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An Analysis of Sex Differences in Teacher-Student Interaction as Manifest in Verbal and Nonverbal Behavior Cues

Wilma Baker Cosper
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To the Graduate Council:

I am submitting herewith a dissertation written by Wilma Baker Cosper entitled "An Analysis of Sex Differences in Teacher-Student Interaction as Manifest in Verbal and Nonverbal Behavior Cues." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Education.

Charles M. Achilles, Major Professor

We have read this dissertation and recommend its acceptance:

Nell P. Logan, Arthur E. Gravatt, C. Kenneth Tanner, Larry W. Hughes

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

November 19, 1970

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and recommend its acceptance:

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Vice Chancellor for
Graduate Studies and Research

AN ANALYSIS OF SEX DIFFERENCES IN TEACHER-STUDENT INTERACTION AS MANIFEST IN VERBAL AND NONVERBAL BEHAVIOR CUES

A Dissertation

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

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by

Wilma Baker Cosper

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ABSTRACT

Purpose

The purpose of this investigation was to analyze sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues.

Procedure

Four female fifth and sixth-grade teachers and 105 gifted students (53 males and 52 females) were the subjects whose verbal and nonverbal behavior was recorded on 16 videotapes during 16 forty-minute class sessions. Following randomization, 8,648 behavior cues were coded on a matrix designed to accommodate a modified version of the French and Galloway IDER system of behavior analysis. Special reference was made to the sex differential as identified in the two categories of the system which specify teacher-initiated and student-initiated student talk. Thirteen null hypotheses were subjected to chi square tests for significance of difference.

Findings

Ten of the 13 null hypotheses were rejected. Although the percentages and ratios of the three exceptions indicated a tendency to differentiate, the differences were not statistically significant. In summary, the results were as

follows: The female teachers of the fifth and sixth-grade gifted students initiated significantly more talk with male students than with female students; discriminated significantly between male and female students in favor of the male; tended to exhibit more restricting behavior toward female than toward male students; and exhibited more indirectness than directness and 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.

Conclusions

Within its scope and limitations, the analysis derived the following conclusions:

1. There were manifest sex differences in teacher-student interaction in the classroom.

2. There was an apparent relationship between teacher-student sex differential and student docility.

3. There was an apparent relationship between sex differential in teacher-student interaction and teacher effectiveness.

4. There was an apparent relationship between sex differential in teacher-student interaction and student participation.

5. Students of the same sex as the teacher demonstrated more passivity in teacher-student verbal and nonverbal interaction than students of the opposite sex.

6. Opposite sex teachers manifested greater flexibility in teacher-student verbal and nonverbal behavior than teachers of the same sex as the student.

7. Opposite sex students responded more often to the teacher than students of the same sex as the teacher.

8. Opposite sex students initiated responses with the teacher more often than did same sex students.

9. Teachers tended to exhibit restricting behavior more often toward same sex students than toward opposite sex students.

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CHAPTER I

INTRODUCTION

Communication in the classroom--as revealed in the beliefs, attitudes, verbal behavior, and nonverbal behavior of teachers and their students--has been an increasing concern of educators throughout the past several decades. Professional education's multiplicity of contemporary research which observes, records, and analyzes teacher-student interaction in the classroom is reflected in such problems as: how overt and covert behaviors of teachers affect the classroom environment and the teaching-learning process and product; how overt and covert behaviors of students affect the climate of the classroom and the teaching-learning enterprise; which teacher behaviors tend to have the greatest impact on student participation; and which student behaviors tend to have the greatest influence on teacher effectiveness.

I. STATEMENT OF THE PROBLEM

More and more studies are being carried out through the instrumentality of interaction analysis, a technique popularized by Ned Flanders and his associates. The various systems of interaction analysis are based upon

the assumption that "the behavior of the teacher, more than that of any other individual, sets the climate of the class" (Amidon and Hough, 1968, p. 104), and that "teachers, next to parents, are probably the most influential adults in the social development of students" (Foote, 1969, p. 149). It is further assumed that appropriate feedback which is made accessible by interaction analysis might enhance the teacher's teaching and the student's learning.

Numerous studies such as those of Withall (1949), Flanders (1960), Bellack (1963), and Smith and Meux (1963) have focused on teacher verbal behavior. Yet a modicum of attention has been given to the elusive nonverbal behavior of teachers. Prall (1959), Galloway (1962, 1966, 1968), and French (1968) are among the few researchers who have explored seriously the nonverbal behavior of teachers.

Lewis, Newell, and Withall (1961), Hughes (1962), Spaulding (1963), and French and Galloway (1968) have given special consideration to both verbal and nonverbal behavior of the teacher in the classroom. A modified version of the French and Galloway IDER system of interaction analysis was the controlling instrument for observing, coding, and analyzing classroom teacher-student interaction in the present study whose unique emphasis was sex

differences. The IDER system is described in Appendix A. According to Mischel (1966, p. 78):

> At present most researchers acknowledge the existence of major sex differences, but for experimental purposes attempt to 'control out' such differences in order to demonstrate other main effects. Although one researcher's independent variable is another's 'error term,' it is clear that sex is a variable which should not be ignored in research.

Is there a relationship between sex differences of teachers and students and the quality of learning that occurs in a classroom? Is there a significant difference in teacher-student interaction in classes taught by teachers of the same sex and those taught by teachers of the opposite sex? Is there an apparent relationship between sex differential and the feelings and attitudes the teachers and students profess toward each other? These questions and questions raised in the next section gave rise to this investigation.

II. PURPOSE OF THE STUDY

The purpose of the study was to observe, analyze, and compare sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues. Special reference was made to teacher-initiated student talk and student-initiated student talk. In pursuance of this purpose, the following questions served as guidelines for the formulation of hypotheses and for the development of the study.

1. Are there manifest sex differences in teacher-student interaction in the classroom?
2. Is there an apparent relationship between teacher-student sex differential and student docility?
3. Is there an apparent relationship between sex differential in teacher-student interaction and teacher effectiveness?
4. Is there an apparent relationship between sex differential in teacher-student interaction and student participation?
5. Will students of the same sex as the teacher demonstrate more passivity in their teacher-student verbal and nonverbal interaction than students of the opposite sex?
6. Will opposite sex teachers manifest greater flexibility in their teacher-student verbal and nonverbal behavior than teachers of the same sex as the student?
7. Will opposite sex students respond more often to the teacher than students of the same sex as the teacher?
8. Will opposite sex students initiate responses with the teacher more often than same sex students?

9. Will teachers exhibit restricting behavior more often toward same sex students than opposite sex students?

Based upon the theoretical framework encompassing the major premise that there are manifest sex differences in teacher-student interaction in the classroom and within the scope of this ex post facto research, the leading hypothesis was stated: Female elementary teachers, in classroom interaction, will discriminate between male and female students in favor of the male. Additional hypotheses, germane to the above queries, are specified in the second chapter of the dissertation.

III. SIGNIFICANCE OF THE STUDY

Fortified with manifold examples of research reported in sociological, psychological, and educational literature, together with the classic publications of L. M. Terman and Catherine C. Miles (1936), Margaret Mead (1949), and Eleanor E. Maccoby (1966), Patricia Cayo Sexton (1969, p. 92) affirmed that few researchers "have cared enough about sex differences to put them in the center of their targets." Moreover, in contemporary literature, professional and otherwise, an increasing degree of criticism is being aimed at the female teacher--who constitutes 85 percent of the public school elementary teachers and 68 percent

of all public school teachers--as one of the main male-factors in the feminization of boys.

For example, Sexton (1969, p. 138) ostensibly echoed the opinion of many educators and laymen when she declared: "Many women actively dislike and resent males. They take their revenge where they can, in the home and the schools, on the young males they control." Such widely held, controversial notions, clothed in authority and loaded with affective and cognitive consequences involving teacher-student relationships, call for thorough examination and collateral prognosis for the sake of both sexes, both roles, and both teaching and learning.

This investigation was unique in the following emphases and methodology:

1. The focus was on sex differential as a significant variable in teacher-student interaction.
2. The sample consisted of 8,648 verbal and non-verbal behavior cues of four female elementary teachers and their 105 gifted students (53 boys and 52 girls) of both sexes whose race, age, intelligence quotient, socioeconomic status, and current achievement level, all were fairly constant.

3. Videotapes recorded the teacher-student interaction in the classroom.
4. The IDER system of interaction analysis, as described in Appendix A, was modified to identify the sex of the student and utilized as the primary instrument for generating the verbal and nonverbal data with which to examine the hypotheses.

Interaction analysis is reputedly one of the most promising innovations for the assessment and quantification of verbal and nonverbal communication in the classroom. It is believed that the observation and analysis of overt behavior of teachers and students might lead to important inferences involving the covert phenomena of classroom interaction. Within the community of the classroom, consciously or unconsciously, teachers and students either actuate or enervate each others' behavior.

If teacher-student sex sameness and/or opposites make a significant difference in classroom conduct, then additional research is indeed imperative. An ample storehouse of sex related teacher-student behavior cues and patterns of interaction might contribute to more persuasive theory concerning the abstruse components of human personality and classroom effectiveness than is currently conceptualized and utilized for problem-solving in the teaching-learning process.

The practical application of this kind of interaction analysis is recognized, by the supporters of interaction analysis, as feedback and guide for teacher evaluation and change. The resulting feedback would likewise be appropriate for students. Teachers and students ought to observe themselves on videotape, evaluate what they see, and make necessary behavior changes to enhance their academic, professional, and social fulfillment. The teaching-learning experience ought always to be a conjoint effort on the part of both teacher and student.

Student behavior cues, though included in interaction analyses, have remained secondary to teacher behavior cues. Clearly, by virtue of sheer numbers, student nonverbal communication is happening many times over; and it is affecting the climate of the classroom. Opportunity for teachers and students to perceive, decode, and judiciously implement the verbal and nonverbal messages of both teachers and students would likely contribute to the constructive change which is needed in teacher-student communication to upgrade the educational process and product.

IV. LIMITATIONS

1. The study was limited to a sample of 8,648 verbal and nonverbal behavior cues of four fifth and sixth-grade female teachers and their 105 students of both sexes (53

boys and 52 girls) who were participating in a five-week project for gifted students at Camp Laboratory School on the campus of Western Carolina University during the 1970 summer session. No male teachers were included.

2. Intact classes of gifted boys and girls and their female teachers may seem to be a limiting factor. However, this laboratory situation was viewed as an opportunity that is not readily accessible to many experimenters.

To illustrate the latter alternative and its possibilities, consider the behaviors of 105 eleven and twelve-year-old students (53 boys and 52 girls) whose IQ range is 138 to 188 and who, as gifted children, are presumed to be generally expressive, inquisitive, and uninhibited. These features, together with the revealing behavior of female teachers who obviously enjoy communicating with gifted children, foreshadowed an exciting frame of reference for the present investigation and for future research.

3. Interaction analysis systems have structural limitations. Allon (1969) pointed out two such limitations: "defining topographically similar behaviors into categories, and the inability of the systems to utilize the behavioral response rates as the basic dependent measures."

4. The obtrusive and reactive nature of the videotape equipment, the cameraman, and the investigator that were present for the taping posed a potential threat to

the validity of the research. The presence of videotape equipment in the classroom created, to some degree, a novel situation which might result in findings which are partially due to either reactive arrangements (the Hawthorne effect) or experimenter and teacher expectancy (the Rosenthal effect).

However, in this instance the whole concept of gifted students' being away from home voluntarily, living in dormitories, and studying in a university environment represented a unique situation. The entire five-week program was replete with expectancy on the part of students and teachers.

There are characteristic terms that require clear delineation for this study.

V. DEFINITION OF TERMS

Behavior: observable, overt actions, especially on a particular occasion.

Communication: a process by which meanings, sometimes cognitive and often affective, are exchanged between individuals through a common system of verbal and/or nonverbal symbols (as languages, signs, or gestures).

Gifted children: students who are in the top 1 percent of the total population with respect to intellectual capacity (i.e., roughly, individuals with an IQ above 137).

IDERS system: a modified form of the IDER system of interaction analysis developed by French and Galloway who took the initials ID from the Flanders configuration of teacher influence as Indirect or Direct, and ER from their own conceptualization of nonverbal cues as Encouraging or Restricting. The initial S was added in this study to indicate the identification of the Sex of the students.

Interaction analysis: the general methodology, utilized by educators in the analysis of teaching and learning processes, which consists of defining, recording, and analyzing teacher and student behaviors as they occur in an actual classroom situation. The data obtained are subjected subsequently to statistical analysis.

Nonverbal communication: behavior that conveys meaning without words.

Verbal communication: behavior that conveys meaning with words.

VI. ORGANIZATION OF THE STUDY

Chapter I of this study has consisted of the introduction, a statement of the problem, the purpose of the study, the significance of the study, definitions and clarification of terms peculiar to the study, and this outline of the organization of the study.

Chapter II presents a selected review of literature in some related areas that were considered relevant to the study and a statement of the hypotheses.

Chapter III describes the theoretical and methodological procedures and the instruments that were employed to implement the investigation.

Chapter IV presents an analysis of data and the results of the study.

Chapter V includes the summary, conclusions, discussion, and implications for further research.

A bibliography, the appendixes, and a vita complete the dissertation.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to lay the foundation for a theoretical framework which might serve as a point of reference for the basic assumptions and hypotheses that will shape the course of the present study. Three related areas are included here: classroom communication, interaction analysis, and sex differences in teacher-student relationships. A statement of the hypotheses will conclude the chapter.

I. CLASSROOM COMMUNICATION

The word "communicate" is an ancient word, having had many meanings throughout its history. One of its earliest meanings was derived from Starkey's History of England in 1538 and is found in the Oxford English Dictionary. There, the word "communicate" is a part of the definition of the Deity. It was written that God is He who communicated His goodness to all others. This concept is related to the word "communicant," a person who shares in the "communion." Originally, then, "communicate" is related to the word "common" or "community," and it means to make common or to share. The "communicants" of this investigation are teachers and students

who are continually "communicating" with each other within the "community" of the classroom.

Achilles (1964) designated four types of communication:

> The most common to each of us is interpersonal communication, or the exchange between persons. This may range from two people writing to--or speaking with--each other to one spokesman contacting virtually millions of people through some form of mass communication network. There is also intrapersonal communication, or the person's internal responses. These may be a person's attitudes, goals, preset notions or biases, interpretation of stimuli, and his understanding. Verbal communication deals with the actual message conveyed in some accepted spoken or written language structure. Nonverbal communication are those things that people infer from some gesture, tone of voice, posture, or action that another exhibits.

While the first two types of communication were involved intrinsically, this study focused primarily on the last two dimensions: verbal and nonverbal.

Hayakawa (1963, p. 29) emphasized two facets of communication:

> One is the matter of output--the speaking and writing, involving problems of rhetoric, composition, logical presentation, coherence, definition of terms, knowledge of the subject and the audience, and so on. Most of the preoccupation with communication is directed toward the improvement of the output. . . . But the other aspect of communication, namely, the problem of intake--especially the problem of how to listen well--is relatively a neglected subject.

These features of communication are relevant here for the reason that communication is a reciprocative experience. In the classroom, it is not only what the

teacher says that counts, but also what students hear the teacher say. And what the students hear depends as much upon what they bring to the situation as upon what the teacher contributes to it. Conversely, communication in the classroom is prepossessed by what the teacher hears the student say. And what the teacher hears depends as much upon what he brings to the situation as upon what the students contribute to it.

Hayakawa stressed further that "the result of communication successfully imparted is self-satisfaction; the result of communication successfully received is self-insight," two important ingredients for effective teaching and learning.

Schramm (1963) edited a volume of research in communication which included experiments relevant to the teaching and learning process and product. Early patterns of research established a single criterion of effectiveness--primarily teacher effectiveness--in the classroom. It was predicted, however, that future research would give increasing attention to the development of theories of classroom climate as an exemplary environment and classroom communication as a dynamic process in which the teacher is an important participant but not the total determiner of the outcomes of learning.

Indeed, long before any significant action was taken upon such enlightenment, researchers have known

that teachers and learners in classrooms are instrumental in influencing the beliefs, attitudes, and values (the affective domain) as well as the intellectual skills (the cognitive domain) and the motor skills (the psychomotor domain) of both teachers and students (Jenkins and Lippitt, 1951). Reporting on social interaction in the classroom, Withall and Lewis (1963) gave special attention to research published by educators during the past four decades. Their review also indicated a progression from emphasis on teacher traits, child growth and development, and sociometry to emphasis on socio-psychological events. The assessment and quantification of climate and communication in the classroom, the authors believed, might lead from observation and analysis of overt behavior to some substantial inferences involving the covert phenomena of teacher-student interaction.

Confirming the field theorists' point of view and the holistic approach, Otto (1969) echoed the supposition that personality functions naturally--and best--in one's associative surroundings, and that the "more a person's environment can be involved in the process of realizing potential, the greater the gains." He argued that institutions such as the schools should have "but one purpose and function--to serve as a framework for the actualization of human potential." Moreover, the best way to

accomplish the task, he contended, is through group experiences.

Otto's contention is consistent with the views of Lewis, Lippitt, and White (1939), Jersild (1941), Withall (1949), Jenkins (1951), Rogers (1959), Rokeach (1960), Thelen (1960), Getzels (1962), Taba (1964), Flanders (1965), and Reno (1967), to name a few. Numerous other authorities, representing the fields of education, clinical psychology and psychiatry, and social psychology, have investigated various hypotheses concerning the impact of classroom climate and communication on the behavior of teachers and students.

Communication, by contemporary definition, is a process by which meanings are exchanged between individuals through a common system of symbols such as language, signs, or gestures which are directed toward one of the senses: sight, sound, touch, taste, or smell. Recently, a group of investigators (McBain, et al., 1970) reported research in an area they called quasi-sensory communication: communication without the use of known sensory channels, a protraction of the parapsychology of its "father" J. B. Rhine (1937) who theorized that "the senses are not the only channels of cognition. . . ." Concerning the latter definition, Hansel (1966, p. 14) concluded: "Unexplained communication always remains inexplicable until at last it is scientifically accounted for."

Explained or unexplained, communication in the classroom is the ground for interaction analysis--a systematic approach to observing and coding the verbal and/or nonverbal behaviors of teachers and students.

II. INTERACTION ANALYSIS

The popular acceptance of interaction analysis as a valuable tool for capturing quantitative and qualitative dimensions of teacher and student behavior is clear to this reviewer: Current educational literature and doctoral dissertation abstracts are saturated with studies incorporating the technique. Its reliability and validity are well documented in a compilation of theory, research, and application edited by Amidon and Hough (1967) whose references date back to 1910. The research work of Ned A. Flanders, spanning the fourteen-year period of 1951-1965, was cited to credit him with the initial development of interaction analysis as an observational instrument. Interaction analysis is reported to have evolved out of social psychological theory and to have been formulated originally "to test the effect of social-emotional climate on student attitudes and learning."

