THE EFFECTS OF FEEDBACK ON TEACHERS' VERBAL BEHAVIOR AND ATTITUDES TOWARD IN-SERVICE EDUCATION

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CHAPTER I

INTRODUCTION

Interest in in-service education has moved in recent years in the direction of developing strategies for human change. Efforts have been made to defend existing practices against change, to orient new staff members to standardized operating procedures, or to make existing practice more uniform. The demands of today's society are such that improvement in professional in-service education is imperative.

Several studies have been conducted which indicate that pupil attitudes and pupil achievement are related to teacher behavior. This research appears to have implications for teacher in-service education. Little has been done to create an awareness of need for change within the teacher in most of the present in-service education programs.

Interaction analysis makes its major contribution to in-service education by providing teachers with feedback that reflects the teaching behavior. Examination of feedback and recognition of its implications lead to better use of techniques in developing teacher sensitivity. Teacher behavior may be improved by modifying the performance of the operations taken on through the language. To make such improvements, the teacher in training takes the feedback from these

operations and, through analysis, comes to recognize their structures. To train the teacher in this way, even though it is only part of the training needed for teaching, is to make use of the observation systems and the analysis of teaching behavior thereby made possible.

Teachers tend to behave in certain set patterns. Teacher talk accounts for more than 50 per cent of the talk in most classrooms, and most student talk is simply in response to teachers' questions. Feedback may be the crucial element in an in-service education program which has been designed to change teachers' classroom behavior. As teachers begin to receive feedback from their teaching strategies, they will then have opportunity to modify teaching habits. By gaining an understanding of teaching behavior while in service, teachers may effect changes that will benefit the total educational climate in classrooms.

Statement of the Problem

The problem of this study was to determine the effect of the use of Flanders'system of interaction analysis on the verbal behavior of an elementary school faculty and on their attitudes toward in-service education.

Purposes of the Study

The following purposes were formulated to further clarify and identify the problem:

1. To determine if training in interaction analysis would cause teachers to change their classroom verbal behavior.

2. To determine if training in, and use of, interaction analysis would result in a more positive attitude toward in-service education.

Hypotheses

Consistent with the above purposes, the following hypotheses were formulated for statistical treatment:

1a. At the end of the experimental period, teachers will use significantly more indirect influence. (See Appendix A.)

1b. At the end of the experimental period, students will use significantly more self-initiated talk.

2. The faculty will exhibit a significantly more positive attitude toward in-service education at the end of the study.

Background and Significance of the Study

In the past six or seven years there has been a growing interest in observing and recording teacher-pupil interaction in the classroom. However, as early as 1936, H. H. Anderson (5, 6, 7, 8) was studying teachers' dominative and integrative behavior. By dominative behavior he meant the ways in which a teacher controls the classroom situation; by integrative behavior he referred to ways in which a teacher tries to get

students to synthesize and to integrate what has been learned. John Withall (28), in the late 1940's, developed a technique for determining the social-emotional climate of the classroom. Following up on Withall's work, Medley and Mitzell (22) developed an instrument which they called the Observation Schedule and Record. OScAR is a list of behaviors of teachers and pupils. This instrument allows one to identify three major factors: (1) the emotional climate of the classroom, (2) the emphasis on verbal discourse, and (3) the social organization.

Flanders (14) created laboratory situations in which one student at a time was exposed to contrasting patterns of teacher behavior. A sustained dominative pattern was consistently disliked by students, reduced their ability to recall the material studied, and produced disruptive anxiety as indicated by galvanic skin responses and changes in heartbeat rates. The opposite trends were noted in student reactions to integrative contacts.

Perkins (23), using Withall's technique, studied groups of teachers organized to discuss the topic of child growth and development.

Cogan (12) administered a single paper-and-pencil instrument to 987 eighth grade students in thirty-three classrooms. The instrument contained three scales: (a) a scale assessing student perceptions of the teacher, (b) a scale on which students reported how often they did required school

work, and (c) a scale on which students reported how often they did extra nonrequired school work. Cogan's first scale assessed traits that he developed in terms of Murray's list of major personality needs. There were two patterns in this scale. The items of one pattern were groups as "dominative," "aggressive," and "nurturant." The second pattern was "integrative," "affiliative," and "nurturant." These are close to Anderson's dominative and integrative patterns. Cogan found that students reported doing more assigned and extra school work when they perceived the teacher's behavior as falling into the integrative pattern rather than the dominative pattern.

Bellack (10) developed a system for categorizing pupil behaviors. The objectives of Bellack's research were to describe the verbal events that occur in the classroom, to discover similarities and consistencies in the teaching pattern or discourse, to define the distinctive aspects of the roles played by teachers and pupils, and to find out how to provide some estimate of the variability among teachers and classes along each of these dimensions. Bellack found the ratio to be three to one, teachers to pupils. Teachers were considerably more active verbally than pupils.

Amidon and Flanders (1) found that dependent-prone eighth-grade students who were taught geometry by indirect teaching methods learned more than dependent-prone children who were taught by direct means.

J. P. Anderson (9) made a significant contribution to the validation of Flanders' interaction analysis system when he found that observers using the system perceived teacher influence in essentially the same way as did the pupils of the teachers under observation.

In a large scale study, Flanders (15) isolated, for the purposes of analysis, junior high school teachers whose pupils learned the most and the least after a two-week experimental program in mathematics. Teachers of the higher achieving classes were found to differ from teachers of the lower achieving classes in the following ways: the former used five to six times as much acceptance of student ideas and encouragement of student ideas; they used five to six times less direction and criticism of student behavior; they talked 10 per cent less; and they encouraged two to three times as much student-initiated talk.

Similar results to those found by Flanders between teachers of high-achieving pupils and those of low-achieving pupils were found by Amidon and Giammatteo (2) when they compared thirty superior teachers, who had been nominated by their supervisors or administrators, with 150 randomly selected teachers in elementary schools.

Interaction Analysis and In-Service Training

Flanders (13) instituted an in-service education program in which interaction analysis was taught as an observational tool to two groups of junior high school mathematics and

social studies teachers. At the end of this experimental program, the teachers in the training program experienced more encouraging and accepting behavior and were less critical and more indirect than they had been at the beginning of the experiment.

Amidon, Kies, and Palisi (3) conducted a two-year in-service program in an elementary school to help the staff learn to study their own teaching. They found that teachers did become sensitized to verbal interaction and that the effect of group activity appeared to influence positively faculty interpersonal relationships, communications, goal setting, and behavioral norms.

Kirk (20) conducted a study with student teachers in elementary education in which he taught interaction analysis to an experimental group and compared this group with student teachers who had no interaction analysis training. He found that the student teachers in the experimental group talked less, had more pupil-initiated talk, and accepted pupil ideas more often than did student teachers in the control groups. Zahn (29) found that student teachers who learned interaction analysis developed more positive attitudes toward student teaching than did a control group of student teachers who were not taught interaction analysis.

Definition of Terms

Terms peculiar to the study and which may need clarification for readers are as follows:

Integrative behavior. Behavior leading to a oneness or commonness of purpose among differences. It is the expression of one who attempts to understand others.

Dominative behavior. Inflexible, rigid, deterministic behavior which disregards the desires or judgment of others.

Verbal behavior. Any verbal communication in the classroom in which teacher, pupil, or both are involved.

Flanders' system of interaction analysis. An observational tool which classifies the verbal behavior of teachers and students into categories.

Feedback. The process by which a teacher learns of her exact verbal behavior as recorded on a matrix by a trained observer.

Observer. A person in the classroom who has been trained to observe and record the verbal behavior of teachers and pupils.

Matrix. The tool on which the observed verbal behaviors are recorded to facilitate understanding of the relationships among categories.

Attitude. The mean of ratings on certain evaluative scales determined by a factor analysis of the adaptation of the semantic differential used in this study.

Attitude change. The difference between the attitude assessed by the pretest and the attitude assessed by the post-test.

Unfavorable attitude. A mean rating between 1 and 3.5 on the selected evaluative scales of the semantic differential adaptation employed in this study.

Favorable attitude. A mean rating between 4.6 and 7.0 on the selected evaluative scales of the semantic differential adaption used in this study.

Neutral attitude. A mean rating between 3.6 and 4.5 on the selected evaluative scales of the semantic differential adaptation employed in this study.

Original attitude. The pretest rating of the selected evaluative scales of the semantic differential adaptation used in this study.

Limitations of the Study

In considering the results of this study, the following limiting factors should be kept in mind:

1. The data accumulated on each subject's verbal behaviors were limited to the classes of verbal behaviors identifiable by the Flanders system of interaction analysis. The system has a social-emotional orientation and does not focus on the teacher's use of cognitive materials. Non-verbal behavior is not a part of the Flanders system.

