THE EFFECTS OF VIDEO-TAPE FEEDBACK ON THE
VERBAL BEHAVIOR OF PRE-SERVICE TEACHERS

By

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By

John William McFadden, Jr.

March, 1971

Chairman: Dr. Charles L. Durrance  
Co-Chairman: Dr. Charles A. Cate  
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The purpose of this study was to investigate the effects of video-tape feedback, in the form of viewing one's own teaching performance, on subsequent verbal behavior as measured by the Reciprocal Category System (RCS) verbal interaction instrument.

Twenty-seven randomly selected junior elementary education majors were given training in analyzing and drawing inferences about teaching from data that had been recorded by means of an interaction analysis instrument.

Beginning with the third week of the subjects' practice teaching they were systematically observed and video-taped. These observations lasted approximately fifteen minutes and were performed twice for each
subject, separated by a time interval of three weeks.

Feedback sessions were held for the observed subjects on the afternoon of the observations. Each subject transcribed the recorded data made of his observation. Questions were handled in group discussion. Members of the experimental group were invited to view privately the video-tape made of their teaching session; the control group members were not.

Significant F-test values of homogeneity of variances and t-test values for group means difference were obtained in three of the ten dependent variables that were tested. Pre-service teachers receiving video-tape feedback of their verbal behavior differed significantly from those who did not, in their use of (1) corrective measures, (2) statements that tended to create tension in the classroom, and (3) rejection or criticism of another's opinion.

Each of the dependent variables, found to be statistically significant in this study, was of a "negative" attitude in the social-emotional climate. Seemingly, the type of verbal behavior that can be readily identified with overt negative behavior on the part of the teacher, can be reduced through the use of visual feedback in the form of video-taping a teacher's classroom performance.
CHAPTER I

THE PROBLEM

Statement of the Problem

This study investigates the influence of video-tape feedback on the verbal behavior of a pre-service teacher as recorded by a classroom observational system. The study is founded on the assumption that a teacher, who has the opportunity to witness his own verbal behavior, will be more cognizant of the effects of that behavior on the instructional interaction taking place in the classroom.

As early as the 1920's researchers in education expressed an interest in analyzing classroom interaction: Morrison (1926), Anderson (1937), Lippitt and White (1943), Withall (1949), Flanders (1951), Cogan (1956), Medley and Mitzel (1958), Hughes (1959), Amidon and Flanders (1961), Furst (1965), and Hough and Ober (1966), to name only some of the efforts. These studies demonstrate the belief that the behavior of the teacher, more than any other single factor, sets the climate of the classroom. Thorndike, many years ago, stated that awareness of the consequences of one's behavior is necessary to its improvement. The current term for "awareness of the consequences" is feedback, a term taken from the study of servo-mechanisms.

As a teacher observes the effects of his actions in the faces, postures, eyes and speech of his pupils, he is in effect, receiving feedback. It has been reported by Flanders (1963) that feedback affects
what the teacher does and that such feedback is most effective when the teacher is aware of the behavior to which it is relevant. What the teacher does with this information depends on his ability to interpret the signals received from the pupils. The teacher who is not trained to observe the effects of his behavior is more likely to react intuitively and often less scientifically. Wolfe (1951) indicates that laboratory studies are unequivocal in emphasizing the importance of giving a subject as specific and immediate information as possible concerning the outcome of his efforts. The student teaching phase of a teacher education program, when pre-service teachers are permitted to teach children in the classroom, provides a prime opportunity for the introduction of feedback and its analysis.

In the more or less commonly designed program of teacher education in this country, the student teacher candidate is assigned a university faculty member to assist him in his induction into the practical aspect of his preparation. The process of supervision usually has the supervisor visiting the classroom and taking notes of what he sees. Frequently he has no firm evidence of what precisely took place or how often, unless it was so deviant from the norm that it would be obvious even to the untrained. It could follow that the report to the student teacher following the observational period would be presented in very global terms and reflective of the supervisor's personal bias and subjective judgment. Yet, such feedback is a major aspect of supervision and adjustments in teacher behavior are predicated upon it. Lantz (1967) and Amidon and Powell (1967) attribute the lack of pre-service teaching success in many cases to failure of the university supervisor to perform the crucial function
of feeding back to the student teacher accurate and comprehensive evaluative information about his verbal behavior. A major portion of the failure may be caused by the subjectiveness of the evaluation and the interpretation placed on it by the student teacher. This can cause a threatening situation to said student which can result in tension and strain on the part of both the student teacher and supervisor. Seemingly, then, there is a real need for some means of assessing the nature of the behavior of the student teacher in a more objective manner, thus reducing this threat while increasing the amount of relevant information necessary for improving his teaching performance.

Pre-service teachers need to have opportunities to try out a variety of teaching behaviors in teaching situations with objective feedback provided for analysis. These teacher trainees should be given experiences whereby they are trained to analyze the teaching-learning situation. The ability to analyze such feedback is too important to leave to mere chance. The use of audio and/or video-tapes provides a record of the individuals' behavior that can be analyzed through the use of systematic observational instruments and/or professional teacher training personnel.

During the past several years, a number of observational systems have been developed for the purpose of assessing a variety of classroom variables including verbal interaction. An observational system can be defined as any technique designed for the purposes of identifying, observing, classifying and/or quantifying specific variables of the classroom teaching-learning situation (Ober, 1968).

Of the observational systems currently in use, Flanders' System of interaction analysis is probably the most widely known
and most extensively used. Several modifications of Flanders' System have been developed, including the Reciprocal Category System (RCS) developed by Ober (1968a).

Interaction analysis is a technique for recording quantitative and qualitative dimensions of teacher verbal behavior in the classroom. As an observational system, however, it clearly does not measure all that occurs. What interaction analysis captures is the verbal behavior of teachers and pupils as it directly relates to the social-emotional climate of the classroom. It is not by accident that this is the view that interaction analysis takes of the classroom. Flanders based his classroom observational technique upon social-psychological theory and it was designed specifically to test the effect of social-emotional climate on student attitudes and learning.

Although verbal behavior is but one aspect of teaching behavior, it is one of the most important. Most of the functions associated with classroom teaching are implemented by verbal communications. Flanders (1960) found that in elementary and secondary classrooms more than sixty percent of the time is spent in talking. Furthermore, he reports that when someone is talking, more than seventy percent of the time it will be the teacher. Aschner (1961) discovered that teaching acts in the classroom primarily involve the use of language.

Nonverbal communication does exist, of course, and is important. A nod of the head to encourage students to talk, a smile, and a frown all communicate. Nonverbal behavior and verbal communication are highly correlated. The smile is usually correlated with statements that express approval while the frown is most often associated with statements expressing disapproval. Galloway (1962) indicated that
difficulties of categorization, the illusiveness of the meaning of nonverbal messages, and the seemingly subordinate function the nonverbal plays to the verbal in classroom settings are major reasons why investigators have focused on the verbal aspect.

It has been stated by Flanders (1963) and again by Hough and Amidon (1965) that when the skill of interaction analysis is learned, it gives the teacher a feedback mechanism in the form of a category system, that he may use to become more sensitively aware of his own teaching behavior.

Feedback in the form of video-tape viewing has been investigated by Allen, McDonald and Orme (1966), Orme (1966) and Young (1967). Each investigator has reported positive results with pre-service teachers in a variety of teaching situations. Meier (1968), in the process of developing a rationale for microteaching, stated:

Knowledge and information about performance aids the learner (in this case the teacher) in his acquisition of a teaching skill. The immediate feedback from video-tape recorders . . . provides a critique of the lesson which will help the teacher constructively modify his behavior.

The use of video-tape recorders as a means of increasing supervisory effectiveness in observation and assessment of instruction was strongly recommended in the results of an investigation conducted by Aubertine (1967). Perlberg and O'Bryant (1968) similarly found the use of video-tape recorders very helpful in assisting college teachers to analyze their teaching. An experimental study conducted at the University of Connecticut by Goodkind (1968) indicated that teachers, who had microteaching training with video-taped lessons,

*A procedure involving a simulation of a teaching act while magnetic audio and video recordings are made, followed by analysis of the recording in order to set new goals based on self-appraisal.
displayed more insight into their teaching and a greater awareness of personal habits than teachers who did not have video-tapes made of their microteaching lessons.

In another study, Weiss (1962) reported a reduction in the emotional involvement on the part of the observer in the video-taped situation, in contrast to live observation. This resulted in more profitable discussion about the observation. Babadalis (1967) found that video-tape recorders also provide an opportunity for pre-service teachers to see themselves as others see them. It is sometimes difficult for an individual to be aware of and to accept his own inadequacies. Frequently the supervising teacher recognizes a personal idiosyncrasy which, if overcome, would bring about a more polished presentation.

Medley and Mitzel (1963) have provided a succinct statement of the need for recorded observation:

Any effect the teacher has on the pupil is mediated by some overt behavior on the teacher's part. If the behavior takes place in the classroom it is ... capable of being seen or heard by a properly trained observer ... each behavior a teacher exhibits has a purpose (conscious or unconscious) and may be effective in achieving that purpose to a greater or lesser degree. The effectiveness of a teacher is defined as the average success of all his behaviors in achieving their intended effects ... we cannot assess the competence of a particular teacher unless we know what effects he is seeking to achieve ... we can, however, measure certain effects of his behavior and see which of his behaviors are followed by effects in which we are interested. If this information were made known to the teacher he could presumably modify his behavior and increase his competence ... as research workers, we have studied effectiveness rather than competence.

Need for the Study

Carl Rogers (1967) states that learning has a quality of
personal involvement and is self-initiated. Success, as defined by Beaumont and Macomber (1949), is the achievement by an individual of a goal which he, himself, has conceived, or at least accepted, as something which he is desirous of attaining. Self-evaluation can then be thought of as placing the growing or learning edge on experience. Experience remains only experience until it is evaluated. Properly evaluated experiences become learning and precipitate the individual's development. Thus by its nature feedback is a necessary part of the teaching-learning-growing cycle. Although interaction analysis and video-tape have been found to be effective feedback mechanisms, we find pre-service teachers have little or no opportunity to utilize feedback of this nature. As has been stated, feedback usually comes from university supervisors and directing teachers, who through observations made without use of recognized observational instruments, limit their comments in many instances to subjective generalities. It would then appear that the coupling of video-tape feedback, for the pre-service teacher, with training in interaction analysis could make for a very important teaching and supervisory tool.

