confusion 4
Percent of Student Talk (Teacher initiated) 19
Percent of Student Talk (Student initiated) 81
Ti/Si Ratio (4.26 times more student initiated talk) 4.26

Percent of Encouraging Behavior 79
Percent of Restricting Behavior 21
E/R Ratio (3.76 times more encouraging) 3.76
Percent of Indirect Behavior 27
Percent of Direct Behavior 73
I/D Ratio (2.70 times more direct) 2.70
Revised I/d Ratio (4 times more controlling) 4
Teacher talk was 61 percent, student talk was 35 percent, while silence made up only 4 percent of all behaviors tabulated for teacher eight in the traditional setting. Of the student talk, 75 percent was teacher-initiated while only 25 percent was student-initiated. There was 3 times more teacher-initiated talk than student-initiated talk.

The tallies of the behaviors of teacher eight in the open-space setting are shown in Table 17. Of the 304 tallies, 239 (79 percent) were encouraging while 65 (21 percent) were restricting behaviors. The I/D ratio for this teacher was .27 which indicated that she was 2.70 times more direct than indirect. The revised i/d ratio was .20 which indicated that teacher eight was 4 times more controlling in her behaviors than motivating.

Teacher talk was 60 percent, student talk was 36 percent, while silence was only 4 percent of the total observed behaviors for teacher eight. Teacher-initiated student talk was 19 percent while student-initiated talk was 81 percent, which indicated that there was 4.26 times more student-initiated talk than teacher-initiated talk.

In summary, teacher eight was more encouraging in both environmental setting, but was more encouraging in the traditional setting. The I/D ratio indicated she was more indirect in the traditional classroom and more direct in the open-space setting. Teacher eight was also more motivating in the traditional setting and more controlling in the open-space setting. There was more teacher talk than student talk in both environments, but a greater amount of teacher talk and student talk was exhibited in the open-space setting. Student talk that was both teacher-initiated and student-initiated was greater in the open-space setting.
Teacher eight imparted more information in the open-space school, and exhibited more praise and encouragement in the traditional school. Although students received less praise and fewer encouraging behaviors in the open-space school, there was still a higher percentage of student-initiated talk in the open-space setting.

**Teacher Nine**

The IDER analysis of teacher nine, Tables 18 and 19, indicates a male entry teacher who taught intermediate children. There were 515 total tallies recorded in both IDER matrices, of which 227 were in the traditional setting and 288 were in the open-space setting.

Table 18 shows the tabulation of verbal and nonverbal behaviors for teacher nine in the traditional environment. All of the 227 tallies were encouraging behaviors. The I/D ratio for this teacher was .33 which indicated that he was 2.03 times more direct than indirect in his behavior. The revised i/d was .66 which showed that teacher nine was 1.94 times more motivating than controlling of the students' behavior.

Teacher talk was 66 percent, student talk was 26 percent, and 8 percent of the total observed behaviors was silence. Student talk was 47 percent teacher-initiated, while 53 percent was student-initiated, which indicated that student-initiated talk was 1.13 times greater than teacher-initiated student talk.

The tallies of the behaviors of teacher nine in the open-space school are shown in Table 19. All of the 288 tallies were encouraging behaviors. The I/D ratio for teacher nine was .72 which indicated that he was 2.57 times more indirect than direct. The revised i/d ratio indicated that he was 100 percent motivating in his behavior.
Table 18
IDER Analysis of Total Observations of Teacher Nine in a
Traditional Environment (Entry) (Intermediate)

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Percent of Teacher Talk 66
Percent of Student Talk 26
S/T Ratio (2.54 times more teacher talk)

Percent of Silence or Confusion 8
Percent of Student Talk (Teacher initiated) 47
Percent of Student Talk (Student initiated) 53
Ti/Si Ratio (1.13 times more student initiated talk)

Percent of Encouraging Behavior 100
Percent of Restricting Behavior 0
E/R Ratio (all encouraging)

Percent of Indirect Behavior 33
Percent of Direct Behavior 67
I/D Ratio (2.03 times more direct)

Revised i/d Ratio (1.94 times more motivating)
Table 19
IDER Analysis of Total Observations of Teacher Nine in an Open-Space Environment (Entry) (Intermediate)

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Percent of Teacher Talk 45
Percent of Student Talk 52
S/T Ratio (1.16 times more student talk)

Percent of Silence or Confusion 3
Percent of Student Talk (Teacher initiated) 35
Percent of Student Talk (Student initiated) 65
Ti/Si Ratio (1.86 times more student initiated talk)

Percent of Encouraging Behavior 100
Percent of Restricting Behavior 0
E/R Ratio (All encouraging)

Percent of Indirect Behavior 72
Percent of Direct Behavior 28
I/D Ratio (2.57 times more indirect)

Revised i/d Ratio (All motivating)
Teacher talk was 45 percent, student talk was 52 percent, while only 3 percent of the total observed behavior was silence. Of the student talk, 35 percent was teacher-initiated, while 65 percent was student-initiated, indicating there was 1.86 times more student-initiated talk than student talk which was teacher-initiated in the open-space setting.

In summary, teacher nine exhibited all encouraging behaviors in both settings. He was more direct in the traditional classroom but was more indirect in the open-space classroom. He was also more motivating than controlling in both environments, but was more motivating in the open-space school.

Teacher nine talked a greater percentage of the time in the traditional classroom, while student talk was greater in the open-space classroom. In the open-space classroom student talk that was both teacher-initiated and student-initiated was greater than in the traditional classroom. More praise in the open-space setting may account for the greater percentage of student-initiated talk.

Teacher Ten

The IDER analysis of teacher ten, Tables 20 and 21, indicates a female entry teacher who taught intermediate children. There were 581 tallies recorded in both IDER matrices, of which 218 were in the traditional environment and 263 were in the open-space environment.

Table 20 shows the tabulation of verbal and nonverbal behaviors for teacher ten in the traditional environment. Of the 218 tallies, 160 (73 percent) were encouraging while 58 (27 percent) were restricting behaviors. The I/D ratio was .32 which revealed that she was 2.13 times
Table 20
IDER Analysis of Total Observations of Teacher Ten in a Traditional Environment (Entry) (Intermediate)

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Percent of Teacher Talk 62  
Percent of Student Talk 33  
S/T Ratio (1.88 times more teacher talk)  
Percent of Silence or Confusion 4  
Percent of Student Talk (Teacher initiated) 32  
Percent of Student Talk (Student initiated) 68  
Ti/Si Ratio (2.13 times more student initiated talk)  

Percent of Encouraging Behavior 73  
Percent of Restricting Behavior 27  
E/R Ratio (2.70 times more encouraging)  
Percent of Indirect Behavior 32  
Percent of Direct Behavior 68  
I/D Ratio (2.13 times more direct)  
Revised i/d Ratio (4.56 times more controlling)
Table 21
IDER Analysis of Total Observations of Teacher Ten in an
Open-Space Environment (Entry) (Intermediate)

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Percent of Teacher Talk: 74
Percent of Student Talk: 25
S/T Ratio (2.96 times more teacher talk)
Percent of Silence or Confusion: 1
Percent of Student Talk (Teacher initiated): 50
Percent of Student Talk (Student initiated): 50
Ti/Si Ratio (equal amounts of teacher initiated and student initiated talk): 115

Percent of Encouraging Behavior: 43
Percent of Restricting Behavior: 57
E/R Ratio (1.33 times more restricting)
Percent of Indirect Behavior: 44
Percent of Direct Behavior: 56
I/D Ratio (1.27 times more direct)
Revised i/d Ratio (2.23 times more controlling)
more direct than indirect in her behaviors. The revised i/d ratio was .18 which indicated she was 4.56 times more controlling than motivating in her behaviors toward students.

Teacher talk was 62 percent, student talk 33 percent, while silence was 4 percent of the total behaviors observed for teacher ten. Student talk was 32 percent teacher-initiated, while 68 percent was student-initiated. This means that student-initiated talk was 2.13 times greater than teacher-initiated student talk.

The tallies of the behaviors of teacher ten in the open-space environment are shown in Table 21. Of the 263 tallies, 112 (43 percent) were encouraging while 151 (57 percent) were restricting behaviors, which indicated that she exhibited 1.33 times more restricting than encouraging behaviors. The I/D ratio for teacher ten was .44 which indicated that she was 1.27 times more direct than indirect in her behaviors. The revised i/d ratio was .31 which showed that teacher ten was 2.23 times more controlling than motivating in her behavior toward students.