2. The study was limited to three observational periods.

Basic Assumptions

1. It was assumed that the ten categories of Flanders system of interaction analysis would include all of the

verbal responses between the students and the teacher in the classroom.

2. It was assumed that a tabulation of the verbal responses obtained during the three observation periods would serve as a representative sample of the teachers' and pupils' verbal behavior.

Procedure for Collecting Data

The subjects in this study were faculty members from an elementary school in the Dallas Independent School District, Dallas, Texas.

Two persons who were trained in recording verbal behavior served as observers in this study. Flanders (15) showed that observer teams could achieve correlation coefficients from 0.64 to 0.76 in six to ten hours of practice, as judged by Scott's reliability coeeficient. Scott's method is unaffected by low frequencies, can be adapted to per cent figures, can be estimated more rapidly, and is sensitive at a high level of reliability. Using Scott's Coefficient, the two observers in this study obtained reliability coefficients of .75, .83, and .90 in three separate observations.

The experimental faculty was administered a pretest semantic differential to determine their attitudes toward in-service meetings.

Each homeroom, arithmetic, art, and science teacher in the study was observed for pretesting purposes. When the verbal observations were recorded in a matrix, there was a

conference with each teacher to explain what kind of verbal behavior was used during the pretest observation period.

The experimental faculty then began a four-month in-service education program in which they studied the Flanders system of interaction analysis. In a series of eight sixty-minute sessions over the four-month period, each teacher was taught how to record verbal behavior, how to enter it on a matrix, and how to evaluate the findings.

The second observation period occurred after the first four group meetings. All teachers were again given feedback on their verbal behavior. The post-test observation period came at the end of the four-month training period.

At the end of the four-month period, the same semantic differential scale on attitude toward in-service education that was administered as a pretest was administered to the faculty.

Treatment of the Data

The hypotheses were tested by examining the data and treating them statistically in the following manner:

Hypotheses 1a and 1b were tested separately by Fisher's *t* technique, using the difference between pretest and post-test means.

Hypothesis 2 was tested by first computing an inter-correlation matrix for the scales on the pretest and post-test semantic differential. The correlations were subjected to a principle axes factor analysis for both tests. This procedure

was used to identify the evaluative scales. A pretest mean and a post-test mean based on the raw scores on the evaluative scales of the semantic differential were computed. The difference between these means was determined by a *t* test.

CHAPTER BIBLIOGRAPHY

1. Amidon, E. J. and N. A. Flanders, "The Effects of Direct and Indirect Teacher Influence on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, 52 (December, 1961), 286-291.

2. Amidon, E. J. and M. E. Giammatteo, "The Behavior of Superior Teachers," The Elementary School Journal, 65 (February, 1965), 283-285.

3. Amidon, Edmund J., Kathleen M. Kies, and Anthony T. Palisi, "A Technique for Improving Teacher Behavior," The National Elementary Principal, XLV (April, 1966), 5.

4. Amidon, Edmund and Anita Simon, "Teacher-Pupil Interaction," Review of Educational Research, 35 (April, 1965), 130-138.

5. Anderson, H. H., "The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children," Child Development, 10 (1939), 73-89.

6. Anderson, H. H. and H. E. Brewer, "Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers," Psychological Monographs, No. 6, 1945.

7. _____, "Studies of Teachers' Classroom Personalities, II: Effects of Teachers' Dominative and Integrative Contacts of Children's Classroom Behavior," Psychological Monographs, No. 8, 1946.

8. Anderson, H. H., H. E. Brewer, and M. F. Reed, "Studies of Teachers' Classroom Personalities, III: Follow-up Studies of the Effects of Dominative and Integrative Contacts on Children's Behavior," Psychological Monographs, No. 11, 1946.

9. Anderson, J. P., "Student Perceptions of Teacher Influence," unpublished doctoral dissertation, University of Minnesota, Minneapolis, 1960.

10. Bellack, J. P. and others, The Language of the Classroom, New York, Bureau of Publications, Teachers College, Columbia University, 1967, p. 201.

11. Brinton, James E., "Deriving an Attitude Scale from Semantic Differential Data," Public Opinion Quarterly, XXV (1961), 289-295.

12. Cogan, M. L., "Theory and Design of Teacher-Pupil Interaction," The Harvard Educational Review, 26 (January, 1956), 315-342.

13. Flanders, N. A., Helping Teachers Change Their Behavior. United States Office of Education, Project Numbers 1721012 and 7-32-0560-171.0, Ann Arbor, Michigan, The University of Michigan, 1963.

14. _____, Interaction Analysis in the Classroom: A Manual for Observers. Minnesota, College of Education, 1960.

15. _____, Teacher Influence, Pupil Attitudes, and Achievement, United States Office of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 397, Minneapolis, University of Minnesota, 1960.

16. Gage, N. L., "A Method for 'Improving' Teacher Behavior," Journal of Teacher Education, 14 (September, 1963), 261-266.

17. Giammatteo, Michael C., "Interaction Patterns of Elementary Teachers Using the Minnesota Categories for Interaction Analysis," unpublished doctoral dissertation, University of Pittsburgh, Dissertation Abstracts, 25:2365, No. 4, 1964.

18. Harris, Ben M., "In-Service Growth--The Essential Requirement," Educational Leadership, XII (December, 1966), 257-260.

19. Hughes, Marie M., "Utah Study of the Assessment of Teaching," Theory and Research in Teaching, edited by Arno A. Bellack, New York, Bureau of Publications, Teachers College, Columbia University, 1963, pp. 31-56.

20. Kirk, J., "The Effects Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers," unpublished doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1964.

21. Lippitt, R. and R. K. White, "The Social Climate of Children's Groups," Child Behavior and Development, edited by R. G. Barker, J. S. Kounin, and H. F. Wright, New York, McGraw-Hill Book Company, 1943.

22. Medley, Donald M. and Harold E. Mitzel, "A Technique for Measuring Classroom Behavior," Journal of Educational Psychology, 49 (April, 1958), 86-92.

23. Perkins, H. V., "Climate Influences Group Learning," Journal of Educational Research, 45 (October, 1951), 115-119.

24. Smith, B. Othanel, "Recent Research on Teaching: An Interpretation," The High School Journal, LI (November, 1967), 41-43.

25. Soar, R. S., "Pupil Needs and Teacher Pupil Relationships: Experiences Needed for Comprehending Reading," mimeographed paper, Temple University, Philadelphia, Pennsylvania, 1966.

26. Sweatman, Charles, "Operation: New Outlook: A Self-Assessment Method for Helping Teachers Change Their Behavior," The Clearing House, 41 (October, 1966), 2.

27. Taba, Hilda and others, Thinking in Elementary School Children, U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 1574, San Francisco State College, California, 1964, pp. 110-117.

28. Withall, John, "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms," Journal of Experimental Education, 17 (March, 1949), 347-361.

29. Zahn, R., "The Effects of Cooperating Teacher Attitudes on the Attitudes of Student Teachers," mimeographed paper by the author, Glassboro State College, Glassboro, New Jersey, 1964.

CHAPTER II

REVIEW OF RELATED LITERATURE

Direct observation has an important role to play in measuring the effectiveness of in-service programs and procedures in teacher education. The ultimate objective of teacher education is to increase teachers' skills in helping pupils to learn; therefore, the effectiveness of a training program would have to be determined by measuring how much is learned by the pupils from the teachers.

> It turns out, however, that the immediate objective of teacher education is to get teachers to behave in certain ways while they teach. The ultimate objective--effects on pupils--can only be reached by way of the intermediate one--changes in teacher behavior. . . . Direct observation should play a crucial part in the most fundamental kind of research on teaching--the search for effective patterns of classroom behavior (20, p. 247).

This review of related literature is concerned with the following areas of research related to the use of interaction analysis in helping teachers change verbal behavior and attitudes about themselves and students:

1. Research related to the development of observational systems

2. Research which used the Flanders system of interaction analysis

3. Relationship of reported research to this study.

Research Which Pertained to the Development of Observational Systems

There have been many attempts to measure classroom behavior by different methods, with the goal being to gain greater insight into better teaching procedures. Horn (20) had observers put symbols in appropriate places on a seating chart to indicate kinds of pupil responses. Thomas (20) observed the number of contacts between teachers and pupils. Wrightstone (20) devised a code to be used with a seating chart for the purpose of recording teacher-pupil responses.

H. H. Anderson (6) and his associates conducted a series of studies of the interaction between teachers and pupils in the classroom. Anderson's studies were primarily concerned with the measurement of dominative and socially integrative behavior.

Anderson's definition of dominative was

> . . . the behavior of a person who is inflexible, rigid, deterministic, who disregards the desires or judgment of others, who himself in the conflict of differences has the answers (6, p. 89).