The need for such feedback has been determined and supported by recent research. With this feedback analysis assuming a significant role in modifying teacher behaviors it becomes necessary to determine the effect that various forms of feedback have on teacher behavior.

In light of this, an investigative study is being conducted. Its purpose is to evaluate the effect that feedback, in the form of viewing one's own teaching performance on video-tape, has on subsequent verbal behaviors as measured by the Reciprocal Category System (RCS) verbal interaction instrument.
This study will test the following hypotheses:

1. There will be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback in terms of the following:

A. Teacher use of verbal behavior that tends to open up and/or eliminate the tension of a given situation; praises or encourages the action, behavior, comments, ideas, and/or contributions of another; jokes that release tension not at the expense of others; accepts and clarifies the feeling tone of another in a friendly manner.

B. Teacher use of acceptant verbal behavior in dealing with the action, behavior, comments, ideas, and/or contributions of another; positive reinforcement of these.

C. Teacher use of "Expanding" verbal behaviors; talk that permits and encourages further interaction between teacher and students.

D. Teacher use of "Divergent" questions; the phrasing of verbal behavior that solicits the student's opinion; can be responded to in more than one way or requires the student to make an evaluation.

E. Permitting various sequences of student verbal behavior to be followed by additional student verbal behavior.
2. There will be a difference between observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback in terms of the following:

A. Teacher use of verbal behavior that tells another that his answer or behavior is inappropriate or incorrect.

B. Teacher use of verbal behavior that is intended to modify the behavior of another from an inappropriate to an appropriate pattern; may tend to create a certain amount of tension and/or produce threat.

C. Teacher use of "Restrictive" verbal behaviors; talk that terminates further interaction between teacher and students.

D. Teacher use of "Convergent" questions; the phrasing of verbal behavior that requires either a yes or no response; is of the simple recall or memory type or has only one correct answer.

E. A continuous pattern of teacher verbal behavior followed by additional teacher verbal behavior.

Design of Study

The subjects of this study were twenty-seven (27) pre-service teacher education students, enrolled in the elementary education program at Western Carolina University, Cullowhee, North Carolina. The twenty-seven students were randomly selected from an approximate population of two hundred elementary education students classified by
the University as junior class members in the four year program of
teacher education. Initially, thirty students were selected through
the utilization of a random numbers table (Games and Klare, 1967) with
the first student assigned to the experimental group as indicated by
a coin toss. Each successive student was alternately assigned to
control or experimental groups. Three students, one assigned to the
experimental group and two assigned to the control group, eliminated
themselves before data collection began. Each of these students was
to begin a laboratory experience of classroom practice teaching during
the spring quarter of the 1969-70 academic year. Every one of the
twenty-seven students received training in interpreting an interaction
analysis instrument that was used in the study and practice in
plotting sample matrices prior to the onset of their practice teaching.

All of the subjects were assigned to a cooperating teacher in the
Camp Laboratory School, Cullowhee, North Carolina, for their laboratory
experience. Each of the students was observed by a trained observer
and video-taped for a period of approximately fifteen minutes on two
separate occasions, with an interval of three weeks between teaching
sessions. The Reciprocal Category System (RCS) developed by Richard
Ober (1968a), an instrument for interaction analysis, was employed
in the observations. In addition the students were video-taped
through the use of portable equipment.

Fourteen of the subjects selected were designated as the
"experimental" group and received feedback in the form of matrices
derived from the Reciprocal Category System instrument plus private
viewing of the video-tape made of their teaching. The "control"
group, numbering thirteen, received the matrices but were not permitted
to view the video-tapes of their teaching.
The independent variables in the study were (1) the video-tape viewing feedback permitted the experimental group and (2) the deprivation of video-tape feedback to the control group. The dependent variables, by which the independent variables were measured, were the selected verbal behaviors developed by the students during their teaching experiences. The specific dependent variables, as measured by the Reciprocal Category System, were the total use of category 1 (Hypothesis 1-A), total use of category 2 (Hypothesis 1-B), the total loading of the block of cells 1, 2, 3 (Hypothesis 1-C), the total loading of cell 4-16 (Hypothesis 1-D), and the total amount of continuous student talk (Hypothesis 1-E). Additionally, total use of category 8 (Hypothesis 2-A), total use of category 9 (Hypothesis 2-B), the total loading of block of cells 7, 8, 9 (Hypothesis 2-C), the total loading of cell 4-15 (Hypothesis 2-D), and the total amount of continuous teacher talk (Hypothesis 2-E) were measured.

Data were analyzed through the use of the Student's t-distribution (Wert, Neidt and Ahman, 1954). An F-test for homogeneity of variances was employed to ascertain the equality of the two groups prior to administering the treatment.

**Clarification of Dependent Variables**

Category 1 of the Reciprocal Category System (RCS) indicates attempts to informalize the climate of the classroom and eliminate tension. The author of the instrument, Richard L. Ober, calls it the "Warming" category. Category 9 is dichotomous to category 1, as it reveals statements made to "Cool" the climate of the classroom and thus tends to produce threat and/or create tension. Both of these
categories deal with the socio-emotional climate of the classroom.

Category 2 of the RCS instrument indicates the amount of positive reinforcement taking place in the classroom on the part of the teacher. This category reflects a spirit of agreement and is assigned to verbal behavior that is given in support of, or reinforcing to the behavior of another person. Category 8, in contrast, is used to voice disagreement or give corrective feedback to another.

The Reciprocal Category System instrument utilizes a matrix that contains a total of 361 individual cells. Each cell is the intersection of a row and a column, 19 rows intersecting with 19 columns equaling 361 cells. The (4-16) cell reveals openness between question and reply, with category 4 revealing an elicited behavior and category 16 indicating a divergent response, which extends or expands the subject under consideration. The (4-15) cell indicates a direct closed response to the elicited verbal behavior, thus curtailing any elaboration on the part of the person responding.

The intersection of rows 1, 2, 3 with columns 1, 2, 3 form a block of cells within the matrix which evidence verbal behaviors that are attributed to indirect influence. Each of these verbal behaviors possesses a quality of acceptance on the part of the teacher. The intersection of rows 7, 8, 9 with columns 7, 8, 9 form a block of cells that reveal the amount of verbal behavior indicative of a direct nature.

The Reciprocal Category System instrument has a matrix of 361 cells that can be subdivided into four separate submatrices:

1. Teacher-Teacher Talk - rows 1 through 9 and columns 1 through 9 inclusively. Various sequences of teacher talk followed by another kind of teacher talk.
2. Teacher-Student Talk - rows 1 through 9 and columns 11 through 19 inclusively. Various sequences of teacher talk followed by student talk.

3. Student-Student Talk - rows 11 through 19 and columns 11 through 19 inclusively. Various sequences of student talk followed by student talk.

4. Student-Teacher Talk - rows 11 through 19 and columns 1 through 9 inclusively. Various sequences of student talk followed by teacher talk.

A more detailed description of the entire Reciprocal Category System (RCS) can be found in Chapter Three of this study.

**Definition of Terms**

**Feedback** - Knowledge of the results of any behavior, considered as influencing or modifying further performance by the organism (Random House, 1966).

**Video-tape** - Reproduction of an image complete with sound for the purpose of self-evaluation by the viewer, through the use of a recorder and monitor.

**Verbal Behavior** - Teacher talk and student talk that is audible and discernible to the observer and occurs under classroom conditions.

**Pre-service Teacher** - An individual who is officially enrolled full-time in a teacher education program with the intent to teach school.

**Reciprocal Category System** - An observational system designed for the purposes of categorizing and describing verbal behavior.

**Teacher Talk** - The verbal behavior generated by the teacher within the context of the teaching-learning situation.
Student Talk - The verbal behavior generated by students within the context of the teaching-learning situation.

Limitations

The following are suggested as limitations in this study:

1. The inability to control the cross-communication between experimental and control groups' members during the interval between teaching sessions.

2. The study was limited to members of the junior class, majoring in elementary education at Western Carolina University, Cullowhee, North Carolina.
CHAPTER II

REVIEW OF RELATED LITERATURE

The literature that provides the background for this investigation was derived from the areas of teacher behavior, educational media, and interaction analysis. Due to the somewhat diverse nature of these domains, they are examined separately.

Teacher Behavior

Social interaction is a relation between persons such that "the behavior of either one is stimulus to the behavior of the other" (English and English, 1959). In an attempt to analyze the behaviors of teachers in social interaction, one study by Johnson (1935) demonstrated that positive, directive, and approving verbal communication to pupils ensured a greater degree of complying with requests and directions by learners, as compared with directions or requests to learners that were negative, nonspecific, and reproving. Anderson and Brewer (1946) postulated that the main direction of influence in the classroom is from the teacher to pupil. To measure this, Anderson developed teacher-behavior categories, and Brewer developed child-behavior categories. With these categories they were able to determine the extent to which teacher behavior influenced the behavior of the pupils and the psychological climate of the classroom.

In the late thirties the social-emotional climate of the classroom was investigated by Lewin, Lippitt and White, with significant findings
reported on the role of leadership styles and their effect on the climate of the classroom (White and Lippitt, 1960). Some ten years later a group of researchers at the University of Chicago sought to develop a theory of instruction based on child development, field theory, and psycho-therapy (Thelen, 1951). Hypotheses were formulated from time-lapse pictures, recordings, and observations in the classroom by sensitive and trained educators. One of the researchers of this group, Withall (1949) studied the social-emotional climate as a group phenomenon determined primarily by the teacher's verbal behavior. An instrument for categorizing and quantifying the verbal behavior of the teacher in the classroom was developed and although very few teachers were involved - four at the most - the results strongly indicated that the procedure had reliability and validity. The following seven categories were seen by Withall (1949), as lying along a continuum from "learner-centeredness" to "teacher-centeredness."

1. **Learner-supportive statements** that have the intent of reassuring or commending the pupil.

2. **Acceptant and clarifying statements** having an intent to convey to the pupil the feeling that he was understood and help him elucidate his ideas and feelings.