Teacher talk was 74 percent, student talk 25 percent, while only 1 percent of the total observed behaviors was spent in silence. Of the student talk, 50 percent was teacher-initiated and 50 percent was student-initiated.

In summary, teacher ten exhibited more encouraging behaviors in the traditional setting and more restricting behaviors in the open-space setting. She exhibited more restricting behaviors than any other teacher observed. Teacher ten was direct in both environments but was more direct in the traditional environment. She exhibited more controlling behavior in both environments but was more controlling in the
traditional setting. Teacher talk was greater than student talk in both settings, but more teacher talk was exhibited in the open-space school. Student talk was greater in the traditional setting, while student talk which was teacher-initiated was greater in the open-space setting and student-initiated talk was greater in the traditional setting.

Analysis of Data Pertinent to the Stated Hypotheses

The data presented above and shown in Tables 2 through 21 were primarily concerned with the verbal and nonverbal behaviors exhibited by the individual teachers in a traditional environment and in an open-space environment as recorded in the IDER system of teacher behavior categorization.

The thirty hypotheses stated in Chapter 1 and directly related to the study are presented with the results of the investigation.

1. There will be no significant difference in the indirect-direct behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.

Table 22 represents an analysis of the verbal and nonverbal behaviors demonstrated by all ten teachers in the traditional setting and in the open-space setting. Those behaviors in the IDER system which represent the indirect behaviors are categories 1 through 4 and those which represent the direct behaviors are considered categories 5 through 7.

There were 3,192 recorded verbal and nonverbal behaviors in the direct and indirect categories for the ten teachers in both environmental settings. These behaviors represented 657 indirect behaviors in the
### Table 22

Relationship of Teachers' Indirect/Direct Behaviors in a Traditional and Open-Space Setting

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<th>Teacher Behavior</th>
<th>Indirect N*</th>
<th>Percent**</th>
<th>Direct N*</th>
<th>Percent**</th>
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<th>Percent**</th>
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<td>Open-Space</td>
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</table>

\[ X^2 = 2.127 \]

\[ P > .20 \]

\[ df = 1 \]

* N = the number of observed indirect-direct behaviors

** percent = the percent of all observed indirect-direct behaviors
traditional classrooms, 851 indirect behaviors in the open-space classrooms, 777 direct behaviors in the traditional school and 907 direct behaviors in the open-space school. The $X^2$ value of 2.127 was not significant at the .05 level. The null hypothesis was accepted.

Teachers in both environmental settings were more direct in their behaviors than indirect but not enough to be significant at the .05 level. The investigator concluded that teachers who move from a traditional setting to an open-space setting attempt to teach their classes in the same manner.

2. There will be no significant difference in the revised indirect-direct ratios of teachers in a traditional setting and of those same teachers in an open-space setting.

Table 23 represents an analysis of the revised indirect-direct teacher behaviors for all ten teachers in both environmental settings. The revised i/d ratio is employed in order to find out the kind of emphasis given to motivation and control in classrooms. The number of tallies in columns 1, 2, and 3 is divided by the number of tallies in columns 1, 2, 3, plus those in 6 and 7, to find this revised ratio. Categories 1, 2, 3, 6, and 7 are more concerned with the actual presentation of subject matter. This ratio eliminates the effects of categories 4 and 5 (lecture and questions), and gives information about whether the teacher is direct or indirect in his approach to motivation and control. The revised i/d ratio for teachers in the traditional school was 46.11 while the revised i/d ratio for teachers in the open-space school was 46.73.
<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio *percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>46.11</td>
</tr>
<tr>
<td>Open-Space</td>
<td>46.73</td>
</tr>
</tbody>
</table>

\[ \bar{x} = 46.42 \]

\[ \chi^2 = 0.0389 \]

\[ P < 0.05 \]

\[ df = 1 \]

* Percent = the percent of controlling and motivating behaviors
The $X^2$ value of .0389 was not significant at the .05 level and the null hypothesis was accepted. It was concluded that teachers in both settings were more controlling in their behaviors than motivating, but teachers in an open-space setting were more motivating than teachers in the traditional setting, although it was not significant.

3. There will be no significant difference in the student-teacher talk of teachers in a traditional setting and of those same teachers in an open-space setting.

Table 24 represents an analysis of the student-teacher talk interactions in a traditional setting and in an open-space setting. Those behaviors in the IDER system which represents teacher talk are categories 1 through 7, and those that represent student talk are categories 8 and 9.

There were 5,354 recorded verbal and nonverbal behaviors in the student-teacher talk categories for the ten teachers in both environmental settings. These behaviors represented 1,434 teacher talk interactions in the traditional setting, 984 student talk interactions in the traditional setting, 1,758 teacher talk interactions in the open-space setting, and 1,178 student talk interactions in the open-space setting.

The $X^2$ value of .180 indicated that student-teacher interactions were independent of setting, therefore the null hypothesis was accepted. From an examination of Table 24, however, it can be seen that more verbal and nonverbal interactions including both teacher talk and student talk occurred in the open-space setting with a total of 2,936 while the total for the traditional setting was 2,418.
Table 24

Relationship of Student/Teacher Talk in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th>Student Talk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>1,434</td>
<td>59.30</td>
<td>984</td>
</tr>
<tr>
<td>Open-Space</td>
<td>1,758</td>
<td>59.87</td>
<td>1,178</td>
</tr>
<tr>
<td>Total</td>
<td>3,192</td>
<td>2,162</td>
<td>5,354</td>
</tr>
</tbody>
</table>

\[ X^2 = .180 \]

\[ P < .05 \]

\[ df = 1 \]

* N = the number of observed student/teacher talk interactions

** percent = the percent of all observed student/teacher talk interactions
4. There will be no significant difference in the amount of teacher-initiated student talk and student-initiated student talk in the traditional setting and in the open-space setting.

Table 25 represents an analysis of the student talk teacher-initiated and student talk student-initiated interactions in a traditional setting and in an open-space setting. Those behaviors in the IDER system which represent teacher-initiated student talk is category 8, and those that represent student-initiated talk is category 9.

There were 2,162 recorded verbal and nonverbal behaviors in the student talk categories for the ten teachers in both environmental settings. These behaviors represented 373 teacher-initiated and 611 student-initiated interactions in the traditional setting, with 446 teacher-initiated and 732 student-initiated in the open-space setting. The $X^2$ value of 0 was not significant at the .05 level, therefore the null hypothesis was accepted. Teacher-initiated student talk or student-initiated talk was independent of the classroom setting. However, more student talk of both kinds occurred in the open-space setting (1,178) as compared with the traditional setting (984).

5. There will be no significant difference in the indirect-direct behaviors of entry teachers and professional teachers in a traditional classroom.

Table 26 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five entry teachers and five professional teachers in the traditional school.
### Table 25
Relationship of Student Talk Teacher-Initiated and Student Talk Student-Initiated in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher-Initiated</th>
<th>Student-Initiated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>-----------------</td>
<td>-------</td>
</tr>
<tr>
<td>Traditional</td>
<td>373</td>
<td>37.90</td>
<td>611</td>
</tr>
<tr>
<td>Open-Space</td>
<td>446</td>
<td>37.88</td>
<td>732</td>
</tr>
<tr>
<td>Total</td>
<td>819</td>
<td></td>
<td>1,343</td>
</tr>
</tbody>
</table>

\[X^2 = 0\]

\[P < .05\]

\[df = 1\]

* N = the number of observed teacher-initiated and student-initiated behaviors

** percent = the percent of all teacher-initiated and student-initiated behaviors
Table 26
Relationship of Entry and Professional Teachers' Indirect/Direct Behaviors in a Traditional Classroom

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th></th>
<th>Direct</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>298</td>
<td>42.14</td>
<td>409</td>
<td>57.85</td>
<td>707</td>
</tr>
<tr>
<td>Professional</td>
<td>359</td>
<td>49.38</td>
<td>368</td>
<td>50.61</td>
<td>727</td>
</tr>
<tr>
<td>Total</td>
<td>657</td>
<td>777</td>
<td>1,434</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

$X^2 = 7.549$

$P > .01$

$df = 1$

* N = the number of observed indirect-direct behaviors

** percent = the percent of observed indirect-direct behaviors
There were 1,434 recorded verbal and nonverbal behaviors in the direct and indirect categories for the ten entry and professional
teachers in the traditional school. There were 298 indirect behaviors
and 409 direct behaviors for the entry teachers and 359 indirect and 368
direct behaviors for the professional teachers. This resulted in a \(X^2\)
value of 7.549 which was significant at the .01 level of confidence.
Entry teachers engaged in more direct interactions while professional
teachers demonstrated more frequent indirect interactions with
students. Consequently, this hypothesis was rejected.