Integrative behavior was defined as

> . . . behavior leading to a oneness or commonness of purpose among differences. . . . It is a non-coercive; it is the expression of one who attempts to understand others, who is open to new data. It is both an expression of growth in the person using it and a stimulus to growth in others (6, p. 89).

Anderson ascertained that no behavior is entirely integrative and that no behavior short of extermination is entirely dominative. He maintained that specific acts or "contacts"

can be said to be expressions of domination or integrative behavior. Findings indicated that most teacher contacts were dominative rather than facilitative. One of the findings of these observations in grades one through six revealed a tremendous number of individual interactions per hour between pupils and teacher.

After Anderson started his work, Lippitt and White (30) working with Kurt Lewin, carried out laboratory experiments to analyze the effects of adult leaders' influence on boys groups. The laboratory approach used had certain advantages in studying the effects of the adult leaders' behavior. First, the contrasting patterns of leader behavior were closely defined in advance and were made more consistent as a result of training and role playing. Second, differences in the underlying personality and appearance of the adult leaders were controlled through role rotation. Third, the effect of the pattern of leader behavior was intensified because there were only five boys to a group.

Most of the conclusions of the Lippitt and White study confirm or extend the general conclusions of Anderson. From the point of view of classroom teaching, one interesting extension was the conceptualization of "dependence on the leader" by Lippitt and White. This is a situation in which group members were unable to proceed without directions from the leader. Anderson used the category "conforming to teacher domination" and thus noted similar events, but in the more

closely controlled situations in the laboratory experiments it was clearly seen that extensive compliance occurs when a generalized condition of dependence is established.

Withall (47) developed a complex technique for the assessment of social-emotional climate in the classroom in the late 1940's. Withall's findings tended to classify teacher behavior into two major categories which were quite similar to those of Anderson and his associates (8, 5, 6, 7) and Lippitt and White (30).

Jayne reported the use and analysis of tape recordings of classroom behavior (20). Withall, in following seventh grade pupils in the change of one classroom to another, discovered that different teachers created a different climate with the same group of pupils (46). This procedure classified the teacher's verbal statements into seven categories which served as an index for teacher behavior. Withall's plan included the coding of typewritten transcripts and sound recordings of classroom behaviors.

Withall's (40) research was followed by that of Medley and Mitzel (32, 33), who developed the OScAR (Observation Schedule and Record) for the purpose of providing quantitative data from observations of beginning teachers. The OScAR is a list of behaviors of teachers and pupils. The observer charts classroom occurrences on a check list which is divided into three major factors. Data for the first studies using the OScAR were collected in the classrooms of forty-nine

first grade teachers in New York City through live observations made by two observers. The second study employed the use of closed-circuit television and video-tape recorders, and no observers went into the classroom.

Medley and Mitzel (32, 33) reported the greatest degree of change in the area of the teacher role. These studies did not identify any aspect of a teacher's behavior which is related to his ability to stimulate pupils to learn. Findings of both studies indicated that ratings of teacher effectiveness do not correlate with measured effects the teacher has on pupils. The most important conclusion to be drawn from the work of Medley and Mitzel (33) with the OScAR is that meaningful measures of classroom behavior can be developed from objective records made by relatively untrained observers.

Mitzel and Rabinowitz (20) used the classroom visitation technique in a study. Two observers working independently observed and classified behavior of four teachers in fourth and fifth grades. Hughes (25) reported a narrative record of forty-one elementary teachers recorded in shorthand by two trained observers.

Another significant study involving the use of an objective observational system was reported by Hughes (26). The objective of the Hughes study was to describe teaching in the elementary schools from kindergarten through the sixth grade. Two observers were used to record teacher behavior and pupil response, using the "Provo Code" developed by Hughes and her

associates. This code allows the categorization of thirty-one specific teacher or pupil functions. A significant teacher function from the Hughes study was that of control, which in the Hughes system refers to setting standards, structuring, and organizing the classroom in line with some focus or purpose. Hughes' findings indicated that most frequent and pervasive functions performed by the teachers were in the first category, that of controlling.

Varied approaches have been used to implement supervisory evaluation. One of the most extensive among these approaches was Ryan's (38) Teacher Characteristic Study. It consisted of over 100 separate but integrated research efforts. It was directed at the determination of teacher behavior patterns observable in the classroom and analysis of relationships between teacher characteristics and observed pupil behaviors. High and low groups of teachers, who had been designated from observer assessments, were compared on the differences in their personal characteristics. The following personal characteristics were prevalent for elementary and secondary teachers considered to be the most capable: generous appraisal of others, great interest in literary affairs, high interest in music, painting, and the other arts, participation in social activities, enjoyment of teacher-pupil interaction, preference for non-directive classroom procedures, superior verbal ability, and emotional maturity.

Flanders (15) studied laboratory situations in which he subjected one pupil at a time to contrasting patterns of teacher behavior. The pupils consistently resisted the dominative patterns of teacher behavior and showed reduced ability to recall the material studied. Instruments for measuring galvanic skin responses and rate of heartbeat indicated the existence of a substantial amount of disruptive anxiety. When subjected to integrative patterns of behavior, pupils responded with opposite reactions. Thus, Flanders early research identified some of the effects of certain kinds of teacher behavior based on the attitudes and behavior of their pupils.

George Brown (12) used the technique developed by Withall to measure classroom climate, categorizing the verbal behavior of third grade teachers. A conclusion reached was that teachers who were inclined to use praise were likely to be less directive and to use less reproof in their teaching. The same teachers were inclined to be problem-structuring in their behavior with children.

Bellack (10), in a study of fifteen high school teachers and 345 students in the New York City area, studied the verbal events that occur in the classroom in an attempt to discover similarities and consistencies in the teaching pattern. Bellack also attempted to determine the distinctive aspects of the roles played by teachers and pupils. A major finding in this study was that the teachers spoke three lines to

every one that a student spoke. As to delineation of roles, Bellack found that a clear line exists between the role of the teacher and that of the pupil. Structuring and soliciting were teacher functions, while responding was strictly a pupil function. Reacting was primarily a teacher function. Bellack also found that approximately 75 per cent of the total discourse in the classroom was concerned with curriculum content. Only 25 per cent of the total discourse involved instructional meanings, and these meanings were significantly expressed by the teachers rather than by the pupils.

Waimon (44) developed a method for recording the teaching-learning process in classrooms by utilizing a team of four members. One member concentrated on recording data about the teacher; two members concentrated on the learners; and the fourth member, on the behavior setting. An observational period lasted thirty minutes and was recorded on time sheets blocked off in five-minute intervals. Immediately following the observation period, the team members combined their records into a running account of everything that happened during the observation period. The descriptive records were divided into smaller units called episodes. These episodes were than classified into Type A, B, or C, depending on the verbal and nonverbal behavior indicating pupil readiness, or lack of readiness, for the learning task and on teacher response to the pupil. The study demonstrated that three elements--teacher, learners, and setting--are mutually

dependent each upon the others. This was a more comprehensive approach to the study of classroom action than that of studies which analyzed only teacher behaviors (44).

Perkins (68), by using Withall's (47) technique, studied groups of teachers organized to discuss the topic of child growth and development. The findings of Perkins (36) indicated that greater learning takes place when the group discussion is free to focus on the topic. The groups with integrative type leaders were better able to develop free discussion than were the groups with dominative type leaders.

In a cross-sectional study involving 987 eighth grade pupils in thirty-nine classrooms, Cogan (13) administered a paper and pencil instrument to the pupils for the purpose of determining their perceptions of their teachers as dominative, aggressive, and rejectant or integrative, affiliative, and nurturant. The findings of Cogan's study indicated that students reported doing more assigned and extra school work when they perceived the teacher's behavior as being within the integrative pattern rather than within the dominative pattern.

Gallagher and Aschner (21) were interested in investigating productive thought processes in gifted children as evidenced within the context of classroom verbal interaction. Productive thinking includes both the creative and critical analytic dimensions of reasoning. It consists of divergent, convergent, and evaluative operations, whereby the individual

draws upon available and past and present facts, ideas, associations, and observations in order to bring forth new facts, ideas, and conclusions. The basic data for this study of verbal interaction were obtained by tape recording five consecutive classroom sessions in twelve classes of intellectually superior children of junior high school age in social studies, mathematics, science, and English. Two observers were present in the classroom during each recording session and took extensive notes on classroom activities. Each transcribed classroom observation was classified, unit by unit, by trained judges working with a scoring manual. The research data captured much of the general flavor of the varieties of intellectual operations that occurred in the classroom context, making it possible to trace profiles of individual children. The research promised to provide insight into effective methods of teaching toward conceptual performance, especially in lifting the level of intellectual productivity of gifted children. The eventual goal of the project was to provide more effective ways of training teachers for the stimulation of productive thought processes.