Papers included in the volume purported to provide "a basis of support for a theory of social-emotional climate, and to provide evidence to support their assumptions

that classroom climate can be objectively and reliably measured; that such climate is related to teaching effectiveness; and that training in interaction analysis does have an effect on the modification and shaping of the classroom behavior of teachers (Amidon and Hough, 1967, pp. 3, 120, 255).

Following a description and explication of the system of interaction analysis and the empirical validation of the theory, most of the studies reported dealt with the translation of the theoretical into the practical. Some studies were "devoted to the problem of the in-service and pre-service training of teachers, the purpose of which was the modification or shaping of flexible and effective patterns of verbal behavior." Several studies dealt "with the topic of helping teachers conceptualize models of verbal teaching behavior, while others dealt with the concept of feedback and its use in teacher training" (Amidon and Hough, 1967, p. 252).

Numerous systems for categorizing verbal and nonverbal behaviors of teachers and students have emerged from the original ten-categories of the Flanders' Interaction Analysis System (FIAS): Hough (1966), Honigman (1966), Amidon and Hunter (1966), Simon and Agazarian (1966), French and Galloway (1968) are among those who have developed observational systems with features similar to the conceptual model of the FIAS. Considering the

popular regard for the FIAS, Amidon and Hunter (1967) published an idea for the creation of flexible, expandable category systems that can be collapsed back into the basic ten-category system.

An example of a research application of the FIAS is a recent field experiment which purposed "to determine the effectiveness of a self-instructional package as an in-service instructional medium and to assess the effects of interaction analysis in promoting the verbal flexibility of teachers" (Kennedy, Haefele, and Ruff, 1969, p. 1). The investigation also

> . . . sought to determine which of two methods of instruction, the self-instructional package alone or the self-instructional package augmented with telelecture instruction, was most effective in accomplishing the goals of content mastery and teacher flexibility. (Kennedy, Haefele, and Ruff 1969, p. 1)

While the "interaction analysis inservice experiences may have been responsible for significant teacher behavior change," the results of the research, according to the investigators, failed to demonstrate the effectiveness of the self-instructional program in relation to the particular methods employed. The authors conceded: "This study . . . joins the ranks of the vast majority of investigations which have attempted to assess the differential effectiveness of teaching methods and which have been able to report only non-significant results" (pp. 48-49).

At least one criticism of the FIAS and similar systems of interaction analysis has persisted: Having been formulated deductively (Allon, 1969), many systems describe only verbal interaction between teachers and students (French and Galloway, 1968). Evans (1969) observed a large number of nonverbal behaviors in the classroom and concluded that nonverbal behaviors ought to be included in all studies of teacher classroom behaviors, particularly if the inductive approach to the category system--facilitated with videotape recordings--is used.

This review of literature revealed a paucity of classroom observational systems which considered nonverbal behavior as well as verbal behavior. Notwithstanding, a significant role in human relationships has been accorded nonverbal behavior for years by such authors as Simmel (1921), Landis (1924), Mead (1934), Ruesch and Bateson (1951), Metzel and Robinowitz (1953), Fretz (1956), Ruesch and Kees (1956), Ekman (1957, 1965), Hall (1959, 1966), Halpin (1960), Birdwhistell (1960, 1963), Galloway (1962, 1966, 1968), Davitz (1964), Scheflen (1964), Delaney and Heimann (1966), Efran and Broughton (1966), Island (1967), Barnlund (1968), French (1968), Middleman (1968), Mehrabian (1968), Geldard (1968), Covey (1969), Moulton (1970), and Galper (1970).

Investigating the visual aspect of nonverbal communication between the sexes, Exline, Gray, and Schuette (1965) discovered that women more than men tend to interact visually. Likewise, they found that the men and women studied who possessed high affiliation needs tended to reciprocate glances more often and that visual contact tended to diminish in competitive settings. Their subsequent studies led to the conclusion that subjects criticized tended to avoid glances and subjects praised tended to increase glances toward their evaluators.

Goffman (1959, pp. 23-24) placed sex in the realm of the nonverbal as a part of an individual's expressive equipment as follows:

> . . . one may take the term "personal front" to refer to the items of expressive equipment. . . . As part of personal front we may include: insignia of office or rank; clothing; sex, age, and racial characteristics; size and looks; posture; speech patterns; facial expressions; bodily gestures; and the like. Some of these vehicles for conveying signs, such as racial characteristics are relatively fixed . . . some of these sign vehicles are relatively mobile or transitory . . . and can vary during performance.

None of the studies reviewed investigated sex differences in teacher-student interaction. Indeed, the FIAS model makes no provision of any kind for sex differentiation of the students. A few studies considered the maleness-femaleness of the teachers and/or student-teachers whose "teacher talk" was coded and analyzed. But the sex differential of the students, whose "student talk"

was coded and analyzed, was missing altogether. This omission, whether intentionally or inadvertently, communicates a tacit assumption that there are no sex differences in teacher-student interaction as manifest in verbal and/or nonverbal behavior cues. Such an assumption, if valid, is the antithesis of the major premise on which the present study is based--that there are manifest sex differences in teacher-student interaction.

III. SEX DIFFERENCES

Contemporary American society is steeped in the many-sided, controversial issue of the so-called liberation of the female. In educational circles, a current entreaty appears to be to liberate male pupils from female teachers, especially on the elementary grade levels. For instance, the titles of two recent articles in Nation's Schools (1969) and Education (1969), respectively, declared: "No Girls (or Lady Teachers), Please" and "Wanted 20,000 Male First Grade Teachers."

The first piece reported an experimental project involving a male sexually segregated kindergarten and first grade in Greeley, Colorado. The report purported to show that in all-boy classes with male teachers the male students "were more aggressive in attacking a problem game or learning situation, . . . able to discuss things more

freely and in more detail, had better attendance records, and liked school better than those in coed classes." A follow-up summary of the same project (Greeley's All-Boy Program, 1969) stated:

> Evidence from numerous studies of sex differences in school achievement and the experience and concern of most primary classroom teachers are remarkably consistent with respect to the fact that, of children who experience school adjustment problems, the vast majority are boys. These studies document the developmental lag and interest differences observed in boys.
>
> Pervading the all-boy experiment is that:
>
> . . . boys live in a world both at home and at school that is, for all practical purposes, feminine oriented. . . . The school provides a mother substitute, in most instances, as far as the teacher is concerned. The boy is then placed in competition with a developmentally superior group of girls which undoubtedly adds to his frustration. The patterns of rewarded behavior are set by females and compared to females. (Greeley's All-Boy Program, 1969)

In this pilot study, the kindergarten and first grade boys were assigned to men teachers "in order to minimize, as much as possible the developmental differences, and to create a masculinized school environment in which boy interests and learning style may thrive." One of several questions considered was: "Are the problems and frustrations encountered caused or aggravated by excessive female influence in the schools?" The achievement data of the segregated boys with the male teachers showed no significant difference. Although attendance improved and some positive gains were noted in a masculinity-femininity test,

the investigators concluded that "considerable additional research needs to be done in order to evaluate this concept."

Vairo (1969), presenting an argument in favor of recruiting male teachers for the elementary school, emphasized that "male teachers are needed who can provide suitable activities in order to challenge a boy's physical aptitude as well as his mental outlook." Earlier, Cronbach (1954) had also stressed the importance of all boys having an appropriate male model to emulate and the importance of balanced elementary faculties which have a variety of personalities as well as men among its staff. Vairo pointed out that the teaching profession had never closely examined the effects of the female teachers who dominate the staff of elementary schools.

Weisstein (1969) criticized contemporary psychology as "less than worthless in contributing to a vision which could truly liberate" boys as well as girls. The same author accused personality theorists of looking for inner traits without substantial evidence, when they should have been looking at social context; because evidence is mounting, she said, "that what a person does and who he believes himself to be, will in general be a function of what people around him expect him to be, and what the overall situation in which he is acting implies that he is."

The work of Block (1968) is reported to have established that personality tests do not yield consistent predictions; i.e., a rigid authoritarian on one measure may be unauthoritarian on the next. The reason for such inconsistency, according to Weisstein (1969), "seems overwhelmingly to have much more to do with the social situation in which the subject finds himself than with the subject himself." Weisstein recommended that psychologists and clinical psychiatrists disregard "the theory of the causal nature of the inner dynamic and look to the social context within which individuals live" for an enlightened understanding of why people behave as they do, and what can be done to effect appropriate changes in their behavior.

The classic Rosenthal experiments (1968) centered on the influence of social expectation. Devotees of the experimentally confounding "Rosenthal effect" and the theory of social context contend that until social expectations for male and female are equal, dialogue concerning sex differences will simply reflect human prejudices (Weisstein, 1969).

Based upon the postulation that society defines what is appropriate or inappropriate behavior for persons occupying the status of male or female, Phillips and Segal (1969) tested and accepted the hypothesis "that women will

report more psychiatric symptoms than will men with an equal number of physical illnesses." They generalized that men are expected to be less expressive than women in their emotional behavior; conversely, women are expected to be more expressive than men in their emotional behavior.

Sexton (1969, 1970) studied the "feminized male," whom she identified in "Urbantown" by a masculinity scale from the California Psychological Inventory. The conclusion drawn from this study was that public schools are chiefly feminine institutions and that the women who teach boys, together with the women who rear them, are essentially to blame for the widespread feminization of boys and men. Emphasizing that the feminized male is not necessarily a sissy or a homosexual, Sexton made the following observations:

> . . . boys who rise to the top in school often resemble girls in many important ways. . . . Scholastic honor and masculinity too often seem incompatible . . . boys and men seem to be acquiring an excess of feminine personality traits . . . boys with distinguished scholastic records . . . have extremely low masculinity scores . . . the more masculine the boy, the lower his report card average tended to be . . . high achievers try significantly harder to be polite to teachers and to make teachers like them. . . . High achievers are much more likely to take part without being called on. . . . High achievers spend more time with parents . . . highest achieving boys tend to be the babies in the family--either because they are the youngest, only children, or unusually small for their age. . . . (pp. 23-29, 66-67)

Sexton (1970, p. 66), granting that "it is indeed a man's world," claimed that mothers and female teachers tend to seek revenge, and asserted:

> Many women go at their limited and arduous tasks with a vengeance. Denied the power to give orders on the job, women have developed compensating muscle in the home and school. There a woman has some power over children. A special target has been the males . . . those who can do what she feels she can't. . . . Her fierce domination of home and school has tended to feminize the men she brings up. . . . What we must do is masculinize the schools and feminize the power structure of the society--balancing out the sexes so they don't corrode any one spot where they concentrate.

Among numerous studies which have consistently shown substantial differences in the academic achievement of boys and girls in favor of girls are those reported by Lincoln (1927), Stroud and Lindquist (1940, and Olson (1959).

Other studies have indicated that girls get better opportunities than boys because female teachers prefer to teach girls whom they believe to be smarter than boys (McNeil, 1964); boys create more problems (Terman and Tyler, 1954); and there is a tendency to reward students of one's own sex (Meyers and Thompson, 1956). Studies by Davidson and Lang (1960), Froerer (1960), and Tschechtelin (1943) also reported sex bias favoring girls in female teacher-pupil interaction in elementary schools. Only one study, Davis and Slobodian (1967), indicated no sex bias in female teacher-pupil interaction. Not a single

study was found among those reviewed to report sex bias in favor of boys where the teacher was female.

McFarland (1969) completed an investigation to determine whether or not there would be significant differences in academic achievement, personality, and sex-role identification in an experimental first-grade with men teachers and a control first-grade with women teachers. Too, he checked to determine which students benefited most from instruction by a male teacher. The study, which the author labeled as "a beginning in a relatively untouched field," revealed no statistically significant differences in the achievement of the first-graders whether the teacher was male or female; although a relationship appeared to have existed between male teacher participation and improved performance by boys and girls who identified with the male figure. McFarland suggested that it would be more desirable to have a sexual balance than to have a predominance of either male or female elementary teachers and that additional research needs to be produced before the influence of male teacher participation in elementary grades can be conclusively determined.

Farrall (1968) undertook an analysis that differentiated the sample in terms of the sex of the student and the sex of the teacher. The purpose of the investigation involving fifth and sixth-graders was to explore the

adjustment of boys in male teacher classrooms as compared with that of boys in female classrooms, and the adjustment of girls in female teacher classrooms as compared with that of girls in male teacher classrooms. His findings, like those of Haner (1947), Ryans (1960), Gage, Leavitt, and Stone (1955), and Spaulding (1963), failed to support the inference that "male teachers at the elementary level would provide a more positive classroom atmosphere for boys." In fact, Farrall noted that while there were no significant differences, "the differences demonstrating the most consistent and obvious tendency for more positive pupil reaction to male rather than female teachers occurred for girls rather than for boys."

The work of Davis and Dollard, and others, reported by Charters (1963), revealed that children from the lower socioeconomic levels get most of the teacher's restricting behaviors while the children from the higher socioeconomic levels get most of the teacher's encouraging behavior. Nevertheless, there are studies which indicate that socioeconomic difference is not the only explanation for the ratio imbalance of teacher-student interaction.

For instance, Hoehn (1954) failed to find a significant relationship between the amount of teacher interaction and the pupil's social class. Instead, he found that low achievers bear the bane of most of the conflictive and

dominative behavior of teachers and that higher achievers receive the rewards of the supportive and promotive behavior of teachers. Thompson (1962) reported that the most scholarly sixth-graders of those studied were the recipients of the teacher's most approving behavior. Good (1970) tested the hypothesis that teachers discriminate among the children they teach. He discovered that in primary grades taught by female teachers in "working class" schools, the high achievers received consistently and significantly more opportunity for classroom response than the low achievers.

Herzog and Sudia (1968), reporting their review of hundreds of studies dealing with sex roles, discovered only two studies which focused exclusively on girls. Obviously, a great deal less attention has been given to female sex role identification than to male sex role identification.

According to Good (1970), research evidence suggests clearly that "teachers treat pupils differently. Pupils do not get equal classroom opportunities, nor do they get equal amounts of praise from the teacher." A disquieting description of the discrimination of teachers as demonstrated in classroom teacher-student interaction was given by Jackson and Lahaderne (1966): "For at least a few students, individual contact with the teacher is as rare as if they were seated in a class of a hundred or more pupils, even though there are actually only 30 or

so classmates present. . . ." Good continued: "The large differences in teacher-pupil contacts in the same classroom suggest that major research efforts should center on patterns of interaction between the teacher and individual pupils."

IV. SUMMARY

As the foregoing review of literature revealed, theoretical controversies go unresolved and experimental testing has just begun. There appears to be a genuine need for significant research of all kinds concerning teacher-student relationships.

Herzog and Sudia (1968) recommended increasing rather than decreasing descriptive research which lately has suffered some degree of debasement in academe. Preliminary observation, detailed description, and careful analysis formed the foundation of Piaget's renown theories, "which have contributed substantially both to theoretical psychology and its practical application." The authors insisted that "theory . . . might profit by a great deal more . . . observation and description."

Of the research works reviewed, most interaction analysis systems were based on a theory of social-emotional climate and focused on the verbal behavior of teachers in the teacher/students dyad. A few researchers concentrated on nonverbal behavior; several centered on both verbal and

nonverbal behavior; some included teacher sex identification; but none considered student sex differential either as a part of the nonverbal dimension or as a significant variable in and of itself.

Findings of research reviewed indicated that students who are identified with the lower levels of socioeconomic status, intelligence quotient, and academic achievement get more of the teacher's restricting, conflicting, and dominative behaviors and less of the teacher's attention and support than students of the upper levels. In a sense, the preceding student characteristics of low estate were "controlled out" in the present study because all the students were from the upper-middle socioeconomic group, classified as gifted and high achieving. They were approximately the same age and in the same grade--a rather uniform group of high estate students with only the evident differences of sex. There was an equivalent ratio of males to females and the teachers were all females. It followed, then, that an appropriate premise for this investigation might be: If sex differences are to be found manifest in teacher-student interaction, then the sex differential of students is a significant variable in the research laboratory and an important pragmatic consideration in the classroom community.

All the studies reviewed either implied or clearly stated the potential function of interaction analysis as

feedback and guide for teachers' and student teachers' evaluating and changing their behavior. Concerning the possible benefits as feedback and guide for evaluating and changing the behavior of students, very little was either apparent or implied. That interaction analysis has great potential as feedback and guide for the students' evaluating and changing their own behavior is an essential assumption of the present investigation.

Much of the research pointed out the opposing forces in action, particularly between female teachers and male students. While not necessarily discounting the influence of opposing forces, particularly social forces, this study counted the influence of attracting forces and assumed the complementarity rather than the corrivalry between sex opposites in the teaching-learning experience.

It would be presumptuous for this investigator to expect to make a substantial contribution to current teacher-student interaction theory and practice through one limited review of literature and one piece of research. It is, however, appropriate to proceed expectantly with faith and hope that at least a small contribution to research theory might come out of this effort to discover ways in which the aforementioned studies are comparable, related to one another, and relevant to the present problem which is restated here: To observe, analyze and

compare sex differences in teacher-student interactions as manifest in verbal and nonverbal behavior cues.

Evolving from a synthesis of the foregoing review and within the scope and limitations of the present study, the following hypotheses were formulated and subjected to statistical examination:

V. HYPOTHESES

H_1a: Female fifth-grade teachers will initiate more talk with male students than with female students.

H_1b: Female sixth-grade teachers will initiate more talk with male students than with female students.

H_1c: Female teachers will initiate more talk with male students than with female students.

H_2a: Fifth-grade male students more often than fifth-grade female students will initiate talk with female teachers.

H_2b: Sixth-grade male students more often than sixth-grade female students will initiate talk with female teachers.

H_2c: Male students more often than female students will initiate talk with female teachers.

H_3a: Female fifth-grade teachers will exhibit restricting behavior more often toward female than male students.

H_3b: Female sixth-grade teachers will exhibit restricting behavior more often toward female than male students.

H_3c: Female teachers will exhibit restricting behavior more often toward female than male students.

H_4: There will be sex differences in teacher-pupil interaction as manifest in verbal and nonverbal cues.

H_5: Female teachers will discriminate between male and female students in favor of the male, as manifest in verbal and nonverbal behavior cues.

H_6a: Female teachers of gifted students will exhibit more indirect than direct behavior cues in the classroom.