6. There will be no significant difference in the revised indirect-
direct ratios of entry teachers and professional teachers in a traditional
classroom.

As shown in Table 27, the revised indirect-direct ratio for
teachers was 45.58 and 49.38 for professional teachers. A \(X^2\)
value of .152 was not significant at the .05 level, therefore the
null hypothesis was accepted. It was concluded that both entry and
professional teachers in a traditional school were more controlling in
their behaviors than motivating while professional teachers were less
controlling although it was not significant at the .05 level.

7. There will be no significant difference in the student-teacher talk
of entry teachers and professional teachers in a traditional classroom.

Table 28 represents an analysis of the student-teacher talk of
teachers in a traditional classroom. There were
2,418 recorded student-teacher talk interactions for the ten entry and
professional teachers in the traditional school. There were 707
Table 27

Relationship of Entry and Professional Teachers' Motivating and Controlling Behaviors in a Traditional Classroom

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry</td>
<td>45.58</td>
</tr>
<tr>
<td>Professional</td>
<td>49.38</td>
</tr>
</tbody>
</table>

\[ \bar{x} = 47.48 \]

\[ x^2 = 0.152 \]

\[ P > 0.70 \]

\[ df = 1 \]
Table 28

Relationship of Entry and Professional Teachers' Student/Teacher Talk in a Traditional Classroom

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th>Student Talk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>707</td>
<td>55.75%</td>
<td>561</td>
</tr>
<tr>
<td>Professional</td>
<td>727</td>
<td>63.21%</td>
<td>423</td>
</tr>
<tr>
<td>Total</td>
<td>1,434</td>
<td></td>
<td>984</td>
</tr>
</tbody>
</table>

\[ X^2 = 13.907 \]

P > .001

df = 1

* N = the number of observed student/teacher talk interactions

** percent = the percent of observed student/teacher talk interactions
interactions of teacher talk for entry teachers and 727 for professional teachers. The total student talk for entry teachers was 561 and 423 for professional teachers. This resulted in a $X^2$ value of 13.907 which was significant at the .001 level of confidence, therefore the null hypothesis was rejected.

In the traditional setting teacher talk was greater than student talk for both entry and professional teachers, but more student talk and less teacher talk was exhibited by entry teachers than by professional teachers.

8. There will be no significant difference in the indirect-direct behaviors of entry teachers and professional teachers in an open-space setting.

Table 29 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five entry teachers and five professional teachers in an open-space school. There were 1,758 recorded verbal and nonverbal behaviors in the indirect and direct categories for the ten entry and professional teachers in the open-space school. There were 487 indirect behaviors and 245 direct behaviors for the entry teachers as compared with 364 indirect behaviors and 662 direct behaviors for the professional teachers in the open-space school.

A $X^2$ value of 164.943 indicated that this difference was significant at the .001 level, therefore, the null hypothesis was rejected. Entry teachers were much less direct and more indirect than were the professional teachers.
<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>487</td>
<td>66.53</td>
<td>245</td>
</tr>
<tr>
<td>Professional</td>
<td>364</td>
<td>35.47</td>
<td>662</td>
</tr>
<tr>
<td>Total</td>
<td>851</td>
<td></td>
<td>907</td>
</tr>
</tbody>
</table>

$x^2 = 164.942$

$P > .001$

$df = 1$

* N = the number of observed indirect-direct behaviors

** percent = the percent of observed indirect-direct behaviors
9. There will be no significant difference in the revised indirect-direct ratios of entry teachers and professional teachers in an open-space setting.

Table 30 shows that the revised indirect-direct ratio for entry teachers was 58.35 as compared with 37.93 for professional teachers. This difference was significant at the .05 level as indicated by a $X^2$ value of 4.331, therefore, the null hypothesis was rejected. The entry teachers are more motivating in their behaviors toward children in the open-space setting than were the professional teachers.

10. There will be no significant difference in the student-teacher talk of entry teachers and professional teachers in an open-space setting.

Table 31 represents an analysis of the student-teacher talk of entry teachers and professional teachers in an open-space setting. There were 1,178 recorded student-teacher talk interactions for the ten entry and professional teachers in the open-space setting. There were 250 interactions of teacher talk for entry teachers and 196 for professional teachers, while student talk was 532 for entry teachers and 200 for professional teachers.

A $X^2$ of 34.320 was significant at the .001 level of confidence and indicated that more teacher talk and student talk was occurring with entry teachers than with professional teachers. Hypothesis ten was rejected.
Table 30
Relationship of Entry and Professional Teachers' Motivating and Controlling Behaviors in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry</td>
<td>58.35</td>
</tr>
<tr>
<td>Professional</td>
<td>37.93</td>
</tr>
</tbody>
</table>

\[ \bar{x} = 48.14 \]

\[ \chi^2 = 4.331 \]

\[ p > .05 \]

\[ df = 1 \]

Percent = the percent of observed motivating and controlling behaviors
Table 31

Relationship of Entry and Professional Teachers' Student/Teacher Talk in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th>Student Talk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>250</td>
<td>31.96</td>
<td>532</td>
</tr>
<tr>
<td>Professional</td>
<td>196</td>
<td>49.49</td>
<td>200</td>
</tr>
</tbody>
</table>

**X^2 = 34.320**

P > .001

df = 1

* N = the number of observed student/teacher talk interactions

** percent = the percent of observed student/teacher talk interactions
11. There will be no significant difference in the indirect-direct behaviors of primary and intermediate teachers in a traditional setting.

Table 32 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five primary teachers and five intermediate teachers in a traditional school. There were 1,434 recorded verbal and nonverbal behaviors in the indirect-direct categories for the ten primary and intermediate teachers in the traditional setting. There were 368 indirect and 326 direct behaviors for the primary teachers as compared with 289 indirect and 451 direct behaviors for the intermediate teachers in the traditional setting.

The resulting $X^2$ value was 28.161 which was significant at the .001 level of confidence. The null hypothesis was rejected. Primary teachers engaged in more indirect behaviors and fewer direct behaviors than was true for the intermediate teachers.

12. There will be no significant difference in the revised indirect-direct ratios of primary and intermediate teachers in a traditional setting.

Table 33 represents the revised indirect-direct ratios of primary and intermediate teachers in a traditional setting. The revised indirect-direct ratio for primary teachers was 48.35 while the indirect-direct ratio for intermediate teachers was 41.34.

A $X^2$ value of .5477 was not significant at the .05 level and the null hypothesis was accepted. It was concluded that although both primary and intermediate teachers were more controlling than motivating, primary teachers were less controlling than intermediate teachers.
Table 32
Relationship of Primary and Intermediate Teachers' Indirect/Direct Behaviors in a Traditional Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent***</td>
<td>N*</td>
</tr>
<tr>
<td>Primary</td>
<td>368</td>
<td>53.02</td>
<td>326</td>
</tr>
<tr>
<td>Intermediate</td>
<td>289</td>
<td>39.05</td>
<td>451</td>
</tr>
<tr>
<td>Total</td>
<td>657</td>
<td></td>
<td>777</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 28.161 \]

\[ P > .001 \]

df = 1

* N = the number of observed indirect-direct behaviors

** percent = the percent of observed indirect-direct behaviors
Table 33

Relationship of Primary and Intermediate Teachers' Motivating and Controlling Behaviors in a Traditional Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>48.35</td>
</tr>
<tr>
<td>Intermediate</td>
<td>41.34</td>
</tr>
<tr>
<td></td>
<td>$\bar{x} = 44.85$</td>
</tr>
</tbody>
</table>

$X^2 = 0.5477$

$P > 0.50$

$df = 1$

percent = the percent of observed motivating and controlling behaviors
13. **There will be no significant difference in the student-teacher talk of primary and intermediate teachers in a traditional setting.**

Table 34 represents an analysis of the student-teacher talk of primary and intermediate teachers in a traditional setting. There were 2,418 recorded student-teacher talk interactions for the ten primary and intermediate teachers in the traditional school. There were 694 interactions of teacher talk for primary teachers and 740 for intermediate teachers, while student talk totals were 662 for primary teachers and 322 for intermediate teachers.