The Minnesota Studies of Student Personnel Work in Teacher Education, as reported by Wilk and Edson, utilized the verbal behavior of student teachers as the criterion for testing the validity of counselor judgments and other admission data (45). Two observational methods were used: (1) OScAR III, an adaptation of Medley and Mitzel's OScAR;

and (2) the Flanders system of interaction analysis. In making observations of student teachers, these two methods were used in alternate five-minute time samples for a period of thirty minutes. Five observers, one of whom was a supervisor, visited each subject one time. Discrepancies between supervisor and combined observer ratings of teaching behaviors occurred seven times out of thirty-six. Thus, supervisor bias was not excluded as a cause of these discrepancies. The implication of this report was ". . . that colleges should assign supervision tasks to persons with special training or provide the training required to make them reliable observers." (45, p. 316)

Flanders' research in the development of interaction analysis actually was a continuation of the work of Anderson and his associates, Lippitt and White, Withall, and Medley and Mitzel (20). As a category system, it is a refinement of previous attempts to record raw data. However, the technique of analyzing raw data within a matrix is what makes the Flanders system unique. The addition of the matrix made possible the presentation of a profile of teacher-pupil interaction immediately following an observation. This objective technique for recording observations is being used in research today.

Research Which Used the Flanders System of Interaction Analysis

Interaction analysis as a system for the categorization of verbal behavior is not too different from other categorization systems reported in this study. However, it is not the categories but the method of recording the raw data and the technique of analyzing the raw data within a matrix that makes the Flanders system unique. It was Bales (9) who first applied the matrix to the tabulation of interaction analysis data in 1949. Because it proved to be a long and laborious process, few were interested in using the technique. The problem of matrix analysis was alleviated when Flanders (16) developed a statistical technique for testing for significance between two matrices.

In 1962, Flanders (18) and his associates further tested interaction analysis as an observational tool. It was found that an indirect teaching style was related to improved content learning in mathematics and social studies at the junior high school level.

Allred (1) attempted to determine the significant relationships between certain personality traits and the classroom verbal behavior of high school student teachers. Personality traits were measured by administering the California Psychological Inventory. Subjects received three visits of approximately twenty minutes duration each, during which an observer recorded verbal behavior using the Flanders system of interaction analysis. Variables of sex and

teaching field were controlled. Allred concluded that many high school student teachers who scored higher on the scales of Responsibility, Good Impression, Achievement, Self-control, and Capacity for Status tended to restrict pupil verbal participation more than did male student teachers scoring lower on these scales. Female high school student teachers whose scores rated them higher in being insightful, confident, adventurous, informal, rebellious, idealistic, cynical, and concerned with personal pleasure tended to allow pupils more freedom to participate verbally in general discussions than was found to be true of those students who scored lower on the above descriptors.

Flanders (17) conducted a study in which fifty-five teachers participated in a nine-week, in-service training program conducted in a public school system. All of the participants were observed for about six hours during the fall before the beginning of the in-service program and then again at the end of the in-service program. Early analysis indicated that those who participated in the in-service training made changes in their patterns of spontaneous verbal behavior. Flanders suggested the following assumptions which are basic to the use of interaction analysis in working with teachers:

1. Only a teacher can change his own behavior. No one can change it for him.

2. Changes in teaching method are personal; they involve feelings and attitudes as well as new knowledge.

3. No one pattern of teaching can be adopted universally by all teachers.

4. The most effective environment for change provides the freedom to express both feelings and ideas, encourages self direction, and is free of coercion.

Storlie (43) investigated the relationship between selected characteristics of secondary teachers and change in verbal behavior. Volunteer teachers participated in a ten-week, in-service education program. Half of the teachers were taught in a direct manner, and the other half were taught in an indirect manner. Subjects were observed before and after the training program. Findings indicated that it was possible to produce changes in the verbal behavior of teachers by means of an in-service program based on interaction analysis.

Amidon, Kies, and Palisi (4) have also adapted interaction analysis to the training and supervision of teachers in-service. They initiated a two-year, in-service program in an elementary school composed of twenty-two teachers, the principal, and seven part-time specialists. The primary objective of the first year of the program was to enable staff members to interpret their own matrices. At the end of the first year, more than half of the teachers decided to analyze their teaching through the analysis of verbal interaction. Although no empirical data were produced by this in-service project as a result of their experience, the authors have

made recommendations which are pertinent to the development of supervisory techniques based upon the use of interaction analysis. The most important factor affecting the climate of the group was the way in which feedback was provided to the participants. The following ground rules relative to feedback were established and used by the faculty group involved in the in-service project:

> 1. The person giving feedback describes, rather than evaluates, the pattern of teaching. He attempts to give as objective a description as possible of what he heard happening, and he avoids saying that it was good or bad.
>
> 2. Feedback is offered only in areas that are perceived as susceptible to change by the recipient.
>
> 3. Feedback is given only upon request of the person whose teaching is being discussed.
>
> 4. Feedback is concerned with those aspects of teacher behavior that are characteristic of the teacher at the time that discussion is taking place, rather than with aspects of behavior that are characteristic of an earlier time.
>
> 5. Feedback does not require a teacher to defend his personal opinion or feelings about the way in which he is teaching.
>
> 6. Feedback is concerned with specific teaching acts, not with generalized interpretations. It can be concerned legitimately with the manner of questioning used, manner of responding to students, pace, or some other pattern of communication (4, pp. 56-67).

In a study of teachers in service, using interaction analysis as an instrument for gathering objective data concerning the description of teaching style in physics classes, Snider (41) confirmed the findings of Flanders (16) relative

to the consistency of teaching style. In this study, interaction analysis was used as an instrument to gather normative data among secondary physics teachers. Conclusions drawn from the research indicate that teaching styles do exist and that they are consistent in their respective subjects. In a comparison of normative styles in physics with those of social studies and mathematics, Snider (41) concluded that differences exist between teaching styles in subject areas. This conclusion supports the contention of a need for normative data in the different areas of science teaching and in the different subject areas.

McLeod (31) conducted a study to identify changes in verbal patterns of secondary student teachers of science who were trained in the Flanders system of interaction analysis. These findings were then compared with those of a different study in which a control group was not trained in the Flanders system. McLeod's subjects were observed for a total of six class hours and behavior was recorded. Then the subjects were given ten hours of instruction in the Flanders system. McLeod found that the most rapid period of change in verbal behavior occurred during the first half of the period of student teaching for those student teachers trained in interaction analysis, and during the second half for those student teachers without such training. He also concluded that the experimental group experienced more non-random changes toward indirect teacher influence and fewer changes toward direct

teacher influence. In addition, the experimental group used more indirect influence and less direct influence in the classroom.

Simons (40) was concerned with the effects of training in the Flanders system of interaction analysis on the teaching behaviors of twenty-eight secondary student teachers as they taught their favored and non-favored classes. The subjects were divided into two groups of fourteen each. One group (experimental) received sixty hours of training in interaction analysis during the period of one semester. The other group (control) received no training in interaction analysis. The findings of the study indicated that the training in interaction analysis exerted significant influence on the classroom verbal behaviors of the student teachers studied. Those subjects who did not receive the training reacted to their favored and non-favored classes interchangeably. The trained student teachers were more flexible in their verbal responses, used less critical and controlling behaviors, and used more facilitating behaviors in all classes.

Amidon and Giammatteo (3) found results similar to those of Flanders (16) in an attempt to determine the relationship between superior teachers and high and low achieving students in their classrooms.

More recently, Soar (42) conducted a study of teachers in-service, and his study showed similar results. Soar's findings indicated, as did the research of Flanders (16),

that indirect teacher behaviors were not only related to high achievement in junior high school pupils but also were related to achievement in reading for elementary school children.

According to Flanders (14, pp. 259-260), certain precautions should be taken in the use of interaction analysis in the instruction and supervision of teachers. These precautions seem to be worthy of consideration in the use of interaction analysis in working with teachers in in-service training. They are as follows:

> 1. No interaction analysis data should be collected unless the person observed is familiar with the entire process and knows its limitations.
>
> 2. The questions to be answered by inspecting the matrix should be developed before the observation takes place.
>
> 3. Value judgments about good and bad teaching behavior are to be avoided. Emphasis is given to the problem being investiaged so that cause and effect relationships can be discovered.
>
> 4. A certain amount of defensive behavior is likely to be present at the initial consultation; it is something like listening to a tape recording for the first time.
>
> 5. A consultation based on two observations or at least two matrices helps to eliminate value judgments or at least control them. Comparisons between matrices are more likely to lead to principles (11, p. 269).