3. **Problem-structuring statements** or questions which proffer information or raise questions about the problem in an objective manner with intent to facilitate learner's problem solving.

4. **Neutral statements** which comprise polite formalities, administrative comments, verbatim repetition of something that has already been said. No intent inferable.

5. **Directive or hortative statements** with intent to have pupil follow a recommended course of action.

6. **Reproving or deprecating remarks** intended to deter pupil from continued indulgence in present "unaccept-able" behavior.
7. Teacher self-supporting remarks intended to sustain or justify the teacher's position or course of action.

In a later study, Withall (1951) followed a group of seventh grade pupils into classrooms with different teachers and found that different teachers produce a different climate with the same group of pupils.

The technique used by Withall was not a direct method for recording teacher behavior in the classroom; rather it was a method for coding typewritten transcripts of sound recordings of classroom behaviors. In New York, Mitzel and Rabinowitz (1953) using the Withall instrument found that because of extraneous noise in transcripts, live visitations to classrooms for categorizing teacher behaviors proved more feasible.

Hughes and Associates (1959) investigated teaching in elementary classrooms through an analysis of the patterns of interaction between teacher and pupils. A comprehensive set of categories for the classification of teacher behavior was developed from extensive specimen records of teacher behavior. Description and categorization were made in relation to the function the behaviors performed for an individual or group to whom the teacher was directing his influence. The categories are similar to Withall's, the major exception being the attempt to record nonverbal behavior in addition to verbal behavior. The information derived from this instrument made it possible to describe teaching on the basis of what teachers actually do in classrooms. It was found that the functions performed were separate and definable, thus providing a means for the empirical description of teacher behavior.

While the above mentioned researchers were involved with
categorizing teacher talk, they did not investigate the concept of interaction in its fullest sense, namely the verbal interaction between teacher and pupil. Classroom interaction analysis is most interested in teacher talk, but it also provides for the domain of student talk. Ned Flanders (1960) is the major figure responsible for the development of interaction analysis. Two of the more interesting findings of the Flanders study are: (1) student achievement in mathematics and social studies is higher in the classes of teachers using more indirect influence; and (2) teachers who use more direct influence do not vary their behavior in different situations as much as the indirect teachers do.

Another avenue of research to the study of classroom behavior focused on the teaching process through analysis of the linguistic behavior of teachers and students. This approach was influenced by concepts developed in the study of language and meaning. Bellack (1963) found that there was remarkable similarity among the verbal behaviors of teachers and students from classroom to classroom, that teachers and pupils obviously followed a set of implicit rules in interacting. In this study it was found that the teacher structures, asks the questions, and reacts to the pupils' answers, indicating a cycle of "solicitation followed by response followed by reaction." Bellack (1963) stated that this cycle accounted for 48 percent of all teaching cycles and needs to be broken if a teaching climate in which the teacher is not the most active member is to be established.

A study of logic in classroom discourse, reported by Smith (1959), collected transcripts made from 85 class sessions taught by 17
Illinois high school teachers in five different communities. The transcripts were analyzed in terms of two basic units: (1) the episode, a verbal exchange between two or more speakers, and (2) the monologue, an individual contribution to class business or solo performance. Based on 3,397 entries the most numerous categories were describing, designating, explaining and classroom management.

A more recent achievement of Smith and his associates (1967) expands the previous research and presents a new verbal unit, the strategy, which is described as a set of verbal behaviors utilized as a means to attain a certain outcome.

Wright and Proctor (1961) investigated the patterns of verbal interaction in differing types of mathematics lessons in an attempt to identify behaviors related to pupil achievement. Working together they developed a scheme that classified verbal behavior in dimensions of content frame, process frame, and attitude frame. The findings of the study indicated that the scores reported were highly useful in discriminating and classifying differences in styles of teaching.

Hilda Taha (1964) studied the relationship between teaching strategies and thought processes. Her results, gleaned from twenty elementary classrooms in California, indicated teacher impact on pupil thinking depended on such things as what questions are asked, what data are given pupils by the teacher, what the teacher seeks from his students, and what ideas he picks up for elaboration.

Flanders (1965) found in two of his studies, in Minnesota and New Zealand, that student learning, as measured by the Flanders System of interaction analysis, was greatest in those classes taught
by teachers using indirect influence, yet were flexible enough to use direct influence if the situation called for it.

From a point of history, the foregoing research studies appeared to be originally motivated by a desire to prove that certain preferred patterns of teacher behavior could be earmarked and recorded, thus providing educators with feedback that, when analyzed, might lend insight to the question posed by Smith in 1961:

> The question of what knowledge is relevant to the control of teaching behavior is an empirical one, because teaching is a natural social phenomenon. It has its own forms, its own constituent elements, its own regularities, and its own problems. It takes place under a stable set of conditions; time limits, authority figures, systems of knowledge, social structures, psychological capacities, etc. If we would understand teaching and thereby gain control over it, we must first study it in its own right (Smith, 1961).

**Educational Media**

**Use of Media in Self-Appraisal**

The teacher must learn to appraise himself realistically; estimating his motivations, feelings, prejudices, strengths, and shortcomings as a person. Schueler (1967) feels that the teacher must then be able to discern the effects of his actions on the behavior and attitudes of his students.

The use of sound and video recordings can be, and has been, utilized for research into human phenomenon involving observable and audible behavior. Prior to the age of sound and sight recordings, such research was limited to one's memory of observed live action, and therefore subject to the fallibility of human recall, bias, and the limited ability of the observer to express himself. Recordings can provide a permanent record, which not being subject to memory loss, can be heard and seen by many, thus reducing the subjectiveness
of evaluation. These qualities lend themselves favorably to any problem that has to do with human action and interaction.

Hunter and Amidon (1966) indicate that the emphasis placed on the utilization of audiovisual media in pre-service teacher experiences has in general targeted on the analysis of teaching behaviors. The use of films and television in conjunction with programmed instruction can help the pre-service teacher to gain prompt feedback on his performance (Briggs, 1964). In a study undertaken by McNeil (1962), he cited the effectiveness of this feedback on the teaching behavior of the student teacher. It was found that improvement in the teacher's rating was directly related to improvement in the quality of the questions he prepared, after he had received feedback from his pupils.

Fulton and Rupiper (1961), working at the University of Oklahoma, determined the feasibility of vicarious observations through films and slides. Significant results were reported in the use of these media forms with pre-service student teachers. A study undertaken by Cate, Cunningham and Landsman (n.d.) demonstrated that feedback from photographs taken of pupils at work, proved more enhancing to their self-concept than verbal praise alone. In separate studies, Bushnell (1963) and Painter (1962) found filmclips and simulation techniques highly effective in providing experiences whereby the student had an opportunity to respond to classroom incidents presented on film, with a choice of possible behavior.

Dwight Allen and his associates (1966) have developed a pre-service training procedure called "microteaching" which involves intensive feedback to the student. The procedure involves a simulation of a
teaching act while magnetic audio and video recordings are made. This is followed by analysis of the recording in order to set new goals based on self-appraisal. Statistically significant relationships, between training assessment measures and subsequent ratings of teaching performance during the first year, indicate that the training involving frequent and immediate feedback, combined with attention to instructional theory, does affect later teaching performance constructively. Bush (1966), in his investigations, also found that performance in the microteaching situation accurately predicted subsequent classroom performance.

Closed-circuit television has been used to give student teachers practice in the skills of observation and as a feedback device for appraisal of their practice teaching efforts (Wooley and Smith, 1962). One investigation initiated by Schueler (1962) was designed to demonstrate the effectiveness of kinescopes, i.e., filmed television performances, in evaluating teaching behaviors of student teachers. A reported result was supervisor preference for kinescope combined with direct observation in deference to either form alone. Tintera (n.d.) reported that student teachers who were supplied with audio tapes and kinescopes immediately following their lessons, scored higher on the Minnesota Teacher Attitude Inventory and on the Ryan Observation scale.

Equally encouraging results of video-tape providing constructive feedback are reported by Allen, McDonald and Orme (1966), McDonald, Allen and Orme (1966), and Orme, McDonald and Allen (1966). Consistent with these studies Schueler (1967) reports the effectiveness of videotape recordings and playback techniques in providing knowledge of
results for modifying behavior and acquisition of complex skills, based on a number of teacher training studies. Results from a study completed by Olivero (1964) indicate that supervision of student teacher interns is significantly more effective when the student intern is provided with a visual record via video-tape.

Research has indicated that sight and sound recordings can be effective mediums for self-appraisal. Seemingly then, any medium used for self-appraisal can also serve for appraisal of self by others.

**Interaction Analysis**

**Evolution of Interaction Analysis**

During the late thirties and early forties, H. H. Anderson developed a number of studies based on the observations of teacher behavior: Anderson (1939), Anderson and Brewer (1945), and Anderson, et al. (1946). Anderson designed and used a category system which revealed that the way teachers behave in the classroom does affect the way pupils behave. The major division of the categories were for identifying dominative behavior, that which tended to restrict children’s activities, and integrative behavior, that which expanded children’s opportunities for self-direction.

In 1939, Lippitt, White and Lewin reported a series of experiments that probed into the effects of leader influence on groups of boys in non-classroom environments. The design for the studies provided for evaluation of three types of leadership roles: (1) authoritarian, (2) democratic, and (3) laissez-faire. The results reinforced the idea of Anderson, that teacher behavior affects the way pupils behave. It also introduced the idea of
"teacher dependence" on the part of group members (Lewin, et al, 1939).

John Withall (1949) reported the development of a technique for assessing the social-emotional climate in a classroom by categorizing teacher statements. Withall's system featured an integrative/dominative ratio, similar to that of Anderson's. The seven categories used by Withall provided a simple classification of the teacher's verbal statements.

The introduction of a timing or quantifying factor to systematic observation studies was reported by Bales (1950) in his book Interaction Process Analysis. In his study of an individual's behavior in certain social situations, he employed a mechanical device for the observer to record his observations and thus controlled the number of distinct verbal behaviors recorded, plus the interval of occurrence.

