AN INVESTIGATION OF THE EFFECTS OF INSTRUCTION IN

INTERACTION ANALYSIS ON THE VERBAL BEHAVIOR

OF STUDENT TEACHERS IN HOME ECONOMICS

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CHAPTER I

INTRODUCTION

The opportunity for maximum learning is the birthright of each
child. Well-educated teachers are necessary in order that high quality
education for all can be provided. It is important, therefore, that
teacher education be as effective as possible. This research has been
conducted to examine a limited segment of teacher education in home
economics. Knowledge gained from this study may contribute to concep-
tual structure concerning learning and behavior of student teachers.
The research instrument used in this study was Interaction Analysis,
a method of observing and classifying verbal behavior in the classroom.

Statement of the Problem

This study was an investigation of the effect of teaching Inter-
action Analysis to student teachers in home economics on their verbal
behavior in the classroom. Answers to the following questions were
sought: What are the verbal teaching patterns of student teachers in
home economics who have not had instruction in Interaction Analysis?
What are the teaching patterns of student teachers in home economics
who have had instruction in Interaction Analysis? What are the dif-
ferences in teaching patterns between the two groups? Is there a
relationship between teaching pattern and grade point average? Is the

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study of Interaction Analysis a useful component of teacher preparation in home economics?

Significance of the Problem

Although considerable research has been conducted which relates to interaction patterns of teachers and their students in other subject areas, research related to home economics teachers has been limited. A study by Jorgenson (1968) categorized the teacher influence patterns of twelve first and second-year teachers of home economics. No reports of observations using Interaction Analysis with student teachers in home economics were found in the literature, although observations in other subject fields such as elementary education, mathematics, English, foreign language, and social studies were numerous.

A number of investigators reported using Interaction Analysis in the preservice training of student teachers. Most results indicated that student teachers trained to use the system used a higher proportion of indirect influence than did those not trained in using the system. Interaction Analysis proved to be a worthwhile tool to use as a basis for conferences between student teachers and supervisors.

Studies of teaching patterns of student teachers in home economics are needed because of the paucity of research in this area. Student teachers in home economics may show patterns of influence that are different from the patterns of student teachers in other fields. One reason for the possible difference is that home economics classes will mainly be limited to girls rather than being co-educational. In addition, the undergraduate preparation of teachers of home economics, with its emphasis on family living and development of each individual

in the family, may influence the student teacher's teaching patterns.
Home economics in the secondary schools, considered to be a family-
centered and pupil-centered curriculum, may further modify the stu-
dent teacher's classroom behavior patterns. Teacher education directed
at modification of behavior may affect student teachers in home eco-
nomics differently than it affects student teachers in other areas.

Through this study, characteristics of student teachers in home
economics that have not been previously confirmed by objective observa-
tion may be identified. From these observations, a basis for study of
segments of instruction of prospective teachers in home economics at
Oklahoma State University may be obtained.

Objectives of the Study

The objectives of this study followed the questions of the prob-
lem. These objectives were:

I. to observe and categorize the verbal behavior of student
teachers in home economics who had no instruction in Inter-
action Analysis.

    A. to determine if classroom influence of student teachers in
home economics is observably different from classroom
influence of student teachers in other subject areas as
reported in previous investigations using Interaction
Analysis.

    B. to determine if the classroom influence patterns of stu-
dent teachers in home economics are related to their
grade point averages.

II. to observe and categorize the verbal behavior of student
teachers in home economics who had instruction in Interaction
Analysis and to compare their verbal behavior with the verbal
behavior of student teachers who had no instruction in Inter-
action Analysis.

    A. to determine if classroom influence patterns of student
teachers in home economics who had instruction in

Interaction Analysis are different from the patterns of those student teachers who did not have the instruction.

B. to determine if classroom influence of student teachers of home economics who had instruction in Interaction Analysis is similar to or different from classroom influence of student teachers in other subject areas who had been given instruction in Interaction Analysis and observed by other investigators.

C. to determine if teaching patterns of student teachers in home economics who had instruction in Interaction Analysis are related to their grade point averages.

In order to accomplish these over-all objectives it was necessary:

1. to review findings of other investigators who used objective analysis of classroom interaction so that these findings could be used for comparative purposes.

2. to develop proficiency in the use of Interaction Analysis.

3. to organize a unit of study for instruction of student teachers in home economics which included development of understanding of Interaction Analysis on the part of the student teachers.

In addition to the achievement of the foregoing objectives, it was considered necessary to evaluate the unit through student and instructor appraisals.

Limiting Factors

The study was limited to two samples of student teachers in home economics at Oklahoma State University. The student teachers observed in the spring semester, 1968, had not had instruction in Interaction Analysis and served as the control group. The student teachers observed during the fall semester, 1968, had studied Interaction Analysis and were the experimental group.

The main limitations of the study were the size of the samples and the number of visits made to each of the student teachers. Because student teachers in home economics at Oklahoma State University

are placed in centers quite distant from each other and from the campus,
there was a practical limitation on the number of student teachers who
could be observed and the number of visits that could be made by one
investigator. It is necessary to assume that the samples of teacher
behavior observed were characteristic of the behavior of that student
teacher within reasonable limits of flexibility. Earlier investigators
support this assumption in reporting that with use of Interaction Anal-
ysis, influence patterns may be determined from a limited number of
observations. Since two student teachers are assigned to each teaching
center, it was necessary to randomly select pairs of student teachers
rather than individual student teachers, which created some sampling
limitation.

Definitions of Terms

Observational techniques have been defined by Medley and Mitzel
(1963, p. 250) as "those procedures which use systematic observations
of classroom behavior to obtain reliable and valid measurements of
differences in the typical behaviors which occur in different class-
rooms, or in different situations in the same classroom."

Interaction Analysis is the observational technique developed by
Ned A. Flanders at the University of Minnesota in the 1950's. It is
a system of recording observations of verbal interaction in the class-
room. The system has four designations in the literature: Interaction
Analysis, Minnesota System of Interaction Analysis (MSIA), Flanders
System of Interaction Analysis, and Flanders System. The system is
described in detail on pages 40 through 44.

Classroom interaction may be operationally defined as the inter-play or give-and-take in the classroom. This study is concerned only with verbal interaction.

Direct influence by a teacher is that behavior which "restricts the freedom of action of a student by setting restraints or focusing his attention on an idea." (Flanders, 1960, p. 12).

Indirect influence is that teacher behavior which "increases the freedom of action of a student by reducing restraints or encouraging participation." (Flanders, 1960, p. 12).

Teaching patterns, teacher influence, and classroom influence are essentially synonymous, in that all refer to degrees of direct and in-direct verbal behavior of teachers as identified by Interaction Analysis. Patterns may be classified in detail by examination of matrices tabu-lated from observed data.

Indirect/Direct (I/D) Ratio is an expression of the relationship between the teacher's indirect verbal behavior (Interaction Analysis categories 1-4 as shown in Table I, page 8) and his direct verbal be-havior (Interaction Analysis categories 5-7 as shown in Table I, page 8). The relationship may be expressed as a decimal ratio or as the percent-age of total talk represented by indirect influence. The method of obtaining the I/D ratio is discussed on pages 42 and 43 with infor-mation concerning its interpretation.

Revised Indirect/Direct (I/D) Ratio is an expression of the rela-tionship between the teacher's indirect control statements (Interaction Analysis categories 1-3 as shown in Table I, page 8) and his direct control statements (Interaction Analysis categories 6-7 as shown in Table I, page 8). The relationship may be expressed as a decimal

or as the percentage of statements in the control categories represented by indirect control statements. The method of obtaining the revised I/D ratio is discussed on pages 42 and 43 with information concerning its interpretation.

Interaction Analysis

Interaction Analysis is discussed in detail in Chapter III, pages 40 to 44. For introduction to the study, the technique is briefly summarized here.

Interaction Analysis is a system of categorizing the verbal behavior of teachers and students in a classroom. A trained observer collects data by writing down the number of one of ten categories for behavior that he has just observed. Observations are recorded at three-second intervals for a period of about twenty minutes for each recording session. A summary of the categories used in the system is given in Table I, page 8.

After the behaviors have been recorded, the numbers are entered in sequence on a ten by ten matrix. By examination of the matrix a number of factors can be determined. Because the numbers are recorded sequentially, responses to verbal cues can be determined. The matrix shows the proportions of teacher and student talk, the types of teacher and student talk, and the proportions of direct and indirect influence used by the teacher. By further examination of the matrix, other observations can be made about a teacher's verbal behavior.

TABLE I

SUMMARY OF CATEGORIES FOR INTERACTION ANALYSIS

	1.	ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
INDIRECT INFLUENCE	2.	PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uhhuh?" or "go on" are included.
	3.	ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play shift to category five.
TEACHER TALK	4.	ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	5.	LECTURES: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions.
DIRECT INFLUENCE	6.	GIVES DIRECTIONS: directions, commands, or orders with which a student is expected to comply.
	7.	CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme self reference.
	8.	STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.
STUDENT TALK	9.	STUDENT TALK-INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
	10.	SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

SOURCE: Amidon and Flanders, 1963, p. 12.

Procedure

The procedure was designed to accomplish the objectives outlined
on pages 3 and 4. A detailed description of the procedure used in con-
ducting the research for this study is found in Chapter III. It may be
summarized briefly as follows:

During the spring semester of 1968, a selected sample of eight stu-
dent teachers in home economics at Oklahoma State University who had
not had special training in Interaction Analysis (control group) was
observed by using Interaction Analysis, and their classroom influence
patterns were analyzed. Each student teacher was observed once during
the first three weeks and once during the last three weeks of her teach-
ing experience. As much interaction as possible (up to forty minutes)
was recorded during each visit. Results were recorded on matrices and
then analyzed. Three matrices were constructed for each student
teacher — one for each visit and a combined matrix for the two visits.

The sample was selected from those high school centers where two
student teachers were placed. Selection of centers was made by using a
random number procedure as explained by Popham (1967). By selecting
four centers, eight student teachers were available for observation.

During the fall semester of 1968, student teachers in home eco-
nomics at Oklahoma State University were given a short program of work
in Interaction Analysis before they went to high school centers for
their student teaching experience. Instruction was given as part of
the learnings in a four-week portion of the class entitled Techniques
and Materials in Home Economics Education. The students spent approxi-
mately six in-class hours learning the Interaction Analysis system and

the theories on which it is based. In addition, students studied and practiced techniques of classroom communication and presented three lessons to the class. Each student video-taped one presentation and observed the playback. Other presentations were audio-taped for self-study by the student who presented the lesson.

Interaction Analysis was studied through prepared tapes, filmstrips, class discussion, readings, and individual practice. Students practiced categorizing of statements and making matrices. Each student analyzed at least three lessons presented by other class members. After the completion of the study, students wrote brief course evaluations.

A random sample of eight of the student teachers who had Interaction Analysis instruction (experimental group) was observed. Procedure for selection of the sample and techniques of observation were the same for the experimental group as for the control group.

Classroom influence patterns of student teachers in home economics were compared to influence patterns of student teachers in other fields and to inservice teachers in home economics and in other areas. To determine if the classroom influence patterns of student teachers were related to their grade point averages, data were analyzed using the Pearson Product Moment correlation technique. The I/D ratio, the revised I/D ratio, and the percentages of teacher and student talk were compared to the grade point averages earned by the student teachers prior to the semester in which they were to student teach.

Differences in teaching patterns between the teachers in the control group and the teachers in the experimental group were analyzed statistically by t tests. Included in this analysis were percent of

tallies in each category, percent of teacher talk, percent of student talk, I/D ratios, and revised I/D ratios.

After all data had been analyzed, conclusions and recommendations about the course work were made. In addition to examination of results of the observations of the samples, the evaluations of course work by all prospective student teachers who studied Interaction Analysis were considered.

CHAPTER II

REVIEW OF RELATED RESEARCH

It is imperative that prospective teachers be educated to teach

their students in the most effective manner possible. Research directed

toward improving teaching and the education of teachers has received

much emphasis in the past two decades. As Amidon and Hough (1967, p. v)

have written:

> These are exciting times for those interested in study-
> ing the dynamics of instruction and in applying the knowl-
> edge gained from their study to the training of teachers and
> the improvement of instruction. Recent developments in tech-
> niques for classification and analysis of the instructional
> language of the classroom have made possible research on in-
> struction and innovations in the training and supervision of
> teachers which just a few years ago were not even considered
> by most educational researchers, teacher educators, and
> instructional leaders.
> Of the recently developed systems for analyzing the
> instructional process, interaction analysis is the one that
> is currently best known and most widely used. . . .

The research reviewed in this chapter will be limited to those

items related to Interaction Analysis and in particular those related

to Interaction Analysis as it applies to student teaching and to home

economics. The chapter has therefore been divided into four sections:

systems for analyzing classroom behavior, the relationship of teacher

influence to student achievement and attitudes, patterns of teacher

influence, and the effects of instruction in Interaction Analysis on

the verbal behavior and attitudes of student teachers.

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Systems for Analyzing Classroom Behavior

As early as 1914, Horn developed a recording instrument to show
pupil participation. Another early device was that of Wrightstone in
1934. Wrightstone's device was very complex; even the directions were
difficult to comprehend (Medley and Mitzel, 1963). Anderson began
studying dominative and integrative behavior of teachers more than three
decades ago and published some of his observations of nursery and ele-
mentary school classes in 1939. Dominative behavior was that behavior
which tended to decrease interplay, and integrative behavior was that
behavior which tended to increase interplay. He developed the D-I ratio,
or the ratio of dominative to integrative contacts. Verbal interaction
was one dimension of his classification system.

Withall (1949) developed an observational technique to measure
social-emotional climate in the classroom. Withall's system catego-
rized teacher statements into seven groups which are considered learner-
centered (related to indirect influence) or teacher-centered (related
to direct influence). The instrument was not designed for direct obser-
vation in the classroom. Instead, statements are coded from typewrit-
ten transcripts of tape recordings. Modifications of this system have
since been used for "live" recording.

Bellack and associates developed a system of categorizing teacher
statements as structuring, soliciting, responding, or reacting. Per-
kins designed a procedure for measuring student behavior, learning
activity, and teacher behavior as related to achievement (Waetjen, 1966).

An observational technique originated by Cogan (1956) was designed
to investigate the relationship of specific teacher behaviors as they

are related to the work of the pupils. This system analyzes teacher behavior by observation, while pupil work response is determined by a special attitude inventory.

The Observational Schedule Record (OScAR) System developed by Medley and Mitzel (1958) has been frequently used in research. It is partially based on Withall's technique and was designed as a method of both observing and evaluating. It is a somewhat complex system which has been found to be reliable for measuring social-emotional climate in the classroom, the amount of emphasis on verbal learning, and the degree to which social structure is teacher-centered.

The Interaction Analysis system has been used with increasing frequency for categorizing classroom behavior. It was developed by Flanders in the late 1950's. As Interaction Analysis is the basic system used in this research, it is described in detail on pages 7 and 8 and 40 through 44.

Amidon and Flanders (1963) have reported that Interaction Analysis was designed as a feedback system in which the teacher can see his own classroom behavior. Its main premise is that verbal behavior is an indicator of total classroom behavior.

Availability of Interaction Analysis data gives a teacher information about the way he actually teaches, not just the way he thinks he teaches. According to Ober (1967, p. 12)

> . . . two inherent features of interaction analysis -- an
> articulated system of cognitive organizers and a means for
> obtaining reliable data -- assist the classroom teacher in
> performing at least six necessary operations that are of
> utmost importance to effective teaching. These six opera-
> tions are: 1. Identify and separate the contributing ele-
> ments that constitute a given teaching-learning situation.
> 2. Conceptualize the relationships between these interacting
> elements. 3. Select and plan instructional strategies that

will facilitate maximum student learning in a variety of teaching-learning situations. 4. Develop and sharpen suitable skills in order to transform the selected instructional strategies into practice in the classroom. 5. Acquire reliable and meaningful data which can subsequently be analyzed to provide feedback concerning the quality of the teaching performance. 6. Improve future teaching performance by means of suitable modification and revision.