In expressing a concern for needed research in the area of teaching behavior, Flanders makes the following evaluation:

> We are now at the point in our technology of data collecting at which procedures for analyzing and conceptualizing teaching behavior can be

> developed. Systems for doing this will become available regardless of whether they are similar or dissimilar to the procedures described in this paper (interaction analysis). When this fine day arrives, the role of the education instructor will change, and the dichotomy between field and theory will disappear. The instructor's role will shift from talking about effective teaching to the rigorous challenge of demonstrating effective teaching. The process of inquiry will produce more independent, self directing teachers whose first day on the job will be their worst, not their best (14, p. 260).

Kirk (27) investigated the use of interaction analysis to collect data on intermediate social studies teachers. There were three stated purposes. The first purpose was to determine how the classes conducted by student teachers at the intermediate level reflected certain patterns of verbal behavior and what these patterns were. Second, the investigator wished to determine whether teaching the Flanders system of interaction analysis would have any effect on a teacher's verbal patterns. The third purpose was an attempt to determine to what extent the pupils of student teachers could detect change in the teaching patterns used by student teachers. Instruments used included one personality inventory--the Runner Studies of Attitude Patterns, Interview Form II--and two teacher attitude inventories--Minnesota Teacher Attitude Inventory and the Teaching Situation Reaction Test. In addition, the Student Perception of Teacher Influence Test was selected for use with the pupils involved.

The experimental group was oriented in processes for notating, constructing, and interpreting the records presented

by interaction analysis, including those of their own teaching efforts. This group met in weekly seminars and private conferences following classroom observation by the college supervisor. No mention was made of interaction analysis to the control group. The study purported to show the effects of objective feedback on the teaching behavior of student teachers. Results of the study indicated certain differences between the experimental and control groups. The tendency to increase direct influence was not as pronounced in the experimental group as in the control group. The feedback of the Flanders system of interaction had no effect on MTAI scores.

A study by Moskowitz (34) focused on student teachers who were trained in the Flanders system of interaction analysis and the cooperating teachers who supervised them. One-half of the high school cooperating teachers received twenty-five hours of instruction in the use of interaction analysis as a supervisory tool. One-half of the student teachers received sixty hours of instruction in interaction analysis with emphasis on its application to their own teaching. At the end of the semester, two attitude questionnaires were administered to the cooperating teachers: Teaching Situation Reaction Test and Cooperating Teacher Attitude Questionnaire. The Student Teachers' Attitude Questionnaire was administered to each student teacher. Two observations were made of each cooperating teacher and each

student teacher using the Flanders system. Findings showed that cooperating teachers were more indirect in teaching patterns and showed greater individuality in teaching procedures. Student teachers with interaction analysis training also showed more indirect teaching patterns and more positive attitudes toward trained cooperating teachers.

Hough and Amidon (2) described a study which involved an experimental course using Flanders' system and a regular lecture and laboratory course in the teaching-learning process. The members of the experimental group had more positive attitudes toward teaching and were rated by their supervisors as more successful in student teaching than were members of the control group.

A study reported by La Shier and Westmeyer (29) focused attention on the teaching of a unit in eighth grade biology by a group of student teachers. The teachers attended a thirty-hour workshop to receive instruction in the content to be covered. They then taught the unit to a group of eighth grade students for a period of six weeks. Each student teacher was observed once a week by one of three observers, with the principle investigator making 85 per cent of the observations and using the Flanders system of interaction analysis. Findings showed that the indirect group of student teachers were more accepting of student-initiated ideas than were the direct group of student teachers.

The purpose of a study by Giammatteo (22) was to determine, first, the identifiable interaction patterns recognized among teachers and students at the various grade levels; second, to establish a norm for pupil-teacher interaction in elementary language arts classes. Three sub-groups representing grades 1-2, 3-4, and 5-6 were analyzed to determine differences in interaction. Findings showed a significant difference in the direct and indirect verbal patterns between the primary and upper grade groups and between the primary and middle grade groups. The upper and middle grade groups were similar in that no significant difference was found in the patterns of verbal behavior. Primary teachers used praise twice as often and criticism one and one-half times as much as that recorded for the upper grades. In summary, primary teachers made greater use of praise and criticism and were more direct than were the teachers of the other two groups.

Schantz (39) compared the effects of verbal recall by children in direct and indirect teaching methods. She investigated the comparative immediate and delayed recall learnings of high and low ability groups in terms of the method of presentation of new material to be learned. The findings revealed that high ability pupils were more likely to benefit from an indirect teaching method and that the low ability pupils were less likely to benefit from the indirect

teaching method. These findings represented a trend only and were not statistically significant.

Zahn (48) conducted a study in 1965 involving the instruction and supervision of student teachers using interaction analysis. This study was an investigation of the effect of using the Flanders system of interaction analysis upon the attitudes and performance of student teachers. The experiment involved ninety-two student teachers from Glassboro State College. The subjects were divided into three groups, one of which received instruction and supervision in interaction analysis with the other two groups serving as control groups.

Findings of the study caused Zahn to conclude that instruction and supervision of student teachers using interaction analysis appeared to be related to a positive change in the teaching attitude of the student teacher when student teachers are not limited by very strong belief-disbelief systems. The amount and direction of teaching attitude change experienced by the student teacher undergoing instruction and supervision in interaction analysis are limited by the strength of the belief-disbelief system. Zahn proposed that the nature of the feedback received by the student teacher may be an influencing factor when the student teacher possesses a very strong belief-disbelief system.

An important finding in Zahn's study showed that feedback was provided by the college supervisor who objectively

recorded data of observed classroom behavior and assisted in clarifying the matrix for the student teacher. Zahn concluded that the method of instruction and supervision had an effect upon the attitude of the student teacher. The effect of the cooperating teacher upon the attitude of the student teacher was greater when students were supervised by conventional techniques rather than when the students experienced supervision by the college supervisor using interaction analysis.

Two observation systems were used by Ragsdale (37) to measure elementary student teacher classroom behavior: Flanders' system of interaction analysis and Ryan's Teacher Characteristic Classroom Record. The purpose was to explore the relationship of the change in student teacher attitudes toward children's behavior and teacher-pupil relations with the student teacher's classroom behavior during a ten-week period of student teaching. The test-retest method using the Minnesota Teacher Attitude Inventory indicated no significant change in student teacher attitudes toward children. The data obtained by use of interaction analysis also indicated no significant change in student teacher classroom behavior.

Hart explored the degree of change in openness of student teachers who studied interaction analysis and those who did not (23). During the period of student teaching, the experimental group received training in the Flanders system of

interaction analysis, while the control group met to discuss important teaching behaviors and the disadvantaged child. The experimental group made changes toward openness but not in sufficient degree to be statistically significant.

Hill's in-service education program of instruction in interaction analysis (24) was conducted for three elementary and two secondary schools. Each teacher was assigned to one of three training periods (six, eight, or ten hours) and was assigned within the building group to one of two modes of receiving feedback from his own teaching: (1) tabulating tape recordings of his own teaching, or (2) conferring with the principal who had observed his teaching. All groups received instruction in the use of the Flanders system of interaction analysis. The investigator made pre- and post-observations using Flanders' interaction analysis as the observational instrument. The data showed no direct relationship between change in verbal teaching behavior and training time on the mode of feedback from teaching.

The purposes of a study by Furst and Amidon (19) were to determine the difference in interaction patterns among six grade levels in the teaching of reading and to determine what differences in interaction patterns, if any, existed between reading and other subject areas. Schools were selected from three socio-economic areas: low, middle, and suburban. Results indicated that none of the grades showed a high indirect pattern of teaching reading. The reading teacher

talked between 41 per cent and 49 per cent of the total class time. First-grade reading teachers gave more directions and criticism than any other grade. The fewest directions were given in the sixth grade. The reading teacher seemed to do less talking than did the teacher in either arithmetic or social studies.

Nelson (35) studied the effects of interaction on the linguistic performance of children. The findings suggested that teacher behaviors varied along a continuum from indirect to direct, depending on the immediate teacher-pupil interaction and specific objectives for a single lesson. This resulted in a wide use of teacher behaviors. The findings further confirm the effects of an indirect leadership style, indicating that an indirect teaching style generally produced superior written expression on both qualitative and quantitative measures. The improvement in language products was due to pupil maturation in language growth as well as to the indirect teaching style.

Relationship of Reported Research to This Study

The research which relates to the development of observational systems and to the development of the Flanders (16) system of interaction analysis indicates that the use of interaction analysis as a tool in the in-service education of teachers has positive value. Little is known as to how feedback is involved in the teacher's perception and use of

interaction analysis data recorded from classroom observations. However, the research reported here indicates that, after having received feedback data recorded by trained observers, teachers have changed their attitudes and classroom verbal behavior. It appears that one of the important variables related to behavioral change on the part of the teacher is the objective feedback of verbal behavior data recorded from classroom observations. The research reported did not test attitude toward the in-service education program; however, empirical evidence suggests a need for such a study.