Toward the middle of the 1950's, Morris Cogan (1958) conducted a large scale study whereby he classified teacher behavior into three categories: (1) inclusive - encourages and solicits student interest and participation, (2) preclusive - imposition of teacher ideas, and (3) conjunctive - neutral inter-personal behaviors. The findings showed strong evidence that in the individual pupil's perceptions, the teacher's conjunctive and inclusive behaviors are each positively related to the pupil's scores in both required and self-initiated work.

In the year 1961, Flanders, Anderson and Amidon (1961) developed a scale to measure the dependence-proneness of students in the classroom. Employing this scale, they found that less dependent students preferred "less directive" teachers. From this work Flanders coined the terms "indirect" and "direct" that were to become major
divisions of teacher talk in his system of interaction analysis.

The Nature of Interaction Analysis

The Flanders System of Interaction Analysis is probably the best known and most widely used classroom observation system in existence today. It is concerned with verbal behavior only, primarily because it can be observed with higher reliability than can nonverbal behavior (Amidon and Flanders, 1963).

The mechanics of interaction analysis are simple enough to be easily understood, and can be mastered with six to eight hours of study. It may be employed by an observer collecting data "live" in the classroom or as he categorizes a tape recording of a previously taught lesson.

In the original version (Amidon and Flanders, 1963), the Flanders system has a total of ten categories: seven are for teacher verbal behavior, two are for pupil verbal behavior, and one is to denote silence or confusion. The section containing the categories for teacher talk are subdivided into: (1) indirect influence, and (2) direct influence. The student talk categories are: (1) responding to teacher, and (2) initiating talk. The tenth category is used to handle anything else that is not teacher or student talk.

A summary of these categories, with brief definitions for use of the observer, can be found in Figure 1, p. 27.

Indirect influence, as described in the Flanders system, encourages the student to participate in classroom discussion, which gives him more freedom to commit himself. Direct influence, however, tends to limit or restrict student freedom by shifting the participatory
emphasis from the student to the teacher.

The Flanders system is coded by the numbers assigned to the ten categories (re: fig. 1, p.27). These numbers, as indicated by the classroom situation, are recorded every three seconds by a trained observer. He records the numbers in sequence in a column, usually 20 in total as this would equal one minute of observation (re: fig. 2, p. 28).

When the record is compiled, an observer may read down the column and get an idea of the sequence of verbal action that occurred during the time period that was allotted for observation. Although the sequence of interaction is revealed, the particular pattern of verbal behavior cannot be readily obtained from the columns. Therefore, in order to obtain the frequency of verbal behavior, the numbers are paired, bracketed and plotted into a matrix similar to the one shown in Figure 3, p. 28.

The matrix for the Flanders system is made up of one hundred cells - ten rows and ten columns. Each bracketed pair of behaviors (numbers) corresponds with a specific cell of the matrix. For example, when a teacher asks a content type question (category 4) and a student replies (category 8), the cell 4-8 receives a tally mark. The total number of tally marks in a given cell constitutes the "loading" of that cell.

The simplicity of the Flanders system has made it a popular tool among teachers, supervisors, counselors, and others who wish to change their pattern of interacting. It is easily adaptable for use in research and as an instructional tool to provide feedback in teacher training. The Flanders system has been utilized, adapted,
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Accepts Feeling</td>
<td>accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.</td>
</tr>
<tr>
<td>2. Praises or Encourages</td>
<td>praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying &quot;uh huh?&quot; or &quot;go on&quot; are included.</td>
</tr>
<tr>
<td>3. Accepts or Uses Ideas of Student</td>
<td>clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five.</td>
</tr>
<tr>
<td>4. Asks Questions</td>
<td>asking a question about content or procedure with the intent that a student answer.</td>
</tr>
<tr>
<td>5. Lectures</td>
<td>giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.</td>
</tr>
<tr>
<td>6. Gives Directions</td>
<td>directions, commands, or orders with which a student is expected to comply.</td>
</tr>
<tr>
<td>7. Criticizes or Justifies Authority</td>
<td>statements, intended to change student behavior from nonacceptable to acceptable pattern; bawling out someone; stating why the teacher is doing what he is doing, extreme self-reference.</td>
</tr>
<tr>
<td>8. Student Talk-Response</td>
<td>talk by students in response to teacher. Teacher initiates the contact or solicits student statement.</td>
</tr>
<tr>
<td>9. Student Talk-Initiation</td>
<td>talk by students, which they initiate. If &quot;calling on&quot; student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.</td>
</tr>
<tr>
<td>10. Silence or Confusion</td>
<td>pauses, short periods of silence, and periods of confusion in which communication cannot be understood by observer.</td>
</tr>
</tbody>
</table>

Figure 1. Description of the ten categories of the Flanders System of Interaction Analysis.
Figure 2. Recorded category numbers of approximately one minute of observation. Bracketed into pairs for plotting into matrix.

Figure 3. Matrix with plotted data and totals for each category recorded from figure 2.
and expanded by others devoted to classroom observation, namely Amidon and Hunter (1966), Hough (1967) and Ober (1968). In a recent survey, Amidon and Simon (1965) found that educational researchers reported over twenty systems for classifying verbal classroom interaction which include many features of the ten-category system of Flanders, but which also branch out from and differ somewhat from Flanders' interaction analysis.

Summary

This chapter consists of three sections. They are designed to present necessary background to the reader. The first section presents a review of past studies dealing with attempts to analyze teacher behavior and categorize it. These studies led to the realization that the social-emotional climate of a classroom appeared to be directly affected by the verbal behavior of the teacher. Likewise, there is evidence available to indicate that teacher verbal behavior can be identified and measured with some degree of validity and reliability.

The second section of this chapter reviews the utilization of media, particularly sound and sight recordings, for providing feedback for self-appraisal. The research, reported in this area, seemingly indicates that the more avenues of feedback provided, the more cognizant the receiver will be of his motivations, feelings, prejudices, strengths, and shortcomings as a person.

The concluding section deals with the systematic observational system called Interaction Analysis. The evolution of the Flanders System of Interaction Analysis is discussed in an attempt to indicate
that the basis for support of the system lies within a theory of social-emotional climate. This is followed by a brief description of the nature and mechanics of the Flanders System of Interaction Analysis.
CHAPTER III

THE DESIGN, PROCEDURES AND COLLECTION OF DATA

Design

The subjects of this study were twenty-seven (27) pre-service teacher education students, enrolled in the elementary education program at Western Carolina University, Cullowhee, North Carolina. The twenty-seven students were randomly selected from an approximate population of two hundred elementary education students classified by the University as junior class members in the four year program of teacher education. Initially, thirty students were selected through the utilization of a random numbers table (Games and Klare, 1967) with the first student assigned to the experimental group as indicated by a coin toss. Each successive student was alternately assigned to control or experimental groups. Three students, one assigned to the experimental group and two assigned to the control group, eliminated themselves before data collection began. All subjects were informed of the purposes of the study and were assured that the data collected would in no way affect their academic standing. In addition, six cooperating teachers who were full-time members of the Camp Laboratory School, Cullowhee, North Carolina, were selected, based on their desire to be a part of the study.

All twenty-seven subjects assigned were assigned to one of these six cooperating teachers. The grades represented were fourth, fifth,
and sixth and were of a self-contained classroom organizational pattern. The cooperating teachers met with the investigator after student assignment but prior to any student teaching. Scheduling of the two teaching sessions for each student was arranged, introduction of the observer and cameraman was effected, and a demonstration of the operating procedures was presented for the purpose of alleviating any misunderstandings arising from the technical aspects of the study.

The subjects of the study received six hours of formal classroom instruction in analyzing and drawing inferences about teaching from data that had been recorded by means of an interaction analysis instrument. Training in the techniques of recording verbal behavior and plotting a matrix were included. The students were also introduced to the use of video and audio taping equipment that was employed in the study, in hopes that this would alleviate any overt concern about the taping procedures.

Two former school teachers were employed for the position of observer: the actual recording of ongoing classroom verbal behavior. They attended training sessions with the investigator for a total of twenty-three hours, including some nine hours of practice with training tapes and six hours actual classroom observation of practicing teachers. Unfortunately one of the two trained observers was lost from the project before actual recordings were attempted. Inter-observer and intra-observer reliabilities were established and maintained at 0.81 (as calculated by Scott's method, 1955, modified by Flanders, 1960a) or better. The reliability checks were performed on four occasions, with the help of two similarly trained observers.
who were involved in another study (re: Appendix C for Observer Reliability method and check).

The electronic equipment used for the taping of the teaching sessions was portable. This allowed for relatively easy access to the six classrooms involved. A Concord TCM-20 video camera, equipped with a Cosmicar 5528 zoom lens, was connected to a Concord VTR 620 ½" tape recorder. The audio pickup was accomplished through an Electrovoice sound spot microphone, model 644. This type microphone is a combination cardioid and distributed front opening instrument that has high rejection of noise from sides and rear, thus reducing reverberation and feedback. Pickup of the teacher's voice plus student responses was highly effective from the rear of the classrooms. The audio signal was sent through a Bogen microphone-preamplifier, permitting reduction in volume control at the tape recorder, thus further minimizing feedback distortion. The entire setup of equipment was transported on a five foot high, double shelf, caster cart. This permitted a single operator to set up and control all aspects of the taping with a minimum of disturbance and effort.

Beginning the third week of the spring quarter, data were collected by means of systematic observation and video taping. Each of the students was observed and taped for a period of approximately fifteen minutes on two separate occasions, with an interval of three weeks between teaching sessions.

The Reciprocal Category System was the observational system used in this study to observe and classify the verbal behaviors that occurred in the classroom (re: section entitled "Measuring Instrument" p. 36 for discussion of Reciprocal Category System). This system is
a modification of the Flanders System of interaction analysis (Amidon and Flanders, 1963). Procedures for observation were the same as utilized in the Flanders System. The observer situated himself in the classroom where he could clearly hear the teacher and students as they interacted verbally. At the end of each three-second interval, he decided which of the categories best described the verbal activity that had just transpired. He recorded the number of this category on a tally sheet, arranged in vertical columns of twenty tallies each, approximately one minute of classroom interaction (re: fig. 6 and 7, p. 41). With the recording of the preceding three-second interval, the observer simultaneously assessed the present three-second interval. The recording of category numbers continued at a regular rate for the entire fifteen minute observation period. The category numbers recorded were transferred to IBM System - 360 Assembler Coding Forms by the observer at the end of the observation day, for key punching on IBM cards. The cards were then submitted to an IBM 360 computer along with a specially prepared program, which provided a print-out of an individual student teacher's matrix containing quantitative and percentage data plus an accumulative record of the two groups, experimental and control.