The $X^2$ value was 84.456 which was significant at the .001 level of confidence. The null hypothesis was rejected. Primary teachers talked less than intermediate teachers while students talked more in the primary teachers' classroom in the traditional setting.

14. **There will be no significant difference in the indirect-direct behaviors of primary and intermediate teachers in an open-space setting.**

Table 35 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five primary and five intermediate teachers in the open-space setting. There were 1,758 recorded verbal and nonverbal behaviors in the indirect-direct categories for the ten primary and intermediate teachers in the open-space setting. There were 430 indirect and 407 direct behaviors for the primary teachers as compared with 421 indirect and 500 direct behaviors for the intermediate teachers in the open-space setting.
### Table 34

Relationship of Primary and Intermediate Teachers' Student/Teacher Talk in a Traditional Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th></th>
<th>Student Talk</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Primary</td>
<td>694</td>
<td>51.17</td>
<td>662</td>
<td>48.82</td>
<td>1,356</td>
</tr>
<tr>
<td>Intermediate</td>
<td>740</td>
<td>69.67</td>
<td>322</td>
<td>30.32</td>
<td>1,062</td>
</tr>
<tr>
<td>Total</td>
<td>1,434</td>
<td></td>
<td>984</td>
<td></td>
<td>2,418</td>
</tr>
</tbody>
</table>

\[ X^2 = 84.456 \]

\[ P > .001 \]

\[ df = 1 \]

* N = the number of observed student/teacher talk interactions

** percent = the percent of observed student/teacher talk interactions
Table 35

Relationship of Primary and Intermediate Teachers' Indirect/Direct Behaviors in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Primary</td>
<td>430</td>
<td>51.37</td>
<td>407</td>
</tr>
<tr>
<td>Intermediate</td>
<td>421</td>
<td>45.71</td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
<td>851</td>
<td></td>
<td>907</td>
</tr>
</tbody>
</table>

$X^2 = 5.630$

P > .02

df = 1

* N = the number of observed indirect-direct behaviors

** percent = the percent of observed indirect-direct behaviors
A $\chi^2$ value of 5.63 indicated that this difference was significant at the .05 level, therefore, hypothesis fourteen was rejected. Primary teachers were more indirect and intermediate teachers were more direct in an open-space setting.

15. There will be no significant difference in the revised indirect-direct ratios of primary and intermediate teachers in an open-space setting.

Table 36 shows that the revised indirect-direct ratio for primary teachers was 48.57 as compared with 44.85 for the intermediate teachers. This difference was not significant at the .05 level as indicated by a $\chi^2$ value of .1480, therefore, hypothesis fifteen was accepted. Both primary and intermediate teachers were more controlling than motivating in their behaviors toward students in the open-space setting. The primary teachers were less controlling.

16. There will be no significant difference in the student-teacher talk of primary and intermediate teachers in an open-space setting.

Table 37 represents an analysis of the student-teacher talk of primary and intermediate teachers in an open-space setting. There were 1,178 recorded student-teacher talk interactions for the ten primary and intermediate teachers in the open-space setting. There were 240 interactions of teacher talk for primary teachers and 206 for intermediate teachers, while student talk totals were 510 for primary and 222 for intermediate teachers in the open-space setting.
Table 36
Relationship of Primary and Intermediate Teachers' Motivating and Controlling Behaviors in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>48.57</td>
</tr>
<tr>
<td>Intermediate</td>
<td>44.85</td>
</tr>
</tbody>
</table>

\[ \bar{x} = 46.71 \]

\[ \chi^2 = .148 \]

P = .70

df = 1

percent = the percent of observed motivating and controlling behaviors
### Table 37

Relationship of Primary and Intermediate Teachers' Student/Teacher Talk in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th>Student Talk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Primary</td>
<td>240</td>
<td>32.00</td>
<td>510</td>
</tr>
<tr>
<td>Intermediate</td>
<td>206</td>
<td>48.13</td>
<td>222</td>
</tr>
<tr>
<td>Total</td>
<td>446</td>
<td></td>
<td>732</td>
</tr>
</tbody>
</table>

\[X^2 = 30.138\]

\[P > .001\]

\[df = 1\]

* N = the number of observed student/teacher talk interactions

** percent = the percent of observed student/teacher talk interactions
A $X^2$ value of 30.138 was significant at the .001 level of confidence, therefore, the null hypothesis was rejected. Primary and intermediate teachers in the open-space setting talked less than the students talked. It was also concluded that both primary teachers and primary students talked more in the open-space setting than do intermediate teachers and students in an open-space setting.

17. There will be no significant difference in the indirect-direct behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

Table 38 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five primary and five intermediate teachers in an open-space setting. There were 1,531 recorded verbal and nonverbal behaviors in the indirect and direct categories for the ten primary and intermediate teachers in the open-space setting. There were 368 indirect and 326 direct for teachers in the traditional setting as compared with 430 indirect and 407 direct behaviors for the teachers in the open-space setting.

A $X^2$ value of .414 was not significant at the .05 level. Hypothesis seventeen was accepted. There were more indirect-direct behaviors exhibited in the open-space setting than in the traditional setting. There were more indirect behaviors in both settings than direct but not enough to be significant at the .05 level.
Table 38

Relationship of Primary Teachers' Indirect/Direct Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>368</td>
<td>53.02</td>
<td>326</td>
</tr>
<tr>
<td>Open-Space</td>
<td>430</td>
<td>51.37</td>
<td>407</td>
</tr>
<tr>
<td>Total</td>
<td>798</td>
<td></td>
<td>733</td>
</tr>
</tbody>
</table>

X² = .414
P > .70
df = 1

* N = the number of observed indirect-direct behaviors

** percent = the percent of observed indirect-direct behaviors
18. There will be no significant difference in the revised indirect-direct ratios of primary teachers in a traditional setting and of those same teachers in an open-space setting.

Table 39 shows that the revised indirect-direct ratio for primary teachers in a traditional setting was 48.35 as compared with 48.57 for primary teachers in an open-space setting. This difference was not significant at the .05 level as indicated by a $X^2$ value of .0526, therefore, hypothesis eighteen was accepted. Primary teachers were more controlling than motivating in both school settings but were slightly less controlling in the open-space school which was not enough to be significant at the .05 level.

19. There will be no significant difference in the student-teacher talk of primary teachers in a traditional setting and of those same teachers in an open-space setting.

Table 40 represents an analysis of the student-teacher talk of primary teachers in traditional setting and those same teachers in an open-space setting. There were 1,412 recorded verbal and nonverbal behaviors in the student-teacher categories for the five primary teachers in both the traditional setting and the open-space setting. There were 204 teacher interactions and 458 student interactions in the traditional setting as compared to 240 teacher interactions and 510 student interactions in the open-space setting.

The $X^2$ value of .228 was not significant at the .05 level, therefore, the null hypothesis was accepted. Primary teachers talked less than students in both the traditional and open-space settings. Primary teachers and students talked more in the open-space setting.
Table 39

Relationship of Primary Teachers' Motivating and Controlling Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised 1/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>48.35</td>
</tr>
<tr>
<td>Open-Space</td>
<td>48.57</td>
</tr>
</tbody>
</table>

$\bar{x} = 48.46$

$X^2 = .0526$

$P > .90$

$df = 1$

percent = the percent of observed motivating and controlling behaviors
Table 40

Relationship of Primary Teachers' Student/Teacher Talk
in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Teacher Talk</th>
<th>Student Talk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>204</td>
<td>30.81</td>
<td>458</td>
</tr>
<tr>
<td></td>
<td>662</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Open-Space</td>
<td>240</td>
<td>32.00</td>
<td>510</td>
</tr>
<tr>
<td></td>
<td>750</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>444</td>
<td>968</td>
<td>1,412</td>
</tr>
</tbody>
</table>

\[ X^2 = .228 \]

\[ P > .90 \]

\[ df = 1 \]

* N = the number of observed student/teacher talk interactions

** percent = the percent of observed student/teacher talk interactions
than did teachers and students in the traditional setting, although the amount of teacher talk and student talk was not significant.

20. There will be no significant difference in the indirect-direct behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

Table 41 represents an analysis of the indirect-direct verbal and nonverbal behaviors of five intermediate teachers in a traditional setting and in an open-space setting. There were 1,661 recorded verbal and nonverbal behaviors in the indirect-direct categories for the five intermediate teachers in both settings. There were 289 indirect and 451 direct behaviors in the traditional setting as compared with 421 indirect and 500 direct behaviors in the open-space setting.