Interaction Analysis has gained wide acceptance as a research tool. Amidon (1966, p. 96) has written, "Interaction Analysis makes its major contribution in that it does bridge the gap between theory and practice." In reviewing a number of analysis systems, Medley and Mitzel (1963, p. 271) called Interaction Analysis "the most sophisticated technique for observing climate thus far." They reported the coefficient of observer agreement to be high, consistently greater than .85.

Interaction Analysis meets all of the criteria that Medley and Mitzel (1963) have considered desirable for an observation tool: (1) Observation should be made as soon as possible after the incident occurs. (2) The observer should not have to rate behavior qualitatively, only quantitatively. (3) The scale should measure what it sets out to measure.

One of the most important advantages of Interaction Analysis as a research tool is the availability of materials for training observers. Tapes, visuals, and manuals have been prepared for this purpose. Another major advantage of the system is the wide availability of results from numerous studies. These results can be used to compare teacher behavior in an on-going research study with the behavior of teachers as observed in other studies, giving a common reference so that objective comparisons can be made.

The major disadvantage of Interaction Analysis appears to be that

some of the categories are not discrete enough. For instance, student-initiated talk could be of many types, but there is only one category.

Several recent observation systems have been developed which expand the number of categories in order to more accurately describe teacher and student talk. Four of these are the Verbal Interaction Category System (Amidon and Hunter, 1966), the Reciprocal Category System developed by Ober and others (1968), the Observational System for Instructional Analysis (Hough, 1967), and a system with up to twenty-four categories reported by Amidon and Hunter (1967). Some categories of these systems can be compared to Interaction Analysis results for research purposes. Because of the increased numbers of categories, problems of observer training and reliability are more complex than with Interaction Analysis.

The methods discussed herein are only a sample of those that have been developed to analyze classroom behavior. Undoubtedly, in the near future, more observational techniques will be devised and those in current use will be revised.

The Relationship of Teacher Influence to Student Achievement and Attitudes

Student learning requires more than just presentation of material. Classroom climate and interaction have been shown to be related to student achievement and attitudes. The studies reviewed in this section are only some of those that have demonstrated this relationship.

The Relationship of Teacher Influence to Student Achievement

Flanders (1960) conducted research to determine the relationship

of teacher influence patterns to student achievement and attitudes in junior high school geometry and social studies classes, both regular and experimental. By considerable testing, teachers were classified as direct, indirect, or average in influence. Indirect teachers were found to be more attentive to student ideas and made greater use of these ideas than did direct teachers. Direct teachers gave more directions than indirect teachers and students resisted these directions more often. When learning goals were not clear, direct influence increased student dependence upon the teacher. Direct influence did not affect dependence after goals were clarified.

Indirect influence patterns, on the whole, were responsible for more achievement than direct influence, regardless of student ability. There was no evidence that ability makes any difference in the student's response to teacher influence patterns. Results of influence patterns did not vary by subject areas (Flanders, 1960).

The dependence of the student on the teacher did not change the effects of teacher influence on learning. A dependent student was defined as a student whose primary concern is to please the teacher. Dependent students, independent students, and students average in dependence all showed greater learning with indirect than with direct teachers (Flanders, 1960).

Students who achieved the most in the Flanders' (1960) study were in classes exposed to flexible influence patterns. Indirect teachers were able to be the most flexible. They tended to be most indirect when setting goals and planning, and then were able to shift to directness after goals were clear.

Amidon and Flanders (1961) organized eighth-grade geometry classes

in which teachers controlled their verbal behavior in order to be direct
or indirect. Students who were classified according to tests as being
dependent-prone were selected for special observation. These dependent-
prone students learned more with indirect teacher influence than direct
teacher influence. Indirect teachers utilized fewer directions, less
criticism, less lecturing, and more praise than direct teachers. In-
direct teachers asked more questions to increase students' verbal par-
ticipation than direct teachers asked.

Soar (1965) investigated the relationship of teaching patterns to
the development of reading skills and vocabulary by elementary pupils.
The revised I/D ratio was used as a basis for determining directness or
indirectness of control by the teacher. Hostile teacher and student
behaviors were also recorded. In vocabulary growth, indirect teaching
produced greater learning than did direct teaching, and the growth was
most pronounced in the classrooms in which indirect teaching was com-
bined with low hostility. In reading, indirect teaching also produced
greater growth than direct teaching, but emotional climate as measured
by hostile behavior was not related to reading growth. Soar (1967),
in another study of elementary classrooms, found that there may be a
level of criticism which is too low for optimal growth in subject mat-
ter learning. He did not specify what he believes this level to be.

Nelson (1966) studied teaching style of primary-grade teachers in
language arts. She found that pupils of teachers whose style was con-
sidered to be indirect produced written work superior in both quality
and quantity to work of pupils of teachers whose style was direct.

LaShier and Westmeyer (1967) investigated the relationship of
verbal patterns of ten student teachers and their 239 eighth-grade

students in science classes. Median student achievement gain was sig-
nificantly higher in classes of student teachers considered to be in-
direct than in classes of student teachers considered to be direct.

Using Interaction Analysis with category subscripts, Johns (1968)
investigated the types of teacher and student statements in relation to
verbal behavior patterns in paired high school English classes. Teach-
ers were considered direct or indirect according to their revised I/D
ratios. There was a significantly greater incidence of thought-pro-
voking questions by students of the indirect group of teachers when com-
pared to questions by students of the direct group of teachers. In
addition, there was a significantly greater use of both thought-provok-
ing questions and thought-provoking statements by the indirect group of
teachers than by the direct group of teachers.

Weber (1968), in studying influence of teaching patterns during
the first four years of school, found that verbal creative potential
was enhanced to a greater degree under the influence of indirect than
direct teaching. Figural creativity was greatest with consistent pat-
terns of teaching (all direct or all indirect) during the four years.
Weber concluded that indirect teaching behaviors facilitate both ver-
bal and figural creativity because both of these means of expression
are open to the pupils. Another conclusion by Weber (1968, p. 15) was:

> ....On the other hand, it seems that direct teaching (and
> then only when it is consistent from year to year) permits
> only figural expressions of the pupils' creative potential
> because this is the only outlet open since verbal expressions
> are generally controlled by the teacher's direct behaviors.

Soar (1967) also found that with elementary classes, the higher
the level of indirect teaching, the greater the growth in creativity.

No studies were found which related creativity to Interaction Analysis data recorded in secondary school classrooms.

The Relationship of Teacher Influence to Student Attitudes

In Flanders' (1960) study, students in those junior high school classrooms in which indirect teaching predominated were found to have more positive attitudes toward the teacher, the class activities, and the material being studied than students in the classrooms in which direct teaching predominated. Students of high school English teachers who were classified by Johns (1968) as having highly indirect revised I/D ratios had significantly more positive attitudes on the Minnesota Student Attitude Inventory than students of teachers with direct revised I/D ratios.

In eighth-grade biology classes, pupils of student teachers who used indirect influence patterns had more positive attitudes toward the teacher and their school work than pupils in classes of student teachers who used direct influence patterns (LaShier and Westmeyer, 1968). Attitudes of the biology students were measured by the Michigan Student Questionnaire. Withall (1949) found that pupils had generally positive reactions during those portions of a class session that were learner-centered and generally negative reactions during teacher-centered classes.

In a study of more than 900 eighth-grade students, Cogan (1956) found that student attitudes toward teacher influence patterns were reflected in their output of school work. Some evidence indicated that pupils' perceptions of teacher behavior as being preclusive (related to direct influence) were negatively related to pupils' accomplishments.

There was strong evidence that pupils' perceptions of teacher behavior as being inclusive (related to indirect influence) were positively related to pupils' work. Cogan further demonstrated that inclusiveness was the main factor in pupils' doing both required and self-initiated tasks.

Emmer (1968) found that as teachers increased use of student ideas (category three), second-grade students increased their self-initiated verbal participation by a significant amount. There was the same effect when increase in use of category three was relatively small as when the increase was large. Student initiation did not appear to relate to the amount of teacher praise.

Theoretical Explanation of the Relationship

Research cited in the foregoing sections has empirically shown that relationships exist between patterns of teacher influence and the achievement and attitudes of students. On the whole, those teacher influence patterns that were indirect produced greater student achievement and more positive student attitudes than those influence patterns which were direct. Several educators have attempted to explain this relationship.

According to Amidon (1966, p. 96), the basis for reviewing teacher behavior in relation to learner behavior is sound in that:

> (1) Apparently there are certain identifiable teacher behaviors that inhibit and others that enhance pupil learning. . . . (2) Patterns of teaching can be described objectively and then related to pupil outcomes. . . . (3) There appear to be certain behaviors that characterize good teachers (in terms of pupil achievement) regardless of the subject matter being taught. . . .

Withall (1949, p. 347) has written:

> It is postulated that learning (changes in behavior)
> is most likely to occur when experiences are both: (1) mean-
> ingful to the learner, that is, are perceived by the learner
> as pertinent to his needs and purposes, are consistent with
> his personality organization, and are associated with self-
> directive behavior; and (2) occur in a non-threatening sit-
> uation, that is, the learner is free from a sense of per-
> sonal threat, interacts with others in a wholesome social
> milieu, and is helped to evaluate himself on the basis of
> objective criteria.

Research by Epperson (1963) may help to explain why teacher indir-

ectness results in increased learning. The categories relating to indir-

ect teacher behavior, i. e., teacher acceptance of student emotions and

ideas, praise, and questioning are related to inclusion of pupils into

the class and opposed to exclusion of pupils. Epperson studied aspects

of alienation with over 700 pupils, grades three through twelve in

twenty-seven classrooms. Epperson's data indicated that teacher exclu-

sion, as measured in this study, was significantly related to students'

feelings of isolation from the teacher, while exclusion from peers was

not similarly related. Epperson theorized that this difference in

perception of exclusion may arise because teacher exclusion is more

visible in the classroom than peer exclusion and thus more likely to be

important in school, or that pupil-teacher relationships may be exag-

gerated more than pupil-peer relationships in the isolation aspect of

alienation.

This feeling of isolation on the part of the student was related

to low actualization (academic performance compared to measured ability)

in the Epperson study. Isolation from both teacher and peers was most

highly correlated of any factor to low actualization. High isolation

from the teacher showed the next highest correlation. High isolation

from peers, however, was slightly related to high, rather than low

actualization. Epperson suggests that the reason that high isolation

from the teacher is related to low actualization is that the student is

expending psychological energy to deal with this classroom condition,

energy which might otherwise be spent on academic efforts.

Amidon and Flanders (1961, p. 290) suggest similar reasons why

dependent-prone students in their research learned less well with direct

than with indirect teaching.

> . . . As the teacher becomes more directive, this type of
> student finds increased satisfaction in more compliance, often
> with less understanding of the problem-solving steps carried
> out. Only when he is free to express his doubts, to ask ques-
> tions and gain reassurance, does his understanding keep pace
> with his compliance to the authority figure. Lacking this
> opportunity, compliance alone may become a satisfactory goal
> and content understanding may be subordinated to the process
> of adjusting to teacher directives. . . .

Indirect and direct patterns of teacher influence may be related

to what is called instructional press. Siegel and Siegel (1967, p. 285)

describe instructional press as generating "predictions about the im-

pact upon students as a group of specific aspects of instructional

management." They say that in extrinsic instructional press, perform-

ance is dependent, in high degree, on instructor-environmental condi-

tions. Intrinsic instructional press is dependent upon learner vari-

ables. Siegel and Siegel (1967, p. 286) have written that

> . . . extrinsic instructional press sensitizes students to
> the potentially punitive and threatening (that is, inhibiting)
> aspects of the instructional environment; an intrinsic in-
> structional press sensitizes students to the potentially sup-
> portive (that is, facilitating) aspects of the instructional
> environment

Indirect teacher influence may be assumed to form the supportive envi-

ronment described by the Siegels.

Soar (1967, p. 9) believes that complex and abstract learning must of necessity be "inner-directed" rather than "teacher-directed." Results of his studies in elementary classrooms suggest

> . . . that the most effective learning depends upon the tension that the child feels, the emotional climate, and the teacher control present in the classroom, and that the optimum of each of these will differ with the abstractness of the learning task.

Bruner (1966) has set up a number of interrelated theoretical constructs regarding instruction. Acceptance fits into what he calls "predispositions to learning." In order that a student may explore among alternatives so that he may learn, Bruner stresses that risks accompanying exploration must be minimized. The teacher must be sure that exploration is not accompanied by loss of face, ridicule, et cetera. Bruner (1966, p. 199) writes, "Learning something with the aid of an instructor should, if instruction is effective, be less dangerous than learning on one's own."

Blackham (1967) has considered teacher acceptance of students in regard to both maladaptive behavior and the student's mental health. He states, "A child tends to move in the direction of more healthy adjustment when he is permitted the opportunity to express his feelings and concerns without censure or disapproval." (Blackham, 1967, p. 85). Blackham points to the necessity of a child's experiencing an "accepting, predictable, and safe relationship with a helping person" in order for the child to modify his behavior. If this relationship occurs with the teacher, then the child may learn to trust the teacher, to identify with the teacher's goals and values, and be free to allow his potential to develop.

Patterns of Teacher Influence

In order to identify characteristic patterns of teacher influence, findings of selected research studies are briefly reviewed in this section Only those aspects of teacher influence patterns which are directly applicable to observations of the current study are summarized.

Influence Patterns of Teachers Not in Home Economics

Flanders (1961) found a consistent basis for what he calls the rule of two-thirds. In an average class, two-thirds of the time some-one is talking; two-thirds of the time the person talking is the teacher, and two-thirds of the time the teacher talks he will be using direct influence — giving his own opinions, lecturing, giving directions, or criticizing students. In classrooms of teachers whom Flanders considers to be superior, someone is talking a similar two-thirds of the time, but the teacher uses only 50 to 60 percent of the talking time, and the teacher is using direct influence only about 40 percent of the time that he talks.

Interaction patterns observed in a number of their research studies have been reported by Amidon and Flanders (1967) and the composite of use of each category has been summarized in Table II. According to the authors, examinations of research have indicated no major differences in interaction patterns among elementary, junior high school, and senior high school teachers according to level of teaching

Flanders (1964) listed a number of characteristics which separated those teachers considered to be direct from those teachers considered to be indirect. The most indirect teachers were more alert to and made

greater use of student ideas and asked longer more extended questions than the most direct teachers. Direct teachers had more discipline problems and interrupted direction-giving in order to criticize students three times as often as indirect teachers. Students tended to resist the directions made by direct teachers. Amidon and Flanders (1967) reported that indirect teachers were able to use social skills of communication more effectively than direct teachers. Direct teachers were not able to shift style as easily as indirect teachers.

TABLE II

COMPOSITE OF USE OF CATEGORIES OF INTERACTION
ANALYSIS REPORTED BY AMIDON AND FLANDERS

Category*	Average of Teachers	Direct Teachers	Indirect Teachers
1	under 0.5%	under 0.1%	0.5%
2	2 %	2 %	2 %
3	2-9 %	2 %	9 %
4	8-15 %	8 %	11 %
5	25-50 %	Little Difference	
6	4-8 %	8 %	4 %
7	3-4 %	5 %	under 1 %
8	16 %	Little Difference	
9	8 %	Little Difference	
10	33 %	More for direct than indirect	

*Categories 1, 2, 3, and 4 are indirect teacher talk. Categories 5, 6, and 7 are direct teacher talk. Categories 8 and 9 are student talk. Category 10 is silence and confusion.