A number of ground rules were observed by the observer and electronic equipment operator:

1. Observer indicated when recording of verbal behavior would begin and end.

2. Each observation period would begin and end with category ten, silence.

3. When more than one category occurred within a three-second
interval, all such categories are recorded.

4. During periods of nonverbal activity, recording ceased and was indicated by category ten dash ten. Taping was to continue.

Observation schedules were limited to two days a week (Tuesday and Thursday). Student teachers knew when they would be observed and taped, eliminating any element of surprise. The classrooms are regularly used for practice teachers and visitations by university personnel, so curiosity on the part of classroom pupils was minimal. If the "Hawthorne effect" were present, it must be assumed to have operated equally in both groups of pre-service teachers.

The group of pre-service teachers who were observed on a given day, five or six individuals, met with the investigator during the late afternoon of the same day. At this feedback session, each of the student teachers was given the original tally sheet of verbal behaviors that occurred during their individual teaching sessions. They were asked to transcribe the information into a matrix sheet following the procedures that were explained during the training sessions. Thus, each student teacher had a permanent record of the sequence of behaviors (tally sheet) and the pattern of verbal interaction (matrix) (re: Appendix A). Questions regarding any pattern on the matrix and sequence of the tally sheet were discussed and answered in the group meeting. Sufficient time was allowed each student teacher for purposes of analyzing his verbal behavior during the interval of the first and second teaching sessions. Information sheets were provided to assist the student teacher in interpreting the feedback information on his own (re: Appendix B).
At this time the individual student teachers were informed as to which group they were members of, experimental or control. The individuals who were designated control were excused. The members of the experimental group were invited, one at a time, to view privately the video-tape made of their teaching session. The viewing took place in a small office with the student teacher seated in front of a 21" video monitor. The investigator discouraged any verbal communication regarding this form of feedback, thus reducing the chance of making value judgments.

Measuring Instrument

The Reciprocal Category System (Ober, 1968a), a modification of the Flanders System of interaction analysis, was utilized as the measuring instrument in the present study. The Reciprocal Category System was conceived and developed in an attempt to correct what is considered to be a limitation of Flanders' original instrument. With seven categories assigned to teacher talk but only two assigned to the student, the original ten category system fails to devote adequate consideration to the general dimension of student verbal behavior as it relates to the classroom situation.

The Reciprocal Category System consists of nine verbal categories, each of which can be assigned to either teacher or student talk, and a single category reserved for silence or confusion (re: fig. 4, p. 39). When verbal behavior is observed as teacher talk, a category number is recorded as a single digit number (Categories 1 through 9, along the left hand margin of fig. 4). In contrast, when verbal behavior is observed as student talk, a category number is recorded as a two
digit number (Categories 11 through 19, along the right hand margin of fig. 4). With the introduction of the reciprocity factor — allowing each of nine categories to be assigned to either teacher or student talk — the system is actually expanded to an operational total of 19 categories (two times the nine common categories plus Category 10 for silence or confusion).

Using the system, the observer records the number of the category indicative of the ongoing behavior during each three-second interval in the classroom. The completed series of category numbers is called "raw data" and represents a sequential record of the verbal interaction that has taken place. Raw data are plotted in a matrix to determine the frequency with which one category follows another. Prior to plotting, they are bracketed off in pairs (re: fig. 6, p. 41). Each bracketed pair corresponds to a particular cell of the matrix (re: fig. 7, p. 41). For example, the first pair of data in figure 6 represents the 10-6 cell (the tenth row down from the top and the sixth column over from the left), the second pair represents the 6-6 cell, and so on. For each bracketed pair, a tally mark is placed in its corresponding cell of the matrix. Figure 7 on page 41, shows a nineteen by nineteen matrix with the cell loadings (total number of tally marks in a given cell) for the raw data shown in Figure 6, page 41. Through the use of an IBM computer, the raw data can be adapted to a form suitable for statistical analysis.

The Reciprocal Category System is designed to produce the following descriptive measures:

1. Percentage totals for each of the 19 categories (re: fig. 7, p. 41, bottom row).
2. A variety of comparative category ratios. For example, the "warm-cool" or 1/9 ratio.

3. A matrix containing 361 cells (re: fig. 7, p. 41).

4. Four submatrices (re: fig. 5, p. 40).

For an expanded discussion of the Reciprocal Category System, the reader is referred to "The Development of a Reciprocal Category System for Assessing Teacher – Student Classroom Verbal Interaction" by Richard Ober (1968a).

Variables

The independent variables in the study were (1) the video-tape viewing feedback permitted the experimental group and (2) the deprivation of video-tape feedback to the control group. The dependent variables, by which the independent variables were measured, were the selected verbal behaviors developed by the students during their teaching experiences. The specific dependent variables, as measured by the Reciprocal Category System were:

1. Total teacher use of category 1 as indicated by the loading of cells (1-1) through (1-19) inclusively (Area "A" of fig. 8, p. 43).

2. Total teacher use of category 2 as indicated by the loading of cells (2-1) through (2-19) inclusively (Area "C" of fig. 8, p. 43).

3. Total teacher use of category 8 as indicated by the loading of cells (8-1) through (8-19) inclusively (Area "D" of fig. 8, p. 43).

4. Total teacher use of category 9 as indicated by the loading of cells (9-1) through (9-19) inclusively (Area "B" of fig. 8, p. 43).

5. Teacher use of "Expanding" verbal behaviors as measured by the 1, 2, 3 block of cells (Area "G" of fig. 8, p. 43).
<table>
<thead>
<tr>
<th>Category Number</th>
<th>Description of Verbal Behavior</th>
<th>Category Number</th>
<th>Description of Talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;WARMS&quot; (INFORMALIZES) THE CLIMATE: Tends to open up and/or eliminate the tension of the situation; praises or encourages the action, behavior, comments, ideas, and/or contributions of another; jokes that release tension not at the expense of others; accepts and clarifies the feeling tone of another in a friendly manner (feelings may be positive or negative; predicting or recalling the feelings of another are included).</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ACCEPTS: Accepts the action, behavior, comments, ideas and/or contributions of another.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AMPLIFIES THE CONTRIBUTIONS OF ANOTHER: Asks for clarification of, builds on, and/or develops the action, behavior, comments, ideas, and/or contributions of another.</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ELICITS: Asks a question or requests information about the content subject, or procedure being considered with the intent that another should answer (respond).</td>
<td>14</td>
<td></td>
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<tr>
<td>5</td>
<td>RESPONDS: Gives direct answer or response to questions, requests for information, or requests for permission, that are initiated by another; includes answers to ones own questions.</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>INITIATES: Presents facts, information, and/or opinion concerning the content, structures, subject, or procedures being considered that are self-initiated; expresses one's own ideas; lectures (includes rhetorical questions -- not intended to be answered).</td>
<td>16</td>
<td></td>
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<tr>
<td>7</td>
<td>DIRECTS: Gives directions, instructions, orders, and/or assignments to which another is expected to comply.</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CORRECTS: Tells another that his answer is inappropriate or incorrect.</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>&quot;COOLS&quot; (FORMALIZES) THE CLIMATE: Makes statements intended to modify the behavior of another from an inappropriate to an appropriate pattern; may tend to create a certain amount of tension (i.e., bawling out someone, exercising authority in order to gain or maintain control of the situation, rejecting or criticizing the opinion or judgment of another).</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>SILENCE OR CONFUSION: Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer; or transition between pupils, or between teachers, or between teacher and aide.</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4. Description of categories of the Reciprocal Category System.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>7</th>
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<th>10</th>
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<td>1</td>
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<td>2</td>
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<td>BLOCK</td>
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Figure 5. Nineteen-by Nineteen Matrix used in the Reciprocal Category System. Cell, Block of cells, and submatrices shown.
Figure 6. Recorded category numbers of approximately one minute of observation. Bracketed into pairs for plotting into matrix.

Figure 7. Reciprocal Category System nineteen-by-nineteen matrix with plotted data from figure 6.
6. Teacher use of "Restrictive" verbal behaviors as measured by the 7, 8, 9 block of cells (Area "H" of fig. 8, p. 43).

7. Teacher use of "Divergent" questions as measured by the loading of the (4-16) cell (Area "E" of fig. 8, p. 43).

8. Teacher use of "Convergent" questions as measured by the loading of the (4-15) cell (Area "F" of fig. 8, p. 43).

9. Continuous "Teacher-Teacher Talk" as measured by the tally count of the Teacher-Teacher Talk submatrice (Area "J" of fig. 8, p. 43).

10. Continuous "Student-Student Talk" as measured by the tally count of the Student-Student Talk submatrice (Area "K" of fig. 8, p. 43).

Treatment of Data

Each of the ten (10) dependent variables was extracted from the matrices compiled for every member of the two groups, experimental and control. A group mean was calculated for the experimental group in each of the ten variables, as was a similar operation performed for the control group. This procedure was followed for both pre- and post measures. An F-test for homogeneity of variances was employed at a significance level of .02.