H_6b: Female teachers of gifted students will exhibit more encouraging than restricting behavior cues.

H_6a and H_6b are by-products of the process of accumulating the data with which to test H_1 through H_5. Such findings as these may provoke additional studies in

related fields, which is one of the things hoped for: that this investigation might germinate fertile hypotheses for further research.

By the process of deduction, it might be concluded that: if H_1a and H_1b, then H_1c; if H_2a and H_2b, then H_2c; if H_3a and H_3b, then H_3c; if H_1c, H_2c, and H_3c, then H_4 and H_5.

Chapter II has presented a review of related literature and an enumeration of the hypotheses to be tested. Chapter III describes the methods, procedures, and the instruments employed to implement the study.

CHAPTER III

METHOD AND PROCEDURE

The primary purpose of this study was to analyze sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues.

Chapter III provides the description of and a rationale for the methods and procedures that were employed to facilitate the present investigation.

I. SUBJECTS

The subjects consisted of four teachers and 105 fifth and sixth-grade students who were participating in an educational experience for gifted students at Camp Laboratory School on the campus of Western Carolina University during the summer of 1970. Two classes, one fifth and one sixth-grade, were in session during the first five-week summer term; and two classes, one fifth and one sixth-grade, were in session during the second summer term. All the teachers were female; 53 students were male; 52 students were female. None of the classes had the same teachers and/or students. The two fifth-grades met in the same classroom but during different terms as did the two sixth-grades.

At the outset, approval was sought and received from the summer director of Camp Laboratory School to carry out the investigation. The director, in turn, sought and received consent of the teachers who, with their students, would be the subjects involved. None refused.

The teachers were told only that certain sessions of their classes would be videotaped to produce data which would be used in a doctoral study concerning systems of classroom observation and analysis; that the teachers would be informed at least two weeks prior to the taping sessions; that every effort would be made by the investigator to prevent the disruption of classes; and that no attempt would be made to evaluate the teachers personally. The teachers were urged to conduct "class as usual" so as not to create any more extraordinary situations than necessary. The investigator avoided either inference or reference to the fact that the study was chiefly concerned with sex differential in teacher-student interaction.

II. THE INSTRUMENTS

Because of its two-dimensional feature--verbal and nonverbal--and its potential adaptability to the problem, the IDER system of interaction analysis as described in Appendix A was selected for modification to include sex

differences between teachers and students during routine interaction in the classroom.

To clarify the point that the sex identification of the students was an important consideration in the present study, the letter S was added to the initials of the parent IDER system. From now on, then, the offspring of IDER, as employed in this investigation, will be referred to as IDERS for clarification and specification.

The IDERS matrix, presented in Figure 1, was designed to serve concomitant functions; to code and to tally at the same time. A duplicate form of the matrix was used to plot the clusters of behavior cues numerically in each of the ten categorized cells. This was a convenient form from which to transfer summarized raw data to data sheets for the subsequent writing of a computer program by The University of Tennessee Computing Center personnel.

The finished product yielded essentially the same patterns of information as that which may be aggregated by the matrixes and satellite matrixes of the FIAS and/or the parent IDER. In addition, the sex differences of the students were manifest in student talk categories eight and nine; thus, providing another important dimension and/or variable for analyzing teacher-student classroom interaction.

It was possible to code and to tally the behavior cues coincidentally because the IDER symbols for encouraging

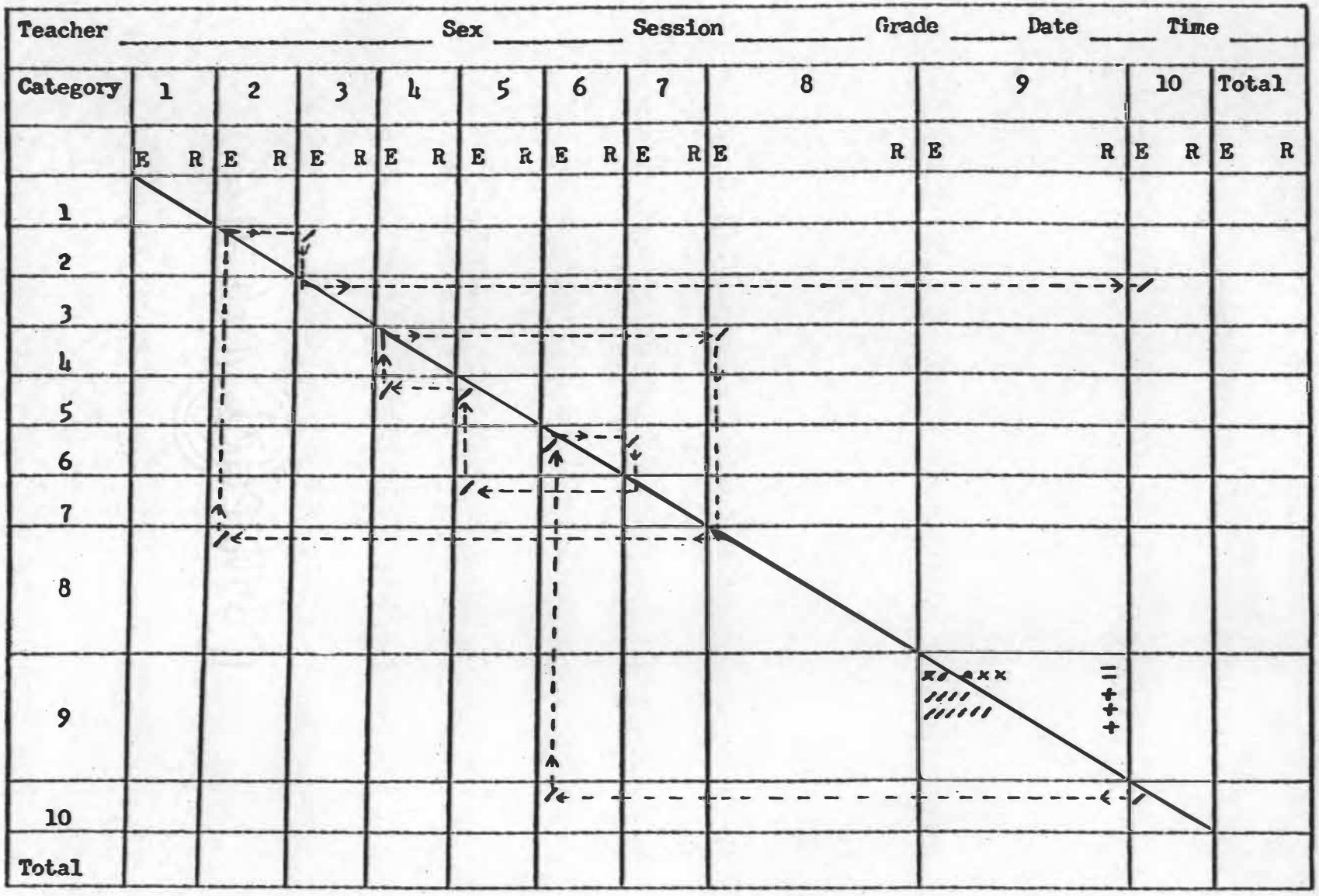

Figure 1. The IDERS matrix.

(/) and restricting (-) could be recorded in the divided, categorized cells of this one ten-by-ten matrix. The IDER symbols were mutated in categories eight and nine to accommodate the sex differentiation of the students. While coding/tallying these two columns/categories, the sex of the students was recorded as follows: The usual slash (/) in columns 8 and 9, subcolumn E (encouraging), indicated that the respondent was a male student and that the corresponding nonverbal behavior cues of the teacher were judged by the observer to be E. A crossed slash (X) in the same cell indicated that the respondent was a female student and the teacher's corresponding nonverbal behavior cues were judged to be E.

A dash (-) in columns/categories 8 and 9, subcolumn R (restricting), indicated that the respondent was a male student and that the teacher's corresponding nonverbal behavior cues were judged by the observer to be R. A crossed dash (+) indicated that the respondent was a female student and that the teacher's corresponding nonverbal behavior cues were judged to be R.

An example of the use of these symbols is plotted in the Row 9, Column 9 (9-9) cell of Figure 1. As shown, the sum of the tallies in the 9-9 cell is 20: ten male student-initiated, male student responses in which the teacher's corresponding behavior was E; and five female

student-initiated, female student responses in which the teacher's corresponding behavior was E. The sum of the tallies in Row 9, Column 9_R is five: two male student-initiated male student responses in which the teacher's corresponding behavior was R; and three female student-initiated female student responses in which the teacher's corresponding behavior was R.

An example of the coding pattern is also shown on Figure 1, page 41. The unbroken line moving from the top left corner to the bottom right corner of the matrix serves as an axis or rest point between three-second codings of behavior cues. For instance, say that every three seconds the observer codes a sequence of E teacher behavior cues for a period of 30 seconds, starting with category cell 10-10 and ending with a 10 as follows: 10, 6, 6, 7, 5, 5, 4, 8, 2, 3, 10. The broken line and arrows were drawn on the matrix in this figure to picture the imaginary path of the observer's pencil as it moves from one cell to another to record the appropriate codes every three seconds. The pencil returns to and rests, but does not mark, on the axis after the recording of each cue code, while it moves on into the direction of the next appropriate cell. This process continues until all the teacher's behavior cues have been registered on the matrix for one session. A

separate matrix is used for each forty-minute session which has been videotaped.

As previously indicated, after the IDERS data for the subjects and sample of this study had been registered in each cell as described above, the sums of the tallies for each session and each teacher were transferred directly to data sheets whereupon The University of Tennessee Computing Center wrote the computer program shown in Appendix C with resultant print-outs containing percentages, ratios, and chi squares for testing the hypotheses. Statistical details and formulas will be presented in Chapter IV in conjunction with tables, analyses, and interpretations of the findings.

The IDERS matrix is also practical for generating data on a smaller scale by hand or with an office calculator, which methods are recommended when learning the system and spot-checking the reliability of observers.

III. THE VIDEOTAPE RECORDING

Because of its durable qualities, videotape was the tool selected to record the teacher-student classroom interaction. Videotape affords the opportunity for: repeated use in learning an interaction analysis system; the application of several different research techniques and studies; checking and double checking the reliability

of observers; feedback and guide in the evaluation and education of student teachers; feedback and guide for appropriate behavior changes in both teachers and students; and storage and dissemination as a part of a central tape library or bank.

Where videotape has not been used for previous research in interaction analysis, either audiotape or individual observation and coding has been used, according to the review of literature in the previous chapter.

Portable videotaping equipment with half-inch videotape was used for this study. The videotape recorder was a Concord Model 900 with the Satchell Carlson M041T playback monitor, both situated on a two-deck metal utility table on wheels. The camera, a Concord Helical Scan Camera Model MTC-12 with a Concord 22-66MM television zoom lens rotated on a lightweight tripod. All the equipment was located in front and to one side of the classrooms for ease in recording the behavior cues of the teacher and the sex identity of the students. Three standard-type microphones were used. One was placed around the neck of the teacher to allow for her mobility. The other two were suspended from the light fixtures a few feet above the heads of the students who were seated in the center-left and center-right of a typical row arrangement of students in a classroom.

All the videotaping occurred in two adjoining rooms. Four tapes for each teacher were recorded during the morning hours between nine and ten o'clock on alternating days; specifically, Mondays and Wednesdays for the fifth-grade classes and Tuesdays and Thursdays for the sixth-grade classes during the second and third weeks of the five-week sessions.

A pilot tape was recorded and played back for the benefit of students and teachers on the Friday preceding the beginning of the official taping in order to accustom the subjects to the procedure.

IV. THE SAMPLE

After producing the 16 videotapes as described above, random sampling with replacement was the method used to select 12 tapes for this study. Each tape, after allowing some lead at the beginning and end, contained approximately 720 teacher and student behavior cues for a total of 2,162 cues per teacher for the three experimental tapes of each of the four teachers. This amounted to a cue sample sum of 8,648 drawn from a total population of 11,555 cues of all four female teachers, the 53 male students, and the 52 female students.

V. INVESTIGATOR RELIABILITY

Having learned and practiced the FIAS and the IDER systems of behavior analysis, the investigator's consistency and reliability were checked via the computation of two kinds of reliability coefficients, in accordance with the IDER system of behavior analysis (French, 1968, p. 57). The investigator and one other expert observer randomly selected and coded three of the twelve experimental videotapes. In addition, the investigator's reliability was monitored by computing reliability coefficients for the initial coding and a re-coding approximately two weeks later. On the basis of the results, the following reliability checks were made.

The first computation consisted of a Scott (1955) reliability coefficient as outlined by Flanders (Amidon and Hough, 1967, pp. 161-166). The formula was as follows:

$$pi = \frac{P_o - P_e}{100 - P_e}$$

Flanders (Amidon and Hough, 1967, p. 166) considers a Scott coefficient of 0.85 or higher a reasonable level of performance.

The second type of computation consisted of a percentage of observer agreement including only tallies demonstrating restricting nonverbal behaviors. The formula was as follows:

$$P- = \frac{\text{N-Neophyte}}{\text{N-Expert}}$$ (When N- represents the number of negative nonverbal behaviors recorded.)

The results of the two reliability checks are indicated in Table I. Correlations between the codings made by the investigator and a second observer (observers[a]) ranged from .94 to .96 as measured by the Scott coefficient and from .80 to .94 by the P- method.

The Scott reliability coefficient of the investigator's (observer[b]) two codings ranged between .89 and .95. According to the P- method, the range was from .78 to .88. Although these P- correlations were not as substantial as the Scott coefficient, they are considered adequate for the measurement of agreement between tallies of restricting nonverbal behavior cues (French, 1968, p. 59). The investigator coded more restricting nonverbal behavior cues the second time than the first in all three tapes. According to French (1968, p. 57), an "investigator's awareness of restricting nonverbal cues may be sharpened by a review of the tapes or there may be an overcompensation in this area and hence a lack of consistency between the two codings."

As previously indicated, the data generated through the IDERS system of coding were transferred to computer data sheets from which a program was developed to:

TABLE I

INVESTIGATOR RELIABILITY/CONSISTENCY IN THE USE OF THE IDERS SYSTEM

	pi			P-		
Observers	Tape 1	Tape 2	Tape 3	Tape 1	Tape 2	Tape 3
Observers[a]	.95	.94	.96	.91	.80	.94
Observer[b]	.93	.89	.95	.80	.88	.78

[a]Coefficients of correlation between the investigator's first coding and the co-observer's coding.

[b]Coefficients of correlation between the investigator's first and second codings.

1. Plot the IDERS data into matrixes appropriate to: (a) each of the twelve class sessions; (b) all three sessions by each of the four teachers; (c) all six sessions by the two fifth-grade teachers; (d) all six sessions by the two sixth-grade teachers; and (e) all twelve sessions by all four teachers.

2. Compute the percentages of verbal and nonverbal behavior in each matrix column/category appropriate to: (a) each of the twelve class sessions; (b) all three sessions by each of the four teachers; (c) all six sessions by the two fifth-grade teachers; (d) all six sessions by the two sixth-grade teachers; (e) all twelve sessions by all four teachers. In columns 8 and 9, in addition to the total percentages of all student response and all student-initiated response, compute the percentages of teacher-initiated (8) male and female student response and student-initiated (9) male and female response.

3. Compute the chi square (x^2) for significance of differences between males and females in columns 8 and 9 respectively and totally for (a) each of the twelve class sessions; (b) all three sessions of each of the four teachers; (c) all six sessions by the two fifth-grade teachers; (d) all six sessions by the two sixth-grade teachers; and (e) all twelve sessions by all four teachers.

4. Compute the I/D, i/d, S/T, S_m/T, S_f/T, S_{m8}/T S_{m9}/T, S_{f8}/T, S_{f9}/T, and E/R ratios for each area of the matrix and for each aggregate matrix representing: (a) each of the twelve class sessions; (b) all three sessions by each of the four teachers; (c) all six sessions by the two fifth-grade teachers; (d) all six sessions by the two sixth-grade teachers; and (e) all twelve sessions by all four teachers.

The formulas used to compute the above data will be presented in Chapter IV in conjunction with the tabulations for the analyses. The derivative print-outs were photo-reduced to a suitable size for complete representation in Figures 2 through 20 (Appendix B). This compilation of data constitutes more than is necessary for this one study. However, it furnishes a comprehensive frame of reference for now and for future research. The data pertaining directly to this investigation were extracted from the appropriate figures and tabulated in Chapter IV.

Chapter III has provided the description of and a rationale for the methods and procedures that were employed in the study. The subjects, the population and sample, the instruments, the videotape recordings, the investigator reliability, and the statistics have all been discussed in preparation for the following chapter which will present an analysis of the data, an examination of the hypotheses, and the final results of the study.

CHAPTER IV

ANALYSES AND RESULTS

The purpose of this investigation was to analyze sex differences in teacher-student interaction as manifest in a random sample of 8,648 verbal and nonverbal behavior cues. These cues, drawn from a population of 11,555, were generated via sixteen videotaped class sessions and the instrumentation of IDERS, a modified form of the French and Galloway IDER system of interaction analysis. Four fifth and sixth-grade female teachers and their 105 gifted students (53 male and 52 female) were the subjects.

That female teachers will discriminate significantly between male and female students in favor of the male was the leading hypothesis. Its counterpart stated in the null hypothesis for statistical testing was: There will be no significant discrimination by female teachers between male and female students in favor of the male.

This chapter proposes to analyze thirteen related hypotheses and to interpret the results in accordance with the statistical findings. The alternate hypotheses as stated in Chapter II, pages 35 and 36, were transformed into null hypotheses for statistical testing. For clarification and organization in the presentation, the alternate hypothesis will antecede the null hypothesis in each case.

The statistic for examining the significance of differences was chi square (x^2). Supplementary methods involved percentages and ratios. All the statistical data reported here, unless stated otherwise, were computerized. The print-outs, after photo-reduction, are figured in Appendix B. Appropriate excerpts from the figures were tabulated, with special reference to student talk categories eight and nine of the IDER ten-category system of interaction analysis.

Except where indicated, the Yates' correction for continuity of data was not made in the two-by-two chi square tables because the expected or theoretical frequency of cell entries in most cases was greater than the minimum of ten. In general, the sample was large enough to use the .001 level of significance. However, in a few instances, either the .01 or the .05 level of significance was specified.

Based upon one degree of freedom (d.f. = 1), the .001 level of significance is 10.827. Stated differently, if the observed value of chi square proves to be greater than the .001 level of probability (p), or 10.827, then it will be concluded that there is a significant difference in favor of the students--differentiated by sex--who were the recipients of the larger number, percentage, or ratio of female teacher verbal and/or nonverbal behavior cues.