The resulting $X^2$ value was 5.42 which was significant at the .05 level of confidence. The null hypothesis was rejected. There was more direct behavior in both school settings than indirect, although the intermediate teachers were less direct in the open-space setting than in the traditional setting.

21. There will be no significant difference in the revised indirect-direct ratios of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

Table 42 represents the revised indirect-direct ratios of intermediate teachers in a traditional and open-space setting. The revised indirect-direct ratio for intermediate teachers in the traditional setting was 41.34 while the revised indirect-direct ratio was 44.85 for the intermediate teachers in the open-space setting.
Table 41
Relationship of Intermediate Teachers' Indirect/Direct Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>289</td>
<td>39.05</td>
<td>451</td>
</tr>
<tr>
<td>Open-Space</td>
<td>421</td>
<td>45.72</td>
<td>500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>710</td>
<td></td>
<td>951</td>
</tr>
</tbody>
</table>

\[ X^2 = 5.42 \]

\[ P > .02 \]

\[ df = 1 \]

* N = the number of observed indirect-direct behaviors

** Percent = the percent of observed indirect-direct behaviors
Table 42
Relationship of Intermediate Teachers' Motivating and Controlling Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Revised i/d Ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>41.34</td>
</tr>
<tr>
<td>Open-Space</td>
<td>44.85</td>
</tr>
</tbody>
</table>

\[ \bar{x} = 43.10 \]

\[ \chi^2 = 6.16 \]

\[ p > .02 \]

\[ df = 1 \]

percent = the percent of observed motivating and controlling behaviors
The $X^2$ value of 6.16 was significant at the .05 level. The null hypothesis was rejected. Intermediate teachers in both the traditional and open-space settings were more controlling than motivating in their behaviors toward students. Intermediate teachers in the open-space were significantly less controlling.

22. There will be no significant difference in the encouraging-restricting behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.

Table 43 represents an analysis of the encouraging-restricting behaviors of teachers in both a traditional and open-space setting. There were 5,544 recorded verbal and nonverbal encouraging and restricting behaviors observed for the ten teachers in both settings. There were 2,250 encouraging and 283 restricting behaviors in the traditional setting as compared with 2,722 encouraging and 289 restricting behaviors for the open-space setting.

The $X^2$ value of 3.685 was not significant at the .05 level of confidence, therefore, the null hypothesis was accepted. The environmental setting did not seem to influence the amount of encouraging or restricting behaviors exhibited by teachers in these two settings.

23. There will be no significant difference in the encouraging-restricting behaviors of entry teachers and professional teachers in a traditional setting.

Table 44 represents an analysis of the encouraging and restricting behaviors of five entry and five professional teachers in a traditional
Table 43

Relationship of Teachers' Encouraging and Restricting Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>2,250</td>
<td>88.82</td>
<td>283</td>
</tr>
<tr>
<td>Open-Space</td>
<td>2,722</td>
<td>90.40</td>
<td>289</td>
</tr>
<tr>
<td>Total</td>
<td>4,972</td>
<td></td>
<td>572</td>
</tr>
</tbody>
</table>

\[ x^2 = 3.685 \]

\[ P > .10 \]

\[ df = 1 \]

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
Table 44
Relationship of Entry and Professional Teachers' Encouraging and Restricting Behaviors in a Traditional Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th></th>
<th>Restricting</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>1,211</td>
<td>92.23</td>
<td>102</td>
<td>7.76</td>
<td>1,313</td>
</tr>
<tr>
<td>Professional</td>
<td>1,039</td>
<td>85.16</td>
<td>181</td>
<td>14.83</td>
<td>1,220</td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
<td></td>
<td>283</td>
<td></td>
<td>2,533</td>
</tr>
</tbody>
</table>

$X^2 = 31.829$

$P > .001$

$df = 1$

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
setting. There were 2,533 recorded encouraging and restricting behaviors observed for the ten entry and professional teachers in the traditional setting. There were 1,211 encouraging and 102 restricting behaviors for the entry teachers as compared with 1,039 encouraging and 181 restricting behaviors for the professional teachers in the traditional setting.

The $X^2$ value of 31.829 was significant at the .001 level of confidence, therefore, the null hypothesis was rejected. It was concluded that entry teachers were more encouraging and less restricting than professional teachers in a traditional setting.

24. There will be no significant difference in the encouraging-restricting behaviors of primary and intermediate teachers in a traditional setting.

Table 45 represents an analysis of the encouraging and restricting behaviors of five primary and five intermediate teachers in a traditional setting. There were 2,533 recorded encouraging and restricting behaviors observed for the ten primary and intermediate teachers in a traditional setting. There were 1,233 encouraging and 173 restricting behaviors for the primary teachers as compared with 1,017 encouraging and 110 restricting behaviors for the intermediate teachers in the traditional setting.

The $X^2$ value of 4.079 was significant at the .05 level of confidence. The null hypothesis was rejected. It was concluded that intermediate teachers were more encouraging and less restricting than primary teachers in a traditional setting.
Table 45

Relationship of Primary and Intermediate Teachers' Encouraging and Restricting Behaviors in a Traditional Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Primary</td>
<td>1,233</td>
<td>87.69</td>
<td>173</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1,017</td>
<td>90.23</td>
<td>110</td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
<td></td>
<td>283</td>
</tr>
</tbody>
</table>

\[X^2 = 4.079\]

P > .05

df = 1

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
25. There will be no significant difference in the encouraging-restricting behaviors of entry and professional teachers in an open-space setting.

The data presented in Table 46 represents the encouraging and restricting verbal and nonverbal behaviors demonstrated by entry and professional teachers in an open-space setting. The ten participating entry and professional teachers had a total of 3,011 verbal and nonverbal encouraging and restricting behaviors. This total reflected 1,364 encouraging behaviors for entry teachers, 1,358 encouraging behaviors for intermediate teachers, 170 restricting behaviors for entry teachers, and 119 restricting behaviors for intermediate teachers in the open-space setting.

The $X^2$ value of these data, 7.937, was significant at the .01 level of confidence, therefore, the null hypothesis was rejected. Entry teachers, although demonstrating more encouraging and restricting verbal and nonverbal behaviors in an open-space setting, were less encouraging and more restricting than professional teachers.

26. There will be no significant difference in the encouraging-restricting behaviors of primary and intermediate teachers in an open-space setting.

The data presented in Table 47 represent the encouraging and restricting verbal and nonverbal behaviors demonstrated by five primary and five intermediate teachers in an open-space setting. The ten participating teachers had a total of 3,011 verbal and nonverbal encouraging and restricting behaviors. This total reflected 1,508 encouraging behaviors for primary teachers, 1,214 encouraging behaviors
Table 46
Relationship of Entry and Professional Teachers' Encouraging and Restricting Behaviors in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Entry</td>
<td>1,364</td>
<td>88.91</td>
<td>170</td>
</tr>
<tr>
<td>Professional</td>
<td>1,358</td>
<td>91.94</td>
<td>119</td>
</tr>
<tr>
<td>Total</td>
<td>2,722</td>
<td></td>
<td>289</td>
</tr>
</tbody>
</table>

$X^2 = 7.937$
$P > .01$
$df = 1$

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
Table 47

Relationship of Primary and Intermediate Teachers' Encouraging and Restricting Behaviors in an Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N* Percent**</td>
<td>N* Percent**</td>
<td>N* Percent**</td>
</tr>
<tr>
<td>Primary</td>
<td>1,508 93.66</td>
<td>102 6.33</td>
<td>1,610 100</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1,214 86.65</td>
<td>187 13.34</td>
<td>1,401 100</td>
</tr>
<tr>
<td>Total</td>
<td>2,722</td>
<td>289</td>
<td>3,011 100</td>
</tr>
</tbody>
</table>

$X^2 = 42.451$

$P > .001$

$df = 1$

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
for intermediate teachers, 102 restricting behaviors for primary teachers and 187 restricting behaviors for intermediate teachers in the open-space setting.

The $X^2$ value of these data, 42.451, was significant at the .001 level of confidence, therefore, the null hypothesis was rejected. Primary teachers were more encouraging and less restricting in an open-space setting than were intermediate teachers.