A scrutiny of the research literature which has been reported in the field of interaction analysis in the classroom revealed at least two factors which have direct relationship to the present study. The first factor was the utilization of the categorical, systematic recording technique. Facilitation of such a recording technique readily lends itself to the requirement of objective, serious research. The second factor is the concept of applying interaction analysis recording techniques to the in-service education of teachers.

This study differed from previous research studies in at least one notable respect. Insofar as has been determined, the use of an observational tool as a means of achieving a more positive attitude toward the in-service education program has not been previously attempted.

CHAPTER BIBLIOGRAPHY

1. Allred, Golden Hugh, "A Study of the Personality Traits and Classroom Verbal Behavior of Senior High School Student Teachers," unpublished doctoral dissertation, University of Oregon, 1966.

2. Amidon, Edmund, Project Director, The Effects of Teaching Interaction Analysis to Student Teachers, Cooperative Research Program, Project Number 2873, Office of Education, U. S. Department of Health, Education, and Welfare, 1966.

3. Amidon, Edmund J. and Michael Giammatteo, "Verbal Behavior of Superior Teachers," Elementary School Journal, LXV (February, 1965), 283-285.

4. Amidon, Edmund J., Kathleen M. Kies, and Anthony T. Palisi, "A Technique for Improving Teaching Behavior," National Elementary Principal, XLV (April, 1966), 54-58.

5. H. H. Anderson, "Studies of Teachers' Classroom Personalities, II: Effects of Teachers' Dominative and Integrative Contacts on Children's Classroom Behavior," Psychological Monographs, VIII (1946), 468-473.

6. _____, "The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children," Child Development, X (June, 1939), 73-89.

7. Anderson, H. H. and H. E. Brewer, "Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers," Psychological Monographs, VI (1946), 101-106.

8. Anderson, H. H. and M. F. Reed, "Studies of Teachers' Classroom Personalities, III: Follow-up Studies of the Effects of Dominative and Integrative Contacts on Children's Behavior," Psychological Monographs, XI (1946), 202-209.

9. Bales, R. F., "Conceptual Framework for Analysis of Social Interaction," Journal of Experimental Education, XXX (June, 1962), 323-324.

10. Bellack, Arno, cited in Walter B. Waetjen, "Recent Analysis of Teaching," The Bulletin of the National Association of Secondary School Principals, L (December, 1966), 17-29.

11. Broadbent, Frank William, "An Application of the Social Judgment-Involvement Approach to Predicting Changes in the Attitudes of Student Teachers," unpublished doctoral dissertation, University of Rochester, 1967, abstracted in Dissertation Abstracts, 28 (July, 1967), 138-A.

12. Brown, George I., "The Relationships between Cagegories of Behavior of Third Grade Teachers," Journal of Educational Research, LIV (May, 1961), 338-344.

13. Cogan, M. L., "Theory and Design of a Study of Teacher-Pupil Interaction," The Harvard Educational Review, XXIV (January, 1956), 315-342.

14. Flanders, Ned. A., "Intent, Action and Feedback: A Preparation for Teaching," Journal of Teacher Education, XIV (September, 1963), 251-260.

15. _____, "Personal-Social Anxiety as a Factor in Experimental Learning Situations," Journal of Experimental Research, CLV (October, 1951), 100-110.

16. _____, "Teacher Influence Pupil Attitudes and Achievement," 1960, University of Minnesota, Project 397, United States Department of Health, Education, and Welfare, Cooperative Research Program, Office of Education.

17. _____, "Using Interaction Analysis in the In-Service Training of Teachers," Journal of Experimental Education, XXX (June, 1962), 313-316.

18. Flanders, Ned A. and Edmund J. Amidon, "Two Approaches to the Teaching Process," Journal of the National Education Association, LI (May, 1962), 43-43.

19. Furst, Norma and Edmund J. Amidon, "Teacher-Pupil Interaction Patterns in the Teaching of Reading in the Elementary School," The Reading Teacher, XVIII (January, 1965), 283-287.

20. Gage, N. L., Handbook of Research on Teaching, Chicago, Rand McNally and Company, 1963, pp. 247-328.

21. Gallagher, James J. and Mary Jane Aschner, "A Preliminary Report on Analyses of Classroom Interaction," Merrill-Palmer Quarterly, IX (July, 1963), 183-194.

22. Giammatteo, M. C., "Interaction Patterns of Elementary Teachers, Using the Minnesota Categories of Interaction Analysis," unpublished doctoral dissertation, University of Pittsburg, 1963.

23. Hart, Mary Anderson, "An Investigation of the Relationship between the Study of Flanders' Interaction Analysis and Changes in the Openness of Elementary Teacher Education Students," unpublished doctoral dissertation, University of Rochester, 1967.

24. Hill, William Morris, "The Effects of Verbal Teaching Behavior of Learning Interaction Analysis as an In-Service Education Activity," unpublished doctoral dissertation, The Ohio State University, 1966.

25. Hughes, Marie M., Development of the Means for the Assessment of the Quality of Teaching in Elementary Schools, Salt Lake City, University of Utah Press, 1959.

26. _____, "Utah Study of the Assessment of Teaching," cited in Theory and Research in Teaching, edited by A. A. Bellack, New York, Columbia University, 1963, pp. 31-56.

27. Kirk, Jeffery, "The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers," unpublished doctoral dissertation, Temple University, 1964.

28. Lantz, Donald LeRoy, "The Relationships between Self Concepts and Teaching Behavior among Elementary Student Teachers," unpublished doctoral dissertation, University of Minnesota, 1961, abstracted in Dissertation Abstracts, 22 (November, 1961), 1510-1511.

29. LaShier, William S. and Paul Westmeyer, "The Use of Interaction Analysis in BSCS Laboratory Block Classrooms," The Journal of Teacher Education, XVIII (Winter, 1967), 439-446.

30. Lippitt, R. and R. K. White, "The Social Climate of Children's Groups," R. G. Barker, J. S. Kornin, and H. F. Wright, editors, Child Behavior and Development, New York, McGraw Hill Book Company, 1943.

31. McLeod, Richard J., "Changes in the Verbal Interaction Patterns of Secondary Science Student Teachers Who Have Had Training in Interaction Analysis and the Relationship of These Changes to the Verbal Interaction of Their Cooperating Teachers," unpublished doctoral dissertation, Cornell University, 1966, abstracted in Dissertation Abstracts, 28 (July, 1967), 145-A.

32. Medley, Donald M., "Experience with the OScAR Technique," Journal of Teacher Education, XIV (December, 1963), 267-273.

33. Medley, Donald M. and H. E. Mitzel, "Measuring Classroom Behavior by Systematic Observation," cited in Handbook of Research on Teaching, edited by N. L. Gage, Rand-McNally, 1963, pp. 247-328.

34. Moskowitz, Gertrude, "The Effect of Training in Interaction Analysis on the Attitudes and Teaching Patterns of Cooperating Teachers and Their Student Teachers," unpublished doctoral dissertation, Temple University, 1966.

35. Nelson, Lois Ney, "The Effect of Classroom Interaction on Pupil Linguistic Performance," unpublished doctoral dissertation, University of California, 1963-1964.

36. Perkins, Hugh V., "Climate Influences Group Learning," Journal of Education Research, XLV (October, 1951), 115-119.

37. Ragsdale, Elva Mae, "Attitude Changes of Elementary Student Teachers and the Changes in Their Classroom Behavior During Student Teaching," unpublished doctoral dissertation, Ball State University, 1967.

38. Ryans, David G., "Teacher Behavior Theory and Research: Implications for Teacher Education," Journal of Teacher Education, XIV (September, 1963), 274-279.

39. Schantz, Betty, "An Experimental Study Comparing the Effects of Recall by Children in Direct and Indirect Teaching Methods as a Tool of Measurement," unpublished doctoral dissertation, Pennsylvania State University, State College, 1963.

40. Simon, Anita, "The Effects of Training in Interaction Analysis on the Teaching Patterns of Student Teachers in Favored and Non-Favored Classes," unpublished doctoral dissertation, Temple University, 1966.

41. Snider, Ray Merrill, "A Project to Study the Nature of Physics Teaching Using the Flanders' Method of Interaction Analysis," unpublished doctoral dissertation, Cornell University, 1966.

42. Soar, R. S., cited in E. J. Amidon, "Interaction Analysis Applied to Teaching," The Bulletin of the National Education of Secondary School Principals, L (December, 1966), 94-97.