It would mean that there is less than one chance in a thousand that a difference as large as the observed value of x^2 or larger would occur by chance. The null hypothesis (H_0) which stated that there will be no difference in the population would, therefore, be rejected and the alternate hypothesis which stated that there will be a difference would be accepted with confidence. If, on the other hand, the observed value of x^2 proves to be less than the .001 level of significance, but greater than either the .01 level of 6.635 or the .05 level of 3.841, then the null hypothesis would still be rejected and the alternate hypothesis would be accepted as significant at the specified level. Contrariwise, if the observed value of x^2 proved to be less than the .001, .01, or .05 levels of significance, then the null hypothesis would be accepted and the alternate hypothesis would be rejected.

Though interested in the overall generalization of the data, the investigator made inferences only from the sample data to the proportion of the population from which the sample was drawn.

As previously indicated, categories eight and nine of the Flanders Interaction Analysis from which the verbal dimension of the IDER (Appendix A) system of behavioral analysis was developed, involves student talk. Category eight (8) consists of teacher-initiated student talk:

talk by students in response to the teacher who initiates the contact or solicits student statement. Category nine (9) involves student-initiated talk: talk by the student which he initiates with the teacher. If the teacher calls on the student only to indicate which of the students who wanted to talk, may talk next, this category is used.

According to French (1968, p. 130):

> 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.

The IDERS, used in this study, included the sex differential of the student as well as the nonverbal dimensional aspects of the parent IDER.

The following two-fold hypotheses and others to be listed in the order of presentation were subjected to statistical testing with results as indicated:

Hypothesis One

H_1a: Female fifth-grade teachers will initiate significantly more talk with male students than with female students.

H_oa: No significant difference will be found to exist between the number of times female

fifth-grade teachers initiate talk with male students and with female students.

Tables II and III present detailed information concerning the significance of differences involving each fifth-grade teacher individually. Table IV presents a composite picture of the chi square tests of significance for both female fifth-grade teachers and the six videotaped sessions involving 32 male students and 33 female students. Of 4,269 behavior cues recorded, student responses to the teacher totaled 576: 355 male and 221 female. The obtained x^2 of 31.174 is greater than the .001 confidence level of 10.827 and hence is significant.

The null hypothesis ($H_o a$) is rejected, therefore, and the alternative hypothesis ($H_1 a$) is accepted. These teachers initiated significantly more talk with the male than with the female students.

Hypothesis Two

$H_1 b$: Female sixth-grade teachers will initiate significantly more talk with male students than with female students.

$H_o b$: There will be no significant difference in the number of times sixth-grade teachers will initiate talk with male students and with female students.

TABLE II

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FEMALE TEACHER ONE: IDERS CATEGORY EIGHT[a]

Videotaped Class Session	Number of Student Responses[b]			
	Male[c]	Female[d]	Total	Chi Square
One	18	5	23	7.348[e]
Two	36	15	51	8.647[e]
Three	155	89	244	17.852[f]
Total	209	109	318	31.447[f]

[a]Data were extracted from the computer print-outs shown in Figures 2, 3, 4, and 5; Appendix B.

[b]Number of student responses of 2,481 verbal and nonverbal behavior cues recorded during the three class sessions of Teacher One.

[c]Sixteen fifth-grade male students.

[d]Seventeen fifth-grade female students.

[e]Significant at the .01 level of confidence; d.f. = 1.

[f]Significant at the .001 level of confidence; d.f. = 1.

TABLE III

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FEMALE TEACHER TWO: IDERS CATEGORY EIGHT[a]

Videotaped Class Session	Number of Student Responses[b]			
	Male[c]	Female[d]	Total	Chi Square
Four	47	47	94	0.000
Five	45	28	73	3.959[e]
Six	54	37	91	3.179
Total	146	112	258	4.481[e]

[a]Data were extracted from the computer print-outs shown in Figures 6, 7, 8, and 9; Appendix B.

[b]Number of student responses of 1,788 verbal and nonverbal behavior cues recorded during the three class sessions of Teacher Two.

[c]Sixteen fifth-grade male students.

[d]Sixteen fifth-grade female students.

[e]Significant at the .05 level (d.f. = 1).

TABLE IV

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FEMALE FIFTH-GRADE TEACHERS: IDERS CATEGORY EIGHT[a]

Teacher	Number of Sessions	Number of Student Responses[b]			Chi Square
		Male[c]	Female[d]	Total	
One	3	209	109	318	31.447[e]
Two	3	146	112	258	4.481[f]
Total	6	355	221	576	31.174[e]

[a]Data were extracted from the computer print-outs shown in Figures 5, 9, and 10; Appendix B.

[b]Number of student responses of 4,269 verbal and nonverbal behavior cues recorded during the six class sessions of Teachers One and Two.

[c]Thirty-two fifth-grade male students.

[d]Thirty-three fifth-grade female students.

[e]Significant at the .05 level (d.f. = 1).

[f]Significant at the .001 level (d.f. = 1).

Tables V and VI reveal the significance of differences involving the individual sixth-grade teachers. Table VII presents the composite for all six sessions of both sixth-grade teachers and their 40 students: 21 male and 19 female. Of 4,379 behavior cues, student responses numbered 1,124: 720 male and 404 female. The obtained x^2 of 88.840 is greater than the .001 confidence level. Hence, $H_o b$ is rejected and $H_1 b$ is accepted. These sixth-grade teachers initiated significantly more talk with male than with female students.

Hypothesis Three

$H_1 c$: Female fifth and sixth-grade teachers will initiate significantly more talk with male students than with female students.

$H_o c$: There will be no significant difference in the number of times female fifth and sixth-grade teachers will initiate talk with male students and female students.

It may now be deduced from the preceding statistical tests and the summary in Table VIII that since $H_1 a$ and $H_1 b$, then $H_1 c$. Of 8,648 behavior cues from twelve videotaped sessions, student responses to teacher-initiated talk totaled 1,700: 1,075 male and 625 female responses. The obtained x^2 of 119.118 is significant at the .001 level. $H_o c$ is rejected; $H_1 c$ is accepted. These fifth and sixth-

TABLE V

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FEMALE TEACHER THREE: IDERS CATEGORY EIGHT[a]

Videotaped Class Session	Number of Student Responses[b]			
	Male[c]	Female[d]	Total	Chi Square
Seven	133	75	208	16.173[e]
Eight	235	154	389	16.866[e]
Nine	94	122	216	3.630
Total	462	351	813	15.155[e]

[a]Data were extracted from the computer print-outs shown in Figures 11, 12, 13, and 14; Appendix B.

[b]Number of student responses of 2,493 verbal and nonverbal behavior cues recorded during the three sessions of Teacher Three.

[c]Ten sixth-grade male students.

[d]Eleven sixth-grade female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE VI

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FEMALE TEACHER FOUR: IDERS CATEGORY EIGHT[a]

Videotaped Class Session	Number of Student Responses[b]			
	Male[c]	Female[d]	Total	Chi Square
Ten	0	1	1	1.000
Eleven	30	12	42	7.714[e]
Twelve	228	40	268	131.881[f]
Total	258	53	311	135.129[f]

[a]Data were extracted from the computer print-outs shown in Figures 15, 16, 17, 18; Appendix B.

[b]Number of student responses of 1,886 verbal and nonverbal behavior cues recorded during the three sessions of Teacher Four.

[c]Eleven sixth-grade male students.

[d]Eight sixth-grade female students.

[e]Significant at the .01 level (d.f. = 1).

[f]Significant at the .001 level (d.f. = 1).

TABLE VII

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY TWO FEMALE SIXTH-GRADE TEACHERS: IDERS CATEGORY EIGHT[a]

Teacher	Number of Sessions	Number of Student Responses[b]			Chi Square
		Male[c]	Female[d]	Total	
Three	3	462	351	813	15.155[e]
Four	3	258	53	311	135.129[e]
Total	6	720	404	1,124	88.840[e]

[a]Data were extracted from the computer print-outs shown in Figures 14, 18, and 19; Appendix B.

[b]Number of student responses of 4,379 verbal and nonverbal behavior cues recorded during the six class sessions of Teachers Three and Four.

[c]Twenty-one sixth-grade male students.

[d]Nineteen sixth-grade female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE VIII

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO TALK INITIATED BY FOUR FEMALE FIFTH AND SIXTH-GRADE TEACHERS: IDERS CATEGORY EIGHT[a]

Grade	Number of Teachers	Videotaped Sessions	Number of Student Responses[b]			
			Male[c]	Female[d]	Total	Chi Square
Fifth	2	6	355	221	576	31.174[e]
Sixth	2	6	720	404	1,124	88.840[e]
Total	4	12	1,075	625	1,700	119.118[e]

[a]Data were extracted from the computer print-outs shown in Figures 10, 19, and 20; Appendix B.

[b]Number of student responses of 8,648 verbal and nonverbal behavior cues recorded during the 12 class sessions of Teachers One, Two, Three, and Four.

[c]Fifty-three male students.

[d]Fifty-two female students.

[e]Significant at the .001 level (d.f. = 1).

grade teachers initiated significantly more talk with male than with female students.

Hypothesis Four

H_2a: Fifth-grade male students, significantly more often than fifth-grade female students, will initiate talk with female teachers.

H_oa: There will be no significant difference in the number of times that fifth-grade male and female students will initiate talk with female teachers.

The data in Tables IX and X concerning fifth-grade Teachers One and Two, respectively, are self-explanatory for the details on individual class sessions and the significance of differences in the numbers of male and female student-initiated responses. Table XI summarizes the data with the following results: Of 4,269 cues coded in IDERS Category 9 during six videotaped class sessions, student-initiated responses to teacher talk numbered 714: 481 male and 233 female. The obtained x^2 of 86.140 is greater than the .001 level of confidence. H_oa is rejected and H_2a is accepted. The male students initiated significantly more talk with the female teachers than did the female students.

TABLE IX

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO FEMALE FIFTH-GRADE TEACHER ONE: IDERS CATEGORY NINE[a]

Videotaped Class Session	Number of Student-Initiated Responses[b]			Chi Square
	Male[c]	Female[d]	Total	
One	184	113	297	16.973[e]
Two	86	30	116	27.034[e]
Three	43	9	52	22.231[e]
Total	313	152	465	55.744[e]

[a]Data were extracted from the computer print-outs shown in Figures 2, 3, 4, and 5; Appendix B.

[b]Number of student-initiated responses of 2,481 verbal and nonverbal behavior cues recorded during the three class sessions of Teacher One.

[c]Sixteen male students.

[d]Seventeen female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE X

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO FEMALE FIFTH-GRADE TEACHER TWO: IDERS CATEGORY NINE[a]

Videotaped Class Session	Number of Student-Initiated Responses[b]			Chi Square
	Male[c]	Female[d]	Total	
Four	106	47	153	22.752[e]
Five	34	15	49	7.367[f]
Six	28	19	47	1.723
Total	168	81	249	30.398[e]

[a]Data were extracted from the computer print-outs shown in Figures 6, 7, 8, and 9; Appendix B.

[b]Number of student-initiated responses of 1,788 verbal and nonverbal behavior cues recorded during the three class sessions of Teacher Two.

[c]Sixteen male students.

[d]Sixteen female students.

[e]Significant at the .001 level (d.f. = 1).

[f]Significant at the .01 level (d.f. = 1).

TABLE XI

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO TWO FEMALE FIFTH-GRADE TEACHERS: IDERS CATEGORY NINE[a]

Teacher	Number of Sessions	Number of Student-Initiated Responses[b]			Chi Square
		Male[c]	Female[d]	Total	
One	3	313	152	465	55.744[e]
Two	3	168	81	249	30.398[e]
Total	6	481	233	714	86.140[e]

[a]Data were extracted from the computer print-outs shown in Figures 5, 9, and 10; Appendix B.

[b]Number of student-initiated responses of 4,269 verbal and nonverbal behavior cues recorded during the six class sessions of Teachers One and Two.

[c]Thirty-two male students.

[d]Thirty-three female students.

[e]Significant at the .001 level (d.f. = 1).

Hypothesis Five

H_2b: Sixth-grade male students, significantly more often than sixth-grade female students, will initiate talk with female teachers.

H_ob: There will be no significant difference in the number of times that sixth-grade male and female students will initiate talk with female teachers.

In conjunction with the above hypotheses, Tables XII and XIII show the chi square analysis of each of the three class sessions of Teachers Three and Four, respectively, indicating that all except one of the six sessions were significantly different in student-initiated talk in favor of the male student. Table XIV presents the composite x^2 values of both sixth-grade teachers and all six class sessions involving 40 students: 21 male and 19 female. Of 4,379 behavior cues, student-initiated talk with the teachers totaled 973: 800 males and 173 females. Again, the obtained x^2 of 404.038 exceeds the .001 level of confidence. Thus, H_ob is rejected; H_2b is accepted. These sixth-grade male students initiated talk significantly more often with the female teacher than did the female students.

TABLE XII

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT INITIATED RESPONSES TO FEMALE SIXTH-GRADE TEACHER THREE: IDERS CATEGORY NINE[a]

Videotaped Class Session	Number of Student-Initiated Responses[b]			Chi Square
	Male[c]	Female[d]	Total	
Seven	8	12	20	0.800
Eight	51	3	54	42.667[e]
Nine	378	0	378	378.000[e]
Total	437	15	452	393.991[e]

[a]Data were extracted from the computer print-outs shown in Figures 11, 12, 13, and 14; Appendix B.

[b]Number of student-initiated responses of 2,493 teacher verbal and nonverbal behavior cues recorded during the three sessions of Teacher Three.

[c]Ten male students.

[d]Eleven female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE XIII

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO FEMALE SIXTH-GRADE TEACHER FOUR: IDERS CATEGORY NINE[a]

Videotaped Class Session	Number of Student-Initiated Responses[b]			Chi Square
	Male[c]	Female[d]	Total	
Ten	218	114	332	32.578[e]
Eleven	120	42	162	37.556[e]
Twelve	25	2	27	19.593[e]
Total	363	158	521	80.662[e]

[a]Data were extracted from the computer print-outs shown in Figures 15, 16, 17, and 18; Appendix B.

[b]Number of student-initiated responses of 1,886 verbal and nonverbal behavior cues recorded during the three sessions of Teacher Four.

[c]Eleven male students.

[d]Eight female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE XIV

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO TWO FEMALE SIXTH-GRADE TEACHERS: IDERS CATEGORY NINE[a]

Teacher	Number of Sessions	Number of Student-Initiated Responses[b]			Chi Square
		Male[c]	Female[d]	Total	
Three	3	437	15	452	393.991[e]
Four	3	363	158	521	80.662[e]
Total	6	800	173	973	404.038[e]

[a]Data were extracted from the computer print-outs shown in Figures 14, 18, and 19; Appendix B.

[b]Number of student-initiated responses of 4,379 behavior cues recorded during the six class sessions of Teachers Three and Four.

[c]Twenty-one male students.

[d]Nineteen female students.

[e]Significant at the .001 level (d.f. = 1).

Hypothesis Six

H_2c: Fifth and sixth-grade male students, significantly more often than fifth and sixth-grade female students, will initiate talk with female fifth and sixth-grade teachers.

H_oc: There will be no significant difference in the quantity of male and female student-initiated talk with female fifth and sixth-grade teachers.

Table XV reveals that the obtained x^2 values of both fifth-grade teachers and both sixth-grade teachers were significant at the .001 level of confidence. The significant x^2 of the total behavior cues involving 105 students (53 male and 52 female) was 453.838. The number of behavior cues involving student-initiated talk with the teachers was 1,687 (1,281 male and 406 female), of a total of 8,648 cues for all 12 videotaped sessions. All these significant data lead to the conclusion that the null hypothesis is to be rejected and the alternate hypothesis is to be accepted. The male students, significantly more often than the female students, initiated talk with female fifth and sixth-grade teachers. It is appropriate at this point to deduce that since H_2a and H_2b, then H_2c.

TABLE XV

CHI SQUARE TESTS FOR SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT-INITIATED RESPONSES TO FOUR FEMALE FIFTH AND SIXTH-GRADE TEACHERS: IDERS CATEGORY NINE[a]

Grade	Number of Teachers	Videotaped Sessions	Number of Student-Initiated Responses[b]			Chi Square
			Male[c]	Female[d]	Total	
Fifth	2	6	481	233	714	86.140[e]
Sixth	2	6	800	173	973	404.038[e]
Total	4	12	1,281	406	1,687	453.838[e]

[a]Data were extracted from the computer print-outs shown in Figures 10, 19, and 20; Appendix B.

[b]Number of student-initiated responses of 8,648 verbal and non-verbal behavior cues recorded during the 12 class sessions of Teachers One, Two, Three, and Four.

[c]Fifty-three male students.

[d]Fifty-two female students.

[e]Significant at the .001 level (d.f. = 1).

Hypothesis Seven

H_3a: Female fifth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_oa: There will be no difference in the restricting behavior that female fifth-grade teachers exhibit toward male and female students during student talk.

Hypothesis Eight

H_3b: Female sixth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_ob: There will be no difference in the restricting behavior that female sixth-grade teachers exhibit toward male and female students during student talk.

Hypothesis Nine

H_3c: Female fifth and sixth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_oc: There will be no difference in the restricting behavior that female fifth and sixth-

grade teachers will exhibit toward male and female students during student talk.

Teacher restricting behaviors toward male and female students, as observed and coded in Categories 8 and 9 of IDERS, were infinitesimal compared to the encouraging behavior. According to Figures 10, 19, and 20 (Appendix B), among the 53 male students and 52 female students, the four teachers exhibited encouraging (E) and restricting (R) behavior cues as follows during student talk:

The two fifth-grade teachers responded to male student talk with a total of 836 E and R behavior cues, of which 98 percent were E and only 2 percent were R; and to female student talk with a total of 454 E and R behavior cues, of which 94 percent were E and 6 percent were R.

The two sixth-grade teachers responded to male student talk with 1,520 E and R behavior cues, of which 97 percent were E and only 3 percent were R; and to female student talk with 577 E and R cues, of which 99.4 percent were E and .6 percent were R.

All four fifth and sixth-grade teachers responded to male student talk with 2,356 E and R behavior cues, of which 97.3 percent were E and 2.7 percent were R; and to female student talk with 998 E and R, of which 96.7 percent were E and 3.3 percent were R.

Thus, in all instances, considering the proportions in number and percent, teacher encouraging behavior cues

exceeded the restricting behavior cues in these two categories of student talk for both male and female students. While the figures do indicate a tendency for female teachers to exhibit more restricting behavior toward female than male students, the difference is not statistically significant as Table XVI indicates. $H_o a$, $H_o b$, and $H_o c$ are, therefore, accepted and $H_3 a$, $H_3 b$, and $H_3 c$ are rejected.