27. There will be no significant difference in the encouraging-restricting behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

The data presented in Table 48 represent the encouraging and restricting verbal and nonverbal behaviors demonstrated by five primary teachers in both the traditional and open-space setting. The five primary teachers had a total of 3,016 encouraging and restricting behaviors. This total reflected 1,233 encouraging behaviors in the traditional setting, 1,508 encouraging behaviors in the open-space setting, 173 restricting behaviors in the traditional setting, and 102 restricting behaviors in the open-space setting.

The $X^2$ value of these data, 32.270, was significant at the .001 level of confidence. The null hypothesis was rejected. It was concluded that primary teachers were more encouraging and less restricting in their behaviors in an open-space setting than they were in the traditional setting.
Table 48
Relationship of Primary Teachers' Encouraging and Restricting Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th></th>
<th>Restricting</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td></td>
<td>N*</td>
<td>Percent**</td>
</tr>
<tr>
<td>Traditional</td>
<td>1,233</td>
<td>87.69</td>
<td></td>
<td>173</td>
<td>12.30</td>
</tr>
<tr>
<td>Open-Space</td>
<td>1,508</td>
<td>93.66</td>
<td></td>
<td>102</td>
<td>6.33</td>
</tr>
<tr>
<td>Total</td>
<td>2,741</td>
<td></td>
<td></td>
<td>275</td>
<td></td>
</tr>
</tbody>
</table>

\[X^2 = 32.270\]

\[P > .001\]

\[df = 1\]

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
28. There will be no significant difference in the encouraging-restricting behaviors of intermediate teachers in a traditional setting and of those same teachers in an open-space setting.

The data presented in Table 49 show the encouraging and restricting verbal and nonverbal behaviors demonstrated by five intermediate teachers in both the traditional and open-space settings. The five intermediate teachers had a total of 2,528 verbal and nonverbal encouraging and restricting behaviors. This total reflected 1,017 encouraging behaviors in the traditional setting, 1,214 encouraging behaviors in the open-space setting, 110 restricting behaviors in the traditional setting, and 187 restricting behaviors in the open-space setting.

The $X^2$ value of these data, 7.751, was significant at the .01 level of confidence, therefore, the null hypothesis was rejected. It was concluded that intermediate teachers in the traditional setting were more encouraging and less restricting in their behavior toward students than they were in the open-space setting.

29. There will be no significant difference in the encouraging-restricting behaviors of entry teachers in a traditional setting and of those same teachers in an open-space setting.

The data presented in Table 50 represent the encouraging and restricting verbal and nonverbal behaviors demonstrated by five entry teachers in both the traditional and open-space settings. The five entry teachers had a total of 2,847 verbal and nonverbal encouraging and restricting behaviors. This total reflected 1,211 encouraging behaviors in the traditional setting, 1,364 encouraging behaviors in the open-space
Table 49

Relationship of Intermediate Teachers' Encouraging and Restricting Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>1,017</td>
<td>90.23</td>
<td>110</td>
</tr>
<tr>
<td>Open-Space</td>
<td>1,214</td>
<td>86.65</td>
<td>187</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,231</td>
<td></td>
<td>297</td>
</tr>
</tbody>
</table>

\[ X^2 = 7.751 \]
\[ P > .01 \]
\[ df = 1 \]

* N = the number of observed encouraging and restricting behaviors
** percent = the percent of observed encouraging and restricting behaviors
Table 50

Relationship of Entry Teachers' Encouraging and Restricting Behaviors in a Traditional and Open-Space Setting

| Teacher Behavior | Encouraging | | | Restricting | | | | Total (N) | Percent** |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                  | N*          | Percent**   | N*          | Percent**   | N*          | Percent**   |
| Traditional      | 1,211       | 92.23       | 102         | 7.77        | 1,313       | 100         |
| Open-Space       | 1,364       | 88.92       | 170         | 11.08       | 1,534       | 100         |
| Total            | 2,575       |             | 272         |             | 2,847       | 100         |

\[ X^2 = 8.657 \]

\[ P > .01 \]

\[ df = 1 \]

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
setting, 102 restricting behaviors in the traditional setting, and 170 restricting behaviors in the open-space setting.

The \( X^2 \) value of these data, 8.657, was significant at the .05 level of confidence. The null hypothesis was rejected. Entry teachers were more encouraging and less restricting in their behaviors toward students in the traditional setting than they were in the open-space setting.

30. There will be no significant difference in the encouraging-restricting behaviors of professional teachers in a traditional setting and of those same teachers in an open-space setting.

The data presented in Table 51 show the encouraging and restricting verbal and nonverbal behaviors demonstrated by five professional teachers in both the traditional and open-space settings. The five professional teachers had a total of 2,698 verbal and nonverbal encouraging and restricting behaviors. This total reflected 1,039 encouraging behaviors in the traditional setting, 1,397 encouraging behaviors in the open-space setting, 181 restricting in the traditional setting, and 119 restricting behaviors in the open-space setting.

The \( X^2 \) value of these data, 30.648, was highly significant at the .001 level of confidence, therefore, the null hypothesis was rejected. It was concluded that professional teachers were more encouraging and less restricting in their behaviors toward students in the open-space setting than they were in the traditional setting.
Table 51
Relationship of Professional Teachers' Encouraging and Restricting Behaviors in a Traditional and Open-Space Setting

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Encouraging</th>
<th>Restricting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N*</td>
<td>Percent**</td>
<td>N*</td>
</tr>
<tr>
<td>Traditional</td>
<td>1,039</td>
<td>85.16</td>
<td>181</td>
</tr>
<tr>
<td>Open-Space</td>
<td>1,358</td>
<td>91.94</td>
<td>119</td>
</tr>
<tr>
<td>Total</td>
<td>2,397</td>
<td>300</td>
<td>2,697</td>
</tr>
</tbody>
</table>

$X^2 = 30.648$

$P > .001$

df = 1

* N = the number of observed encouraging and restricting behaviors

** percent = the percent of observed encouraging and restricting behaviors
The data presented and analyzed were concerned primarily with the encouraging and restricting, direct and indirect, motivating and controlling, teacher talk and student talk, verbal and nonverbal behaviors of teachers as they interacted with students in a traditional setting and in an open-space setting. The model employed was the IDER matrix which classified the verbal and nonverbal behaviors into one of ten categories of interaction analysis as described in Appendix B.

The presentation of data was designed to describe the total behavior patterns of each teacher in the traditional setting and in the open-space setting and to illustrate the behaviors categorized as encouraging or restricting, direct or indirect, motivating or controlling, and student talk or teacher talk. From the behaviors observed an E/R, I/D, revised i/d, S/T, and an Si/Ti ratio were determined, by percentages and ratio, to illustrate certain characteristics of each teacher.

The thirty hypotheses developed and presented in the null format were concerned directly with the encouraging and restricting, direct and indirect, motivating and controlling, student talk and teacher talk, and student talk teacher-initiated and student-initiated behaviors of entry and professional, primary and intermediate teachers in both the traditional and open-space settings.

The following hypotheses were rejected: 5, 7, 8, 9, 10, 11, 13, 14, 16, 20, 21, 23, 24, 25, 26, 27, 28, 29, and 30. The following hypotheses were accepted: 1, 2, 3, 4, 6, 12, 15, 17, 18, 19, and 22.

The results of the study should be examined in relation to numerous factors affecting the lack of research depth. It is important
to remember that the population of ten teachers for a total of 5,544 observations of behaviors could not represent the total population nor the population of teachers' behaviors. Since behaviors are probably relatively constant for a teacher, it is probable that the population of behavior was influenced by the small number of teachers. In addition, all subjects in the study voluntarily agreed to be part of an investigation of verbal and nonverbal behavior between teachers and students.