43. Storlie, Theodore Rudolph, "Selected Characteristics of Teachers Whose Verbal Behavior Is Influenced by an In-Service Course in Interaction Analysis," unpublished doctoral dissertation, University of Minnesota, 1961, abstracted in Dissertation Abstracts, 22 (May, 1962), 3941.

44. Waimon, Morton D., "Feedback in Classrooms: A Study of Corrective Teacher Responses," Journal of Experimental Education, XXX (June, 1962), 355-359.

45. Wilk, Roger E. and William H. Edson, "Predictions and Performance: An Experimental Study of Student Teachers," The Journal of Teacher Education, (September, 1963), 308-317.

46. Withall, John, "The Development of the Climate Index," Journal of Educational Research, XLV (October, 1951), 93-100.

47. _____, "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms," Journal of Experimental Education, XVII (March, 1949), 347-361.

48. Zahn, Richard David, "The Use of Interaction Analysis in Supervising Student Teachers," unpublished doctoral dissertation, Temple University, 1965.

CHAPTER III

METHODS AND PROCEDURES

Description of the Subjects

The subjects who participated in this study were thirty-two teachers from an elementary school in the Dallas Independent School District, Dallas, Texas. Selection of the subjects was not based on an equal number of male and female teachers.

All thirty-two faculty members were administered the pre- and post-tests to determine attitude toward in-service education. All thirty-two teachers participated in the training period where they were taught the Flanders system of interaction analysis. However, because this study was primarily concerned with the verbal behavior of teachers, certain teaching areas were excluded from the study. The teachers of language arts, social studies, mathematics, health-science, and art were included in the observation phase of the study. In teaching areas such as physical education, music, speech-arts, and library, a large part of the class time is spent on non-verbal instruction and performance and therefore they were not included. In all, twenty-five of the thirty-two teachers were observed in their classrooms by the trained observers.

TABLE I

DESCRIPTIVE ANALYSIS OF TEACHERS WHO WERE ADMINISTERED THE SEMANTIC DIFFERENTIAL

Sex	Range of Years in Teaching	Bachelor's Degree	Master's Degree
Male	6-7	1	1
Female	1-35	24	6
Total		25	7

TABLE II

DESCRIPTIVE ANALYSIS OF TEACHERS WHO WERE OBSERVED

Sex	Homeroom: Language Arts and Social Studies	Math	Art	Health-Science	Total
Male				1	1
Female	19	3	2		24
Total	19	3	2	1	25

Instruments Used

Flanders' System of Interaction Analysis

The Flanders system of interaction analysis was used to record the verbal classroom behavior of the teachers and pupils in the present study. This system, developed by Ned A. Flanders and refined by Edmund J. Amidon, evolved from

earlier attempts of H. H. Anderson, John Withall, and others to categorize teacher behavior. It is a process of abstracting the intent of an act from the act itself. The system ". . . is concerned with verbal behavior only, primarily because it can be observed with higher reliability than can nonverbal behavior." (1, p. 6) The authors of this well-developed system of interaction analysis assumed that verbal statements make up an adequate sample of total teacher behavior. A method of categorization of statements can be done in one of three major sections: teacher talk, student talk, and a separate category for silence or confusion. In this system, observations of all teacher statements are recorded and classified first as either direct or indirect influence.

The first major section is primarily concerned with the teacher's verbal behavior. This classification gives central attention to the amount of freedom the teacher grants the student. In a given situation, therefore, a teacher has a choice. He can be direct, thereby minimizing the freedom of the student response; or he can be indirect, thus maximizing the freedom of the response. His choice, conscious or unconscious, depends upon several factors. One factor for consideration is the degree of perception he brings to a situation and the goal for the particular learning situation. In order to make all verbal behavior in the classroom meaningful, the second major section of Flanders' system of

interaction analysis provides for the categorizing of students' verbalizations. A third major section, that of silence or confusion, is included in order to account for the time spent in behavior other than that which can be classified as either teacher or student talk.

The larger sections of teacher and student verbal behavior are subdivided to give the total pattern of teacher-pupil interaction meaning. The two subdivisions for teacher verbal behavior, indirect and direct teacher talk, are further divided into smaller categories. Indirect influence consists of accepting feelings, praising or encouraging, accepting ideas, and asking questions. Direct influence consists of lecturing, giving directions, and criticizing or justifying authority. Student talk is divided into two categories and consists of responding to the teacher and initiating talk. All categories are mutually exclusive, yet totally inclusive of all verbal interaction occurring in the classroom. A brief description of each of the ten categories of Flanders system is given in the following paragraphs.

Accepting feeling.--The teacher accepts feelings when he professes to understand how the children feel and admit their right to have such feelings. Also included in this category are statements that recall past feeling, refer to enjoyable or uncomfortable feelings that are present, or predict happy or sad events that might occur in the future.

In our society it is recognized that people often react to negative feelings by offering negative feelings in return. However, acceptance of these emotions in the classroom is rare.

Praising or encouraging.--Included in this category is any positive form of judgment made by the teacher in an attempt to indicate that the pupil's statement is acceptable. The teacher primarily encourages by placing value on a student's idea. Praise is often a single word, such as "good," "fine," or "right."

Accepting ideas.--This category refers to restatements or clarifications by the teacher of a pupil's contribution. It includes only acceptance of student ideas, not acceptance of expressed emotion. If a student makes a suggestion, the teacher may paraphrase the student's statement, restate the idea more simply, or summarize what the student has said.

Asking questions.--This category includes only questions to which the teacher expects an answer from the pupils. A rhetorical question is not categorized as a question. Questions can be either narrow and restrict the student in his answer, or they can be very broad and give the student much freedom in answering. All questions which require answers, however broad or narrow, fall into this category. A teacher's restatement of the original question would also fall into this category.

Lecturing.--Lecture is the form of verbal interaction that is used to give information, facts, opinions, or ideas to students. The presentation of material may be used to introduce, review, or focus the attention of the class on an important topic. Whenever the teacher is explaining, discussing, giving an opinion, or giving facts or information, this category is used. Rhetorical questions are also included in this category. Lecturing is the one most frequently used category in classroom observation.

Giving directions.--Authoritative instruction given by the teacher is recorded in this category. When a statement is made in such a way that the observer can predict compliance on the part of a student or several students, either long term or short range, then the statement is classified as a direction.

Criticizing or justifying authority.--A statement of criticism is one that is designed to change a student's behavior from nonacceptable to acceptable. Another group of statements included in this category is one which might be called statements of defense or self-justification. If the teacher is explaining himself or his authority, defending himself against the student, or justifying himself, the statement falls in this category. Other kinds of statements that can be recorded in this category are those having extreme self-reference.

Student response.--This category is used when the teacher has initiated the contact or has solicited student statements. Anything that the student says that is clearly in response to teacher initiation belongs in this category.

Student initiation.--In this category there are recorded voluntary student contributions to the classroom discussion. Spontaneous student-to-student communication would also fall into this category. In general, if the student raises his hand to make a statement or to ask a question when he has not been prompted to do so by the teacher, this would be the appropriate category.

Silence or confusion.--Included in this category is the time spent in behavior other than that which can be classified as either teacher or student talk. Periods of confusion in communication, when it is difficult to determine who is talking, are classified in this category.

This study was concerned only with categories 1, 2, 3, 6, 7, 8, and 9. Categories 4 and 5 were deleted because they are influenced by subject content and were, therefore, not related to the social-emotional focus of this study.

The trained observers recorded at three-second intervals the category of interaction as it occurred. The numbers were written in chronological sequence and were arranged in a column, as follows:

10
3
7
3
7
2
4
4
4
4
10.

The use of a 10 at the beginning and the end of any sequence tabulation is necessary in order to balance the matrix.

After being recorded, the numbers were tabulated in a 10 x 10 matrix, one pair of numbers at a time. The row is indicated by the first number, and the column is indicated by the second number:

10) 1st pair
(3 2nd pair
7) 3rd pair
(3 4th pair
7) 5th pair
(2 6th pair
4) 7th pair
(4 8th pair
4) 9th pair
(4 10th pair
10.

Figure 1 illustrates where the preceding tallies are placed on a matrix. The totals for the columns are also indicated.

COLUMNS

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

Fig. 1--Sample matrix for recording interaction analysis.

After the observer tabulates a matrix, a description of the classroom interaction must then be developed. First, the different kinds of statements are reported in terms of percentages. Second, the percentage of tallies in each column is computed. This is done by dividing each of the column totals, one through ten, by the total number of tallies in the matrix. This computation gives the proportion of the total interaction in the observed classroom situation found in each category.