Hypothesis Ten

H_4: There will be significant sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues.

H_o: There will be no significant sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues.

Hypothesis Eleven

H_5: Female teachers will discriminate significantly between male and female students in favor of the male as manifest in verbal and nonverbal behavior cues.

H_o: There will be no significant discrimination by female teachers between male and female students in favor of the male as manifest in verbal and nonverbal behavior cues.

TABLE XVI

PERCENT OF FEMALE TEACHER RESTRICTING (R) BEHAVIOR TOWARD MALE AND FEMALE STUDENTS DURING STUDENT TALK: IDERS CATEGORIES EIGHT AND NINE[a]

Grade	Number of Teachers	Videotaped Sessions	Percent of Restricting Cues		Chi Square[d]
			Male[b]	Female[c]	
Fifth	2	6	2	6	1.135
Sixth	2	6	3	.6	1.600
Total	4	12	2.7	3.3	.060

[a]Data were extracted from the computer print-outs shown in Figures 10, 19, and 20; Appendix B.

[b]Fifty-three male students.

[c]Fifty-two female students.

[d]Calculated by hand, using Yates' correction for continuity. Chi squares are not significant at any of the appropriate levels of confidence.

The detailed presentations of data and the conclusions involving H_1a, H_1b, H_1c, H_2a, H_2b, and H_2c plus the compendium of data provided by Tables XVII and XVIII all presuppose the favorable outcome of the two alternate hypotheses: H_4 and H_5. Table XVII reflects the level of confidence with which the null hypotheses of H_4 and H_5 are rejected and the alternative hypotheses are accepted.

There were 8,648 behavior cues of four fifth and sixth-grade teachers, 53 male students, and 52 female students. Student talk in Categories 8 and 9 consisted of 3,387 cues: 2,356 male (70 percent) and 1,031 female (30 percent). Taking into account all the teacher-student behavior cues recorded in the IDERS matrix, each teacher discriminated between male and female students in favor of the male. The obtained composite x^2 of 518.342 is greater than the .001 significance level of 10.827. This being so, it was concluded that, according to this investigation, there were significant sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues; that the female teachers discriminated significantly between the male and female students in favor of the male; and that the male students, significantly more often than the female students, initiated talk with the female teachers.

TABLE XVII

CHI SQUARE TESTS OF SIGNIFICANCE OF DIFFERENCE BETWEEN MALE AND FEMALE STUDENT RESPONSES TO FOUR FEMALE FIFTH AND SIXTH-GRADE TEACHERS: IDERS CATEGORIES EIGHT AND NINE[a]

Grade	Teacher	Videotaped Sessions	Number of Student Responses[b] Male[c]	Female[d]	Total	Chi Square
Fifth	One	3	522	261		87.000[e]
Fifth	Two	3	314	193		28.878[e]
Total		6	836	454	1,290	113.119[e]
Sixth	Three	3	899	366		224.576[e]
Sixth	Four	3	621	211		202.043[e]
Total		6	1,520	577	2,097	424.058[e]
Grand Total		12	2,356	1,031	3,387	518.342[e]

[a]Data were extracted from the computer print-outs shown in Figures 5, 9, 10, 14, 18, 19, and 20; Appendix B.

[b]Number of student responses of 8,648 verbal and nonverbal behavior cues recorded during the 12 class sessions of the four female teachers.

[c]Fifty-three male students. [d]Fifty-two female students.

[e]Significant at the .001 level (d.f. = 1).

TABLE XVIII

IDERS RATIOS OF STUDENT-TEACHER INTERACTION[a]

Grade	Female Teacher	Videotaped Sessions	Students: Male (M)		Total M	Students: Female (F)		Total F	Total M and F
			S_{m8}/T^{b}	S_{m9}/T^{c}	S_{m}/T^{d}	S_{f8}/T^{e}	S_{f9}/T^{f}	S_{f}/T^{g}	S/T^{h}
Fifth	One	3	0.143	0.214	0.358	0.075	0.104	0.179	0.536
Fifth	Two	3	0.162	0.186	0.348	0.124	0.090	0.213	0.561
	Total	6	0.150	0.203	0.354	0.093	0.099	0.192	0.546
Sixth	Three	3	0.452	0.428	0.881	0.344	0.015	0.358	1.239
Sixth	Four	3	0.316	0.445	0.761	0.065	0.194	0.259	1.020
	Total	6	0.392	0.435	0.827	0.220	0.094	0.314	1.142
	Grand Total	12	0.256	0.305	0.561	0.149	0.097	0.245	0.806

[a]The amount of student talk increases as the representative ratio approaches and exceeds 1.00. Teacher talk increases as the representative ratio approaches .00. Data were extracted from the computer print-outs shown in Figures 5, 9, 10, 14, 18, 19, and 20; Appendix B.

TABLE XVIII (continued)

[b]The S_{m8}/T ratio represents the balance between male student response and female teacher talk and is obtained from the division of the total number of tallies in column 8_m by the total number of tallies in columns 1-7.

[c]The S_{m9}/T ratio represents the balance between male student initiated response and female teacher talk and is obtained from the division of the total number of tallies in column 9_m by the total number of tallies in columns 1-7.

[d]The S_m/T ratio represents the balance between total male student talk and female teacher talk and is obtained from the division of the total number of tallies in columns 1-7.

[e]The S_{f8}/T ratio represents the balance between female student response and female teacher talk and is obtained from the division of the total number of tallies in column 8_f by the total number of tallies in columns 1-7.

[f]The S_{f9}/T ratio represents the balance between female student initiated response and female teacher talk and is obtained from the division of the total number of tallies in column 9_f by the total number of tallies in columns 1-7.

[g]The S_f/T ratio represents the balance between total female student talk and female teacher talk and is obtained from the division of the total number of tallies in columns 8_f and 9_f by the total number of tallies in columns 1-7.

[h]The S/T ratio represents the balance between total male and female student talk and female teacher talk and is obtained from the division of the total number of tallies in columns 8-9 by the total number of tallies in columns 1-7.

An aggregation of IDERS ratios is presented in Table XVIII to substantiate the above findings and to illustrate an alternative approach to viewing the preceding hypotheses and some related ones which might be examined later under different circumstances. Specific suggestions will be made in Chapter V. Lengthy footnotes beneath the table make the values in the tabulation self-explanatory for those who are familiar with the Flanders Interaction Analysis System (FIAS) and the IDER system of behavioral analysis and reasonably clear to those who are not. Consequently, a recapitulation will not be undertaken here in order to expedite the present investigation.

Hypothesis Twelve

H_6a: Female fifth and sixth-grade teachers of gifted students will exhibit more indirect than direct behavior cues in the classroom.

H_oa: There will be no difference in the indirect and direct behavior cues in the classroom of female fifth and sixth-grade teachers of gifted students.

Hypothesis Thirteen

H_6b: Female fifth and sixth-grade teachers of gifted students will exhibit more encouraging than restricting behavior cues in the classroom.

H_ob: There will be no difference in the encouraging and restricting behavior cues in the classroom of female fifth and sixth-grade teachers of gifted students.

H_6a and H_6b represent examples of the kinds of secondary or incidental hypotheses which can accompany the development of primary hypotheses such as those expressed in H_1 through H_6. The FIAS rules that directness of teacher verbal influence as shown in both I/D and i/d ratios increases as the representative number approaches .00, and indirectness of teacher verbal influence increases as the representative number approaches and exceeds 1.00. The ratios shown in Table XIX indicate that each teacher and all teachers studied exhibited a high degree of indirectness in classroom interaction with their gifted students. Therefore H_oa was rejected; H_6a was accepted.

The IDER rules that encouraging nonverbal teacher influence increases as the representative number approaches and exceeds 1.00, and restricting nonverbal teacher influence increases as the representative number approaches .00. Table XIX contains ratios which indicate that each teacher and all teachers studied exhibited a high degree of encouraging nonverbal behavior in classroom interaction with their gifted students. H_ob was rejected; H_6b was accepted. Hence,

TABLE XIX

IDERS RATIOS FOR INDIRECT/DIRECT AND ENCOURAGING/RESTRICTING BEHAVIOR INVOLVING FOUR FIFTH AND SIXTH-GRADE TEACHERS AND ONE HUNDRED FIVE GIFTED STUDENTS[a]

Grade	Number of Teachers	Videotaped Sessions	I/D[b]	i/d[c]	E/R[d]
Fifth	2	6	0.917	0.721	11.162
Sixth	2	6	1.260	1.583	15.907
Total		12	1.053	0.942	13.177

[a]Data extracted from the computer print-outs shown in Figures 10, 19, and 20; Appendix B.

[b]An I/D ratio, representing the balance between teacher indirect and direct verbal influence, results from the division of the total number of tallies in matrix columns 1-4 by the total number of tallies in columns 5-7.

[c]An i/d ratio is obtained by dividing the total number of tallies in matrix columns 1-3 by the total number of tallies in columns 6-7. The i/d ratio is more sensitive to social-emotional climate in the classroom than is the I/D ratio which contains content oriented teacher behavior.

[d]The E/R ratio, representing the balance between encouraging and restricting teacher nonverbal cues, results from the division of the total number of tallies in columns 1_E - 10_E by the total number of tallies in columns 1_R - 10_R.

these female fifth and sixth-grade teachers of gifted students exhibited more indirect than direct influence and more encouraging than restricting influence in their classroom behaviors. Significance of the differences could be determined by testing with the chi square statistic.

Summary

This investigation embraced the statistical examination of 13 hypotheses which yielded the following results:

Ten alternate hypotheses were accepted: namely, H_1a, H_1b, H_1c, H_2a, H_2b, H_2c, H_4, H_5, H_6a, and H_6b. Although limited data revealed a tendency in the direction of acceptance--for lack of statistically significant evidence, three alternate hypotheses were rejected: H_3a, H_3b, and H_3c.

Considering the scope and limitations of the present study, and making inferences to that proportion of the population from which the random sample was drawn, the following paragraph constitutes a brief accounting of the major findings.

Female teachers of fifth and sixth-grade gifted students initiated significantly more talk with male students than with female students; discriminated significantly between male and female students in favor of the male; tended to exhibit more restricting behavior toward female

than toward male students, although the difference as indicated in the two student talk categories of the IDERS was not statistically significant; and exhibited more indirectness than directness and more encouraging than restricting behavior. Male students, significantly more often than female students, initiated talk with the female teachers.

Chapter V includes an additional summarization of the results of this investigation, a discussion of implications, and suggestions for further research.

CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSION, AND IMPLICATIONS FOR FURTHER RESEARCH

The purpose of this investigation was to analyze sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues. The study involved four female fifth and sixth-grade teachers and 105 gifted students: 53 boys and 52 girls. A total of 11,555 verbal and nonverbal behavior cues of these subjects was recorded on sixteen videotapes. A random sample of 8,648 of the cues was coded on a matrix designed to accommodate a modified version of the French and Galloway IDER system of behavior analysis described in Appendix A. Special attention was given to the sex differential as identified in the two categories of the system which specified teacher-initiated and student-initiated student talk.

I. SUMMARY

The null hypotheses of the following alternate hypotheses were subjected to chi square tests of significance of difference:

H_1a: Female fifth-grade teachers will initiate significantly more talk with male students than with female students.

H_1b: Female sixth-grade teachers will initiate significantly more talk with male students than with female students.

H_1c: Female fifth and sixth-grade teachers will initiate significantly more talk with male students than with female students.

H_2a: Fifth-grade male students, significantly more often than fifth-grade female students, will initiate talk with female teachers.

H_2b: Sixth-grade male students, significantly more often than sixth-grade female students, will initiate talk with female teachers.

H_2c: Fifth and sixth-grade male students, significantly more often than fifth and sixth-grade female students, will initiate talk with female teachers.

H_3a: Female fifth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_3b: Female sixth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_3c: Female fifth and sixth-grade teachers will exhibit restricting behavior more often toward female than male students during student talk.

H_4: There will be significant sex differences in teacher-student interaction as manifest in verbal and nonverbal behavior cues.

H_5: Female teachers will discriminate significantly between male and female students in favor of the male as manifest in verbal and nonverbal behavior cues.

H_6a: Female fifth and sixth-grade teachers of gifted students will exhibit more indirect than direct behavior cues in the classroom.

H_6b: Female fifth and sixth-grade teachers of gifted students will exhibit more encouraging than restricting behavior cues in the classroom.

The null hypotheses were rejected and the alternate hypotheses were accepted for all except H_3a, H_3b, and H_3c. Although the percentages and ratios of these three exceptions revealed a tendency to differentiate; the differences were not statistically significant.

II. CONCLUSIONS

Within the scope and limitations of this study, the following generalizations were concluded: The female teachers of the fifth and sixth-grade gifted students initiated significantly more talk with male students than with female students; discriminated significantly between male and female students in favor of the male; tended to exhibit more restricting behavior toward female than toward male students; and exhibited more indirectness than directness and encouraging than restricting behavior toward male and female students. Male students, significantly more often than female students, initiated talk with the female teachers.

III. DISCUSSION

The conclusions of the present study, indicating that there are manifest sex differences in female teacher-student interaction significantly in favor of the male student, will likely add to the unresolved theoretical controversies concerning communication in the classroom, interaction analysis, and sex differences. These findings contradict some commonly held beliefs as well as some of the results of research cited in the second chapter's review of literature which reported sex bias in favor of

female students in elementary classes taught by female teachers.

There appears to be a relationship between the results of this investigation and the one carried out by Farrall (1968) which indicated a tendency for positive teacher-student interaction involving students and teachers of the opposite sex. Among other findings, Farrall's study pointed out an apparent, though not statistically significant, sex bias in favor of female fifth and sixth-grade students whose teachers were male. McFarland (1969), in an experiment involving first-grade students and teachers, found a relationship to exist between male teacher participation and improved performance by girls who identified with the male teacher.

While the class sessions of the present study were being videotaped, the investigator recorded an informal tally of the number of times the female teachers called on boys as compared to girls. The total tally showed that boys were called on approximately twice as many times as were the girls. Thus, early in the investigation, a tendency in the direction of more interaction between female teachers and male students than between female teachers and female students began to materialize.

In taped interviews with each of the teachers, the investigator collected information concerning the background

of the teachers and their professed feelings toward their students. Some excerpts from the interviews, which reveal the teachers' preferences to teach boys, are quoted in Appendix C.

A great deal of experimental research is needed before inferences may be made beyond the subjects of this investigation. However, relative to the specific sample of verbal and nonverbal behavior cues generated, and in light of the conclusions concerning the hypotheses, the questions raised in Chapter I may be answered in the affirmative.

1. There were manifest sex differences in teacher-student interaction in the classroom.
2. There was an apparent relationship between teacher-student sex differential and student docility.
3. There was an apparent relationship between sex differential in teacher-student interaction and teacher effectiveness.
4. There was an apparent relationship between sex differential in teacher-student interaction and student participation.
5. Students of the same sex as the teacher demonstrated more passivity in teacher-student verbal and nonverbal interaction than students of the opposite sex.

6. Opposite sex teachers manifested greater flexibility in teacher-student verbal and nonverbal behavior than teachers of the same sex as the student.
7. Opposite sex students responded more often to the teacher than students of the same sex as the teacher.
8. Opposite sex students initiated responses with the teacher more often than same sex students.
9. Teachers tended to exhibit restricting behavior more often toward same sex students than opposite sex students.

IV. IMPLICATIONS FOR FURTHER RESEARCH

1. For a more persuasive presentation of significance of difference than is possible with the present immeasurably small number of restricting behavior cues in student talk categories eight and nine of the IDERS system of interaction analysis used in the present study, it is suggested that in future research other categories be differentiated by sex. This concept was neither evident nor foreseen at the outset of this investigation. For example, Figure 20, Appendix B, reveals that categories three, six, and seven actually contain large clusters of restricting behavior cues, which, if differentiated according to the sex of the students, might

have been statistically significant in terms of H_3a, H_3b, and H_3c.

Category three contains Flanders original verbal dimension representing the teacher's use of the student's ideas and French and Galloway's nonverbal dimension representing the teacher's implemental (encouraging) or perfunctory (restricting) use of the student's idea. Data were generated to show that, of 620 behavior cues coded in this one category, 219 (35.3 percent) were encouraging (E) and 401 (64.7 percent) were restricting (R). However, while a large number of restricting cues may add to the overall significance of the findings, if the observer-coder is also the investigator, experimenter bias may pose a threat to the internal validity of such an experiment unless some precautionary measures of control are exercised.

2. The present study, with appropriate changes, might be replicated using the verbal and nonverbal behavior cues of experimental and control groups involving male and female teachers as well as male and female students. The significance of differences might be tested with a factorial analysis of variance.

3. The Davidson and Lang (1960) Checklist of Trait Names might be administered to each of the boys and girls and the teachers in the above study or a different study

to check, by sex, the teachers' and students' feelings and attitudes toward each other. The data might be analyzed to consider among other factors the question: Is there an apparent relationship between sex differential and the feelings and attitudes the teachers and students profess toward each other?

4. Since the reliability and consistency of an observer is important, and reliability coefficients must be established in research involving interaction analysis, a question for future research might be: Are there significant differences in the observation and classification of verbal and nonverbal behavior cues between and/or among male and female observers?

5. A study might be designed to determine whether or not there is a significant difference between the achievement of students in a control group and those in an experimental group who use videotaped class sessions as feedback for self-evaluation and behavior change.

6. The same videotaped class sessions used for the present study might be coded by one or more different types of interaction analysis systems to determine if there is a correlation between or among the various results.

7. Differences may well exist between the patterns of verbal and nonverbal behavior teachers exhibit toward same sex students and opposite sex students. For this reason, a study might be carried out to determine whether

or not there are such differences. If differences are found, what are the differences and how may they be utilized for more effective teaching and learning?

8. A study might be designed to test the hypothesis that the greater the emotional aspect (or affective loading) of a classroom situation, the greater the influence of nonverbal communication.