Flanders (1964) reported that the revised I/D ratios of the most direct teachers were between 0.01 and 2.0 with most below 0.4. Those teachers who were considered most indirect in over-all measure had revised I/D ratios of between 0.01 and 18.0 indicating greater flexibility of indirect than direct teachers. As a norm for his study, Flanders (1960) considered teachers with over-all revised I/D ratios of 1.37 and above to be indirect.

Furst and Amidon (1967) made 160 observations of elementary classrooms during 1962. They found that I/D ratios varied between 1.0 and 1.4 in grades one and two to between 0.60 and 1.0 in grades five and six. Teacher talk averages represented from 45 to 52 percent of total interaction, student talk averages from 27 to 39 percent, and category ten (silence or confusion) averages from 15 to 25 percent of the time.

The teachers considered to be direct in Johns' (1968) study of English classes had a mean revised I/D ratio of 0.342 compared to 4.341 for those considered indirect. LaShier and Westmeyer (1967) studied interaction patterns of ten student teachers who were teaching eighth-grade biological science. I/D ratios ranged from 0.223 to 0.903 with a mean of 0.545. Revised I/D ratios were from 0.360 to 2.40 with 1.076 being the mean.

Pfeiffer (1967) studied five eleventh-grade English teachers' classes. Verbal interaction was not different in classes of different ability levels taught by the same teacher. Four of the five teachers used more than one-half of the time in teacher talk. Students tended to initiate talk more frequently when teachers followed student talk with indirect influence.

Influence Patterns of Home Economics Teachers

Only two studies were found which reported patterns of influence of teachers in home economics. Jorgenson (1968), using Interaction Analysis, observed the classroom behavior of six first-year and six second-year teachers in high school vocational home economics classes. When compared with averages for teachers in other subject areas, the first-year home economics teachers were within the average range in acceptance and use of student ideas, in amount of questioning, and in lecture. They were lower than average in other categories of teacher talk. Jorgenson reported that the second-year teachers were average in amount of questioning and criticism, and lower than average in accepting feeling, praise, accepting and using student ideas, and in direction-giving. They used more than an average amount of lecture. Mean values for each category, teacher talk, student talk, I/D ratios, and revised I/D ratios are given in Table III.

Jorgenson (1968) concluded that the first and second-year teachers whom she observed showed weakness in accepting and using student ideas. They tended to have a high amount of lecture and a rather low percentage of student talk. The teachers compared favorably with superior teachers in using a low amount of direction-giving.

Kalbfleisch (1967) studied classroom interaction patterns of home economics classes using the Verbal Interaction Category System (see explanation on page 16). Some of the data obtained by using this system can be compared to Interaction Analysis data. Kalbfleisch analyzed tape recordings of laboratory and discussion classes taught by experienced teachers and by student teachers. She found that there was little

TABLE III

MEAN INTERACTION ANALYSIS VALUES FOR FIRST AND SECOND-YEAR
HOME ECONOMICS TEACHERS AS REPORTED BY JORGENSON

Aspects of Verbal Behavior*	First-Year Teachers	Second-Year Teachers
Category 1	0.05%	0.13%
Category 2	0.43%	0.13%
Category 3	4.20%	1.80%
Category 4	8.20%	6.60%
Category 5	41.42%	51.00%
Category 6	1.00%	0.41%
Category 7	0.70%	1.30%
Category 8	23.00%	20.40%
Category 9	16.00%	13.90%
Category 10	5.00%	4.33%
Teacher Talk	56.00%	61.37%
Student Talk	39.00%	34.30%
I/D Ratio	.288	.157
Revised I/D Ratio	1.68	1.17

*Categories 1, 2, 3, and 4 are indirect teacher talk. Categories
  5, 6, and 7 are direct teacher talk. Categories 8 and 9 are student
  talk. Category 10 is silence and confusion.

difference in teaching pattern between the student teachers and the experienced teachers. Teacher talk accounted for over 60 percent of the class time; student talk constituted a little less than 20 percent and silence or confusion about 10 percent. Teachers gave information or opinion 28.4 percent of the total time (comparable to Interaction Analysis category five), and gave directions 10.5 percent of the time (comparable to Interaction Analysis category six). Teacher accepting statements occurred seven times as often as rejecting statements. Teacher questioning (comparable to Interaction Analysis category four) represented about 12 percent of interaction time, and accepting feeling (comparable to Interaction Analysis category one) represented 0.56 percent of the time. These averages included all teachers regardless of experience and included both laboratory and discussion classes.

Teacher Influence Patterns in Relation to Outside Evaluations

It is worthwhile to consider the relationship of Interaction Analysis data to other evaluations of teacher behavior. Amidon and Giammateo (1967) conducted a study of 153 elementary teachers to determine if there were patterns of verbal behavior characteristic of those teachers considered superior by their administrators and supervisors. Thirty-three teachers considered to be superior were compared to 120 teachers chosen at random from the same districts.

Results of the study indicated that teachers considered to be superior encouraged student participation by using more acceptance of student ideas and emotions and more encouragement of student ideas than the average teachers. The superior teachers talked 40 percent of the total class time and their students talked 52 percent of the time. The

average teachers talked 52 percent of the time while their students talked 40 percent of the time. Superior teachers used more indirect verbal behavior with correspondingly less direction-giving, less criticism, and less dominant behavior than the average group.

Using the sixteen-category modification of Interaction Analysis, the Observational System for the Analysis of Classroom Instruction (see explanation on page 16), Pankratz (1967) compared two groups of twelfth-grade physics teachers. The groups were considered high or low according to ratings by the participating teachers' principals and students, and the responses of the teachers to the Teaching Situation Reaction Test.

Pankratz's results indicated that the teachers in the high group used significantly more praise with fewer commands and less criticism than the teachers in the low group. There was significantly less confusion and irrelevant behavior in the classrooms of the high than the low group of teachers. The mean revised I/D ratio of the high group was 6.25 while the mean revised I/D ratio of the low group was 0.78, the difference being significant at the .01 level. Lecturing represented about 50 percent of the tallies for both groups.

Teaching Patterns of Student Teachers Related to Grade Point Averages

Only one report that compared the verbal behavior of student teachers to their academic performance in college was found in the literature. Results of a study by Wilk and Edson (1963) indicated that a high sophomore grade point average was significantly related to indirect teaching patterns of student teachers in elementary schools. The authors theorized that good command of subject matter enabled the

student teachers with high grade point averages to be comfortable in
the classroom.

The Effects of Instruction in Interaction Analysis on the
Verbal Behavior and Attitudes of Student Teachers

In order for prospective teachers to learn what he calls "critical
behaviors", Flanders (1967a, p. 373) considers that teacher education
must involve the following factors:

a) It will be necessary to conceptualize behavior patterns
and classroom learning situations. b) It will be necessary
to develop tools for gathering reliable information about
behavior and situations. c) The understanding of these tools
and concepts will require practice under conditions which
help the prospective teachers transform knowledge into their
own spontaneous behavior. d) Valid principles to guide crit-
ical decisions can be discovered once concepts and tools are
at hand. Teacher education, in part (or in whole), consists
of creating situations in which education students can dis-
cover these principles.

Study of Interaction Analysis gives preservice teachers a means
of working toward the achievement of these behaviors. Results of
research concerning the teaching of Interaction Analysis to student
teachers will be reviewed in this section.

Effects of Instruction in Interaction Analysis
on the Verbal Behavior of Student Teachers

A study similar to the subject of this research was conducted by
Kirk (1964, 1967) with student teachers teaching social studies in the
intermediate grades of elementary schools. He observed a control group
of student teachers who had no training in Interaction Analysis and an
experimental group of student teachers who were given instruction in
Interaction Analysis in seminars conducted during the student teaching

experience. In addition, Interaction Analysis was used by the college supervisor as a tool in supervision of the experimental group.

Statistically significant findings in the study by Kirk which related to the problem under investigation were: When compared to student teachers with conventional instruction (control group), student teachers who had instruction in Interaction Analysis (experimental group) talked less, had more indirect teaching patterns, used less direct influence (categories five, six, and seven), and gave fewer directions. Pupils of student teachers in the experimental group talked more (categories eight and nine combined) and used more self-initiated talk than pupils of student teachers in the control group. Areas relevant to this research in which differences between the control group and the experimental group were not significant were in amount of lecture, use of criticism, and use of indirect influence (categories one, two, and three).

In research reported by Furst (1967), student teachers in secondary education who had studied Interaction Analysis used significantly more accepting behaviors and fewer rejecting behaviors than student teachers conventionally trained. There was more student talk in the classes of the Interaction Analysis trained group. Whether student teachers were trained in Interaction Analysis before or during student teaching made no significant difference in verbal behavior. Student teachers trained in Interaction Analysis were more aware of their behavior than student teachers without the instruction.

Lohman, Ober, and Hough (1967) obtained similar results when they observed student teachers four to twelve months after Interaction Analysis training. Significant differences were that student teachers

trained in Interaction Analysis used more indirect statements, used fewer direct statements, did less lecturing, gave fewer directions, used more acceptance and clarification of student ideas, and had more student participation than student teachers without the training. The mean over-all I/D ratio of the group with instruction in Interaction Analysis was significantly more indirect than the mean over-all I/D ratio of the group not trained in Interaction Analysis.

In a study which extended over four semesters, Amidon (1968) found that student teachers who had been taught Interaction Analysis were more indirect than those who were taught a course in learning theory instead. As part of the same study, Simon et al.(1966), reported that student teachers who had studied Interaction Analysis had teaching patterns which were significantly more indirect, as evidenced by higher I/D and revised I/D ratios, than student teachers without the instruction. There was a tendency for the pupils of student teachers trained in Interaction Analysis to use more self-initiated talk than pupils of student teachers not trained in Interaction Analysis. An additional comparison with other student teachers showed that student teachers who were trained in Interaction Analysis tended to be more accepting, less critical, and less directive, yet have less silence and confusion in their classrooms.

Moskowitz (1967a) studied interaction in the classes of student teachers in foreign languages before and after they learned Interaction Analysis. After instruction in Interaction Analysis, influence patterns of the student teachers were more indirect, as evidenced by I/D and revised I/D ratios, than they were before the instruction. Moskowitz (1968) also compared groups of foreign language student

teachers trained and not trained in Interaction Analysis. The trained
group used a wider variety of teaching behaviors including more indirect
behaviors than the untrained group.

Another factor to be considered when evaluating results of
instructing student teachers in Interaction Analysis is the influence
of the cooperating teacher's teaching style on the student teacher's
teaching style. Moskowitz (1967b) compared four groups of cooperating
teachers and their student teachers. The four groups, classified
according to Interaction Analysis training were: I. trained cooperat-
ing teachers with trained student teachers, II. untrained cooperating
teachers with trained student teachers, III. trained cooperating
teachers with untrained student teachers, and IV. untrained cooperat-
ing teachers with untrained student teachers.

Both cooperating teachers and student teachers in Group I used
significantly more indirect influence than those in Group IV. In both
of these groups, student teachers tended to develop teaching patterns
similar to their cooperating teachers. In Group II the teaching pat-
terns of the trained student teachers were significantly more indirect
than the patterns of their cooperating teachers, indicating that the
student teachers refused to emulate their more direct cooperating teach-
ers. There were no significant differences between teaching patterns
of the untrained student teachers and the trained cooperating teachers
of Group III, showing the apparent influence of the trained cooperat-
ing teachers on the teaching patterns of their untrained student
teachers. Additional evidence of this influence was that the untrained
student teachers in Group III were more indirect than the untrained stu-
dent teachers in Group IV. In addition to being more indirect in

verbal influence, the cooperating and student teachers trained in

Interaction Analysis used a greater variety of teaching patterns and

showed more individual differences in teaching behavior than the con-

ventionally trained cooperating teachers and student teachers.

Effects of Instruction in Interaction Analysis
on the Attitudes of Student Teachers

Moskowitz (1967a) found that student teachers in foreign language

who learned Interaction Analysis during their student teaching exper-

ience became more positive in their attitudes toward teaching as

measured by the Teaching Situation Reaction Test (hereafter referred

to as TSRT). Student teacher attitudes toward their cooperating teach-

ers became less positive, but there was no change in the attitude of

the cooperating teachers toward the student teachers.

Moskowitz (1968) obtained similar results in another study of

student teachers in foreign language in which one group of student

teachers was trained in Interaction Analysis before student teaching

and the other group was not so trained. The student teachers who were

familiar with Interaction Analysis had more positive attitudes toward

teaching as measured by the TSRT, but less positive attitudes toward

their cooperating teachers than the group with no Interaction Analysis

instruction. Attitudes of the cooperating teachers toward the student

teachers were similar for both groups.

Zahn (1965, 1967) conducted a study to determine if there were

differences in attitude between elementary school student teachers who

had been given instruction in Interaction Analysis combined with super-

vision using Interaction Analysis and those student teachers who had

conventional instruction and supervision. Attitudes were determined by the TSRT. Student teachers who experienced the Interaction Analysis instruction and supervision had significantly more positive post-teaching attitudes than those who had conventional instruction and supervision. More positive attitudes toward teaching were evidenced by the group of student teachers trained in Interaction Analysis regardless of the attitudes toward teaching expressed by their cooperating teachers as measured by the TSRT.

Hough and Amidon (1967; also Amidon, 1965; and Amidon, 1968) evaluated attitudes of selected student teachers in secondary education by using the TSRT. The group of student teachers who had had instruction in Interaction Analysis during the semester while they were student teaching showed significant positive gain in attitudes toward teaching. Another group of student teachers who had not had Interaction Analysis instruction, but had studied the teaching-learning process instead, did not show a significant change. The positive change occurred primarily in those students who scored below the mean (relatively open-minded) on Rokeach's Dogmatism Scale. There were no significant differences in the two groups in their ability to be empathic toward students, their objectivity in use of data about students, in their use of experimental methods, or in being indirect in their attitudes toward control as measured by the TSRT.

Furst (1967) also found larger positive attitude change in student teachers taught Interaction Analysis than those not so taught. The change was greater for student teachers taught Interaction Analysis during student teaching than for those whose Interaction Analysis instruction was given prior to the beginning of their student teaching experience.

Interaction Analysis was taught to student teachers in elementary education in a preservice seminar by Brann (1967). The self-concepts of the student teachers as measured by the Tennessee Self-Concept Scale showed a significant positive mean increase between measurements taken before and after the instruction period.

Effects of Instruction in Interaction Analysis on the Evaluations of Student Teachers by Other Persons

Hough and Amidon (1967; also Amidon, 1965; and Amidon, 1968) found that secondary school student teachers who had been trained in use of Interaction Analysis were judged superior to a control group of student teachers by their college supervisors. The control group had studied the teaching-learning process instead of Interaction Analysis.

As discussed on page 36, Moskowitz (1967a, 1968) found that attitudes of cooperating teachers toward their student teachers were not different for student teachers who had instruction in Interaction Analysis and those who had had conventional instruction.

Pupils of foreign language in the Moskowitz (1968) study had significantly more positive attitudes toward student teachers who had studied Interaction Analysis than toward student teachers who had not studied Interaction Analysis. However, in the four-semester study by Amidon (1968), results concerning pupil perceptions of teaching patterns of student teachers were inconsistent from semester to semester.