Table 52 shows the hypotheses of the study and their relationship to each other.
### Table 52

**School Setting**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Traditional</th>
<th></th>
<th>Open-Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>There will be no significant difference in</td>
<td>Entry</td>
<td>Professional</td>
<td>Primary</td>
</tr>
<tr>
<td>41 - Indirect-direct behaviors</td>
<td>D*</td>
<td>D*</td>
<td>D*</td>
</tr>
<tr>
<td>42 - Revised indirect-direct ratios</td>
<td>C*</td>
<td>C*</td>
<td>C*</td>
</tr>
<tr>
<td>43 - Student-teacher talk</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>44 - Student talk teacher-initiated</td>
<td>S1</td>
<td>S1</td>
<td>S1</td>
</tr>
<tr>
<td>and student-initiated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 - Revised indirect-direct ratios</td>
<td>C*</td>
<td>C*</td>
<td>C*</td>
</tr>
<tr>
<td>46 - Revised indirect-direct behaviors</td>
<td>D**</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>47 - Student-teacher talk</td>
<td>T</td>
<td>T**</td>
<td>T**</td>
</tr>
<tr>
<td>48 - Revised indirect-direct ratios</td>
<td>I**</td>
<td>I**</td>
<td>I**</td>
</tr>
<tr>
<td>49 - Revised indirect-direct behaviors</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>50 - Revised indirect-direct ratios</td>
<td>S**</td>
<td>S**</td>
<td>S**</td>
</tr>
<tr>
<td>51 - Revised indirect-direct behaviors</td>
<td>C*</td>
<td>C*</td>
<td>C*</td>
</tr>
<tr>
<td>52 - Revised indirect-direct ratios</td>
<td>T</td>
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<td>53 - Revised indirect-direct behaviors</td>
<td>D**</td>
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<td>54 - Revised indirect-direct ratios</td>
<td>I**</td>
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<td>55 - Revised indirect-direct behaviors</td>
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<tr>
<td>56 - Revised indirect-direct ratios</td>
<td>D**</td>
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<td>57 - Revised indirect-direct behaviors</td>
<td>C**</td>
<td>C**</td>
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<tr>
<td>58 - Encouraging-restricting behavior</td>
<td>E</td>
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<td>59 - Encouraging-restricting behavior</td>
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<td>60 - Encouraging-restricting behavior</td>
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<td>61 - Encouraging-restricting behavior</td>
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<td>62 - Encouraging-restricting behavior</td>
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<tr>
<td>66 - Encouraging-restricting behavior</td>
<td>E**</td>
<td>E</td>
<td>E</td>
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</tbody>
</table>

* + accepted null hypothesis
  - rejected null hypothesis
  * * greater but not statistically significant
  ** statistically significantly greater
  *** does not apply to this hypothesis
  T Teacher talk
  S Student talk
  TI Student talk teacher-initiated
  SL Student talk student-initiated
  E Encouraging
  R Restricting
  M Motivating
  C Controlling
  D Direct
  I Indirect
Chapter 5

SUMMARY, FINDINGS, CONCLUSIONS, AND IMPLICATIONS

SUMMARY

The problem of the study was to determine whether verbal and nonverbal behavior patterns of ten randomly selected teachers differed significantly as a result of moving from a traditional to an open-space classroom setting.

The study was concerned with the patterns of teacher verbal and nonverbal behaviors as they were exhibited in a traditional setting and in an open-space setting. In order to determine patterns of verbal and nonverbal behaviors in the two settings, it was necessary to (1) select an instrument capable of an appropriate for measuring teacher verbal and nonverbal behaviors and collecting relevant data, (2) select subjects representative of a population appropriate for the study, (3) gain approval from teachers being observed, and (4) develop procedures for collecting, recording, and analyzing data which would be efficient and reliable.

A review of related literature was conducted in the areas of verbal and nonverbal communication, interaction analysis, and clinical supervision. Examination of the literature focused on the criteria for an effective learning environment with a comparison of traditional and open-space settings.
The study was limited to a population of ten teachers, five who taught in the primary grades and five who taught in the intermediate grades. Their teaching experience ranged from one year to forty. These ten teachers taught both in traditional and open-space settings.

FINDINGS

The following null hypotheses were rejected: 5, 7, 8, 9, 10, 11, 13, 14, 16, 20, 21, 23, 24, 25, 26, 27, 28, 29, and 30. The rejection of these research hypotheses indicated there was a significant difference in the number of verbal and nonverbal behaviors of teachers in the following comparisons:

5 - Entry and professional teachers' indirect-direct behaviors in a traditional setting.
7 - Entry and professional teachers' student-teacher talk in a traditional setting.
8 - Entry and professional teachers' indirect-direct behaviors in an open-space setting.
9 - Entry and professional teachers' motivating and controlling behaviors in an open-space setting.
10 - Entry and professional teachers' student-teacher talk in an open-space setting.
11 - Primary and intermediate teachers' indirect-direct behaviors in a traditional setting.
13 - Primary and intermediate teachers' student-teacher talk in a traditional setting.
14 - Primary and intermediate teachers' indirect-direct behaviors in an open-space setting.
16 - Primary and intermediate teachers' student-teacher talk in an open-space setting.

20 - Intermediate teachers' indirect-direct behaviors in a traditional and open-space setting.

21 - Intermediate teachers' motivating and controlling behaviors in a traditional and open-space setting.

23 - Entry and professional teachers' encouraging and restricting behaviors in a traditional setting.

24 - Primary and intermediate teachers' encouraging and restricting behaviors in a traditional setting.

25 - Entry and professional teachers' encouraging and restricting behaviors in an open-space setting.

26 - Primary and intermediate teachers' encouraging and restricting behaviors in an open-space setting.

27 - Primary teachers' encouraging and restricting behaviors in a traditional and open-space setting.

28 - Intermediate teachers' encouraging and restricting behaviors in a traditional and open-space setting.

29 - Entry teachers' encouraging and restricting behaviors in a traditional and open-space setting.

30 - Professional teachers' encouraging and restricting behaviors in a traditional and open-space setting.

Eleven null hypotheses were not rejected. They were:

1 - There was no significant difference in the indirect-direct behaviors of teachers in a traditional setting and of those same teachers in an open-space setting.
2 - There was no significant difference in the revised indirect-direct ratios of teachers in a traditional setting and of those same teachers in an open-space setting.

3 - There was no significant difference in the student-teacher talk of teachers in a traditional setting and of those same teachers in an open-space setting.

4 - There was no significant difference in the amount of teacher-initiated student talk and student-initiated student talk in the traditional classroom setting and in the open-space setting.

6 - There was no significant difference in the revised indirect-direct ratios of entry teachers and professional teachers in a traditional classroom.

12 - There was no significant difference in the revised indirect-direct ratios of primary and intermediate teachers in a traditional setting.

15 - There was no significant difference in the revised indirect-direct ratios of primary and intermediate teachers in an open-space setting.

17 - There was no significant difference in the indirect-direct behaviors of primary teachers in a traditional setting and of those same teachers in an open-space setting.

18 - There was no significant difference in the revised indirect-direct ratios of primary teachers in a traditional setting and of those same teachers in an open-space setting.

19 - There was no significant difference in the student-teacher talk of primary teachers in a traditional setting and of those same teachers in an open-space setting.
22 - There was no significant difference in the encouraging-restricting behaviors of teachers in a traditional classroom setting and of those same teachers in an open-space setting.

CONCLUSIONS

Considering the limitations of the study and the assumptions supporting the rationale of the study, the following conclusions were made by the investigator:

1. Teachers in both the traditional and open-space settings were more direct than indirect in their behaviors. Teachers who moved from a traditional setting to an open-space setting tend to teach their classes in the same manner.

2. Teachers in both the traditional and open-space settings were more controlling than motivating in their behaviors.

3. Teachers in both the traditional and open-space settings talked a greater percentage of the time than students talked. Student-teacher interactions were independent of setting.

4. Student talk whether teacher-initiated or student-initiated was independent of classroom setting. However, more student talk of both kinds occurred in the open-space setting.

5. Entry teachers engaged in more direct interactions while professional teachers demonstrated more frequent indirect interactions with students in a traditional setting.

6. Entry and professional teachers were more controlling than motivating in a traditional setting. Motivating and controlling behaviors were independent of setting.
7. Entry and professional teachers talked more than students in the traditional setting, although more student talk and less teacher talk was exhibited by entry teachers than professional teachers in a traditional setting.

8. Entry teachers were more indirect than professional teachers in an open-space setting.

9. Entry teachers were more motivating than professional teachers in an open-space setting.

10. Entry and professional teachers talked less than students in an open-space setting, but students of entry teachers talked more than students of professional teachers.

11. Primary teachers were more indirect than intermediate teachers in a traditional setting.

12. Primary and intermediate teachers were more controlling than motivating in a traditional setting. Motivating and controlling behaviors appeared to be independent of setting.

13. Primary teachers talked less than intermediate teachers, while students talked more in the primary teachers' classrooms in the traditional setting.

14. Primary teachers were more indirect and intermediate teachers were more direct in an open-space setting.

15. Primary and intermediate teachers were more controlling than motivating in the open-space setting. Motivating and controlling behaviors seemed independent of setting.

16. Primary and intermediate teachers talked less than students in an open-space setting. Both primary teachers and students talked more than intermediate teachers and their students in the open-space setting.
17. Primary teachers were more direct than indirect in both traditional and open-space settings. Indirect-direct behaviors seemed independent of setting.