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APPENDIXES

APPENDIX A

THE IDER SYSTEM OF BEHAVIOR ANALYSIS

Schematically, the IDER system appears as follows, according to French (1968, pp. 127-130):

	Indirect - Direct (verbal)	Encouraging - Restricting (nonverbal)
1.	Accepts student feeling	
2.	Praises or encourages	Congruent - Incongruent
3.	Uses student idea	Implement - Perfunctory
4.	Asks questions	Personal - Impersonal
5.	Lectures--gives information	Responsive - Unresponsive
6.	Gives directions	Involve - Dismiss
7.	Criticizes or justifies authority	Firm - Harsh
8.	Student talk (response)	Receptive - Inattentive
9.	Student talk (initiated)	Receptive - Inattentive
10.	Silence or confusion	Comfort - Distress

French and Galloway (1968), the authors of the IDER, attempted "to match the ten verbal categories of Flanders' Interaction Analysis with appropriate nonverbal dimensions. Flanders' concept of direct to indirect teacher influence is incorporated into a larger conceptual framework, a continuum ranging from encouraging to restricting interaction" as shown above. An extensive rationale for each category was provided:

> Category one of the Flanders' system (accepts student feeling) suggests both verbal and nonverbal

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 conjoint verbal and nonverbal activity.

Flanders category two (praises or encourages) implies 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 believable. 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. Individual styles of teacher behavior are so variant in their consequence congruities and incongruities can appear in many behavioral manifestations. Praise and encouragement are demanding behaviors for teachers and incongruities occur most frequently when praising or encouraging students. An important ground rule to be noted in observing teacher praise and encouragement is that all behavior should be viewed as congruent until it is obvious that an incongruity is evident.

The nonverbal consequences of category three (uses student idea) is 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 makes 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 or pro forma. Conversely, a teacher may respond by using a student's idea 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 acknowledgment of student ideas, and can be understood as truly using or implementing ideas. Both perfunctory and implementing teacher response are largely dependent upon the purpose and direction of teacher response. While nonverbal cues are always present, they are often fewer and more mechanical in a perfunctory response. A perfunctory use of a student idea undoubtedly provides steady reinforcement, and the value of this response cannot be denied. But the active involvement and partial reinforcement provided by implementing student ideas in discussion is important to fostering classroom interactions and classroom learning.

Teacher question-asking (category four) of the Flanders system, can be 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 feeling 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.

Lecture or giving information (category five) can be observed in light of teacher ability or willingness to use pupil nonverbal responses as cues to guide teacher talk. A teacher can 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 restive, bored, disinterested, or inattentive, the teacher may change the pace or direction of his own talk--this 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 relation of pupil nonverbal behavior to their verbal performance--teacher talk that continues in the face of unreceptive student behavior is unresponsive. A significant dimension in a description of teacher information-giving behavior is the response of pupil behavior to teacher talk, and the teacher's use of that feedback.

Category six (gives directions) can be viewed as behaviors that involve or dismiss students. Teacher directions can involve students in a clarification of either maintenance or learning tasks; or they can dismiss or control student behavior. While involving behaviors facilitate further pupil-teacher interactions, controlling behaviors restrict interaction. Facilitating directions get across to students the idea that learning is a conjoint venture in which both pupils and teacher have a mutual purpose. Dismissing directions tend to be punitive. The notion is communicated that the teacher would rather not clarify with directions but would rather control activity independent of student involvement.

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. It is almost needless to point out that teacher nonverbal expressions most often provide the means for differentiating between criticisms or authority justifications that make the difference between appearing firm or harsh.

Flanders separates 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 is used as a "catch-all" category, and possesses little inherent value. Yet, there are different kinds of silence and confusion which can exist in a classroom. The dimension of comfort or distress is useful for recording the distinction--comfortable silence 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, 1968, pp. 127-130)

The IDER system is designed to enable an observer to use the categories, time intervals, and ground rules of the original Flanders system, while encoding nonverbal behaviors simultaneously with verbal ones. By marking a slash (encouraging) or dash (restricting) to the right of recorded numerical tallies, the observer can record both dimensions of teacher behavior within the allotted three-second interval. The appropriate category number circled is used to designate a teacher behavior which is solely nonverbal. (p. 130)

APPENDIX B

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	1
ROW 2	0	0	1	0	0	0	1	0	1	0	1	0	4	0	1	0	0	0	1	0	2	0	0	0	2	0	0	0	11	0
ROW 3	0	0	2	0	3	0	24	0	11	0	1	0	4	0	0	0	0	0	0	0	1	0	1	0	2	0	4	0	51	0
ROW 4	0	0	1	0	2	1	13	0	1	0	4	0	1	4	9	0	4	0	13	0	28	0	12	0	40	0	24	0	99	5
ROW 5	0	0	1	0	1	0	13	0	12	0	13	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	7	0	49	0
ROW 6	0	0	1	0	0	0	9	0	2	0	15	4	0	0	1	0	0	0	1	0	1	0	2	0	3	0	8	0	39	4
ROW 7	0	0	1	0	2	0	11	0	1	0	1	1	11	1	0	0	0	0	0	0	1	0	0	0	1	0	2	0	30	2
ROW 8	1	0	0	0	7	0	1	0	1	0	2	0	0	1	7	0	1	0	8	0	0	0	0	0	0	0	1	0	21	1
ROW 9	2	0	1	0	16	10	14	0	5	0	0	1	2	2	0	0	0	0	0	0	123	19	72	26	195	45	4	0	239	58
ROW 10	2	0	2	0	5	4	16	0	4	0	7	1	1	2	0	0	0	0	0	0	7	0	0	0	7	0	11	0	55	7

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	5	10	36	104	38	45	23	18	5	23	165	87	252	62	598
T R	0	0	15	0	0	8	10	0	0	0	19	26	45	0	78
T ER	5	10	51	104	38	53	33	18	5	23	184	113	297	62	676
% E	100.0	100.0	70.6	100.0	100.0	84.9	69.7	100.0	100.0	100.0	89.7	77.0	84.8	100.0	88.5
% R	0.0	0.0	29.4	0.0	0.0	15.1	30.3	0.0	0.0	0.0	10.3	23.0	15.2	0.0	11.5

IDERS RATIOS

I/D(LARGE)	= 1.371	S(M8)/T	= 0.061
I/D(SMALL)	= 0.767	S(M9)/T	= 0.626
S/T	= 1.088	S(F8)/T	= 0.017
S(M)/T	= 0.687	S(F9)/T	= 0.384
S(F)/T	= 0.401	E/R	= 7.667

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	7.348
COL	9M	VS COL	9F	=	16.973
COL	8-9M	VS COL	8-9F	=	22.050

Figure 2. IDERS computerized analysis of videotaped session one taught by fifth grade female teacher one.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW	2	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
ROW	3	0	0	2	0	1	0	22	0	17	0	9	0	0	0	0	0	0	0	0	0	2	0	1	0	3	0	8	0	62	0
ROW	4	1	0	0	0	0	0	6	0	3	0	4	0	0	0	14	0	12	0	26	0	34	0	15	0	49	0	21	0	110	0
ROW	5	0	0	1	0	0	0	23	0	77	0	5	9	2	0	0	0	0	0	0	0	2	0	0	0	2	0	3	0	113	9
ROW	6	0	0	0	0	0	0	14	0	3	0	20	2	1	3	0	0	0	0	0	0	6	0	1	0	7	0	8	0	53	5
ROW	7	0	0	0	0	0	0	3	0	2	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3	0	12	0
ROW	8	0	0	0	0	0	12	7	0	3	0	1	0	2	0	12	0	3	0	15	0	1	0	0	0	1	0	0	0	29	12
ROW	9	1	0	1	0	17	21	16	0	4	0	2	0	1	1	0	0	0	0	0	0	37	0	13	0	50	0	5	0	97	22
ROW	10	0	0	0	0	10	51	70	0	100	0	90	0	10	10	10	0	0	0	10	0	3	0	0	0	3	0	39	0	332	61

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	2	4	28	164	209	135	16	36	15	51	86	30	116	87	812
T	R	0	0	84	0	0	11	14	0	0	0	0	0	0	0	109
T	ER	2	4	112	164	209	146	30	36	15	51	86	30	116	87	921
%	E	100.0	100.0	25.0	100.0	100.0	92.5	53.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	88.2
%	R	0.0	0.0	75.0	0.0	0.0	7.5	46.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8

IDERS RATIOS

I/D(LARGE)	= 0.732	S(M8)/T	= 0.054
I/D(SMALL)	= 0.670	S(M9)/T	= 0.129
S/T	= 0.250	S(F8)/T	= 0.022
S(M)/T	= 0.183	S(F9)/T	= 0.045
S(F)/T	= 0.067	E/R	= 7.450

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	8.647
COL	9M	VS COL	9F	=	27.034
COL	8-9M	VS COL	8-9F	=	35.503

Figure 3. IDERS computerized analysis of videotaped session two taught by fifth grade female teacher one.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	F	R
ROW 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW 2	0	0	0	0	1	0	4	0	5	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0	14	0
ROW 3	0	0	3	0	2	9	25	0	31	0	2	0	1	0	3	0	0	0	3	0	0	0	0	0	0	0	1	0	68	9
ROW 4	1	0	0	0	0	2	29	0	6	0	1	0	0	0	56	0	19	0	75	0	3	0	1	0	4	0	33	0	149	2
ROW 5	0	0	1	0	3	0	45	0	131	0	8	0	3	0	1	0	0	0	1	0	4	0	1	0	5	0	12	0	209	0
ROW 6	0	0	0	0	0	0	4	0	1	0	20	3	0	0	1	0	0	0	1	0	1	0	1	0	2	0	8	0	36	3
ROW 7	0	0	0	0	0	0	4	0	3	0	1	0	3	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	13	1
ROW 8	0	0	1	0	1	51	14	0	6	0	3	0	2	0	91	0	65	3	156	3	0	0	0	0	0	0	2	0	185	54
ROW 9	0	0	2	0	1	3	2	0	1	0	0	0	1	1	0	0	0	0	0	0	34	0	6	0	40	0	29	0	76	4
ROW 10	0	0	6	0	1	5	15	0	27	0	1	0	2	0	1	0	2	0	3	0	1	0	0	0	1	0	0	0	56	5

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	1	13	9	142	211	36	12	155	86	241	43	9	52	89	806
T R	0	0	70	0	0	3	2	0	3	3	0	0	0	0	78
T ER	1	13	79	142	211	39	14	155	89	244	43	9	52	89	884
% E	100.0	100.0	11.4	100.0	100.0	92.3	85.7	100.0	96.6	98.8	100.0	100.0	100.0	100.0	91.2
% R	0.0	0.0	88.6	0.0	0.0	7.7	14.3	0.0	3.4	1.2	0.0	0.0	0.0	0.0	8.8

IDERS RATIOS

I/D(LARGE)	= 0.890	S(M8)/T	= 0.311
I/D(SMALL)	= 1.755	S(M9)/T	= 0.086
S/T	= 0.593	S(F8)/T	= 0.178
S(M)/T	= 0.397	S(F9)/T	= 0.018
S(F)/T	= 0.196	E/R	= 10.333

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	17.852
COL	9M	VS COL	9F	=	22.231
COL	8-9M	VS COL	8-9F	=	33.784

Figure 4. IDERS computerized analysis of videotaped session three taught by fifth grade female teacher one.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	1
ROW	2	0	0	1	0	1	0	8	0	6	0	2	0	4	0	2	0	0	0	2	0	2	0	0	0	2	0	3	0	29	0
ROW	3	0	0	7	0	6	9	71	0	59	0	12	0	5	0	3	0	0	0	3	0	3	0	2	0	5	0	13	0	181	9
ROW	4	2	0	1	0	2	3	48	0	10	0	9	0	1	4	79	0	35	0	114	0	65	0	28	0	93	0	78	0	358	7
ROW	5	0	0	3	0	4	0	81	0	220	0	26	9	5	0	1	0	0	0	1	0	8	0	1	0	9	0	22	0	371	9
ROW	6	0	0	1	0	0	0	27	0	6	0	55	9	1	3	2	0	0	0	2	0	8	0	4	0	12	0	24	0	128	12
ROW	7	0	0	1	0	2	0	18	0	6	0	5	1	14	2	1	0	0	0	1	0	2	0	0	0	2	0	6	0	55	3
ROW	8	1	0	1	0	8	63	22	0	10	0	6	0	4	1	110	0	69	3	179	3	1	0	0	0	1	0	3	0	235	67
ROW	9	3	0	4	0	34	34	32	0	10	0	2	1	4	4	0	0	0	0	0	0	194	19	91	26	285	45	38	0	412	84
ROW	10	2	0	8	0	16	60	101	0	131	0	98	1	13	12	11	0	2	0	13	0	11	0	0	0	11	0	50	0	443	73

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	8	27	73	410	458	216	51	209	106	315	294	126	420	238	2216
T	R	0	0	169	0	0	22	26	0	3	3	19	26	45	0	265
T	ER	8	27	242	410	458	238	77	209	109	318	313	152	465	238	2481
%	E	100.0	100.0	30.2	100.0	100.0	90.8	66.2	100.0	97.2	99.1	93.9	82.9	90.3	100.0	89.3
%	R	0.0	0.0	69.8	0.0	0.0	9.2	33.8	0.0	2.8	0.9	6.1	17.1	9.7	0.0	10.7

IDERS RATIOS

I/D(LARGE)	= 0.889	S(M8)/T	= 0.143
I/D(SMALL)	= 0.879	S(M9)/T	= 0.214
S/T	= 0.536	S(F8)/T	= 0.075
S(M)/T	= 0.358	S(F9)/T	= 0.104
S(F)/T	= 0.179	E/R	= 8.362

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	31.447
COL	9M	VS COL	9F	=	55.744
COL	8-9M	VS COL	8-9F	=	87.000

Figure 5. IDERS computerized analysis of three videotaped sessions taught by fifth grade female teacher one.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	6	0
ROW	2	0	0	0	0	1	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	9	0
ROW	3	0	0	1	0	2	0	10	0	6	0	9	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	12	0	44	0
ROW	4	1	0	0	0	2	0	5	0	1	0	5	0	0	0	10	0	6	0	16	0	24	0	10	0	34	0	14	0	78	0
ROW	5	0	0	1	0	1	0	9	0	16	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	12	0	42	0
ROW	6	0	0	1	0	0	0	14	0	0	0	47	0	1	0	2	0	2	0	4	0	2	0	1	0	3	0	18	0	88	0
ROW	7	0	0	0	0	1	0	1	0	0	0	3	0	5	0	0	0	2	0	2	0	1	0	0	0	1	0	1	0	14	0
ROW	8	0	0	0	0	5	7	5	0	0	0	0	0	2	0	35	0	37	0	72	0	0	0	0	0	0	0	2	0	86	7
ROW	9	2	0	4	0	10	5	8	0	4	0	6	0	3	2	0	0	0	0	0	0	71	0	34	0	105	0	1	0	143	7
ROW	10	2	0	3	0	7	2	19	0	14	0	13	1	1	0	0	0	0	0	0	0	2	0	2	0	4	0	58	0	121	3

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	5	10	29	74	42	86	13	47	47	94	106	47	153	125	631
T	R	0	0	14	0	0	1	2	0	0	0	0	0	0	0	17
T	ER	5	10	43	74	42	87	15	47	47	94	106	47	153	125	648
%	E	100.0	100.0	67.4	100.0	100.0	98.9	86.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.4
%	R	0.0	0.0	32.6	0.0	0.0	1.1	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6

IDERS RATIOS

I/D(LARGE)	= 0.917	S(M8)/T	= 0.170
I/D(SMALL)	= 0.569	S(M9)/T	= 0.384
S/T	= 0.895	S(F8)/T	= 0.170
S(M)/T	= 0.554	S(F9)/T	= 0.170
S(F)/T	= 0.341	E/R	= 37.118

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	0.0
COL	9M	VS COL	9F	=	22.752
COL	8-9M	VS COL	8-9F	=	14.093

Figure 6. IDERS computerized analysis of videotaped session four taught by fifth grade female teacher two.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW 2	0	0	0	0	1	0	3	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	7	1
ROW 3	0	0	2	0	0	0	18	0	6	0	2	0	0	0	1	0	0	0	1	0	3	0	2	0	5	0	7	0	41	0
ROW 4	0	0	0	0	0	0	4	0	5	0	2	0	0	0	29	0	21	0	50	0	5	0	1	0	6	0	38	0	105	0
ROW 5	0	0	0	0	0	1	22	0	15	0	5	1	1	0	0	0	0	0	0	0	4	0	2	0	6	0	16	0	65	2
ROW 6	0	0	0	0	0	0	7	0	2	0	40	0	0	0	4	0	1	0	5	0	6	0	2	0	8	0	17	0	79	0
ROW 7	0	0	0	0	0	0	3	0	2	0	1	0	0	0	0	1	0	0	0	1	2	0	0	0	2	0	3	0	11	1
ROW 8	0	0	4	0	5	16	14	0	5	0	5	0	3	1	10	0	6	0	16	0	2	0	2	0	4	0	5	0	61	17
ROW 9	0	0	0	0	1	8	5	0	10	0	14	1	5	1	0	0	0	0	0	0	1	0	0	0	1	0	3	0	39	10
ROW 10	0	0	3	0	8	5	27	0	20	0	9	1	0	1	0	0	0	0	0	0	10	0	6	0	16	0	34	0	117	7

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	0	9	15	103	66	79	9	44	28	72	34	15	49	123	525
T R	0	0	30	0	0	4	3	1	0	1	0	0	0	0	38
T FR	0	9	45	103	66	83	12	45	28	73	34	15	49	123	563
% E	0.0	100.0	33.3	100.0	100.0	95.2	75.0	97.8	100.0	98.6	100.0	100.0	100.0	100.0	93.3
% R	0.0	0.0	66.7	0.0	0.0	4.8	25.0	2.2	0.0	1.4	0.0	0.0	0.0	0.0	6.7

IDERS RATIOS

I/D(LARGE)	= 0.975	S(M8)/T	= 0.142
I/D(SMALL)	= 0.568	S(M9)/T	= 0.107
S/T	= 0.384	S(F8)/T	= 0.088
S(M)/T	= 0.248	S(F9)/T	= 0.047
S(F)/T	= 0.135	E/R	= 13.816

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	3.959
COL	9M	VS COL	9F	=	7.367
COL	8-9M	VS COL	8-9F	=	10.623