Summary

Amidon and Flanders (1967, p. 90) have summarized the effects of instruction of student teachers in Interaction Analysis as reported in studies prior to 1967:

。。。Student teachers who had been taught Interaction Analysis differed significantly from those who had been exposed to traditional teacher-education programs (although the latter may have differed from one study to another). Student teachers trained in Interaction Analysis were found to:
1) Take more time to accept and use student ideas
2) Encourage a greater amount of pupil-initiated talk
3) Use less criticism
4) Use less direction
5) Be more accepting and encouraging in response to student ideas
6) Have a more generally indirect style.

In addition, studies cited in this section have indicated that student teachers who have had instruction in Interaction Analysis have more positive attitudes toward teaching than those who have not had the instruction. Perhaps, because knowledge of Interaction Analysis gives student teachers increased awareness of their own behaviors and their influence on pupils, they approach the teaching process differently than student teachers without this knowledge.

CHAPTER III

PROCEDURE AND METHODS

To accomplish the objectives of the study as outlined on pages 3 and 4, the procedure and methods described in this chapter were followed. The study was conducted at Oklahoma State University with the cooperation of the faculty of the Department of Home Economics Education. The research was carried out during the spring and fall semesters of 1968, with analysis of results being made in the spring semester of 1969.

The Observation Instrument -- Interaction Analysis

Interaction Analysis is a system of categorizing the verbal behavior of teachers and students by a trained observer. For a complete description of the system and instructions for its use, the reader is referred to The Role of the Teacher in the Classroom, either the first or the revised edition (Amidon and Flanders, 1963, 1967). Interaction Analysis was used by the observer in a manner indicated by instructions in this book.

A summary of the ten categories included in Interaction Analysis is given in Table I on page 8. These descriptions plus the rules suggested by Amidon and Flanders (1963, 1967) were used to decide which category to use when recording. In brief the categories are:

Teacher Talk, Indirect Influence: (1) Accepts feeling
                                                (2) Praises or encourages

	(3)	Accepts and/or uses student ideas
	(4)	Asks questions
Teacher Talk, Direct Influence:	(5)	Lectures
	(6)	Gives directions
	(7)	Criticizes or justifies authority
Student Talk:	(8)	Student talk – response
	(9)	Student talk – initiation
Other:	(10)	Silence or confusion

Observations of classroom verbal behavior were made by the re-searcher who recorded a code number for each verbal behavior evidenced. Code numbers, which referred to the ten categories, were recorded at three-second intervals, unless the type of verbalization shifted within the interval, in which case the number of the new category was recorded. Recording was generally continued for a period of about twenty minutes. At the end of this time the observer had a series of more than 400 code numbers representing the verbal behavior which had occurred. Recording of classroom behavior through Interaction Analysis is generally done "live", but may be accomplished through the use of audio or video-tapes. For this research all recording was done "live" in the classroom.

Before beginning to record, the observer allowed time to orient herself to the class and classroom, and allowed time for the class to be settled and such routine procedures as roll taking, assignments, and announcements to be completed. Only discussion portions of the classes were recorded.

After the recording was completed, numbers were plotted sequentially on a ten by ten matrix. Each number was recorded twice. Therefore, by examination of the matrix cells, one could determine what action preceded and followed each type of verbal behavior. For example,

if recorded numbers were 10, 9, 9, 3, 4; then the first pair of numbers, 10-9, would be recorded in the cell representing row 10 column 9; the second pair, 9-9, in row 9 column 9; the third pair, 9-3, in row 9 column 3; the fourth pair, 3-4, in row 3 column 4.

A sample of the tally matrix used is given on page 103 of Appendix A. It can be observed that all cells are not equal in size. The matrix form was designed by the writer in order to accommodate easily the large number of tallies in categories four, five, eight, and nine. Research studies have indicated that most of the classroom interaction is behavior which fits into these categories. Matrix information was then transferred to the work matrix (sample on page 104 of Appendix A). After the total number of tallies in each category was found; then percent of tallies in each category, percent teacher talk, and percent student talk were computed.

To determine the teaching pattern of each student teacher, the I/D (Indirect/Direct) ratio and the revised or control I/D ratio were calculated. Calculations of I/D may be made in two ways. To derive a ratio (Method I), the number of tallies in categories 1-4 (indirect influence) is divided by the number of tallies in categories 5-8 (direct influence). The decimal figure derived shows the relationship between the teacher's indirect and direct verbal behavior. If the number derived is greater than 1.00, the teacher used more indirect than direct influence. If the number is smaller than 1.00, more direct than indirect influence was used.

The revised or control I/D indicates the relationship between the teacher's indirect control or motivating statements (categories 1-3) and his direct control statements (categories 6-7). This ratio is

computed in Method I by dividing the number of tallies in categories 1-3 by the number of tallies in categories 6 and 7. A revised I/D ratio of 1.00 indicates an equal number of indirect and direct control statements. Higher numbers show more indirect than direct control statements, and numbers under 1.00 indicate more direct than indirect control statements.

The second method of expressing I/D and revised I/D ratios is to designate the relationship as a percent. To obtain the I/D percent, the number of tallies in categories 1-4 is divided by the number of tallies in categories 1-7. The percent obtained indicates indirect statements as they compare to total teacher statements, i. e., an I/D of 60 percent would indicate that 60 percent of the teacher's statements were indirect in influence (categories 1-4).

The revised percent I/D expressed by the second method is calculated by dividing the number of tallies in categories 1-3 by the number of tallies in categories 1, 2, 3, 6, and 7. The percent obtained indicates the proportion of the teacher's control and motivating statements. A teacher with a revised I/D of 75 percent would have made 75 percent of her controlling and motivating statements in a manner corresponding to categories 1, 2, and 3, and 25 percent corresponding to categories 6 and 7.

By examination of the matrix, percents in each category, and the I/D and revised I/D ratios, a teacher or evaluator can determine the influence patterns of the teacher. Questions such as the following ones can be answered for the teacher: Was I more direct or indirect in my influence? Were my control and motivating methods more direct or indirect? How much did I talk? How much time did I spend lecturing?

How much did my students talk and did I initiate their talking or did
they? How much silence and confusion was there in my classroom? How
did I respond to student talk? Further examination of the matrix can
answer other questions which are of particular interest to each teacher.

For this study, the following information was derived from each
Interaction Analysis recording of the verbal interaction in the class-
room: (1) a ten by ten matrix showing sequentially the behaviors
observed, (2) the percent of tallies occurring in each of the ten
categories of verbal behavior, (3) the proportion of teacher talk
expressed in percent, (4) the proportion of student talk expressed in
percent, (5) the I/D ratio, and (6) the revised I/D ratio.

Development of Proficiency in Use of Interaction Analysis

In order to develop proficiency in use of Interaction Analysis,
the researcher studied The Role of the Teacher in the Classroom (Amidon
and Flanders, 1963) and other published materials during February and
early March, 1968. The Interaction Analysis Training Kit: Level I
(Amidon and Amidon, 1967) was used for practice in recording and making
matrices. The kit includes a tape recording of classroom discussions
and a manual.

After about twelve hours of practice, two twenty-minute sessions
of a college-level discussion class were recorded "live" by coding. In
addition, the same sessions were tape recorded. Then the tape record-
ings were coded several times at home. From these sessions, reliability
was estimated by the Scott or π coefficient (Flanders, 1967b). Relia-
bility was checked between the "live" and taped sessions and between
replications of the taped sessions. Reliability was found to be

consistently above .85 which Flanders (1967b) has indicated to be nec-
essary for research purposes.

To insure correlation between the observations of the control group
and the experimental group, further tests were made in the fall semes-
ter, 1968. Again practice was conducted using the audio-tape and man-
ual, Interaction Analysis Training Kit: Level I (Amidon and Amidon,
1967). Following the practice sessions, correlations were estimated be-
tween twenty-minute interaction sessions coded in the spring and fall
semesters and between replications made in the fall. Reliability above
.85 was consistently obtained using the Scott or π' coefficient
(Flanders, 1967b).

The Samples

Two samples of student teachers were selected for use in the
research. The control group did student teaching in the spring semes-
ter, 1968, and had no instruction in Interaction Analysis. The exper-
imental group had instruction in Interaction Analysis and did student
teaching in the fall semester, 1968.

The student teaching program in home economics at Oklahoma State
University includes a semester block of courses, part of the block being
on-campus instruction and part being the student teaching experience.
For their student teaching experience, students move to various commu-
nities in Oklahoma having vocational home economics in the high schools.
Student teachers are generally assigned in pairs to one school with one
cooperating teacher. A list of centers approved by the state supervi-
sors of vocational home economics and the department faculty is given

to the student teachers and each pair of student teachers indicates preference for a center.

The samples of student teachers to be observed were selected from the centers to be used during each semester by a random number procedure as outlined by Popham (1967). It was necessary to use both students of each selected pair for observation as centers were some distance from the university and the researcher's time was limited. All students selected were willing to cooperate in the study. Eight of a total of forty-two eligible student teachers were selected for the control group and eight of twenty-six eligible student teachers were selected for the experimental group.

The control group consisted of eight senior women twenty-one or twenty-two years of age. The experimental group, also eight senior women, were between the ages of twenty and twenty-one. All had completed most of their required courses for the vocational home economics certification with the exception of the student teaching block courses.

During the spring semester of 1968, the student teachers in the control group, along with the others in the student teaching block, participated in four weeks of on-campus classwork, then did student teaching for seven weeks. After student teaching, they returned to the campus for another four weeks of instruction. Their on-campus classes involved study of philosophy of education, youth organizations, various aspects of vocational home economics teaching, and demonstration techniques.

The main difference in the education of the groups was that the experimental group had instruction in Interaction Analysis as part of the course, Techniques and Materials in Home Economics Education, while

they were on campus. The Interaction Analysis instruction is explained in detail in the next section. Like the control group, the student teachers in the experimental group also studied philosophy of education, youth organizations, and various aspects of vocational home economics teaching. Their study of demonstration techniques was integrated into the Techniques and Materials in Home Economics Education course.

The schedule for the experimental group was somewhat different from that of the control group. The student teachers in the experimental group participated in on-campus instruction for eight weeks, then student teaching for eight weeks, after which they returned to the campus for three days to evaluate their experiences. Because of the longer period on campus before student teaching, the expanded course work which included Interaction Analysis was possible.

No special arrangements were made for the student teachers sampled to participate in the research. Their courses in the student teaching block were identical to those of their classmates in the parent populations.

Instruction in Interaction Analysis

The instruction with which this research is concerned was expansion of the Demonstration Techniques course to Techniques and Materials in Home Economics Education. The course as expanded included in addition to demonstration techniques, instruction in audio-visual techniques, additional practice in oral communication, and study of Interaction Analysis.

The course, Techniques and Materials in Home Economics Education, was divided between two instructors; another staff member taught the

areas pertaining to demonstration techniques and audio-visual instruction while the researcher taught Interaction Analysis and oral communication techniques. The latter section is of concern in this research. Groups met with one instructor for four weeks then the other for four weeks so that each group received similar instruction. Each group met the class eight fifty-minute periods per week.

The following specific behavioral objectives were formulated concerning the learning pertaining to Interaction Analysis. Other behavioral objectives for the course were also formulated but have not been considered pertinent to list here.

In order to better understand and interpret her own behavior as a teacher through Interaction Analysis, it is essential for each student:

(1) to commit to memory the categories of the Interaction Analysis system.

(2) to be able to record classroom behavior by Interaction Analysis.

(3) to learn to construct an interaction matrix.

(4) to be able to interpret and analyze an interaction matrix using available source material.

(5) to become aware of and be able to evaluate the effects of praise, acceptance of student feelings, and acceptance of student ideas on learning. (Also, on the other hand, to become aware of and be able to evaluate the effects of the absence of praise, acceptance of student feelings, and acceptance of student ideas on learning, especially when coupled with criticism.)

(6) to apply course learnings in order to design her part of the classroom dialogue effectively (both questions to pupils and responses to their answers).

(7) to be able to demonstrate skill in use of student ideas in order to facilitate learning.

(8) to comprehend the types of direct and indirect teacher behaviors and their effects upon learning of dependent-prone and independent-prone students.

(9) to become familar with research findings related to Inter-
action Analysis.

(10) to use learnings in order to increase in ability to do self-
evaluation and to decrease in dependence upon others.

Copies of the objectives were distributed to the students at the

first class meeting. Progress was discussed at intervals throughout

the course. Interaction Analysis instruction and related discussions

and practice took approximately six to seven hours of actual class time.

In addition to this, students practiced recording using the Interaction

Analysis Training Kit. Level I (Amidon and Amidon, 1967) during out-of-

class time. They also recorded one five-minute and two fifteen-minute

class lessons presented by other students and made matrices for the

lessons.

The Role of the Teacher in the Classroom (Amidon and Flanders,

1967) served as a text. Filmstrips and tapes, Studying Teacher Influ-

ence, parts 2, 3, and 4 (University of Minnesota), were also used for

instructional purposes. The filmstrips and tapes explain the use of

Interaction Analysis.

In addition to learnings specifically related to Interaction Anal-

ysis, each student presented three simulated lesson segments which she

considered appropriate for secondary school home economics with the

college class role-playing high school students. Two of each student's

presentations were five minutes in length and one was fifteen minutes.

One five-minute and one fifteen-minute lesson were audio-taped for self-

study by the students. One five-minute session was video-taped and

students were able to observe the playback. Techniques appropriate for

various areas of home economics education were discussed and materials

available were shared by the group. At the end of the four-week

instruction period, students answered one page of questions evaluating the course work. A sample of the evaluation sheet is given in Appendix A, page 105.

Observation of the Student Teachers

After the eight student teachers in the control group were selected, their cooperation was solicited and obtained. It was briefly explained to them that this project was being pursued to gain knowledge concerning teaching patterns in home economics. The coding system was illustrated and student teachers were assured that they were not being evaluated by the researcher. No other information on Interaction Analysis was given to student teachers in the control group.

All of the student teachers with Interaction Analysis instruction who were selected for the experimental group sample were willing to participate in the study. The investigator served as college supervisor for these student teachers. It was stressed that Interaction Analysis results would not be used in grading the student teachers.

Cooperating teachers and administrators in the selected centers were contacted by letter to ask if observations would be permissible. All indicated their willingness to cooperate in the study.

Two visits were made to each center and approximately forty-minutes interaction was recorded for each student teacher during each visit. It was not always possible to record as much as forty-minutes interaction as a few student teachers taught only one class in which there was discussion or lecture. In those cases, the total time that was spent in interaction was recorded. Visits were made at least two weeks apart. The student teachers in the experimental group were at

the teaching centers for eight weeks, whereas the student teachers in the control group were at the centers for seven weeks. In order to negate any effects of this difference in time in the centers, no visits were made to the student teachers in the experimental group during their eighth week in the centers. Student teachers knew in advance the dates visits were scheduled. Only classes with lecture and/or discussion were recorded with Interaction Analysis. Laboratory classes and classes in which individual work was being done were not recorded with Interaction Analysis, nor were student reports and other classwork in which discussion was not planned. Classes observed ranged in grade level from nine to twelve. Subjects under study were varied and included all areas of home economics. Classes taught by student teachers in the control group included between four and twenty-three students. Student teachers in the experimental group had classes which ranged from five to twenty-nine students.

Interaction Analysis observations of each student teacher were summarized in matrix form for each visit. Tallies from each category from both visits were added together to form each student teacher's combined matrix. Percentages and I/D ratios were then computed for the combined matrices.

Student teachers in the experimental group were asked to prepare at least one twenty-minute Interaction Analysis matrix from one of their classes before each visit of the researcher. As student teachers were in pairs, they recorded Interaction Analysis observations for each other. These prepared matrices were utilized in conferences with the student teachers. In addition, matrices which the investigator prepared

for the classes which she observed were sent to the student teachers in the experimental group for their own use.