The Student t-distribution (Wert, Neidt and Ahman, 1954) was used in testing the significance of the difference between the two group means for each of the ten dependent variables in the post measures. A significance level of .05 was employed with the t-distribution.
Figure 8. Matrix for the Reciprocal Category System showing the areas measured by the instrument for the selected dependent variables of this study.
CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The intent of this study was to investigate the effects feedback, in the form of viewing a video-tape of one's own teaching, had on the verbal behavior of pre-service teachers. Twenty-seven randomly selected junior class students majoring in elementary education at Western Carolina University, Cullowhee, North Carolina, were trained in the use and interpretation of an interaction analysis instrument. The instrument chosen for the study was the Reciprocal Category System as developed by Richard Ober (1968a). Following the training period, the students were assigned to cooperating teachers at the Camp Laboratory School, Cullowhee, North Carolina for practice teaching. The twenty-seven student teachers were observed for 15 minute periods on two separate occasions by a trained observer. The two teaching sessions were scheduled with a three week interval separating them. Videotapes were made during these teaching sessions for viewing by the members of the experimental group. In the later part of the afternoon following a teaching session, the student would receive a tally sheet of verbal behaviors that occurred during the teaching session (re: Appendix A). A matrix of these behaviors would be prepared by the student (re: Appendix A) for feedback purposes. If the student were a member of the experimental group, she would be invited to view her teaching performance privately. The data gathered from the observations
were submitted to key punch operators and then processed through an IBM 360 computer along with a program developed specially for the study. At the conclusion of the observation period the data collected were analyzed by use of the Student's t-distribution (Wert, Neidt and Ahman, 1954). An F-test for homogeneity of variances was employed to ascertain whether or not to pool the variances. This procedure was followed for the post measure on all twenty-seven student teachers.

The results of this study are presented in the order of the hypotheses that were tested. Each hypothesis is summarized and data used to test the hypothesis are presented with reference to appropriate tables and/or figures.

Discussion of conclusions and implications that may be drawn from the reported results is presented in Chapter V. This chapter, IV, considers the extent in which the hypothesis is supported or rejected in light of the data collected and analyzed. Each hypothesis is reported in the following manner: a general statement of the hypothesis; account of how the hypothesis was tested; report of findings resulting from the tested hypothesis; and finally the degree to which the hypothesis can be supported or rejected.

The data in Table 1 represent the first teaching session that was systematically observed and video-taped. This set of data was calculated to determine the equality of the variances of the two groups, experimental and control. An F-test for homogeneity of variances was performed for each of the ten dependent variables. A tabular F was consulted at the .02 level of significance. In all ten variables the calculated F was less than the table F, 3.98 for 13 and 12 degrees of freedom and 4.11 for 12 and 13 degrees of
freedom. Since calculated $F$ was less than the tabular $F$ retention of the null hypothesis of no difference between the variances is indicated.

The data reported in Table 1 represent approximately 7 hours of classroom observation by a trained observer. Tabulating at an average rate of at least one tally (verbal behavior) every three seconds, more than 8500 tallies were recorded in the pretest section of this study.

The data in Table 2 denote the second teaching session for each of the twenty-seven subjects of this study. This set of data was collected to determine if a difference between the means of the two groups, experimental and control, existed in reference to the ten variables, following the treatment extended to the experimental group. The treatment was in the form of video-tape feedback of an individual's teaching performance. An F-test of variances was calculated to determine the feasibility of using "pooled variances" and thus the benefit of a higher number of degrees of freedom (a t-distribution approximates a normal curve when the degrees of freedom increase upwards from 25). A t-test was calculated for each of the dependent variables to determine the differences between the means. The .02 level of significance was chosen for the F-test of variances and the .05 level for the t-test prior to administering the treatment.

The data reported in Table 2 represent an additional 7 hours of classroom observation by a trained observer. An additional 8500 plus tallies were recorded during the posttest, indicating a minimum of 17,000 individual tallies for the complete study.

A comparison of the two teaching groups in their use of opening
### TABLE 1

Test for Homogeneity of Variances
Performed on Pretest Measures

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>F-test*</th>
</tr>
</thead>
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<tr>
<td></td>
<td>( \overline{X} )</td>
<td>( \text{Ex}^2 )</td>
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<td>7.26</td>
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<tr>
<td>Student-Student Talk</td>
<td>28.84</td>
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<td>17.82</td>
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*Significant at the .02 level. Tabular \( F = 3.98 \) for 13 and 12 degrees of freedom.
TABLE 2
Tests for Homogeneity of Variances and Group Means Difference Performed on Posttest Measures

<table>
<thead>
<tr>
<th>Dependent Variables</th>
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<td>Cell 4-16</td>
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<td>Cell 4-15</td>
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<td>Teacher-Teacher Talk</td>
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<td>Student-Student Talk</td>
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</table>

*Significant at the .02 level. Tabular F = 3.98 for 13 and 12 degrees of freedom
**Significant at the .05 level. Tabular t = 2.18 for 13 degrees of freedom
up or curtailing verbal behavior is set forth in Figure 9, p. 51.
A comparison made between the two teaching groups in their use of verbal behaviors indicative of communication control in a classroom may be found in Figure 10, p. 53.

Tests of the Hypotheses

All data collected to test the hypotheses were treated by an F-test of variances and Student's t-distribution (Wert, Neidt and Ahman, 1954). The following tests of significance were performed:

1. Tests that the variances of the experimental and control groups were not equal for each of the ten dependent variables.
2. Tests that the means of the experimental and control groups were not equal for each of the ten dependent variables.

Hypothesis One

Hypothesis one, that there would be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback, was tested by five of ten dependent variables stated in the null form. The hypotheses are as follows: Hypothesis 1-A, that there would be no difference between the groups in the use of verbal behavior that would warm the classroom climate (category 1 of the RCS) was supported by an F-test value of 1.72 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis
was further subjected to a t-test for group means difference. A t-test value of .107 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. No statistically significant difference could be found between the two groups and their use of verbal behavior designed to warm the classroom climate. A bar graph showing the percent of tallies recorded in category 1 (warming the classroom climate) is presented in Figure 9, p. 51.

Results of the administered F-tests of variance homogeneity and t-tests for group means difference are reported in Table 2.

Hypothesis 1-B, that there would be no difference between the groups in the use of verbal behavior that indicates an acceptance of student ideas (category 2 of the RCS) was supported by an F-test value of 1.14 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of .036 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. No statistically significant difference could be found between the two groups and their use of verbal behavior designed to indicate acceptance of student ideas. A bar graph showing percent of tallies recorded in category 2 (acceptance) is presented in Figure 9, p. 51.

Hypothesis 1-C, that there would be no difference between the groups in the use of verbal behaviors that indicate an "expanding" nature (block of cells 1,2,3 of the RCS), was supported by an F-test value of 1.26 for homogeneity of variances. An F-test value of 3.98
Figure 9. A comparison of experimental and control groups with reference to the "Expanding" and "Restrictive" forms of verbal behavior.
was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of .455 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. No statistically significant difference could be found between the two groups and their use of verbal behavior designed to "expand" communications. A bar graph showing percent of tallies recorded in the block of cells 1, 2, 3 (expanding communications) is presented in Figure 9, p. 51.

Hypothesis 1-D, that there would be no difference between the groups in the use of verbal behavior that indicated teacher use of "divergent" questions (cell 4-16 of the RCS), was supported by an F-test value of 1.03 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of .090 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. No statistically significant difference could be found between the two groups and their use of "divergent" type questions. A bar graph showing percent of tallies recorded in cell 4-16 (divergent questioning) is presented in Figure 10, p. 53.

Hypothesis 1-E, that there would be no difference between the groups in the amount of continuous student-student talk permitted (student-student talk submatrice), was supported by an F-test of 1.29 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of
Figure 10. A comparison of Experimental and Control groups with reference to communication control.
freedom. The null hypothesis was further subjected to a t-test for
group means difference. A t-test value of .077 was obtained. A
t-test value of 2.06 was necessary for significance at the .05 level
of confidence for 25 degrees of freedom. No statistically significant
difference could be found between the two groups and the total amount
of continuous student to student talk permitted. A bar graph showing
percent of tallies recorded in the Student-Student Talk Submatrice
(student-student talk) is presented in Figure 10, p. 53.

In summary, hypothesis one, that there would be a difference
between the observed verbal behavior of pre-service teachers
receiving video-tape feedback and the verbal behavior of pre-
service teachers not receiving video-tape feedback with the observed
differences being greater for the pre-service teachers not receiving
video-tape feedback, was rejected in terms of no significant difference
at the .02 level of confidence of an F-test of homogeneity of variances
and at the .05 level of confidence of a t-test for group means
difference. This was true for all five of the dependent variables
tested. Pre-service teachers who received video-tape feedback of their
own teaching performances, showed no statistically significant
difference from those pre-service teachers who did not receive video-
tape feedback in their use of the following verbal behaviors:

1. Attempts to informalize (warm) the classroom climate by
reducing tension and offering praise.

2. Accepting the action, behavior, comments, ideas, and/or
contributions of another.

3. Use of "extending" patterns such as - asking for clarification,
developing the verbal action, accepting behavior in a positive manner,
and Praising the action.

4. Use of questions that permit expression of one's own ideas.

5. Allowing various sequences of student talk to be followed by additional student talk without the interjection of teacher talk.

Hypothesis Two

Hypothesis two, that there would be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback, with the observed differences being greater for the pre-service teachers not receiving video-tape feedback was tested by five of ten dependent variables stated in the null form. The hypotheses are as follows: Hypothesis 2-A, that there would be no difference between the groups in the use of verbal behavior that is corrective in nature (category 8 of the RCS) was rejected by an F-test of 11.40 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of 2.543 was obtained. A t-test value of 2.18 was necessary for significance at the .05 level of confidence for 13 degrees of freedom. Results of the administered F-tests of homogeneity of variances and t-tests for group means difference are reported in Table 2. Pre-service teachers who did not receive video-tape feedback used significantly more corrective verbal behavior than the pre-service teachers who did receive video-tape feedback. A bar graph showing the percent of tallies recorded in category 8 (corrective feedback) is presented in Figure 9, p. 51.
Hypothesis 2-B, that there would be no difference between the groups in the use of verbal behavior that is designed to "cool" the classroom climate (category 9 of the RCS), was rejected by an F-test of 7.34 for homogeneity of variances. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of 2.222 was obtained. A t-test value of 2.18 was necessary for significance at the .05 level of confidence for 13 degrees of freedom. Results of the administered F-tests of homogeneity of variances and t-tests for group means difference are reported in Table 2. Pre-service teachers who did not receive video-tape feedback used significantly more verbal behavior that tends to produce threat and/or create tension in the classroom environment, than the pre-service teachers who did receive video-tape feedback. A bar graph showing percent of tallies recorded in category 9 (cooling the climate) is presented in Figure 9, p. 51.