Figure 7. IDERS computerized analysis of videotaped session five taught by fifth grade female teacher two.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	F	R	E	R	F	R	F	R
ROW	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	1
ROW	2	0	0	0	0	0	0	2	0	1	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0
ROW	3	0	0	1	0	2	0	11	0	6	0	4	0	2	0	0	0	2	0	2	0	2	0	0	0	2	0	5	0	35	0
ROW	4	1	0	1	0	0	0	4	0	6	0	2	0	0	0	37	0	17	0	54	0	3	0	5	0	8	0	44	0	120	0
ROW	5	1	0	0	0	0	0	11	0	20	0	5	0	0	1	0	0	3	0	3	0	4	0	2	0	6	0	23	0	69	1
ROW	6	0	0	0	0	0	0	8	0	4	0	22	3	1	0	0	0	1	0	1	0	6	0	2	0	8	0	16	0	60	3
ROW	7	0	0	1	0	0	0	7	0	2	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	16	2
ROW	8	1	0	2	0	0	9	19	0	3	0	5	0	0	2	10	0	11	0	21	0	2	0	3	0	5	0	20	0	76	11
ROW	9	0	0	0	0	5	5	9	0	11	0	6	0	3	1	1	0	0	0	1	0	2	0	4	0	6	0	2	0	43	6
ROW	10	0	0	1	0	4	4	45	0	20	0	10	1	4	2	5	0	3	0	8	0	9	0	2	0	11	0	16	0	119	7

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	3	7	11	116	73	59	10	54	37	91	28	19	47	129	546
T	R	0	0	18	0	0	4	9	0	0	0	0	0	0	0	31
T	ER	3	7	29	116	73	63	19	54	37	91	28	19	47	129	577
%	E	100.0	100.0	37.9	100.0	100.0	93.7	52.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.6
%	R	0.0	0.0	62.1	0.0	0.0	6.3	47.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4

IDERS RATIOS

I/D(LARGE)	= 1.000	S(M8)/T	= 0.174
I/D(SMALL)	= 0.476	S(M9)/T	= 0.090
S/T	= 0.445	S(F8)/T	= 0.119
S(M)/T	= 0.265	S(F9)/T	= 0.061
S(F)/T	= 0.181	E/R	= 17.613

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	3.176
COL	9M	VS COL	9F	=	1.723
COL	8-9M	VS COL	8-9F	=	4.899

Figure 8. IDERS computerized analysis of videotaped session six taught by fifth grade female teacher two.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	5	0	8	1
ROW	2	0	0	0	0	2	0	8	0	3	0	4	1	0	0	1	0	0	0	1	0	2	0	0	0	2	0	2	0	22	1
ROW	3	0	0	4	0	4	0	39	0	18	0	15	0	3	0	1	0	2	0	3	0	8	0	2	0	10	0	24	0	120	0
ROW	4	2	0	1	0	2	0	13	0	12	0	9	0	0	0	76	0	44	0	120	0	32	0	16	0	48	0	96	0	303	0
ROW	5	1	0	1	0	1	1	42	0	51	0	11	1	1	1	0	0	3	0	3	0	10	0	4	0	14	0	51	0	176	3
ROW	6	0	0	1	0	0	0	29	0	6	0	109	3	2	0	6	0	4	0	10	0	14	0	5	0	19	0	51	0	227	3
ROW	7	0	0	1	0	1	0	11	0	4	0	7	0	5	2	0	1	2	0	2	1	3	0	0	0	3	0	7	0	41	3
ROW	8	1	0	6	0	10	32	38	0	8	0	10	0	5	3	55	0	54	0	109	0	4	0	5	0	9	0	27	0	223	35
ROW	9	2	0	4	0	16	18	22	0	25	0	26	1	11	4	1	0	0	0	1	0	74	0	38	0	112	0	6	0	225	23
ROW	10	2	0	7	0	19	11	91	0	54	0	32	3	5	3	5	0	3	0	8	0	21	0	10	0	31	0	108	0	357	17

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	8	26	55	293	181	224	32	145	112	257	168	81	249	377	1702
T	R	0	0	62	0	0	9	14	1	0	1	0	0	0	0	86
T	ER	8	26	117	293	181	233	46	146	112	258	168	81	249	377	1788
%	E	100.0	100.0	47.0	100.0	100.0	96.1	69.6	99.3	100.0	99.6	100.0	100.0	100.0	100.0	95.2
%	R	0.0	0.0	53.0	0.0	0.0	3.9	30.4	0.7	0.0	0.4	0.0	0.0	0.0	0.0	4.8

IDERS RATIOS

I/D(LARGE)	= 0.965	S(M8)/T	= 0.162
I/D(SMALL)	= 0.541	S(M9)/T	= 0.186
S/T	= 0.561	S(F8)/T	= 0.124
S(M)/T	= 0.347	S(F9)/T	= 0.090
S(F)/T	= 0.213	E/R	= 19.791

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	4.481
COL	9M	VS COL	9F	=	30.398
COL	8-9M	VS COL	8-9F	=	28.878

Figure 9. IDERS computerized analysis of three videotaped sessions taught by fifth grade female teacher two.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	1	0	0	0	2	0	0	0	2	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	6	0	12	2
ROW	2	0	0	1	0	3	0	16	0	9	0	6	1	4	0	3	0	0	0	3	0	4	0	0	0	4	0	5	0	51	1
ROW	3	0	0	11	0	10	9	110	0	77	0	27	0	8	0	4	0	2	0	6	0	11	0	4	0	15	0	37	0	301	9
ROW	4	4	0	2	0	4	3	61	0	22	0	18	0	1	4	155	0	79	0	234	0	97	0	44	0	141	0	174	0	661	7
ROW	5	1	0	4	0	5	1	123	0	271	0	37	10	6	1	1	0	3	0	4	0	18	0	5	0	23	0	73	0	547	12
ROW	6	0	0	2	0	0	0	56	0	12	0	164	12	3	3	8	0	4	0	12	0	22	0	9	0	31	0	75	0	355	15
ROW	7	0	0	2	0	3	0	29	0	10	0	12	1	19	4	1	1	2	0	3	1	5	0	0	0	5	0	13	0	96	6
ROW	8	2	0	7	0	18	95	60	0	18	0	16	0	9	4	165	0	123	3	288	3	5	0	5	0	10	0	30	0	458	102
ROW	9	5	0	8	0	50	52	54	0	35	0	28	2	15	8	1	0	0	0	1	0	268	19	129	26	397	45	44	0	637	107
ROW	10	4	0	15	0	35	71	192	0	185	0	130	4	18	15	16	0	5	0	21	0	32	0	10	0	42	0	158	0	800	90

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	16	53	128	703	639	440	83	354	218	572	462	207	669	615	3918
T	R	0	0	231	0	0	31	40	1	3	4	19	26	45	0	351
T	ER	16	53	359	703	639	471	123	355	221	576	481	233	714	615	4269
%	E	100.0	100.0	35.7	100.0	100.0	93.4	67.5	99.7	98.6	99.3	96.0	88.8	93.7	100.0	91.8
%	R	0.0	0.0	64.3	0.0	0.0	6.6	32.5	0.3	1.4	0.7	4.0	11.2	6.3	0.0	8.2

IDERS RATIOS

I/D(LARGE)	= 0.917	S(M8)/T	= 0.150
I/D(SMALL)	= 0.721	S(M9)/T	= 0.203
S/T	= 0.546	S(F8)/T	= 0.093
S(M)/T	= 0.354	S(F9)/T	= 0.099
S(F)/T	= 0.192	E/R	= 11.162

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	31.174
COL	9M	VS COL	9F	=	86.140
COL	8-9M	VS COL	8-9F	=	113.119

Figure 10. IDERS computerized analysis of six videotaped sessions taught by two fifth grade female teachers.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW 3	0	0	0	0	0	0	20	0	19	0	2	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	44	0
ROW 4	0	0	0	0	1	1	30	0	2	0	1	0	0	0	43	0	17	0	60	0	0	0	1	0	1	0	28	0	123	1
ROW 5	0	0	0	0	0	0	21	0	185	0	12	0	3	0	0	0	0	0	0	0	1	0	0	0	1	0	8	0	230	0
ROW 6	0	0	0	0	0	0	2	0	6	0	35	0	0	0	0	0	2	0	2	0	0	0	2	0	2	0	8	0	55	0
ROW 7	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	0
ROW 8	0	0	0	0	4	27	26	0	3	0	1	0	0	0	85	2	50	3	135	5	3	0	2	0	5	0	3	0	177	32
ROW 9	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	2	0	3	0	2	0	7	0	9	0	1	0	16	0
ROW 10	0	0	0	0	1	12	20	0	11	0	3	0	1	0	0	0	1	0	1	0	2	0	0	0	2	0	84	0	123	12

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	0	0	6	119	230	55	6	131	72	203	8	12	20	135	774
T R	0	0	40	0	0	0	0	2	3	5	0	0	0	0	45
T ER	0	0	46	119	230	55	6	133	75	208	8	12	20	135	819
% E	0.0	0.0	13.0	100.0	100.0	100.0	100.0	98.5	96.0	97.6	100.0	100.0	100.0	100.0	94.5
% R	0.0	0.0	87.0	0.0	0.0	0.0	0.0	1.5	4.0	2.4	0.0	0.0	0.0	0.0	5.5

IDERS RATIOS

I/D(LARGE) =	0.567	S(M8)/T =	0.292
I/D(SMALL) =	0.754	S(M9)/T =	0.018
S/T =	0.500	S(F8)/T =	0.164
S(M)/T =	0.309	S(F9)/T =	0.026
S(F)/T =	0.191	E/R =	17.200

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	16.173
COL	9M	VS COL	9F	=	0.800
COL	8-9M	VS COL	8-9F	=	12.789

Figure 11. IDERS computerized analysis of videotaped session seven taught by sixth grade female teacher three.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW 2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	4	0
ROW 3	0	0	2	0	0	0	31	0	13	0	0	0	0	0	3	0	0	0	3	0	2	0	0	0	2	0	1	0	52	0
ROW 4	0	0	0	0	0	1	31	0	0	0	0	0	1	0	57	0	38	0	95	0	3	0	0	0	3	0	27	0	157	1
ROW 5	0	0	0	0	0	0	16	0	77	0	3	0	0	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	99	0
ROW 6	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	10	0
ROW 7	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0
ROW 8	0	0	1	0	3	39	46	0	6	0	1	0	1	0	174	0	112	1	286	1	3	0	0	0	3	0	0	0	347	40
ROW 9	0	0	0	0	1	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	42	0	2	0	44	0	0	0	47	6
ROW 10	0	0	0	0	0	3	26	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	5	0	35	3

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	0	3	4	155	99	10	3	235	153	388	51	3	54	38	754
T R	0	0	49	0	0	0	0	0	1	1	0	0	0	0	50
T ER	0	3	53	155	99	10	3	235	154	389	51	3	54	38	804
% E	0.0	100.0	7.5	100.0	100.0	100.0	100.0	100.0	99.4	99.7	100.0	100.0	100.0	100.0	93.8
% R	0.0	0.0	92.5	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	6.2

IDERS RATIOS

I/D(LARGE)	= 1.884	S(M8)/T	= 0.728
I/D(SMALL)	= 4.308	S(M9)/T	= 0.158
S/T	= 1.372	S(F8)/T	= 0.477
S(M)/T	= 0.885	S(F9)/T	= 0.009
S(F)/T	= 0.486	E/R	= 15.080

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	16.866
COL	9M	VS COL	9F	=	42.667
COL	8-9M	VS COL	8-9F	=	37.564

Figure 12. IDERS computerized analysis of videotaped session eight taught by sixth grade female teacher three.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW 2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW 3	0	0	1	0	0	1	17	0	2	0	1	0	0	0	3	0	1	0	4	0	0	0	0	0	0	0	3	0	28	1
ROW 4	0	0	0	0	0	0	35	0	1	0	1	0	0	0	28	0	35	0	63	0	3	0	0	0	3	0	20	0	123	0
ROW 5	0	0	0	0	0	0	13	0	60	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	76	0
ROW 6	0	0	0	0	0	0	1	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8	0
ROW 7	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4	0
ROW 8	1	0	0	0	1	27	31	0	5	0	0	0	1	0	63	0	86	0	149	0	0	0	0	0	0	0	1	0	189	27
ROW 9	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	287	37	0	0	287	37	2	0	293	37
ROW 10	0	0	0	0	1	1	17	0	5	0	2	0	1	0	0	0	0	0	0	0	45	5	0	0	45	5	5	0	76	6

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	F	1	1	2	120	76	9	4	94	122	216	336	0	336	34	799
T	P	0	0	29	0	0	0	0	0	0	0	42	0	42	0	71
T	ER	1	1	31	120	76	9	4	94	122	216	378	0	378	34	870
%	E	100.0	100.0	6.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	88.9	0.0	88.9	100.0	91.8
%	R	0.0	0.0	93.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	11.1	0.0	8.2

IDERS RATIOS

I/D(LARGE)	= 1.719	S(M8)/T	= 0.388
I/D(SMALL)	= 2.538	S(M9)/T	= 1.562
S/T	= 2.455	S(F8)/T	= 0.504
S(M)/T	= 1.950	S(F9)/T	= 0.0
S(F)/T	= 0.504	E/R	= 11.254

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	3.630
COL	9M	VS COL	9F	=	378.000
COL	8-9M	VS COL	8-9F	=	206.229

Figure 13. IDERS computerized analysis of videotaped session nine taught by sixth grade female teacher three.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW 2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	5	0
ROW 3	0	0	3	0	0	1	68	0	34	0	3	0	0	0	8	0	1	0	9	0	2	0	0	0	2	0	5	0	124	1
ROW 4	0	0	0	0	1	2	96	0	3	0	2	0	1	0	128	0	90	0	218	0	6	0	1	0	7	0	75	0	403	2
ROW 5	0	0	0	0	0	0	50	0	322	0	16	0	4	0	0	0	2	0	2	0	1	0	1	0	2	0	9	0	405	0
ROW 6	0	0	0	0	0	0	3	0	7	0	45	0	0	0	0	0	2	0	2	0	0	0	2	0	2	0	14	0	73	0
ROW 7	0	0	0	0	0	0	4	0	2	0	1	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	3	0	13	0
ROW 8	1	0	1	0	8	93	103	0	14	0	2	0	2	0	322	2	248	4	570	6	6	0	2	0	8	0	4	0	713	99
ROW 9	0	0	0	0	1	6	4	0	4	0	0	0	1	0	1	0	2	0	3	0	331	37	9	0	340	37	3	0	356	43
ROW 10	0	0	0	0	2	16	63	0	18	0	5	0	3	0	0	0	1	0	1	0	48	5	0	0	48	5	94	0	234	21

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	1	4	12	394	405	74	13	460	347	807	395	15	410	207	2327
T	R	0	0	118	0	0	0	0	2	4	6	42	0	42	0	166
T	ER	1	4	130	394	405	74	13	462	351	813	437	15	452	207	2493
%	E	100.0	100.0	9.2	100.0	100.0	100.0	100.0	99.6	98.9	99.3	90.4	100.0	90.7	100.0	93.3
%	R	0.0	0.0	90.8	0.0	0.0	0.0	0.0	0.4	1.1	0.7	9.6	0.0	9.3	0.0	6.7

IDERS RATIOS

I/D(LARGE)	= 1.075	S(M8)/T	= 0.452
I/D(SMALL)	= 1.552	S(M9)/T	= 0.428
S/T	= 1.239	S(F8)/T	= 0.344
S(M)/T	= 0.881	S(F9)/T	= 0.015
S(F)/T	= 0.358	E/R	= 14.018

CHI SQUARE ANALYSIS

COL	8M	VS	COL	8F	= 15.155
COL	9M	VS	COL	9F	= 393.991
COL	8-9M	VS	COL	8-9F	= 224.576

Figure 14. IDERS computerized analysis of three videotaped sessions taught by sixth grade female teacher three.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R		E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW	2	0	0	0	0	3	0	11	0	2	0	1	1	0	0	0	0	0	0	0	0	3	0	1	0	4	0	2	0	23	1
ROW	3	0	0	3	0	13	0	36	0	6	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	63	0
ROW	4	0	0	0	0	3	0	24	0	5	0	3	0	0	0	0	0	1	0	1	0	28	0	24	0	52	0	26	0	114	0
ROW	5	0	0	2	0	2	0	16	0	27	0	3	0	0	0	0	0	0	0	0	0	3	0	6	0	9	0	1	0	60	0
ROW	6	0	0	0	0	0	0	7	0	6	0	7	1	0	0	0	0	0	0	0	0	7	0	2	0	9	0	6	0	35	1
ROW	7	0	0	0	0	0	0	1	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
ROW	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW	9	1	0	15	0	32	6	11	0	12	0	5	6	0	0	0	0	0	0	0	0	165	0	76	0	241	0	3	0	320	12
ROW	10	0	0	5	0	4	1	7	0	2	0	6	0	0	0	0	0	0	0	0	0	11	0	5	0	16	0	5	0	45	1

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	1	25	57	114	62	27	6	0	1	1	218	114	332	44	669
T	R	0	0	7	0	0	8	0	0	0	0	0	0	0	0	15
T	ER	1	25	64	114	62	35	6	0	1	1	218	114	332	44	684
%	E	100.0	100.0	89.1	100.0	100.0	77.1	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	97.8
%	R	0.0	0.0	10.9	0.0	0.0	22.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2

IDERS RATIOS

I/D(LARGE)	= 1.981	S(M8)/T	= 0.0
I/D(SMALL)	= 2.195	S(M9)/T	= 0.710
S/T	= 1.085	S(F8)/T	= 0.003
S(M)/T	= 0.710	S(F9)/T	= 0.371
S(F)/T	= 0.375	E/R	= 44.600

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	1.000
COL	9M	VS COL	9F	=	32.578
COL	8-9M	VS COL	8-9F	=	31.859

Figure 15. IDERS computerized analysis of videotaped session ten taught by sixth grade female teacher four.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
ROW	2	1	0	1	0	2	2	12	0	1	0	0	3	0	0	1	0	0	0	1	0	4	0	0	0	4	0	0	0	22	5
ROW	3	0	0	2	0	0	1	19	0	2	0	1	1	0	0	2	0	0	0	2	0	4	0	1	0	5	0	1	0	32	2
ROW	4	0	0	3	0	0	1	7	0	3	0	7	5	1	0	20	0	9	0	29	0	17	0	6	0	23	0	16	0	89	6
ROW	5	0	0	0	0	0	1	13	0	11	0	0	0	0	0	3	0	0	0	3	0	4	0	1	0	5	0	5	0	37	1
ROW	6	0	0	2	0	1	0	7	0	1	0	4	2	1	0	2	0	0	0	2	0	8	0	3	0	11	0	6	0	35	2
ROW	7	0	0	0	0	0	0	2	0	1	0	1	2	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	6	2
ROW	8	0	0	5	0	1	10	16	1	3	0	1	2	2	0	1	0	2	0	3	0	12	0	0	0	12	0	25	0	68	13
ROW	9	0	0	10	0	0	11	6	0	4	0	1	1	3	0	1	0	0	0	1	0	12	0	1	0	13	0	79	0	117	12
ROW	10	0	0	6	0	2	0	19	1	9	0	0	6	1	0	0	0	1	0	1	0	57	0	30	0	87	0	29	0	154	7