Statistical Treatment of the Data

Statistical treatment was accomplished with the help of two statisticians and the university computer services. Methods of analyzing data were determined by the objectives of the study, pages 3 and 4. Data from combined matrices were used in the analyses.

For the major part of the problem it was necessary to determine if use of verbal interaction and teaching patterns were different for student teachers in home economics who had not had instruction in Interaction Analysis (control group) from those of student teachers who had had instruction in Interaction Analysis (experimental group). To do this, t tests were employed to find if there were differences between means of the two groups in verbal behavior represented by each of the ten categories of Interaction Analysis, the percent of teacher talk, the percent of student talk, the I/D ratios, and the revised I/D ratios. Because of the particular computer program which was used, F ratios rather than t values were obtained. The F ratio is equal to the square of the t value. For this study .05 was designated as the significance level.

In order to find out whether teaching patterns were related to grade point averages, the Pearson Product Moment correlation technique was used. Correlation coefficients between grade point averages and the student teachers' I/D ratios, revised I/D ratios, percent teacher talk, and percent student talk were obtained.

Summary

In order that the reader may briefly ascertain the steps included in the research and the time schedule used, the following summary is presented.

Spring Semester, 1968:

(1) The researcher studied Interaction Analysis through The Role of the Teacher in the Classroom (Amidon and Flanders, 1963) and other published materials. Proficiency in recording and preparation of matrices was developed through use of commercially and personally prepared tapes and live observation.

(2) A random sample of eight senior students who were to student teach in high school home economics classes during the spring semester, 1968, was selected. This group of student teachers had had no instruction in Interaction Analysis and was considered the control group.

(3) Observations using Interaction Analysis were made of each of the student teachers on two different occasions with at least two weeks spacing between visits.

(4) Plans were begun for teaching Interaction Analysis to the group of student teachers who were scheduled to teach during the fall semester, 1968.

Fall Semester, 1968:

(1) Plans were completed for inclusion of Interaction Analysis instruction in the course, Techniques and Materials in Home Economics Education, for all home economics education students who planned to student teach during the semester.

(2) The course was taught as planned. All students in the course

received instruction in Interaction Analysis at some time during the first eight weeks of the semester.

(3) The researcher again practiced Interaction Analysis through tapes to maintain necessary proficiency.

(4) A sample of eight student teachers who had participated in the Interaction Analysis instruction was selected. This group of student teachers constituted the experimental group.

(5) The student teachers in the experimental group were observed and Interaction Analysis matrices were tabulated. Two visits with a separation interval of at least two weeks were made.

Spring Semester, 1969:

(1) Data from observations of the control and experimental groups were analyzed with computer assistance.

(2) Writing of the dissertation was done.

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the findings of the research will be reported
and discussed. Throughout the chapter, the group of eight student
teachers who had no instruction in Interaction Analysis will be desig-
nated as the control group. The group of eight student teachers who
studied Interaction Analysis prior to their student teaching experience
will be referred to as the experimental group.

The statement of the problem and the objectives of the study have
been given on pages 1, 3, and 4. When considering the findings, the
reader may wish to keep in mind the five questions of the problem:
What are the verbal teaching patterns of student teachers in home econ-
omics who have not had instruction in Interaction Analysis? What are
the teaching patterns of student teachers in home economics who have
had instruction in Interaction Analysis? What are the differences in
teaching patterns between the two groups? Is there a relationship be-
tween teaching pattern and grade point average? Is the study of Inter-
action Analysis a useful component of teacher preparation in home
economics?

Verbal Behavior of the Student Teachers

This portion of the dissertation has been divided into twelve
sections. Each of eleven of the sections will include a discussion of

one aspect of verbal behavior in the classroom. Because total student talk and student talk in categories eight and nine are so closely related, findings for these three aspects of verbal behavior have been discussed in one section. Explanations of the aspects of verbal behavior included in Interaction Analysis have been given on pages 5 to 9 and 40 to 44.

The data gathered from Interaction Analysis observations of each teacher are reported in Tables VI and VII of Appendix B (pages 107 and 108). The means of both groups, F ratios, and probability levels for each aspect of verbal behavior with which the objectives of this study are concerned are shown in Table IV, page 57. Data used for this table included the ten Interaction Analysis categories, teacher talk, student talk, I/D ratios, and revised I/D ratios as obtained from the combined matrices for the teachers. As stated in the description of the procedure, because of the computer program used, F ratios rather than t values have been reported. One may find t by calculating the square root of the F ratio.

In each section results of the study will be reported, then these results will be compared to findings of other investigators which are related to this study. The reader may wonder why data gathered by certain investigators appear in some, but not all, of the sections. There may be two reasons. Some investigators have reported only selected data from their Interaction Analysis observations so that findings may be unavailable for certain categories of verbal behavior. Other researchers have used modifications of Interaction Analysis such as those described on page 16. Therefore, only certain categories of their data are comparable to observations obtained by using Interaction Analysis.

TABLE IV

STATISTICAL COMPARISON OF DATA FROM THE CONTROL
GROUP AND THE EXPERIMENTAL GROUP

Variable	Means		F Ratio*	Probability
Category 1	Control	.04%	2.568	< .25
	Experimental	.17%		
Category 2	Control	4.13%	3.201	< .10
	Experimental	2.95%		
Category 3	Control	2.02%	14.070	< .005**
	Experimental	5.76%		
Category 4	Control	14.70%	.720	< .50
	Experimental	12.93%		
Category 5	Control	42.94%	.559	< .50
	Experimental	36.64%		
Category 6	Control	1.10%	1.624	< .25
	Experimental	.59%		
Category 7	Control	.51%	.868	< .50
	Experimental	.29%		
Category 8	Control	11.51%	4.977	< .05**
	Experimental	6.44%		
Category 9	Control	11.52%	4.508	< .10
	Experimental	24.74%		
Category 10	Control	11.53%	.308	< .75
	Experimental	9.49%		
Teacher Talk	Control	65.44%	.705	< .50
	Experimental	59.34%		
Student Talk	Control	23.03%	1.230	< .50
	Experimental	31.17%		
I/D Ratio	Control	.508	2.053	< .25
	Experimental	1.142		
Revised I/D Ratio	Control	10.194	1.861	< .25
	Experimental	19.640		

*F at .05 is 4.60; F at .01 is 8.86
**Significant difference between groups

Results and Discussion -- Category One

Teacher statements in category one are those which are used in
accepting and clarifying student feelings. Results of Interaction Anal-
ysis observations pertaining to use of category one were:

	Mean	Range
Control group	0.04%	0.00 - 0.25%
Experimental group	0.17%	0.00 - 0.60%

Student teachers who had studied Interaction Analysis used more
than four times as much acceptance of feeling as student teachers with-
out the knowledge of Interaction Analysis. However, the F value, 2.568,
was not large enough to be significant at the .05 level.

The range of behaviors in this category was greater for the stu-
dent teachers in the experimental than for those in the control group.
It is also worth noting that when combined matrices of individual teach-
ers are examined (Table VI and VII, pages 107 and 108), it can be ob-
served that only two of the eight student teachers in the control group
made any statements which were classified as being in category one. In
the experimental group six of the eight student teachers used statements
in this category.

According to Amidon and Flanders (1967), most teachers use state-
ments in category one less than 0.5 percent of the interaction time,
with direct teachers using the category less than 0.1 percent and
indirect, 0.5 percent. According to this criteria, the control group
of student teachers used category one statements in an amount similar
to direct teachers, while the experimental group showed slightly more
use of the category than the direct teachers, but less than the
indirect teachers.

In comparison to the use of category one by inservice teachers
in home economics in the study by Jorgenson (1968), the mean use of
category one by the student teachers who had no instruction in Inter-
action Analysis was similar to the mean use of category one by first-
year teachers (mean, 0.05 percent). Student teachers in the experimental
group used category one statements somewhat more often than the second-
year teachers (mean, 0.13 percent) and about three times as much as the
first-year teachers. Kalbfleisch (1967) found that the inservice and
student teachers in home economics whom she observed accepted student
feeling during 0.56 percent of the interaction time, much more than the
student teachers in this study. Kalbfleisch used observation results
from both discussion and laboratory classes.

The student teachers in this study used category one statements
less frequently than comparable secondary school student teachers
observed by Lohman, Ober, and Hough (1967). In their research, stu-
dent teachers with no training in Interaction Analysis had 0.14 percent
of tallies in category one, while those who had Interaction Analysis
instruction prior to student teaching used category one statements
0.26 percent of the time.

Results and Discussion -- Category Two

Category two of Interaction Analysis represents those verbal
statements of the teacher which praise or encourage student ideas and
behavior. Tension releasing jokes are included here, but in the liter-
ature, the category is often referred to simply as praise. According

to combined matrices, use of category two by the student teachers in this study was:

	Mean	Range
Control group	4.13%	2.48 - 5.72%
Experimental group	2.95%	1.32 - 5.59%

The experimental group had a wider range in percentage of behavior in category two than did the control group. The student teachers in the control group used category two a greater percent of the time than did the experimental group, but the F ratio, 3.201, was not large enough to consider the difference significant at the .05 level. The probability of this difference occurring by chance was, however, less than .10 as shown in Table IV, page 57. The reason for the difference may have been that the student teachers who were familiar with Interaction Analysis might have tended to respond to student ideas with acceptance and clarification (category three) rather than praise.

Kirk (1964) also found that elementary school student teachers who were not trained in Interaction Analysis used slightly more praise than the trained group. Category two means for the group of student teachers he observed were 3.46 percent for the group not trained in Interaction Analysis and 3.31 percent for the trained group. Lohman, Ober, and Hough (1967) found an opposite tendency. In their research, the group of secondary school student teachers who had studied Interaction Analysis used more praise (mean, 2.19 percent) than the group of student teachers not familiar with Interaction Analysis (mean, 1.41 percent). Differences were not significant in either study.

According to a comparison of means, the control group of student teachers in this study used more praise than their counterparts in secondary and elementary education observed by Lohman, Ober, and Hough

(1967) and Kirk (1964). The experimental group in this study used less praise than the experimental group of elementary school student teachers observed by Kirk, but more praise than the group of secondary school student teachers observed by Lohman et al.

Both groups of student teachers in home economics used more praise than the inservice teachers observed by Amidon and Flanders (1967) who reported about 2 percent average use of category two with no appreciable difference between direct and indirect teachers. Group means for student teachers in this study were comparable to the 3 to 6 percent range of means for category two reported for elementary teachers by Furst and Amidon (1967).

Both groups of student teachers in this study used more praise than the first and second-year home economics teachers observed by Jorgenson (1968). In her study the mean for first-year teachers for category two was 0.43 percent. For second-year teachers the mean was even lower, 0.13 percent.

Results and Discussion -- Category Three

Category three of Interaction Analysis represents the teacher's verbal behavior as she accepts and uses students' ideas. For the student teachers in the two groups, the following data represent category three use as shown by combined matrices:

	Mean	Range
Control group	2.02%	0.51 - 3.40%
Experimental group	5.76%	2.19 - 10.32%

Mean use of category three by student teachers in the experimental group was more than two and one-half times as great as mean use of this category by student teachers in the control group. Statistical analysis

of the difference between groups yielded an F value of 14.070 which was significant at the .005 level.

The findings may be contrasted with those in category two, praise. The control group had higher use of praise, whereas the experimental group had higher use of acceptance and clarification of students' ideas. As stated in the discussion of category two, perhaps student teachers with Interaction Analysis instruction use acceptance and clarification of student ideas instead of teacher praise to encourage student participation.

Differences between groups may also be indicated by a comparison of individual student teachers. According to information from combined matrices, the highest use of category three by a student teacher in the control group was 3.40 percent. In contrast to this, seven of the eight student teachers in the experimental group used category three statements more than 3.70 percent of the interaction time. However, as with categories one and two, the range of percent of use of category three was greater for the student teachers in the experimental group than for the student teachers in the control group.

Amidon and Flanders (1967), in summarizing effects of instruction in Interaction Analysis, have indicated that student teachers who have knowledge of Interaction Analysis take more time in accepting and clarifying student ideas than student teachers with no Interaction Analysis instruction. Student teachers in home economics followed this pattern. Lohman, Ober, and Hough (1967) also found that student teachers in secondary schools who had studied Interaction Analysis used significantly more acceptance and use of students' ideas than those student teachers without the instruction.

Both groups of student teachers in home economics observed in
this study used less time in accepting and clarifying ideas than the
secondary school student teachers in the Lohman, Ober, and Hough (1967)
study. Means which they observed were 8.93 percent for student teachers
without training in Interaction Analysis and 10.66 for student teachers
with the training.

Kirk, however, found little difference in mean use of category
three for elementary school student teachers not trained in Interaction
Analysis (mean 4.51 percent) and student teachers with Interaction
Analysis instruction (mean 4.29 percent). When compared to these ele-
mentary school student teachers with comparable Interaction Analysis
instruction, the control group of student teachers in home economics
used category three less frequently than the control group of elementary
school student teachers, while the experimental group of student teach-
ers in home economics used category three more frequently than the ex-
perimental group of elementary school student teachers.

Student teachers in home economics observed in this study may be
compared to inservice teachers according to mean use of category three.
In the Jorgenson (1968) study of inservice teachers in home economics,
mean use of category three by first-year teachers was 4.20 percent; but
for second-year teachers it was only 1.80 percent. Therefore, both
groups of the student teachers in this study used more time accepting
and clarifying pupil ideas than the group of second-year teachers, but
only the experimental group of student teachers used more time in this
category than the first-year teachers in home economics.

Amidon and Flanders (1967) have reported average use of category
three statements for inservice teachers as being from 2 to 9 percent,

with direct teachers using about 2 percent and indirect teachers about
9 percent. According to this criteria, the mean for the control group
was similar to direct teachers and the mean for the experimental group
fell between the mean of the direct teachers and the mean of the indirect
teachers observed by Amidon and Flanders.

Results and Discussion -- Category Four

Category four of Interaction Analysis represents the questions
asked by the teacher. Use of category four by the student teachers in
this study was:

	Mean	Range
Control group	14.70%	9.58 - 19.55%
Experimental group	12.93%	9.30 - 21.14%

The difference between category four means for the control and
experimental groups of student teachers was small, less than 2 percent,
with the control group using the most questioning behavior. The F
ratio obtained from the statistical analysis was only .720, far from
being significant. As with categories one, two, and three, the range
of percent of interaction represented by category four was greater for
teachers in the experimental group than for teachers in the control
group.

Lohman, Ober, and Hough (1967) and Kirk (1964) also found small
differences in use of questioning by student teachers who were familiar
with Interaction Analysis and those who were not. However, Furst (1967),
who observed student teachers teaching in secondary school social
studies and English classes, found that student teachers with no instruc-
tion in Interaction Analysis used questions 11.6 percent of the inter-
action time, while mean use of questioning was 19.1 percent by student

teachers who had Interaction Analysis instruction before their student
teaching began. The difference between the groups was not significant.

Mean use of category four by student teachers in the control
group was slightly greater than that of the control group in the Furst
(1967) study, while mean use of category four by the experimental group
was less than category four use by the experimental group of teachers
observed by Furst. Mean use of category four by student teachers in
both groups in this study was slightly greater than mean use of category
four by both groups of secondary student teachers in the study by
Lohman, Ober, and Hough (1967). Means which they reported were 12.37
percent for the Interaction Analysis trained group and 12.26 for the
untrained group. Kirk (1964), however, reported greater mean use of
category four by the elementary school student teachers he observed
than the mean use by student teachers in the current study. The stu-
dent teachers who had studied Interaction Analysis in the research by
Kirk used questioning 14.55 percent of the time, while for those who
had not studied Interaction Analysis, questioning represented 15.85
percent of the interaction.