18. Primary teachers were more controlling than motivating in their behaviors toward students in an open-space setting. Motivating and controlling behaviors seemed independent of setting.

19. Primary teachers talked less than students in both the traditional and open-space setting while primary teachers and students talked more in the open-space setting. Student-teacher interactions appeared to be independent of setting.

20. Intermediate teachers were more direct than indirect in both traditional and open-space settings, although they were less direct in the open-space setting.

21. Intermediate teachers were more controlling than motivating in both the traditional and open-space settings, although they were significantly less controlling in the open-space setting.

22. Encouraging and restricting behaviors were independent of setting, although there were more encouraging than restricting behaviors in both the traditional and open-space settings.

23. Entry teachers were more encouraging and less restricting than professional teachers in a traditional setting.

24. Intermediate teachers were more encouraging and less restricting than primary teachers in a traditional setting.

25. Professional teachers were more encouraging than entry teachers in an open-space setting.

26. Primary teachers were more encouraging than intermediate teachers in an open-space setting.
27. Primary teachers were more encouraging in an open-space setting than in a traditional setting.

28. Intermediate teachers were more encouraging in the traditional setting than in the open-space setting.

29. Entry teachers were more encouraging in the traditional setting than the open-space setting.

30. Professional teachers were more encouraging in the open-space setting than in the traditional setting.

The problem of the study was to analyze teacher verbal and nonverbal behavior to determine whether they differed significantly as a result of moving from a traditional setting to an open-space setting. The data revealed a definite pattern which appeared to be influenced by the experience and grade level being taught by the teacher. Based on the results of this study, it is the opinion of the investigator, that while distinct patterns of verbal and nonverbal behavior existed, teachers were more encouraging than restricting, more direct than indirect, more controlling than motivating and talked more than students in both the traditional and open-space settings.

Entry teachers talked less than students, were more indirect, and motivating in the open-space setting than they were in the traditional setting. This seemed to imply that teachers with less experience adjusted easier and benefited more by teaching in an open-space setting.

IMPLICATIONS AND RECOMMENDATIONS

The findings of the study suggested the need for additional research in behavioral analysis as a technique for aiding administrators,
personnel involved in teacher preparation programs, and individual teachers interested in self-improvement.

Administrators could use the results of research in interaction analysis in numerous ways. There is a need to provide in-service preparation programs for teachers in developing an analytical approach to their own classroom behavior. Instructional improvement will take place when teachers are helping one another observe, analyze, and assess their teaching strategies and classroom interactions.

Teacher preparation institutions need to incorporate the findings of the research in a curriculum which will provide practical experiences prior to student teaching. These could include observing, analyzing, and interpreting verbal and nonverbal behaviors, and opportunities for student teachers to experience both traditional and open-space settings.

This study was not intended to be exhaustive, nor all-inclusive. It was, however, intended to provide some areas of information and serve as an impetus for further experimentation such as the following:

1. A study of longer duration with more videotaping sessions presenting a more representative analysis of teacher verbal and nonverbal behavior.

2. A study conducted with an experimental group (those teachers receiving in-service in verbal and nonverbal communication) and a control group (those teachers receiving no in-service in verbal and nonverbal communication).

3. A study involving a larger sampling of teachers, drawn from a wider geographical distribution, to provide a more representative sample.
4. A study involving all major academic areas for both traditional and open-space classrooms.

5. A study concerned with student and teacher attitude change in traditional and open-space settings.

6. A study of the social and emotional impact on students in an open-space school in association with a continuous progress program.

Qualitative verbal and nonverbal behavior may provide an additional body of knowledge which could be investigated and utilized by teachers to create an awareness of the way they see themselves in their interpersonal relations with students. Recognition by teachers of the qualitative nonverbal and verbal dimensions of communication should enhance their ability to relate to all students.
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## APPENDIX A

### CATEGORIES FOR INTERACTION ANALYSIS

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEACHER TALK</strong></td>
<td></td>
</tr>
<tr>
<td>1.* ACCEPTS FEELING:</td>
<td>accepts and clarifies the feeling tone of the students in a nontreathening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.</td>
</tr>
<tr>
<td>2.* PRAISE OR ENCOURAGES:</td>
<td>praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, &quot;um hum?&quot; or &quot;go on&quot; are included.</td>
</tr>
<tr>
<td>3.* ACCEPTS OR USES IDEAS OF STUDENT:</td>
<td>clarifying, building, or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, shift to category five.</td>
</tr>
<tr>
<td>4.* ASKS QUESTIONS:</td>
<td>asking a question about content or procedure with the intent that a student answer.</td>
</tr>
<tr>
<td>5.* LECTURING:</td>
<td>giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.</td>
</tr>
<tr>
<td>6.* GIVING DIRECTIONS:</td>
<td>directions, commands, or orders to which a student is expected to comply.</td>
</tr>
<tr>
<td>7.* CRITICIZING OR JUSTIFYING AUTHORITY:</td>
<td>statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>STUDENT TALK</strong></td>
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</tr>
<tr>
<td>8.* STUDENT TALK--RESPONSE:</td>
<td>a student makes a predictable response to teacher. Teacher initiates the contact or solicits student statement and sets limit to what the student says.</td>
</tr>
<tr>
<td>9.* STUDENT TALK--INITIATION:</td>
<td>talk by students which they initiate. Unpredictable statements in response to teacher. Shift from 8 to 9 as student introduces own ideas.</td>
</tr>
<tr>
<td>10.* SILENCE OR CONFUSION:</td>
<td>pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.</td>
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**APPENDIX B**

**IDER SYSTEM**

<table>
<thead>
<tr>
<th>Verbal Category</th>
<th>Encouraging</th>
<th>Restricting</th>
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</thead>
<tbody>
<tr>
<td><strong>TEACHER TALK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. ACCEPTS FEELING</td>
<td>1. ACCEPTS FEELING</td>
<td>11. INCONGRUENT: contradiction occurs between verbal &amp; nonverbal cues.</td>
</tr>
<tr>
<td>2. PRAISES OR ENCOURAGES</td>
<td>2. CONGRUENT: nonverbal cues reinforce and further clarify the credibility of a verbal message.</td>
<td>12. PERFUNCTORIOUS: perfunctory use occurs when the teacher merely recognizes or acknowledges student's idea by automatically repeating or restating it.</td>
</tr>
<tr>
<td>3. ACCEPTS OR USES IDEAS OF STUDENT</td>
<td>3. IMPLEMENT: implementation occurs when the teacher actually uses student's idea either by discussing it, reflecting on it or turning it to the class for consideration.</td>
<td>13. PERFUNCTORIOUS: perfunctory use occurs when the teacher merely recognizes or acknowledges student's idea by automatically repeating or restating it.</td>
</tr>
<tr>
<td>5. LECTURES</td>
<td>5. RESPONSIVE: change in teacher's pace or direction of talk in response to student behavior, i.e., bored, disinterested, or inattentive.</td>
<td>15. UNRESPONSIVE: inability or unwillingness to alter the pace or direction of lecture disregarding pupil cues.</td>
</tr>
<tr>
<td>6. GIVES DIRECTIONS</td>
<td>6. INVOLVE: students are involved in a clarification or maintenance of learning tasks.</td>
<td>16. DISMISS: teacher dismisses or controls student behavior.</td>
</tr>
<tr>
<td>7. CRITICISMS OR JUSTIFIED AUTHORITY</td>
<td>7. FIRM: criticisms which evaluate a situation cleanly and crisply and clarify expectations for the situation.</td>
<td>17. HARSH: criticisms which are hostile, severe, and often denote aggressive or defensive behavior.</td>
</tr>
<tr>
<td><strong>STUDENT TALK</strong></td>
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<tr>
<td>8. STUDENT TALK-RESPONSE</td>
<td>8 &amp; 9. RECEPTIVE: involves attitude of listening, thought, interest, facial involvement, and eye contact.</td>
<td>18 &amp; 19. INATTENTIVE: involves lack of attending eye contact and teacher travel or movement.</td>
</tr>
<tr>
<td>9. STUDENT TALK-INITIATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. SILENCE OR CONFUSION</td>
<td>10. COMFORT: silences characterized by times of reflection, thought, or work.</td>
<td>20. DISTRESS: instances of embarrassment or tension-filled moments, usually reflecting disorganization and disorientation.</td>
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</table>