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	1	29	6	101	36	15	8	30	12	42	120	42	162	161	561
T	R	0	0	26	2	0	22	0	0	0	0	0	0	0	0	50
T	ER	1	29	32	103	36	37	8	30	12	42	120	42	162	161	611
%	E	100.0	100.0	18.8	98.1	100.0	40.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	91.8
%	R	0.0	0.0	81.3	1.9	0.0	59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2

IDERS RATIOS

I/D(LARGE)	= 2.037	S(M8)/T	= 0.122
I/D(SMALL)	= 1.378	S(M9)/T	= 0.488
S/T	= 0.829	S(F8)/T	= 0.049
S(M)/T	= 0.610	S(F9)/T	= 0.171
S(F)/T	= 0.220	E/R	= 11.220

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	7.714
COL	9M	VS COL	9F	=	37.556
COL	8-9M	VS COL	8-9F	=	45.176

Figure 16. IDERS computerized analysis of videotaped session eleven taught by sixth grade female teacher four.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL		1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW	2	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
ROW	3	0	0	0	0	1	0	12	0	14	0	3	0	2	0	2	0	1	0	3	0	0	0	0	0	0	0	1	0	36	0
ROW	4	0	0	0	0	0	0	14	0	3	0	1	1	0	0	27	0	16	0	43	0	6	0	0	0	6	0	17	0	84	1
ROW	5	0	0	0	0	0	1	21	0	70	0	4	0	1	0	1	0	1	0	2	0	2	0	1	0	3	0	4	0	105	1
ROW	6	0	0	0	0	0	0	8	0	2	0	6	1	1	0	2	0	1	0	3	0	3	0	1	0	4	0	1	0	25	1
ROW	7	0	0	0	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	7	1
ROW	8	0	0	1	0	9	9	19	0	5	0	2	2	1	1	194	0	21	0	215	0	2	0	0	0	2	0	0	0	254	12
ROW	9	0	0	1	0	4	6	1	0	3	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10	0	1	0	20	6
ROW	10	0	0	1	0	2	2	11	0	4	1	2	0	1	1	2	0	0	0	2	0	2	0	0	0	2	0	6	0	31	4

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	0	3	16	87	103	19	7	228	40	268	25	2	27	33	563
T	R	0	1	19	0	1	5	2	0	0	0	0	0	0	0	28
T	ER	0	4	35	87	104	24	9	228	40	268	25	2	27	33	591
%	E	0.0	75.0	45.7	100.0	99.0	79.2	77.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.3
%	R	0.0	25.0	54.3	0.0	1.0	20.8	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7

IDERS RATIOS

I/D(LARGE)	= 0.920	S(M8)/T	= 0.867
I/D(SMALL)	= 1.182	S(M9)/T	= 0.095
S/T	= 1.122	S(F8)/T	= 0.152
S(M)/T	= 0.962	S(F9)/T	= 0.008
S(F)/T	= 0.160	E/R	= 20.107

CHI SQUARE ANALYSIS

COL	8M	VS	COL	8F	= 131.881
COL	9M	VS	COL	9F	= 19.593
COL	8-9M	VS	COL	8-9F	= 150.919

Figure 17. IDERS computerized analysis of videotaped session twelve taught by sixth grade female teacher four.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
ROW 2	1	0	1	1	5	3	23	0	4	0	1	4	0	0	1	0	0	0	1	0	7	0	1	0	8	0	2	0	46	8
ROW 3	0	0	5	0	14	1	67	0	22	0	6	1	3	0	4	0	1	0	5	0	5	0	1	0	6	0	3	0	131	2
ROW 4	0	0	3	0	3	1	45	0	11	0	11	6	1	0	47	0	26	0	73	0	51	0	30	0	81	0	59	0	287	7
ROW 5	0	0	2	0	2	2	50	0	108	0	7	0	1	0	4	0	1	0	5	0	9	0	8	0	17	0	10	0	202	2
ROW 6	0	0	2	0	1	0	22	0	9	0	17	4	2	0	4	0	1	0	5	0	18	0	6	0	24	0	13	0	95	4
ROW 7	0	0	0	0	0	0	4	0	3	0	2	3	6	0	0	0	0	0	0	0	2	0	0	0	2	0	3	0	20	3
ROW 8	0	0	6	0	10	19	36	1	8	0	3	4	3	1	195	0	23	0	218	0	14	0	0	0	14	0	25	0	323	25
ROW 9	1	0	26	0	36	23	18	0	19	0	6	7	3	0	1	0	0	0	1	0	187	0	77	0	264	0	83	0	457	30
ROW 10	0	0	12	0	8	3	37	1	15	1	8	6	2	1	2	0	1	0	3	0	70	0	35	0	105	0	40	0	230	12

CATEGORY TOTALS AND PERCENTAGES

COL		1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T	E	2	57	79	302	201	61	21	258	53	311	363	158	521	238	1793
T	R	0	1	52	2	1	35	2	0	0	0	0	0	0	0	93
T	ER	2	58	131	304	202	96	23	258	53	311	363	158	521	238	1886
%	E	100.0	98.3	60.3	99.3	99.5	63.5	91.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.1
%	R	0.0	1.7	39.7	0.7	0.5	36.5	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9

IDERS RATIOS

I/D(LARGE) =	1.542	S(M8)/T =	0.316
I/D(SMALL) =	1.605	S(M9)/T =	0.445
S/T =	1.020	S(F8)/T =	0.065
S(M)/T =	0.761	S(F9)/T =	0.194
S(F)/T =	0.259	E/R =	19.280

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	135.129
COL	9M	VS COL	9F	=	80.662
COL	8-9M	VS COL	8-9F	=	202.043

Figure 18. IDERS computerized analysis of three videotaped sessions taught by sixth grade female teacher four.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
ROW 2	1	0	1	1	5	3	26	0	4	0	1	4	0	0	2	0	1	0	3	0	7	0	1	0	8	0	2	0	51	8
ROW 3	0	0	8	0	14	2	135	0	56	0	9	1	3	0	12	0	2	0	14	0	7	0	1	0	8	0	8	0	255	3
ROW 4	0	0	3	0	4	3	141	0	14	0	13	6	2	0	175	0	116	0	291	0	57	0	31	0	88	0	134	0	690	9
ROW 5	0	0	2	0	2	2	100	0	430	0	23	0	5	0	4	0	3	0	7	0	10	0	9	0	19	0	19	0	607	2
ROW 6	0	0	2	0	1	0	25	0	16	0	62	4	2	0	4	0	3	0	7	0	18	0	8	0	26	0	27	0	168	4
ROW 7	0	0	0	0	0	0	8	0	5	0	3	3	8	0	0	0	0	0	0	0	3	0	0	0	3	0	6	0	33	3
ROW 8	1	0	7	0	18	112	139	1	22	0	5	4	5	1	517	2	271	4	788	6	20	0	2	0	22	0	29	0	1036	124
ROW 9	1	0	26	0	37	29	22	0	23	0	6	7	4	0	2	0	2	0	4	0	518	37	86	0	604	37	86	0	813	73
ROW 10	0	0	12	0	10	19	100	1	33	1	13	6	5	1	2	0	2	0	4	0	118	5	35	0	153	5	134	0	464	33

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	3	61	91	696	606	135	34	718	400	1118	758	173	931	445	4120
T R	0	1	170	2	1	35	2	2	4	6	42	0	42	0	259
T ER	3	62	261	698	607	170	36	720	404	1124	800	173	973	445	4379
% E	100.0	98.4	34.9	99.7	99.8	79.4	94.4	99.7	99.0	99.5	94.7	100.0	95.7	100.0	94.1
% R	0.0	1.6	65.1	0.3	0.2	20.6	5.6	0.3	1.0	0.5	5.2	0.0	4.3	0.0	5.9

IDERS RATIOS

I/D(LARGE) =	1.260	S(M8)/T =	0.392
I/D(SMALL) =	1.583	S(M9)/T =	0.435
S/T =	1.142	S(F8)/T =	0.220
S(M)/T =	0.827	S(F9)/T =	0.094
S(F)/T =	0.314	E/R =	15.907

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	88.840
COL	9M	VS COL	9F	=	404.038
COL	8-9M	VS COL	8-9F	=	424.058

Figure 19. IDERS computerized analysis of six videotaped sessions taught by two sixth grade female teachers.

TEN CATEGORIES OF TEACHER AND STUDENT BEHAVIOR CUES ENCOURAGING (E) RESTRICTING (R)

COL	1		2		3		4		5		6		7		8M		8F		TOT 8		9M		9F		TOT 9		10		TOTAL	
E R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
ROW 1	0	0	1	0	0	0	2	0	3	0	2	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	6	0	15	2
ROW 2	1	0	2	1	8	3	42	0	13	0	7	5	4	0	5	0	1	0	6	0	11	0	1	0	12	0	7	0	102	9
ROW 3	0	0	19	0	24	11	245	0	133	0	36	1	11	0	16	0	4	0	20	0	18	0	5	0	23	0	45	0	556	12
ROW 4	4	0	5	0	8	6	202	0	36	0	31	6	3	4	330	0	195	0	525	0	154	0	75	0	229	0	308	0	1351	16
ROW 5	1	0	6	0	7	3	223	0	701	0	60	10	11	1	5	0	6	0	11	0	28	0	14	0	42	0	92	0	1154	14
ROW 6	0	0	4	0	1	0	81	0	28	0	226	16	5	3	12	0	7	0	19	0	40	0	17	0	57	0	102	0	523	19
ROW 7	0	0	2	0	3	0	37	0	15	0	15	4	27	4	1	1	2	0	3	1	8	0	0	0	8	0	19	0	129	9
ROW 8	3	0	14	0	36	207	199	1	40	0	21	4	14	5	682	2	394	7	1076	9	25	0	7	0	32	0	59	0	1494	226
ROW 9	6	0	34	0	87	81	76	0	58	0	34	9	19	8	3	0	2	0	5	0	786	56	215	26	1001	82	130	0	1450	180
ROW 10	4	0	27	0	45	90	292	1	218	1	143	10	23	16	18	0	7	0	25	0	150	5	45	0	195	5	292	0	1264	123

CATEGORY TOTALS AND PERCENTAGES

COL	1	2	3	4	5	6	7	8M	8F	TOT 8	9M	9F	TOT 9	10	TOTAL
T E	19	114	219	1399	1245	575	117	1072	618	1690	1220	380	1600	1060	8038
T R	0	1	401	2	1	66	42	3	7	10	61	26	87	0	610
T ER	19	115	620	1401	1246	641	159	1075	625	1700	1281	406	1687	1060	8648
% E	100.0	99.1	35.3	99.9	99.9	89.7	73.6	99.7	98.9	99.4	95.2	93.6	94.8	100.0	92.9
% R	0.0	0.9	64.7	0.1	0.1	10.3	26.4	0.3	1.1	0.6	4.8	6.4	5.2	0.0	7.1

IDERS RATIOS

I/D(LARGE) =	1.053	S(M8)/T =	0.256
I/D(SMALL) =	0.942	S(M9)/T =	0.305
S/T =	0.806	S(F8)/T =	0.149
S(M)/T =	0.561	S(F9)/T =	0.097
S(F)/T =	0.245	E/R =	13.177

CHI SQUARE ANALYSIS

COL	8M	VS COL	8F	=	119.118
COL	9M	VS COL	9F	=	453.838
COL	8-9M	VS COL	8-9F	=	518.342

Figure 20. IDERS computerized analysis of twelve videotaped sessions taught by four fifth and sixth grade female teachers.

APPENDIX C

EXCERPTS FROM TEACHER INTERVIEWS

Fifth-grade: Teacher One

Teacher One is young, attractive, unmarried, and has taught gifted children for a number of years. She and two sisters (no brothers) lived in an orphanage during their childhood where they enjoyed middle class opportunities with television, plenty of books, magazines, newspapers, and encouragement to read and prepare to attend college. Considering herself the teacher's pet when she was in the fifth grade, she was a high achiever throughout elementary and high school primarily, she said, because she wanted to please the teacher and be liked. The following are some excerpts from a taped interview containing some of the feelings she expressed about her gifted students who were among the subjects of the present study:

> Gifted children are children and act as all children do. They are open, outspoken, willing to do anything, work faster, catch on quickly, and think more alike than regular children. They are definitely more responsive and uninhibited in gifted classes. However in regular classes they seem to hold back because they don't want to be known as the smart aleck.

> I don't really see too much difference in the way I feel about boys and girls. Boys have a tendency to be a little more dependent on me for ideas. Whereas girls will go ahead and take the initiative on their own. Boys tend to come to me with more questions. In general, though, it is pretty equal. It seems like I have always had boys coming to me more often than girls. Maybe boys are lazy.

> I have never found gifted boys to have more feminine characteristics than masculine. I have never found any gifted boys who would avoid playing sports or any other such activities. In regular classes, I have had some boys who acted sissy, but they were not my best students. The gifted boys I have taught have always been typical boys.
>
> My gifted girls have appeared to be more aggressive and more active than most girls. I think perhaps they have more masculine traits than gifted boys have feminine traits. Girls are more hesitant to talk unless they are sure of what the teacher wants.

Fifth-grade: Teacher Two

Teacher Two is young, attractive, unmarried, and has taught gifted children for three consecutive summers. She has one brother and no sisters. She has an upper middle-class background and a mother who was a teacher. Since early childhood, Teacher Two says that she has aspired to be a teacher.

> I don't see too much difference in the participation of boys and girls in the gifted classes. Maybe boys do feel more free to answer. They are not afraid of being wrong as girls sometimes tend to be.
>
> I do not think female teachers discriminate against boys. Personally, I prefer that boys have a bit of devilment about them. I do not believe these boys have been feminized or that they have feminine characteristics. I usually have more girls than boys in my regular classes. I don't think I really prefer the boys or the girls. I try not to. Maybe I do. I don't really know.
>
> I don't prefer one over the other. I may call on boys more, if I do, in order to utilize their ideas since there are fewer boys in the regular classes than girls.

> Girls try to please teachers more than boys do. Girls seem to work more independently, but they are supposed to be a bit more mature at this age.

Sixth-grade: Teacher Three

Teacher Three is young, attractive, married, and enjoying her first experience teaching gifted students. Her background was similar to that of the gifted students in that she was a high achiever. But her home life was not comparable economically. She did not have many material advantages. However, the aunt and uncle who raised her had a good attitude toward education and encouraged her to pursue a college education. She had no brothers and sisters; however, there were two retarded cousins who lived in the home. She became a teacher, she said, because the only way she could go to college was by accepting a teaching scholarship. She made the following statements about teaching gifted students:

> I love children and I love to teach. I find the gifted children are usually much better behaved than in a regular classroom. I do not have a discipline problem. They are so interested in learning something that they do not have time to misbehave.
>
> Gifted boys are not aggressive to the point that they will cause a disturbance, but they are aggressive as much as the low achievers. Gifted boys are just normal little boys. They do act at times more mature and less noisy than boys in regular classes.
>
> Gifted girls are very much like other girls their age but again they act more mature at times. They are not as silly and do not seem to giggle as much as girls do in regular classes. Gifted girls do not

> seem to be as sure of themselves as gifted boys do. If the boys are not sure of themselves, they don't say so as much as the girls. They about balance out. They are very independent and would rather work individually than in a class group situation. When they have something to say, they will raise their hands and say it. I have noticed that the boys speak up more readily than the girls. On the whole the girls will just sit. I don't know why. They either withhold their knowledge because they do not want to seem smarter than the other students or because they are just used to sitting back and pursuing their own interests. I think that their previous habits play a part and that the gifted are neglected in regular classrooms. I do not think that the majority of teachers play favorites as to how well they like a child or whether or not he is gifted.
>
> I would rather teach boys than girls. I have always said I would rather have eighteen boys with discipline problems than to have one girl with discipline problems, because boys do not hold grudges, do not pout and things of this type. However, I like classes of both boys and girls. It makes the classes well rounded. I have never noticed any difference in the way boys and girls relate to me.
>
> Gifted students have a good sense of humor, more so than regular achievers. The humor is usually a high level humor rather than the dirty joke kind.

Sixth-grade: Teacher Four

Teacher Four is attractive, married, and the mother of a son and daughter, ages 10 and 12, respectively. She classified her own childhood as socially and economically deprived, but filled with the happiness and love of both parents and eight brothers. She was second to the oldest and carried heavy responsibilities, with her mother, for the "men" in the family. This was her second summer to teach gifted children. Her comments included the following:

I like boys. They are easier to get along with than girls. I don't know exactly why. Boys mature faster in some ways. They are more serious about some things. And you can kid with boys, which I love to do, and you can tease them a little better than you can girls. I think you can establish rapport faster with boys than with girls.

Boys are basically doers and movers and school to a certain extent is structured for girls who sit still and obey all the rules. I'm a doer and mover and so I lean this way. School hems boys in and does not let them move.

These children respond well all the time, not just for videotaping. The girls do not respond voluntarily very often. In regular school students learn early that if they are wrong in their answers they will be told so. If you tell a girl she is wrong, you don't stop her from continuing to answer nearly as quickly as you will a boy if you tell him he is wrong.

Girls are more passive in this gifted class. I mixed the girls up in class among the boys and it still did not help much. These children are not interested in detail. They are too impatient. Some of them do not like to work in groups. They work faster alone. I have not noticed that the boys are any more dependent on the teacher than the girls in this class.

VITA

Wilma Nelle Baker Cosper was born in Seville, Georgia, on December 6, 1923. She received her elementary and secondary education in Manchester, Georgia, where she was graduated from Manchester High School in 1940. She attended Tift College, Forsyth, Georgia, from 1943 to 1945 and Louisiana State University, Baton Rouge, Louisiana, from 1946 to 1948, where she received the Bachelor of Science degree with a major in home economics. In 1956, she received the Master of Science degree with a major in home economics education from Texas Technological University, Lubbock, Texas. She received the Doctor of Education degree with a major in home economics education from The University of Tennessee in 1970.

Mrs. Cosper served as an administrative assistant to the heads of the home economics and family life education departments at Teachers College, Columbia University, New York, New York, from 1950 to 1951; assistant professor of home economics and director of family life studies at Wayland College, Plainview, Texas, from 1951 to 1962; and associate professor of home economics at Western Carolina University, Cullowhee, North Carolina, from 1962 to the present.

Mrs. Cosper is married to Cecil Cosper, Ed.D., who is a professor of education at Western Carolina University. They have a son Cecil Kyle, age 17, and a daughter Marla Kay, age 13.