Hypothesis 2-C, that there would be no difference between the groups in the use of verbal behavior that is considered restrictive in nature (block of cells 7, 8, 9), was rejected by an F-test of 8.24 for homogeneity of variance. An F-test value of 3.98 was required for significance at the .02 level of confidence for 13 and 12 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of 2.293 was obtained. A t-test value of 2.18 was necessary for significance at the .05 level of confidence for 13 degrees of freedom. Results of the administered F-tests of homogeneity of variances and t-tests for group means difference are reported in Table 2. Pre-service teachers who
did not receive video-tape feedback used significantly more verbal behavior intended to be directive, corrective and critical, than the pre-service teachers who did receive video-tape feedback. A bar graph showing the percent of tallies recorded in the block of cells 7, 8, 9 (restrictive) is presented in Figure 9, p. 51.

Hypothesis 2-D, that there would be no difference between the groups in the use of verbal behavior that indicated teacher use of "convergent" questions (cell 4-15 of the RCS), was supported by an F-test of 1.08 for homogeneity of variances. An F-test value of 4.11 was required for significance at the .02 level of confidence for 12 and 13 degrees of freedom. The null hypothesis was further subjected to a t-test for group means difference. A t-test value of .070 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. Results of the administered F-tests of homogeneity of variances and t-tests for group means difference are reported in Table 2. Pre-service teachers who did not receive video-tape feedback showed no statistically significant difference from the pre-service teachers who received the video-tape feedback, in their use of "convergent" type questions. A bar graph showing percent of tallies recorded in cell 4-15 (convergent questioning) is presented in Figure 10, p. 53.

Hypothesis 2-E, that there would be no difference between the groups in the amount of continuous teacher-teacher talk generated (teacher-teacher talk submatrice), was supported by an F-test of 1.34 for homogeneity of variances. An F-test value of 4.11 was required for significance at the .02 level of confidence for 12 and 13 degrees of freedom. The null hypothesis was further subjected to
a t-test for group means difference. A t-test value of .129 was obtained. A t-test value of 2.06 was necessary for significance at the .05 level of confidence for 25 degrees of freedom. Results of the administered F-tests of homogeneity of variances and t-tests for group means difference are reported in Table 2. Pre-service teachers who did not receive video-tape feedback showed no statistically significant difference from the pre-service teachers who did receive the video-tape feedback, in their use of continuous teacher-teacher talk. A bar graph showing the percent of tallies recorded in the Teacher-Teacher Talk Submatrice (continuous teacher talk) is presented in Figure 10, p. 53.

In summary, hypothesis two, that there would be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback, was supported in terms of a significant difference at the .02 level of confidence of an F-test of homogeneity of variances and at the .05 level of confidence of a t-test for group means difference by three of the five dependent variables. Pre-service teachers who did not receive video-tape feedback differed significantly from pre-service teachers who did receive video-tape feedback in the use of the following verbal behaviors:

1. The student teachers not receiving video-tape feedback used a greater amount of corrective talk.

2. Made more statements that tended to create tension in the classroom.
3. Total use of "restrictive" patterns, such as giving directions, telling another his behavior is inappropriate, "bawling out" someone, and rejecting or criticizing the opinion or judgment of another.

There was no statistically significant difference between the group that did not receive video-tape feedback and the group that did receive the video-tape feedback in terms of the following verbal behaviors:

1. The use of questions that require either a "yes" or "no" response, simple recall or are of the convergent type - only one correct answer.

2. Various sequences of one kind of teacher talk followed by another kind of teacher talk.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the effects of video-tape feedback, in the form of viewing one's own teaching performance, on subsequent verbal behavior as measured by the Reciprocal Category System (RCS) verbal interaction instrument. During the spring quarter of the 1969-70 academic year, twenty-seven randomly selected junior elementary education majors at Western Carolina University, Cullowhee, North Carolina, were given training in analyzing and drawing inferences about teaching from data that had been recorded by means of an interaction analysis instrument. Training in the techniques of recording verbal behavior and plotting a matrix was included. In addition, the subjects were introduced to the operating procedures involved with the use of video and audio taping equipment. Beginning with the third week of the spring quarter, 1970, each of the twenty-seven subjects was systematically observed using the Reciprocal Category System interaction analysis instrument, and video-taped. These observations lasted approximately fifteen minutes and were performed twice for each subject, separated by a time interval of three weeks. The inter-observer reliability of the trained observer was checked on four occasions with the help of two similarly trained observers utilizing
tape recordings and classroom visits. The mean inter-reliability was 0.81 as calculated by Scott's formula (re: Appendix C). The video-taping was accomplished through the use of portable equipment operated by a competent technician.

Feedback sessions were held for the observed subjects on the afternoon of the observations. Each student teacher transcribed the recorded data into a matrix sheet for his own use. Thus, each subject had a permanent record of the sequence of behaviors provided by the tally sheet and the pattern of verbal interaction indicated by the matrix (re: Appendix A). The fourteen members designated "experimental" were allowed individually to view privately the video-tape made of their teaching session. At the termination of the observations, the data were submitted to an IBM 360 computer to be adapted to a form suitable for statistical analysis. Each of the ten dependent variables was tested by an F-test of homogeneity of variances and the Student t-distribution for group means difference (Wert, Neidt and Ahman, 1954). This procedure was followed for the post measure on all twenty-seven student subjects. A significance level of .02 was employed for the F-test of homogeneity of variances and a .05 level of significance was designated for the t-test for group means difference.

Significant F-test values of homogeneity of variances and t-test values for group means difference were obtained in three of the ten dependent variables that were analyzed. These data reveal that pre-service teachers receiving video-tape feedback of their verbal behavior differed significantly from those pre-service teachers who did not receive video-tape feedback of their verbal behavior in the use of:

1. Corrective feedback as measured by category 8 of the RCS
2. Statements that tended to create tension in the classroom as measured by category 9 of the RCS instrument.

3. Restrictive patterns, such as giving directions, telling another his behavior is inappropriate, "bawling out" someone, and rejecting or criticizing the opinion or judgment of another as measured by the block of cells 7, 8, 9 of the RCS instrument.

No significant differences were found to exist between the two groups in seven of the ten dependent variables tested. The seven were as follows:

1. Attempts to informalize the classroom climate by reducing tension and offering praise as measured by category 1 of the RCS instrument.

2. Accepting the action, behavior, comments, ideas, and/or contributions of another as measured by category 2 of the RCS instrument.

3. Use of extending patterns, such as asking for clarification, developing the verbal action, accepting behavior in a positive manner as measured by block of cells 1, 2, 3 of the RCS instrument.

4. Use of questions that permit expression of one's own ideas as measured by cell 4-16 of the RCS instrument.

5. Allowing various sequences of student talk to be continuous as measured by the Student-Student Talk Submatrice of the RCS instrument.

6. Use of convergent questions as measured by cell 4-15 of the RCS instrument.

7. Allowing various sequences of one kind of teacher talk to be followed by another kind of teacher talk as measured by the Teacher-Teacher Talk Submatrice of the RCS instrument.
Conclusions

Hypothesis One

Hypothesis one, that there would be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback, was rejected in terms of no significant difference at the .02 level of confidence of an F-test of homogeneity of variances and at the .05 level of confidence of a t-test for group means difference by all five of the dependent variables tested. The five are as follows:

1. Attempts to informalize (warm) the classroom climate as measured by category 1 of the RCS instrument.

2. Accepting the action, behavior, comments, ideas, and/or contributions of another as measured by category 2 of the RCS instrument.

3. Use of "extending" patterns, such as asking for clarification, developing the verbal action, accepting behavior in a positive manner, praising the action as measured by the block of cells 1, 2, 3 of the RCS instrument.

4. Use of questions that permit expression of one's own ideas as measured by cell 4-16 of the RCS instrument.

5. Allowing various sequences of student talk to be followed by additional student talk without the interjection of teacher verbalism as measured by the Student-Student Talk Submatrice of the RCS instrument.

Hypothesis Two

Hypothesis two, that there would be a difference between the observed verbal behavior of pre-service teachers receiving video-tape feedback and
the verbal behavior of pre-service teachers not receiving video-tape feedback with the observed differences being greater for the pre-service teachers not receiving video-tape feedback was supported in terms of a significant difference at the .02 level of confidence of an F-test of homogeneity of variances and at the .05 level of confidence of a t-test for group means difference by three of the five dependent variables tested. The three dependent variables tested that supported hypothesis two are as follows:

1. Use of corrective feedback as measured by category 8 of the RCS instrument.

2. Use of statements that tend to create tension in the classroom as measured by category 9 of the RCS instrument.

3. Total use of restrictive patterns, such as giving directions, telling another his behavior is inappropriate, "bawling out" someone, and rejecting or criticizing the opinion or judgment of another as measured by the block of cells 7, 8, 9 of the RCS instrument.

The two dependent variables tested that did not support hypothesis two are:

1. Use of questions that require either a "yes" or "no" response, simple recall or are of the convergent type as measured by the cell 4-15 of the RCS instrument.

2. Verbal patterns that allowed various sequences of teacher talk to be followed by additional teacher talk as measured by the Teacher-Teacher Talk Submatrice of the RCS instrument.

The conclusions drawn as a result of this study are based on the thousands of verbal behavior patterns that were systematically recorded by a trained observer during more than thirteen hours of classroom
observation of twenty-seven student teacher subjects. Significant F-test values of homogeneity of variances and t-test values for group means difference were obtained in three of the ten dependent variables tested. The results of this study statistically indicate that pre-service teachers who received video-tape feedback differed significantly from those pre-service teachers who did not receive video-tape feedback in their use of the following verbal behaviors:

1. They used less corrective feedback.
2. They voiced less disagreement with student replies.
3. They gave fewer directions.
4. They produced fewer threatening situations.
5. They created less tension among their students, and
6. They criticized less.

Each of the dependent variables found to be statistically significant in this study, was of a "negative" attitude in the social-emotional climate. Seemingly, the type of verbal behavior that can be readily identified with overt negative behavior on the part of the teacher, can be reduced through the use of visual feedback in the form of video-taping a teacher's classroom performance.