Student teachers in home economics in this study used more ques-
tioning than either the first-year or second-year home economics
teachers observed by Jorgenson (1968). The mean for first-year teach-
ers for category four was 8.20 percent; for second-year teachers, the
mean was 6.60 percent. The inservice teachers and student teachers in
home economics observed by Kalbfleisch (1967) used teacher questioning
about 12 percent of the time — less than either group of student
teachers in this study.

Amidon and Flanders (1967) have indicated that teachers use

questioning an average of about 8 to 15 percent of the class time, with direct teachers using about 8 percent and indirect teachers about 11 percent. Compared to these averages, both groups of student teachers in this study used a relatively high percentage of questions.

Results and Discussion — Category Five

Category five of Interaction Analysis is teacher lecture. Computations from combined matrices of student teachers in this study gave the following data for category five:

	Mean	Range
Control group	42.94%	30.64 – 59.69%
Experimental group	36.64%	6.09 – 62.80%

Category five was used more than any other category by student teachers in both groups. Considering its heavy use, the difference between means was rather minor, about 6 percent, with teachers in the control group using more lecture than the teachers in the experimental group. The F ratio representing differences between groups was small, .559.

The range of percents in category five was almost twice as great for the teachers in the experimental group as for the teachers in the control group. The range of percent use of category five was very wide for teachers in the experimental group. There was a difference of nearly 57 percent between the amount of lecture by the student teacher using the most lecture and the student teacher using the least lecture.

Kirk (1964) and Furst (1967) also found no significant difference in amount of lecture between groups of student teachers with and without instruction in Interaction Analysis. However, mean amount of lecture by student teachers observed in those two studies was much lower than

the mean amount of lecture by student teachers in the current study.
Means of category five for secondary school student teachers in the
research by Furst were: student teachers with no Interaction Analysis
instruction, 24.0 percent; student teachers with Interaction Analysis
instruction before student teaching, 26.0 percent. For elementary
school student teachers in the control group of the study by Kirk, mean
lecture was 25.74 percent; in the experimental group mean lecture was
26.12 percent.

Lohman, Ober, and Hough (1967) found that secondary school student
teachers with instruction in Interaction Analysis did significantly less
lecturing than those with no Interaction Analysis instruction. In their
observations, mean amount of lecture for the untrained group was 38.64
percent; for the trained group, 32.63 percent. These means are somewhat
lower than the mean amount of lecture by the comparable groups of stu-
dent teacher in home economics, but do not appear to be appreciably
different.

The student teachers in home economics observed in this study were
within the average range of lecturing, 25 to 50 percent, reported by
Amidon and Flanders (1967). According to their research, direct and
indirect teachers were not found to differ greatly in amount of lecture.
Pankratz (1967) found the amount of lecture was not different for
twelfth-grade physics teachers considered to be superior and twelfth-
grade physics teachers not considered to be superior. Mean amount of
lecture was about 50 percent for both groups.

When compared to inservice home economics teachers observed by
Jorgenson (1968), the control group was similar in amount of lecture
to the mean of the first-year teachers, 41.42 percent; while the student

teachers the experimental group did less lecturing than the first-year teachers. The second-year teachers lectured more (mean, 51.00 percent) than either group of the student teachers in home economics who were observed in this study.

Results and Discussion -- Category Six

Category six of Interaction Analysis represents the teacher's directions and commands with which the pupils are expected to comply. In this study student teachers used category six statements a small percent of the time as shown by the following values:

	Mean	Range
Control group	1.10%	0.06 - 3.07%
Experimental group	0.59%	0.06 - 1.64%

The mean use of category six by the student teachers in the control group was nearly double the mean use of category six by student teachers in the experimental group. However, the F ratio, 1.624, was not large enough for the difference to be considered significant at the .05 level. Student teachers in the control group had wider individual variations in use of category six than student teachers in the experimental group.

Amidon and Flanders (1967) have reported that considering an over-view of research investigating learning of Interaction Analysis by student teachers, those who had instruction used fewer directions than the student teachers who did not have the instruction. This trend would seem to be true for student teachers in this study.

The student teachers in home economics used somewhat less direction-giving behavior than comparable groups of secondary school student teachers observed by Lohman, Ober, and Hough (1967), and

considerably less than elementary school student teachers observed by Kirk (1964). Means reported by Lohman, Ober, and Hough were: control group, 1.76 percent; experimental group, 1.08 percent. Means which were reported by Kirk were: control group, 5.17 percent; experimental group, 3.40 percent. The difference between groups was significant in Kirk's study.

When compared to averages for teachers as reported by Amidon and Flanders (1967), the student teachers in this study were very low in use of category six, considerably lower than either the teachers considered direct (mean, about 8 percent) or the teachers considered indirect (mean, about 4 percent).

In this study student teachers in home economics apparently used few directions and commands, with ten of the sixteen student teachers using this behavior less than 1 percent of the recorded interaction time. One reason for the low recorded values may have been that activities such as making assignments, which would be considered category six behavior, often occurred at the beginning or the end of the class period and at times other than when discussion was being conducted. Therefore, Interaction Analysis recording was not in progress. Also the pupils of the student teachers did not present any severe behavior problems at the time the observer was in the classroom so that the student teachers did not use commands on any extended basis in order to gain pupil compliance.

On the other hand, perhaps home economics teachers characteristically use little directive behavior. Jorgenson (1968) found that second-year teachers in home economics used this category only 0.41 percent of the time, which was less than category six used by either group of

student teachers. The category six mean for first-year teachers (1.00 percent) ranked between the means of the two groups of student teachers in this study. However, the home economics student teachers and experienced teachers observed by Kalbfleisch (1967) used direction-giving 10.5 percent of the time. The high figure might be expected in this particular research, since Kalbfleisch recorded both discussion and laboratory classes and significantly more direction-giving was done in the laboratories than in the discussion classes. Separate means for the types of classes were not reported.

Results and Discussion -- Category Seven

Criticism of pupils by the teacher is the main behavior which is recorded in category seven of Interaction Analysis. When it was used at all, criticism was used sparingly by the student teeachers in this study. Data from combined matrices shows

	Mean	Range
Control group	0.51%	0.00 - 1.18%
Experimental group	0.29%	0.00 - 1.53%

The mean amount of criticism used by the control group was almost twice as high as the mean for the experimental group. Both groups used small amounts of criticism and the difference was not significant. The F value was .868. The direction of the difference tends to follow the norm, as Amidon and Flanders (1967) have reported that student teachers who have had instruction in Interaction Analysis generally use less criticism than those who have not had the instruction.

The range of percents of combined matrix values in category seven was greater for student teachers in the experimental group than for student teachers in the control group. Two student teachers in the experimental group and one in the control group used no criticism during the

time that they were observed. It is worth noting that seven of the eight teachers in the experimental group used less than 0.30 percent of the interaction time in category seven.

One reason for the low values for criticism was probably the fact that the student teachers were not experiencing any major behavior problems in their classrooms. Occasional whispering constituted the only distrubances observed by the researcher. Also, the student teachers appeared to try hard not to criticize students' responses to questions. Instead they attempted to help students clarify their own answers through use of restatements of the students' ideas or further questioning of the students in order that they might clarify their own ideas.

Mean values in use of category seven by both groups of student teachers in this study were smaller than the mean values for category seven use by student teachers observed by Kirk (1964) in the elementary grades. Mean value for the control group of student teachers in his study was 1.29 percent. For the group with Interaction Analysis instruction the mean value was 0.86 percent. The difference was not significant.

Category seven means for both groups of student teachers in this study were very low compared to composite values for teachers as reported by Amidon and Flanders (1967). They have written that average teachers use category seven statements 3 to 4 percent of the time; direct teachers, 8 percent of the time; and indirect teachers, 4 percent of the time. The category seven means for student teachers in this study were also quite low when compared to means of 2 to 3 percent use of category seven by elementary teachers as reported by Furst and Amidon (1967).

As with commands, perhaps teachers in home economics use little criticism. Jorgenson (1968) reported mean percent use of category seven by first-year teachers as being 0.70, with mean percent use by second-year teachers being 1.30. According to comparison of means, the student teachers in home economics observed in this study used less criticism than either the first or second-year teachers in home economics observed by Jorgenson.

Results and Discussion -- Category Eight, Category Nine, and Total Student Talk

Because categories eight and nine and the total student talk in the classroom are so interrelated, it appears to be logical to discuss them together. Category eight statements included answers to teachers' questions which the teacher solicited. These were answers which a pupil gave when the teacher had called on her, but she had not volunteered to answer. Short, predictable answers given by a pupil who had volunteered or by several class members speaking at the same time were also included in category eight. Category nine, pupil-initiated talk, included all other pupil talk not recorded in category eight. Student-volunteered answers that included the student's own thoughts or ideas were recorded as category nine statements. All of the pupil statements which were "spoken out" in class without hand raising were included in category nine. Any questions asked by students were also recorded as student-initiated talk. Total student talk was the percent of the total interaction representing the sum of the tallies in categories eight and nine.

So that the reader may compare the groups in relation to percents

in categories eight and nine and total student talk, the results for
these categories have been shown together. All data have been obtained
from combined matrices of individual teachers.

Category eight results were:

	Mean	Range
Control group	11.51%	7.44 - 15.01%
Experimental group	6.44%	1.02 - 14.21%

Category nine results were:

	Mean	Range
Control group	11.52%	1.72 - 17.85%
Experimental group	24.74%	4.07 - 54.45%

Total student talk was:

	Mean	Range
Control group	23.03%	15.39 - 32.15%
Experimental group	31.17%	13.70 - 68.66%

Observations of the data regarding student talk show three impor-
tant trends. The first trend observed is that there was more total
pupil talk in classes of student teachers who had studied Interaction
Analysis than in classes of student teachers who had not studied Inter-
action Analysis. The mean difference was about 13 percent, but was not
great enough for significance at the .05 level -- F ratio, 1.230.

The second important observation is that the distribution of
pupil talk in categories eight and nine was different for the control
group and the experimental group. Classes of the teachers in the con-
trol group had nearly the same amount of category eight talk as category
nine talk. However, the pupil talk in classes of the student teachers
in the experimental group was self-initiated nearly four times as often
as it was teacher-initiated.

When means of the two groups are compared, the control group had
about twice as much category eight student talk in their classes as the

experimental group. The difference was significant at the .05 level, the F ratio being 4.977.

When means of the two groups are compared in category nine, the opposite trend is apparent. Pupils in classes of student teachers in the experimental group used category nine statements more than twice as much as pupils in classes of student teachers in the control group. The difference was very close to being significant at the .05 level. The F ratio was 4.508 with an F of 4.6 being needed for significance.

The third major observation is that for all three aspects of pupil talk the range of percents was greater in classes of student teachers in the experimental group than in classes of student teachers in the control group. In fact, there was a 54.96 percent difference in the amount of total student talk between the student teacher in the experimental group who had the most student talk and the student teacher who had the least student talk as shown by their combined matrices.

According to composite values for teachers as reported by Amidon and Flanders (1967), average teachers have about 16 percent category eight student talk in their classrooms, with little difference between classrooms of direct and indirect teachers. The pupils of first-year and second-year home economics teachers in the study by Jorgenson (1968) used category eight statements 23.00 percent and 20.40 percent, respectively. Compared to these means, percent of category eight statements was low in classes of student teachers in both groups in the study. No data comparable to that found for inservice teachers for categories eight and nine were found for student teachers.

The experimental group of student teachers had a much higher

percent of pupil-initiated talk in their classrooms than did inservice teachers observed by Jorgenson (1968) or teachers in the composites reported by Amidon and Flanders (1967). Amidon and Flanders reported that average teachers have about 8 percent student-initiated talk in their classrooms, with little difference existing between the classrooms of direct and indirect teachers. Both groups of student teachers had more category nine talk than this. Category nine statements represented 16.00 and 13.90 percent of interaction in classes of the first and second-year home economics teachers observed by Jorgenson. The student teachers in the control group had somewhat less category nine talk than this while the classes of the experimental group had much more.

Total pupil talk reported by other researchers has varied so much from study to study that it is difficult to draw conclusions as to whether total pupil talk in classes of the student teachers in home economics is average, above average, or below average. As far as instruction in Interaction Analysis is concerned, the trend has been the same as it was in this study, i.e., there was more total pupil talk in classes of student teachers who had Interaction Analysis instruction than in classes of student teachers who did not have Interaction Analysis instruction. Means for student teachers in other studies were: Lohman, Ober, and Hough (1967) secondary school student teachers — untrained 25.29 percent, trained 30.76 percent; Furst (1967) secondary school student teachers in English and social studies — untrained 21.05 percent, trained 25.55 percent; Kirk (1964) elementary school student teachers — untrained 31.49 percent, trained 40.63 percent. It can be seen that the student teachers in home economics compared favorably in amount of pupil talk in their classrooms with the other secondary

school student teachers, but had less pupil talk than the elementary
school student teachers with comparable Interaction Analysis instruction

When compared to Flanders' rule of two-thirds in which students
talk one-third of the class time, pupils of student teachers in this
study had a low amount of pupil talk. However, if one uses other
information by Amidon and Flanders (1967) which says that teachers gen-
erally have about 24 percent student talk in their classrooms, then the
classrooms of the student teachers in the control group were average
and the classrooms of the student teachers in the experimental group
above average in amount of student talk. Pupils of the student teach-
ers in this study did not talk as much as pupils of teachers considered
superior by Flanders (1961) and Amidon and Giammateo (1967). In both of
these studies students of superior teachers talked about 40 percent of
the time.

When compared to classes of other home economics teachers, pupils
of the student teachers in this study talked more than pupils of teach-
ers in the research by Kalbfleisch (1967) who found average student
talk to be slightly less than 20 percent. However, pupils of the
inservice teachers in the study by Jorgenson (1968) talked somewhat
more than pupils of student teachers in the experimental group and
much more than pupils of student teachers in the control group. Pupil
talk means in the Jorgenson study were 39.00 percent for first-year
teachers and 34.30 percent for second-year teachers.

Results and Discussion -- Category Ten

Category ten of Interaction Analysis indicates silence or confu-
sion in the classroom. According to combined matrices, use of category

ten by student teachers in this study was:

	Mean	Range
Control group	11.53%	3.31 - 28.63%
Experimental group	9.49%	4.09 - 22.00%

The control group of student teachers had slightly more silence and confusion in their classroom than the experimental group. The difference was statistically very small, the F ratio being .308. The range of percents in category ten was greater for the control group than the experimental group.

In only two cases did the amount of silence or confusion appear to be excessive for the lessons being taught. On one of the days that teacher C of the control group was observed, she conducted the lesson in a very slow and halting manner. Pauses seemed to be excessively long. Teacher C had the highest use of category ten by a teacher in the control group, 28.63 percent of the class time. There was also what appeared to be undue confusion at times in the classes of teacher J of the experimental group. She used 22.00 percent of interaction time in category ten. For the most part, however, the tallies in category ten were for silences occurring naturally in the conduct of the classes. Very often the silences were pauses during which the teacher was writing on the chalk board.

The means of category ten for student teachers in this study were similar to means observed for other student teachers by Lohman, Ober, and Hough (1967) and Kirk (1964). In both of these studies the student teachers who had Interaction Analysis instruction used less time in category ten than student teachers without the instruction, but differences between groups were not significant. Means for the secondary school student teachers in the study by Lohman, Ober, and Hough were:

control group, 10.49 percent; experimental group, 9.41 percent. Means
for the elementary school student teachers in the study by Kirk were:
control group, 11.99 percent; experimental group, 6.66 percent.

If one looks at the rule of two-thirds (Amidon and Flanders, 1967),
then 33 percent of the time would be expected to be recorded in category
ten. This seems very high, and the writer tends to interpret this fig-
ure as meaning one-third of over-all classroom time, not just the time
spent in discussion periods. Flanders and Amidon also have said that
category ten values tend to be higher for direct than indirect teachers.
Furst and Amidon (1967) found that elementary school teachers had
silence or confusion in their classes 15 to 25 percent of the time,
which is a higher percentage than that of either group of student
teachers in this study.

Student teachers in this study had about twice as much silence and
confusion in their classes as did the inservice teachers in home econ-
omics observed by Jorgenson (1968). In her study mean use of category
ten by first-year teachers was 5.00 percent, while mean use by second-
year teachers was 4.33 percent. In the study of home economics teach-
ers conducted by Kalbfleisch (1967) mean value for silence and confu-
sion was about 10 percent, an amount similar to that of student teach-
ers in the current research.

Results and Discussion -- Teacher Talk

Total teacher talk includes categories one through seven of

Interaction Analysis. Total percent teacher talk for student teachers
in this study was:

	Mean	Range
Control group	65.44%	54.61 - 78.31%
Experimental group	59.34%	26.27 - 80.74%

Total teacher talk was somewhat higher for the control group than
the experimental group, but the statistical difference as measured by the
F ratio, .705, was very small. The range in percent use of teacher talk
was much larger for teachers in the experimental group than for teachers
in the control group.

Mean percent teacher talk by groups was similar to the teacher
talk of secondary school student teachers observed by Lohman, Ober,
and Hough (1967). Means reported in their study were: control group,
64.33 percent; experimental group, 60.11 percent.

Mean values obtained by Furst (1967) for total teacher talk were
similar in size to values in this study but the differences were in the
opposite direction. Subjects of the study were student teachers in
English and social studies in secondary schools. The mean amount of
teacher talk for student teachers without Interaction Analysis instruc-
tion was 57.9 percent; for student teachers with Interaction Analysis
instruction before student teaching, 66.7 percent. The elementary
school student teachers in the study by Kirk (1964) used less teacher
talk than the secondary school student teachers in this study and the
Furst (1967) and Lohman, Ober, and Hough (1967) studies. Means for the
elementary school student teachers were 56.04 percent for the untrained
group and 52.71 percent for the trained group. As in the current study,
differences between groups were not significant in the studies by Lohman
and others, Furst, and Kirk.

If Flanders (1961) rule of two-thirds is used, then teachers are expected to talk about 67 percent of the interaction time, an average very similar to the control group mean. Teachers in the experimental group talked somewhat less than this average. Teachers considered superior by Flanders (1961) talked 50 to 60 percent of the time. The teachers considered superior by principals and supervisors in the study by Amidon and Giammateo (1967) talked only about 40 percent of the time as compared to average teachers in their study who talked about 52 percent of the time.

Teacher talk by student teachers in this study was not too different than that of other home economics teachers observed by Jorgenson (1968) and Kalbfleisch (1967). The first-year teachers observed by Jorgenson had a mean percent teacher talk of 56.00; the second-year teachers had a mean percent teacher talk of 61.37 percent. Experienced teachers and student teachers in home economics observed by Kalbfleisch talked over 60 percent of the time.

Results and Discussion -- I/D Ratios

The I/D or Indirect/Direct ratio is the statement of the relationship between the total of the teacher's indirect statements (categories one through four) and the total of the teacher's direct statements (categories five through eight). A detailed explanation of the I/D ratio and its interpretation is given on page 42. If an I/D ratio is 1.00, then the teacher used the same amount of time in making direct statements as in making indirect statements. I/D ratios smaller than 1.00 indicate more direct than indirect statements by the teacher; those larger than 1.00 indicate more indirect than direct teacher statements.

Therefore, the higher the I/D ratio, the more indirect the teacher is in over-all influence. According to the rule of two-thirds which Flanders (1961) observed from studying numerous teachers, it would be expected that two-thirds of the time that a teacher talks, she would be using direct influence (categories five through seven). This would be equivalent to an I/D ratio of 0.5.

I/D ratios obtained from combined matrices of teachers in this study were:

	Mean	Range
Control group	0.508	0.299 - 0.737
Experimental group	1.142	0.253 - 3.112

The mean I/D ratio of teachers in the experimental group was three times as indirect as the mean I/D ratio of teachers in the control group. Because of the wide variability of individuals within the groups, the F ratio, 2.053, was not significant. The range of percents was much wider between the high and low individuals in the experimental group than between the high and low individuals in the control group. As far as I/D ratios are concerned, student teachers in this study who had instruction in Interaction Analysis did not tend to teach with the same over-all pattern.

If Flanders' (1961) norm of 0.5 I/D ratio for teachers is used as a standard, then the mean I/D ratio of the control group was average, and the mean I/D ratio of the experimental group was much more indirect than average. Furst and Amidon found that mean I/D ratios were from 0.60 to 1.4 for elementary school teachers, with means varying by grade level and subject. The mean I/D ratio of student teachers in the control group was similar to the lower value, while the mean I/D ratio of student teachers in the experimental group was somewhat smaller than

the higher value in this observation of elementary school teachers.
The high school English teachers considered direct by Johns (1968)
had a mean I/D ratio of 0.342, lower than either of the groups of stu-
dent teachers in this study. The indirect teachers in the study by
Johns had a mean I/D ratio of 4.341, much more indirect than the mean
I/D ratio of either group of student teachers in this study.

The mean I/D ratios of groups of student teachers in this study
were more indirect than the mean I/D ratio of either group of inservice
teachers in home economics observed by Jorgenson (1968). In her study
first-year teachers had a mean I/D ratio of 0.288, while second-year
teachers had a mean I/D ratio of 0.157.

When compared to the elementary school student teachers observed
by Kirk, the student teachers in home economics were much more indirect.
Kirk found that the mean I/D ratio of student teachers without Inter-
action Analysis instruction was 0.74; for student teachers with Inter-
action Analysis instruction the mean I/D ratio was 0.73. LaShier and
Westmeyer (1967) observed student teachers teaching eighth-grade bio-
logical science. The I/D ratios for these student teachers who had had
no instruction in Interaction Analysis varied from 0.223 to 0.903. The
mean was 0.545, very similar to the mean I/D ratio for student teachers
in the control group in this study.

Results and Discussion -- Revised I/D Ratios

The revised I/D ratio indicates the relationship between those
teacher control and motivating statements that are indirect (categories
one, two, and three) and those that are direct (categories six and
seven). It may be recalled that these indirect categories include

those teacher statements of acceptance of student emotions, praise, and acceptance, use, and/or clarification of student ideas. The direct control categories represent mainly the teacher's commands and criticism. A detailed discussion of the computation and interpretation of revised I/D ratios is given on pages 42 and 43. A revised I/D ratio of 1.0 indicates that the teacher used an equal amount of time making indirect control and motivating statements (categories one, two, and three) and direct control and motivating statements (categories six and seven). A revised I/D ratio greater than 1.00 indicates that the teacher used more indirect than direct control and motivating statements. For instance, a revised I/D ratio of 5.0 shows that the teacher had five times as many tallies in categories one, two, and three as she had in categories five and six. Revised I/D ratios smaller than 1.0 indicate more direct than indirect motivation and control statements.

In research cited in Chapter II, it was generally the revised I/D ratio that seemed to be the measure of the directness and indirectness of teacher influence patterns which correlated most closely to student attitudes and achievement. Revised I/D ratios which were considered to be indirect were related to higher pupil achievement and more positive pupil attitudes than revised I/D ratios that were considered to be direct.

Revised I/D ratios obtained from combined matrices for student teachers in this study were:

	Mean	Range
Control group	10.194	1.222 - 40.667
Experimental group	19.640	2.730 - 35.500

The most important finding of this study concerning revised I/D ratios was that both groups of student teachers were highly indirect.

When individual revised I/D ratios from combined matrices are examined, it can be seen that every student teacher, regardless of her group, used more indirect than direct control and motivating statements. The very low use of statements in categories six and seven helps to account for the very high revised I/D ratios.

A comparison of the two groups shows that the mean revised I/D ratio for student teachers in the experimental group was nearly twice as large as the mean revised I/D ratio of student teachers in the control group. However, because of the wide differences between individuals within the groups, the F ratio, 1.861, was not large enough to be significant. The range of revised I/D ratios for individuals in both groups was very large, but the difference between the highest and lowest individuals in the control group (39.445) was larger than the difference between the highest and lowest individuals in the experimental group (32.770). According to revised I/D ratios neither student teachers in the control group nor student teachers in the experimental group tended to all teach alike.

Mean revised I/D ratios for both groups of student teachers in home economics were more indirect than mean revised I/D ratios of groups of either student teachers or inservice teachers observed by other investigators. The only study which reported mean revised I/D ratios higher than 7.0 was the study of secondary school student teachers by Lohman, Ober, and Hough (1967). In their study the mean revised I/D ratio of the group of student teachers without instruction in Interaction Analysis was 7.07. The mean revised I/D ratio of student teachers with Interaction Analysis instruction was 8.75. In the research by Kirk (1964) mean revised I/D ratios of elementary school student

teachers were much smaller than the mean revised I/D ratios of groups of student teachers in this study. The mean revised I/D ratio for the experimental group of elementary school student teachers was 1.83, while the mean revised I/D ratio for the control group was 1.24. LaShier and Westmeyer (1967) found that student teachers in eighth-grade biological science who had no Interaction Analysis instruction had a mean revised I/D ratio of 1.076.

The student teachers in this study had much higher revised I/D ratios than inservice teachers observed by other investigators. In Flanders' research with junior high school teachers as reported in 1964, direct teachers had mean revised I/D ratios between 0.01 and 2.00 with most of the revised I/D ratios being below 0.4. Teachers were considered indirect if their over-all revised I/D ratios were 1.37 or above. The student teachers in this study were more indirect than the twelfth-grade physics teachers considered to be superior by Pankratz (1967). The mean revised I/D ratio of these superior teachers was 6.25.

Also, the student teachers in home economics were much more indirect in their control and motivation than the inservice teachers in home economics observed by Jorgenson (1968). The mean revised I/D ratio for the first-year teachers was 1.68, while the mean revised I/D ratio for the second-year teachers was 1.17. These mean values were lower than the revised I/D ratio of the most direct teacher in the experimental group. All individual student teachers in this study had higher revised I/D ratios than the mean for second-year teachers.

Grade Point Average and Teaching Pattern

One question of the problem was: Is there a relationship between teaching pattern and grade point average? To answer this question, the Pearson Product Moment Correlation technique was used to find the correlation between grade point average (GPA) and teacher talk, student talk, I/D ratio, and revised I/D ratio for each group of student teachers. The over-all grade point average earned prior to the student teaching semester was used in the analysis.

There was little difference between mean grade point averages of the two groups. The mean grade point average of the control group was 2.856. Mean grade point average of the experimental group was 2.787. The F ratio denoting difference between groups was very small, .058.

The Pearson r values of correlation coefficients between grade point average and the selected aspects of verbal teaching behavior are given in Table V. A Pearson r value of 1.0 denotes absolute positive correlation; -1.0 denotes absolute negative correlation; and 0.0 shows no correlation.

According to correlation coefficients, for student teachers observed in this study there was no relationship between grade point average and either teacher talk, student talk, I/D ratio, or revised I/D ratio. As shown in Table V, all correlation values for both groups of student teachers were very small. None approached significance at the .05 level. These findings were different from results of the study by Wilk and Edson (1963) who found that a high sophomore grade point average was significantly related to indirect teaching patterns of student teachers in elementary schools.

TABLE V

CORRELATION COEFFICIENTS FOR GRADE POINT AVERAGES
AND SELECTED ASPECTS OF VERBAL BEHAVIOR

	Pearson r Value*	
Correlated Items	Control Group	Experimental Group
GPA and Teacher Talk	0.296	-0.281
GPA and Student Talk	0.332	0.080
GPA and I/D Ratio	-0.290	0.195
GPA and Revised I/D Ratio	0.339	-0.012

*r of 0.707 needed for significance at the .05 level

Evaluation of Interaction Analysis Instruction

The instruction in Interaction Analysis for the student teachers
in the experimental group has been described in Chapter III, pages 47
through 49. After the four-week portion of the class which included
the Interaction Analysis instruction was completed, the prospective
student teachers were asked to answer questions on an evaluation form.
The questions have been listed on page 105 of Appendix A. Students were
requested to omit names from their papers so that they would be encour-
aged to be honest in their evaluations.

In almost all cases answers to the questions indicated very posi-
tive attitudes toward the entire four-weeks' instruction. Students gen-
erally expressed enthusiastic comments about all of the learning expe-
eriences. All of the students answered the first question by saying
that, yes, they did feel more prepared to teach than they had felt four
weeks earlier.

Two questions pertained to the learning of Interaction Analysis.
The first was: With some review of The Role of the Teacher in the
Classroom, do you feel that you can use Interaction Analysis to evaluate
your own teaching? All answered the question affirmatively. A few
students added the comment that they would need more practice to be
very efficient.

The second question about Interaction Analysis was: What comments
do you have on Interaction Analysis? Nearly all of the twenty-seven
students wrote comments. Only one of the responses was considered to
be negative in regard to learning Interaction Analysis. This person
wrote that she "didn't feel that it was really necessary for knowing
your style of teaching unless you were just unable to adequately eval-
uate yourself." This particular student identified herself to the
instructor. She was not a member of the group of teachers who had
previously been chosen for the experimental sample. On this question
also, some students commented that they did not have as much practice
in Interaction Analysis as they would have liked to have.

Twenty of the twenty-seven prospective student teachers wrote
comments which indicated that they were enthusiastically in favor of
instruction in Interaction Analysis. A few of the comments are given
here in the student's own phrasing. "—worthwhile and effective way to
analyze your classroom behavior — It makes me aware of the different
types of teacher-student communications and motivates one to con-
sciously try to employ those that are considered conducive to [a]
good learning environment." "It is a very effective way to evaluate
yourself and the type of teaching we will be doing — what type of
instructor we might expect to be. I like it — I wish we would have

had time to do more." "It was time consuming, but was very beneficial and interesting to see the results." "Since behavioral changes are so important to learning, the analysis gives you foundation on which to build your structure of teaching so that you will have interaction instead of just giving out information. The responsibilities we have to produce independent students are so great. . . ." "To be able to present a lesson and be able to analyze it is one of the most important parts of teaching. I personally would like to see a full eight weeks or more devoted to interaction analysis."

The other questions in the evaluation did not pertain to Interaction Analysis. They were answered in a manner which indicated that students had very positive feelings about the course content and learning experiences. The most frequently written suggestion for improvement was to have a longer time period for the course.

The writer, who also served as instructor, can add her favorable comments about the course. It appeared that instruction in Interaction Analysis helped student teachers to view their behavior in a more objective manner than would have been possible without the instruction.

The course, Techniques and Materials in Home Economics Education, which immediately preceded the student teaching experience was an appropriate place for the instruction. The primary change that the instructor would make would be to allow somewhat more in-class time for Interaction Analysis study. The prospective student teachers were always cooperative and participated in all learning experiences with interest and enthusiasm. The teaching experience was very rewarding.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was an investigation of the effect of teaching Inter-
action Analysis to student teachers in home economics on their verbal
behavior in the classroom. Answers to the following questions were
sought: What are the verbal teaching patterns of student teachers in
home economics who have not had instruction in Interaction Analysis?
What are the teaching patterns of student teachers in home economics
who have had instruction in Interaction Analysis? What are the dif-
ferences in teaching patterns between the two groups? Is there a
relationship between teaching pattern and grade point average? Is
Interaction Analysis a useful component of teacher preparation in home
economics?