Although this study did not replicate any other study, similar results regarding the reduction of negative aspects of verbal behavior through feedback are reported by Bondi (1968), Flanders (1963), Kirk (1964), Lohman, Ober and Hough (1966), and others. None of these studies cited, however, isolated the variable of video-tape feedback as is the case in the present study.
Recommendations for Further Study

The results of this study seem to indicate that feedback in the form of video-tape viewing of one's own teaching performance can lead to significant differences between the verbal behaviors utilized in the classroom by pre-service teachers who received feedback and by those who did not. Based on these findings one might suggest that teacher verbal behavior can be modified by teacher education programs that incorporate feedback procedures in their training sequences, especially visual forms of feedback of the type employed in this study.

Considering the limitations stated in Chapter I, the following recommendations are made concerning further study of feedback and teacher verbal behavior:

1. The present study needs to be replicated in its existing form. Appropriate controls should be applied to take into account some or all of the limitations of this study.

2. There is a need to compare the two groups of the design of this study with a group not receiving feedback or training in interaction analysis.

3. There is a need to replicate this study with a larger sampling to reduce the chance of error that is prevalent with small sampling.

4. There is a need to replicate this study with a group of pre-service teachers at the senior level of their training to see if they are influenced in the same manner as are junior level pre-service teachers.

5. There is a need to replicate this study at the beginning of the school year and then again near the close of the school year to
determine if the group differences persisted.

6. Finally, there is a need to replicate this study design utilizing a systematic observational instrument that is designed to isolate non-verbal behavior in addition to the verbal aspect of behavior that occurs in the classroom, thus adding another dimension to the investigation of teacher behavior.
APPENDIX A

SAMPLE OF OBSERVATION SHEET AND MATRIX

PROVIDED SUBJECTS FOR SELF-STUDY
Observation sheet with recorded category numbers. First three columns show the bracketing necessary for transfer to matrix. This sheet will allow the teacher to pinpoint the sequence of verbal behaviors and the approximate time a particular sequence occurred. Each column represents about one minute of observation.
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Individual student teacher's matrix showing the recording of tally marks as indicated by the bracketed pairs of category numbers.
APPENDIX B

SAMPLE OF INFORMATION MATERIAL USED BY

SUBJECTS TO INTERPRET THEIR MATRICES
Information Useful for Interpreting Your Matrix*

The RCS consists of nine verbal categories, each of which can be assigned to either teacher or student talk, and a single category reserved for silence or confusion (refer to Fig. 1 for category descriptions). When verbal behavior is observed as teacher talk its category number is recorded as a single digit number (Categories 1 through 9, along the left hand margin of Fig. 1). In contrast, when verbal behavior is observed as student talk, its category number is recorded as a two digit number (Categories 11 through 19, along the right hand margin of Fig. 1).

In order to tabulate the frequency with which one category follows another, the columns of observed category numbers are plotted in a matrix (refer to Fig. 2). Prior to plotting, they are bracketed off by pairs:

10,
  6
( 6
  4
(15,
  2
  6

Each bracketed pair corresponds to a particular cell of the matrix. For example, the first pair (10-6) represents the 10-6 cell (tenth row down from the top and sixth column over from the left). The

second pair represents the 6-6 cell (sixth row down and sixth column over) and so on. For each bracketed pair, a tally mark is placed in its corresponding cell of the matrix (refer to Fig. 2). The total number of tally marks in a given cell represents its "loading."

The RCS matrix yields a series of ratios which compare individual and groups of individual categories. Here are four examples:

A. The "warm-cool" or 1/9 Ratio: This ratio compares the total amount of "warm" teacher talk with the total amount of "cool" teacher talk. Calculated by dividing the total amount of Category 1 by the total amount of Category 9.

B. The "Accept-Correct" or 2/8 Ratio: This ratio compares the total amount of teacher talk used for the purpose of "accepting" with the total amount of teacher talk used for "correcting." Calculated by dividing the total amount of Category 2 by the total amount of Category 8.

C. The "Elicit-Initiate" or 4/6 Ratio: This ratio compares the total amount of "eliciting" by the teacher with the total amount of teacher "initiation." Calculated by dividing the total amount of Category 4 by the total amount of Category 6.

D. The "Student-Teacher" or S/T Ratio: This ratio compares the total amount of "Teacher Talk" with the total amount of "Student Talk." Calculated by dividing the total amount of Categories 11-19 by the total amount of Categories 1-9.

Considering the four examples described, it becomes apparent that a variety of other ratios are possible. Two or more categories can be compared to two or more other categories. For example, an "acceptance-rejection" ratio might be calculated by dividing the total amount of Categories 1, 2, 3 by the total amount of Categories 8, 9.

The variety of combinations of verbal behavior is great; you alone determine the extent to which information is desired. The more you dig into the matrix, the more revealing a picture of your verbal behavior in the classroom is uncovered.
<table>
<thead>
<tr>
<th>Category Number</th>
<th>Description of Verbal Behavior</th>
<th>Category Number</th>
<th>Assigned to Party 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;WARMs&quot; (INFORMALIZES) THE CLIMATE: Tends to open up and/or eliminate the tension of the situation; praises or encourages the action, behavior, comments, ideas, and/or contributions of another; jokes that release tension not at the expense of others; accepts and clarifies the feeling tone of another in a friendly manner (feelings may be positive or negative; predicting or recalling the feelings of another are included).</td>
<td>11</td>
<td>Assigned to Party 2</td>
</tr>
<tr>
<td>2</td>
<td>ACCEPTS: Accepts the action, behavior, comments, ideas, and/or contributions of another.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AMPLIFIES THE CONTRIBUTIONS OF ANOTHER: Asks for clarification of, builds on, and/or develops the action, behavior, comments, ideas and/or contributions of another.</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ELICITS: Asks a question or requests information about the content subject, or procedure being considered with the intent that another should answer (respond).</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>RESPONDS: Gives direct answer or response to questions, requests for information, or requests for permission, that are initiated by another; includes answers to one's own questions.</td>
<td>15</td>
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</tr>
<tr>
<td>6</td>
<td>INITIATES: Presents facts, information, and/or opinion concerning the content, structures, subject, or procedures being considered that are self-initiated; expresses one's own ideas; lectures (includes rhetorical questions -- not intended to be answered).</td>
<td>16</td>
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<td>7</td>
<td>DIRECTS: Gives directions, instructions, orders, and/or assignments to which another is expected to comply.</td>
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<td>8</td>
<td>CORRECTS: Tells another that his answer is inappropriate or incorrect.</td>
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<td>9</td>
<td>&quot;COOLS&quot; (FORMALIZES) THE CLIMATE: Makes statements intended to modify the behavior of another from an inappropriate to an appropriate pattern; may tend to create a certain amount of tension (i.e., bawling out someone, exercising authority in order to gain or maintain control of the situation, rejecting or criticizing the opinion or judgment of another).</td>
<td>19</td>
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<tr>
<td>10</td>
<td>SILENCE OR CONFUSION: Pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer; or transition between pupils, or between teachers (in a team teaching situation), or between teacher and teacher-aide.</td>
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<td></td>
</tr>
</tbody>
</table>

1 Category numbers assigned to Teacher Talk when used in classroom situation.
2 Category numbers assigned to Student Talk when used in classroom situation.

Fig. 1 Summary of categories for the Reciprocal Category System
Fig. 2 - Nineteen-by-Nineteen Matrix with Plotted Data.

![Nineteen-by-Nineteen Matrix with Plotted Data](image-url)
APPENDIX C

METHOD OF CALCULATING OBSERVER RELIABILITY

AND SAMPLE CHECK
The Scott method of estimating reliability was utilized in this study. The method employs the Scott coefficient and is unaffected by low frequencies.

Scott calls his coefficient "pi" and it is determined by the two formulae below.

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

Po is the proportion of agreement, and Pe is the proportion of agreement expected by chance which is found by squaring the proportion of tallies in each category and summing these over all categories.

\[
Pe = \sum_{i=1}^{k} Pi^2
\]

In formula two there are k categories and Pi is the proportion of tallies falling into each category. Pi, in formula one, can be expressed in words as the amount that observers exceeded chance agreement divided by the amount that perfect agreement exceeds chance.

*The method employed in this study was adapted for use in the Reciprocal Category System from the procedure described by Flanders in "Interaction Analysis in the Classroom: A Manual for Observers," (1960a).
## OBSERVER RELIABILITY CHECK # 2

<table>
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<th>Category</th>
<th>Study Compared with</th>
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<th>%1</th>
<th>%2</th>
<th>%Diff. (Ave.%)²</th>
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<td>0.74</td>
<td>0.00</td>
<td>0.74</td>
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</table>

Po - Pe = (100 - 11.23) - 19.7881 = 88.77 - 19.7881 = 0.859

Pi = \frac{1 - Pe}{100 - 19.7881} = 80.2119

Pi = 0.859
LIST OF REFERENCES


Schueler, Herbert, et al. *Teacher Education and the New Media.*


BIOGRAPHICAL SKETCH

John William McFadden, Jr. was born December 9, 1932, at Jersey City, New Jersey. He was graduated from Snyder High School, Jersey City, New Jersey in June, 1951. From 1953 to 1957 he served in the United States Air Force as a musician. He received the Bachelor of Arts Degree in Elementary Education from Jersey City State College, Jersey City, New Jersey, in 1960. Following graduation he was employed as a teacher at the Franklin School, East Orange, New Jersey until June, 1968. During this time he was awarded a Master of Arts Degree in Science Education from Teachers College, Columbia University, in 1963. He was a member of the 1967-68 National Science Foundation Earth Science Institute at the University of Florida. From 1968 to 1969 he was employed by the Division of Continuing Education, University of Florida, as an instructor, at the same time pursuing his graduate studies toward the degree of Doctor of Education. In January, 1970 he accepted a position as assistant professor of education at Western Carolina University, Cullowhee, North Carolina.

John William McFadden, Jr. is married to the former Anne St. Jacques, and is the father of two sons, John William, III and Lawrence Thomas.

He is a member of the Association for Educational Communications and Technology, National Association of Educational Broadcasters and Phi Delta Kappa educational fraternity.
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Charles L. Durrance
Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Charles A. Cate
Associate Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Myron A. Cunningham
Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Caspar Rappenecker
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This dissertation was submitted to the Dean of the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

March, 1971

Dean, College of Education

Dean, Graduate School