Research by other investigators has indicated that teachers whose
influence patterns were indirect were able to be the most flexible in
their teaching. Students of indirect teachers generally made greater
achievement gains and showed more positive attitudes toward the teacher
and their school work than students of direct teachers.

Considering an over-all view of studies reported in the litera-
ture, those student teachers who had instruction in Interaction Analy-
sis were more indirect in their teaching patterns than other student
teachers. Those student teachers with the instruction tended to use

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less directive and critical behavior and more accepting behavior than student teachers without Interaction Analysis instruction.

Two random samples of student teachers in home economics were observed using Interaction Analysis. The eight student teachers in the control group had no instruction in Interaction Analysis, while the eight student teachers in the experimental group had studied Interaction Analysis prior to their student teaching experience.

For student teachers observed in this study, in only two categories of Interaction Analysis was there a significant difference between groups. Mean percent use of statements in category three (acceptance, clarification, and use of student ideas) by student teachers in the experimental group was more than twice as large as mean percent use by student teachers in the control group. The difference was significant at the .005 level.

Although there was more total pupil talk in classes of student teachers in the experimental group, category eight pupil talk (teacher-initiated) was significantly greater in classes of student teachers in the control group. The significance level was .05.

There were some differences in means for other aspects of verbal behavior, but because of the small number of subjects and the wide variability among subjects within the groups, the F values were not significant. These trends are, however, worth noting. Differences between groups were generally in the direction observed by other researchers who had studied student teachers with and without instruction in Interaction Analysis.

Though both means were very small, the mean use of statements in category one (acceptance of students' feelings) was more than four

times as large for student teachers in the experimental group as for student teachers in the control group. Only two of eight student teachers in the control group used any category one statements, while six of eight student teachers in the experimental group used category one statements.

The control group had somewhat greater mean use of category two (praise) and category seven (criticism) than the experimental group. Mean use of direction-giving and commands (category six) by the control group was nearly double the mean use by the experimental group.

Differences between means for the groups were relatively small for categories four (questioning), five (lecture), and ten (silence and confusion). In all three of these categories student teachers in the control group used slightly greater percents of total behavior than did student teachers in the experimental group. Total teacher talk did not vary greatly between the two groups, but the student teachers in the control group talked somewhat more than the student teachers in the experimental group.

Total pupil talk and types of pupil talk were different for classes of student teachers in the two groups. According to mean values, there was more total pupil talk in classes of student teachers who had studied Interaction Analysis than in classes of student teachers who had not studied Interaction Analysis. The distribution of pupil talk in categories eight (teacher-initiated pupil talk) and nine (self-initiated pupil talk) was different for the control group and the experimental group. Classes of the teachers in the control group had nearly the same amount of category eight talk as category nine talk. However, the pupil talk in classes of the student teachers in the

experimental group was self-initiated nearly four times as often as it was teacher-initiated. When means of the two groups were further compared, the control group had about twice as much category eight student talk in their classes as did the experimental group, a difference which was significant. Pupils of teachers in the experimental group used category nine statements more than twice as much as pupils in classes of student teachers in the control group.

Considering all areas of teacher talk, the experimental group used more indirect than direct statements, a factor which was reflected in their mean I/D ratio of 1.142. This I/D ratio was more than twice as large as the mean for the control group, 0.508.

When revised I/D ratios are considered, both groups were very indirect. However, the mean revised I/D ratio for teachers in the experimental group (19.640) was nearly twice as indirect as the mean revised I/D ratio for the teachers in the control group (10.194).

Special instruction in Interaction Analysis did not cause the student teachers in the experimental group to teach alike. Range of percent use was greater for the student teachers in the experimental group than for student teachers in the control group in categories one, two, three, four, five, seven, eight, and nine; in total pupil talk; and in total teacher talk. The range of I/D ratios was also greater for student teachers in the experimental group than for student teachers in the control group. The range of percents of behavior in category ten and the range of revised I/D ratios were large for teachers in the experimental group, but not as wide as ranges for teachers in the control group. In only two categories, six and seven, did the

individuals in the experimental group appear to be similar in their teaching behavior. All of them used criticism and commands very sparingly.

When compared to other student teachers and inservice teachers, the student teachers in home economics in both groups had very indirect revised I/D ratios. Use of criticism and commands was low by student teachers in both groups. The classes of the experimental group had a large mean percent of student-initiated talk when compared to means of classes of other teachers. In other aspects of verbal behavior the student teachers in home economics were not widely different from other teachers.

No significant correlations were found between grade point averages and either student talk, teacher talk, I/D ratios, or revised I/D ratios. In fact, all of these correlation coefficients were smaller than 0.34.

In the opinion of the writer, the instruction in Interaction Analysis was worthwhile. This recommendation must be based primarily on experiences in teaching the course rather than the research data. The course received very favorable evaluation from the student teachers. The investigator believes that study of Interaction Analysis helped student teachers to view their behavior in a more objective manner than would have been possible without the instruction. It is recommended that instruction in Interaction Analysis be retained as part of the preservice preparation for student teachers in home economics at Oklahoma State University. The course, Techniques and Materials in Home Economics Education, is an appropriate place for the inclusion of this instruction.

The student teachers in the experimental group were significantly more indirect than student teachers in the control group in only one aspect of verbal behavior. The group of student teachers with Interaction Analysis instruction used significantly more acceptance, use, and clarification of student ideas than the student teachers in the control group. Other aspects of verbal behavior, when considered together, also indicate a greater tendency toward indirect behavior by teachers in the experimental group when compared to teachers in the control group. Although differences were not significant, when means are compared student teachers in home economics with instruction in Interaction Analysis used more acceptance of student feeling, less criticism and direction-giving behavior, had more indirect I/D ratios and revised I/D ratios, and had more total pupil talk and self-initiated pupil talk in their classrooms than did student teachers in home economics without Interaction Analysis instruction. Perhaps more student teachers with instruction in Interaction Analysis can be observed in future semesters to see if these patterns are typical.

A follow-up study of home econimics teachers who have had Interaction Analysis instruction would be desirable. What will their verbal behavior patterns be when they are inservice teachers? How will these behavior patterns differ from those of student teachers who had Interaction Analysis instruction? Will the inservice teachers use Interaction Analysis to study the interaction in their classrooms? What will be the effects of their verbal behavior on the achievement and attitudes of the students in their classes?

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APPENDIX A

SAMPLE DATA FORMS

TALLY MATRIX

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
TOTAL										
PERCENT										

WORK MATRIX

Teachers's name _____

Observer's name _____   Time _____

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Tally Matrix

I/D Ratio _____   Revised I/D Ratio _____

% Teacher Talk _____   % Student Talk _____

QUESTIONS FOR STUDENT EVALUATION

1. Do you feel better prepared to teach than you did four weeks ago?

2. With some review of The Role of the Teacher in the Classroom do you feel that you can use Interaction Analysis to evaluate your own teaching.

3. What comments do you have on Interaction Analysis?

4. Were the individual presentations valuable to you? What suggestions can you make to improve their worth?

5. Was the video-tape valuable for self-evaluation? the tape recorder?

6. What suggestions do you have to make this course more valuable?

7. Are the handouts from the teacher and students valuable?

8. Is discussions of situations valuable?

9. Is the exchange of ideas for learning experiences worthwhile?

10. Which learning activity (or activities) was (were) most valuable to you?

APPENDIX B

RESULTS OF INTERACTION ANALYSIS OBSERVATIONS

TABLE V I

INTERACTION ANALYSIS RESULTS OBTAINED FROM
OBERVATIONS OF THE CONTROL GROUP

	% Category 1	% Category 2	% Category 3	% Category 4	% Category 5	% Category 6	% Category 7	% Category 8	% Category 9	% Category 10	Teacher Talk	Student Talk	I/D Ratio	Revised I/D Ratio
Teacher A														
Visit I	.00	2.77	.62	8.31	24.92	5.85	.92	3.08	27.38	26.15	43.38	30.46	.369	.500
Visit II	.00	5.61	.47	18.81	33.64	.12	.23	19.16	7.83	14.14	58.88	26.99	.732	17.333
Combined	.00	4.83	.51	15.92	31.24	1.69	.42	14.73	13.21	17.44	54.61	27.94	.629	2.520
Teacher B														
Visit I	.00	6.20	2.11	12.51	43.16	.94	.23	5.26	14.62	14.97	65.15	19.88	.470	7.100
Visit II	.00	5.23	2.38	21.28	46.14	.00	.95	9.87	9.27	4.88	75.98	19.14	.618	8.000
Combined	.00	5.72	2.24	16.86	44.63	.47	.59	7.55	11.97	9.96	70.52	19.46	.542	7.500
Teacher C														
Visit I	.00	4.36	2.09	21.29	27.05	2.79	.52	24.78	1.05	16.06	58.12	25.83	.914	1.947
Visit II	.00	2.43	1.09	17.23	33.13	.24	.36	5.95	2.18	37.38	54.48	8.13	.615	5.800
Combined	.00	3.22	1.50	18.90	30.64	1.29	.43	13.67	1.72	28.63	55.98	15.39	.730	2.750
Teacher D														
Visit I	.00	3.51	.23	11.94	34.43	6.09	1.17	12.41	26.93	3.28	57.38	39.34	.376	.516
Visit II	.00	4.30	3.10	20.29	32.22	.00	1.19	16.23	8.59	14.08	61.10	24.82	.829	6.200
Combined	.00	3.90	1.65	16.08	33.33	3.07	1.18	14.30	17.85	8.63	59.21	32.15	.576	1.222
Teacher E														
Visit I	.00	1.72	.34	2.75	71.48	4.47	.00	2.06	6.87	10.31	80.76	8.93	.063	.462
Visit II	.00	3.48	3.13	12.30	38.63	.35	1.39	11.25	18.21	11.25	59.28	29.47	.468	3.800
Combined	.00	3.04	2.43	9.89	46.92	1.39	1.04	8.93	15.35	11.01	64.71	24.28	.311	2.250
Teacher F														
Visit I	.51	3.55	5.08	12.94	45.30	.13	.13	7.61	20.94	3.81	67.64	28.55	.485	36.000
Visit II	.00	5.54	.62	8.74	73.65	.00	.12	7.27	1.23	2.83	88.67	8.50	.202	50.000
Combined	.25	4.56	2.81	10.81	59.69	.06	.13	7.44	10.94	3.31	78.31	18.38	.308	40.667
Teacher G														
Visit I	.00	2.89	1.19	7.82	60.88	.17	.00	16.84	3.06	7.14	72.95	19.90	.195	24.000
Visit II	.00	1.55	2.71	13.57	56.59	.39	.00	10.85	7.36	6.98	74.81	18.21	.313	11.000
Combined	.00	2.48	1.65	9.58	59.57	.24	.00	15.01	4.37	7.09	73.52	19.38	.229	17.500
Teacher H														
Visit I	.00	6.19	3.76	20.63	36.29	1.21	.00	15.05	9.59	7.28	68.08	24.64	.816	8.200
Visit II	.13	4.29	3.03	18.43	38.76	.00	.51	5.68	24.24	4.92	65.15	29.92	.659	14.750
Combined	.06	5.26	3.40	19.55	37.50	.62	.25	10.46	16.77	6.13	66.65	27.23	.737	7.143

TABLE VII

INTERACTION ANALYSIS RESULTS OBTAINED FROM
OBSERVATIONS OF THE EXPERIMENTAL GROUP

	% Category 1	% Category 2	% Category 3	% Category 4	% Category 5	% Category 6	% Category 7	% Category 8	% Category 9	% Category 10	% Teacher Talk	% Student Talk	I/D Ratio	Revised I/D Ratio
Teacher I														
Visit I	.00	2.83	1.72	13.30	48.03	.12	.12	.37	16.01	17.49	66.13	16.38	.370	18.500
Visit II	.00	1.13	5.53	10.16	37.92	.00	.11	1.69	39.84	3.61	54.85	41.53	.442	59.000
Combined	.00	1.94	3.71	11.66	42.76	.06	.12	1.06	28.45	10.25	60.25	29.51	.403	32.000
Teacher J														
Visit I	.25	3.57	2.22	14.29	48.65	.49	.37	2.22	7.39	20.57	69.83	9.61	.410	7.000
Visit II	.00	.79	6.08	7.80	30.95	1.19	2.78	3.84	23.02	23.54	49.60	26.85	.420	1.733
Combined	.13	2.23	4.08	11.16	40.11	.83	1.53	3.00	14.92	22.00	60.08	17.92	.414	2.730
Teacher K														
Visit I	.00	3.69	.24	8.09	70.75	2.38	.00	2.85	4.52	7.49	85.14	7.37	.164	1.650
Visit II	.23	3.67	5.96	14.68	47.48	.23	.00	22.71	3.21	1.83	72.25	25.92	.514	43.000
Combined	.08	3.68	2.19	10.34	62.80	1.64	.00	9.63	4.07	5.56	80.74	13.70	.253	3.619
Teacher L														
Visit I	.22	1.54	10.12	15.95	6.60	.33	.00	18.15	41.69	5.39	34.76	59.85	4.016	36.000
Visit II	.00	1.11	10.52	19.93	11.96	.22	.11	8.97	41.97	5.20	43.85	50.94	2.568	35.000
Combined	.11	1.32	10.32	17.94	9.27	.28	.06	13.58	41.83	5.30	39.29	55.41	3.092	35.500
Teacher M														
Visit I	.00	4.04	2.14	8.56	64.09	2.14	.00	8.32	5.23	5.47	80.98	13.56	.223	2.889
Visit II	.71	2.00	6.13	10.02	56.60	.12	.00	6.25	15.45	2.71	75.59	21.70	.333	75.000
Combined	.35	3.02	4.14	9.30	60.33	1.12	.00	7.28	10.36	4.09	78.27	17.64	.272	6.684
Teacher N														
Visit I	.00	1.67	9.30	7.39	5.24	.36	.00	23.24	44.58	8.22	23.96	67.82	3.277	30.667
Visit II	.12	1.67	7.78	11.84	6.94	.00	.24	5.14	64.35	1.91	28.59	69.50	2.983	40.000
Combined	.06	1.67	8.54	9.61	6.09	.18	.12	14.21	54.45	5.07	26.27	68.66	3.112	34.400
Teacher O														
Visit I	.84	6.10	8.29	23.44	29.33	.60	.12	.60	20.07	10.70	68.63	20.67	1.284	21.000
Visit II	.36	5.16	9.48	18.85	38.90	.12	.24	1.44	22.45	3.00	73.11	23.89	.870	41.667
Combined	.60	5.59	8.89	21.14	34.11	.36	.18	1.02	21.26	6.85	70.87	22.28	1.045	27.889
Teacher P														
Visit I	.00	3.71	4.19	11.38	44.91	.24	.24	1.56	21.44	12.34	64.67	22.99	.425	16.500
Visit II	.00	4.60	4.26	13.23	30.72	.35	.35	1.84	23.59	21.06	53.51	25.43	.703	12.833
Combined	.00	4.17	4.23	12.32	37.68	.29	.29	1.70	22.54	16.78	58.98	24.24	.541	14.300

VITA

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Doctor of Education

Thesis: AN INVESTIGATION OF THE EFFECTS OF INSTRUCTION IN INTERACTION ANALYSIS ON THE VERBAL BEHAVIOR OF STUDENT TEACHERS IN HOME ECONOMICS

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