Semantic Differential Scale

It was from Osgood's work with the semantic differential as a measure of meaning that the technique's adaptation as an attitude measurement instrument evolved. According to Osgood (6), it is tenable to claim that by employing the semantic

differential, a vehicle is available that will identify and localize attitude within the general mediational activity. Osgood explains this function of the semantic differential, as follows:

> If attitude is, indeed, some portion of the internal mediational activity, it is, by inference from our theoretical model, part of the semantic structure of an individual, and may be correspondingly indexed. The factor analysis of meaning may then provide a basis for extracting this attitudinal component of meaning. In all the factor analysis we have done to date . . . a factor readily identifiable as evaluative in nature has invariably appeared; usually it has been the dominant factor, that accounting for the largest proportion of the total variance. . . . It seems reasonable to identify attitude, as it is ordinarily conceived in both lay and scientific language, with the evaluative dimension of the total semantic space as time is isolated in the factorization of meaningful judgments (6, p. 42).

The semantic differential is a way of arriving at a certain type of information, a highly generalizable technique of measurement which must be adapted to the requirement of each research problem to which it is applied.

In order to index attitude, it was necessary to use sets of adjective scales which have high loadings on the evaluative factor and little or no loadings on other factors. With respect to scoring the ratings, one would first arbitrarily assign the unfavorable poles of the scales the score "1" and the favorable poles the score "7." Then by merely summing over all evaluative ratings, an attitude score would be derived. Osgood (6) suggests the inclusion

of a "considerable" number of scales representing other factors to obscure the obvious purpose of the measurement.

The semantic differential attitude measure indexes the properties that any measurement technique is expected to index. It will indicate direction of attitude--favorable, unfavorable, or neutral--simply as a score, more toward the favorable poles for a favorable attitude or more toward the unfavorable poles for an unfavorable attitude. Intensity of attitude is indexed by the magnitude of the polarization of the attitude score. Mehling (5) lends credence to both the direction and intensity assumption that the middle interval in the scales represents the neutral point in attitude. The unidimensionality of the attitude scale is automatically validated by the factor analytic treatment which uncovered the evaluative scales.

Test-retest reliability data have been reported by Tannenbaum (9) in Osgood's The Measurement of Meaning. Attitude scores were computed by summing over six evaluative scales, after realignment according to a constant evaluative direction. The test-retest coefficients ranged from .87 to .93 with a mean r of .91. Osgood and Tannenbaum (7) report that reliability of the semantic differential as an attitude measure is "reasonably high, running in the .80's and .90's in available data."

The validity of the semantic differential as an attitude measure was tested by Osgood (6). Correlations between scores

on the Thurstone scales on attitudes toward The Church, Negro, and Capital Punishment are .74, .82, and .81 respectively. Osgood states that "whatever the Thurstone scales measure, the evaluative factor of the semantic differential measures just about as well. When the six validity coefficients are corrected for attenuation, each is raised to the order of .90 or better."

In another study carried out by Osgood (6), the evaluative scales of the semantic differential were compared to a Guttman type scale. The rank order correlation between the two instruments was highly significant, revealing a rho of .78; $p < .01$.

Brinton (2) found an r of .82 between the five evaluative scales of a semantic differential and a Guttman type scale, both assessing attitude toward capital punishment.

Adaption of the Semantic Differential for the Present Study

Construction of the semantic differential for this study conformed to criteria suggested by Osgood (6). He recommends that the investigator choose concepts that are relevant to and representative of the area of research interest. The object of judgment that was selected was "In-Service Education."

The second step in constructing the semantic differential for this study was the selection of appropriate scales (bipolar adjective pairs). Two main criteria determined the

scales: (1) factorial composition and (2) relevance to the concepts being judged. The nineteen scales used in rating the concepts came from four main sources: Osgood (6), McCroskey (4), Husek and Wittrock (3), and Smith (8).

All of the scales were not evaluative in their primary factor loading. An attempt was made to include scales of known composition representing the three main factors found most often in Osgood's work: evaluative, activity, and potency.

A seven-step scale was interposed between the bipolar adjectives, the scale positions being defined for the subject in the instructions. (See Appendix C). The semantic differential format conformed to Osgood's Form II.

The adjective pairs appeared on the instrument in random order. Tne of the nineteen pairs were reversed at random to counteract response bias tendencies.

A copy of the semantic differential used in this study appears in Appendix B.

Procedure for Collecting the Data

An invitation to participate in a research study was issued to a faculty committee of the experimental school two months before the research was begun. The purposes of the study were explained to the school administrators. The school administration granted permission for the study, and the faculty committee agreed to participate. The teachers were

informed that they would be observed but they were not told what the emphasis of the observations would be. All of the teachers agreed to participate. Assurances were given that neither teacher rating nor placement would be influenced by the study.

The semantic differential on attitude toward in-service education was administered one week before the first of the eight, sixty-minute sessions. No explanation of the Flanders system was given at that time.

The first observations were also made one week before the first of the eight sessions. During this week, each homeroom, art, science, and arithmetic teacher was observed twice; once by each of the trained observers.

Within forty-eight hours after the observations, each teacher met in conference with the experimenter, and the nature of the observations and the Flanders system were fully explained. The teachers were given the percentage of time spent in each of the ten categories of the Flanders system. The percentage given each teacher was the average percentage from the information collected from both observers. This percentage was based on 400 tallies or a twenty-minute observation, which constitutes the pre-test data used in hypotheses 1a and 1b.

The second observation took place seven weeks after the first one. The teachers were again given feedback concerning the percentage of time spent in each of the Flanders categories.

The final observation period occurred six weeks after the second one. Data collected during this observation were used as post-test data in hypotheses 1a and 1b.

During the last week of the study all thirty-two teachers were again administered the semantic differential concerning attitude toward in-service education.

The two observers worked simultaneously but independently during the observation periods. A matrix was made from each observer tabulation. Since there were two observers for each observation, the tabulations of the two matrices were averaged, and a third matrix was constructed from the means. The values of the third matrix comprised the data used in the study.

Statistical Treatment of the Data

Hypotheses 1a and 1b were tested separately by Fisher's *t* technique, using the differences between pretest and post-test means.

Hypothesis 2 was tested by first computing an inter-correlation matrix for the scales on the pretest and post-test semantic differential. The correlations were subjected to a principle axes factor analysis for both tests. This procedure was used to identify the evaluative scales. A pretest mean and post-test mean of the evaluative scales on the semantic differential were computed. The difference between these means was determined by a *t* test.

CHAPTER BIBLIOGRAPHY

1. Amidon, Edmund J. and Ned A. Flanders, The Role of the Teacher in the Classroom, A Manual for Understanding and Improving Teacher Classroom Behavior, revised edition, Minneapolis, Minnesota, Association for Productive Teaching, Inc., 1967.

2. Brinton, James E., "Deriving an Attitude Scale from Semantic Differential Data," Public Opinion Quarterly, XXV (Summer, 1961), 289-295.

3. Husek, T. F. and M. C. Wittrock, "The Dimensions of Attitudes Toward Teachers as Measured by the Semantic Differential," Journal of Educational Psychology, LIII (October, 1962), 23-24.

4. McCroskey, James C., "Special Reports; Scales for the Measurement of Ethos," Speech Monographs, XXIII (March, 1966), 49.

5. Mehling, Reuben, "A Simple Test for Measuring Intensity of Attitudes," Public Opinion Quarterly, XXIII (Winter, 1959-1960), 103.

6. Osgood, Charles E., George J. Suci, and Percy H. Tannebaum, The Measurement of Meaning, Urbana, Illinois, University of Illinois Press, 1957.

7. Osgood, Charles E., and Percy H. Tannenbaum, "The Principle of Congruity in the Prediction of Attitude Change," Psychological Review, LXII (January, 1955), 91.

8. Smith, Raymond G., "Development of a Semantic Differential for Use with Speech Related Concepts," Speech Monographs, XXVI (November, 1959), 109.

9. Tannenbaum, Percy H., "Initial Attitude Toward Source and Concept as Factors in Attitude Change Through Communication," Public Opinion Quarterly, XX (Summer, 1956), 12.

CHAPTER IV

ANALYSIS OF DATA, SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This study was concerned with elementary teachers' attitude toward in-service education. An additional problem was to determine the effects of feedback on the verbal behavior of teachers as an in-service education technique. The subjects were thirty-two elementary teachers in the Dallas Independent School District, Dallas, Texas.

Primary emphasis was placed on the influence of observational feedback of indirect and direct verbal behavior of teachers. The Flanders system of interaction analysis was used to categorize observed classroom behavior. A semantic differential was used to determine attitude toward in-service education.

Statistical Analysis of the Data

Hypotheses 1a and 1b related to observed verbal behavior. Hypothesis 1a stated that at the end of the experimental period teachers would show significantly more indirect influence. Data related to this hypothesis are reported in Table III.

TABLE III

MEANS AND STANDARD DEVIATIONS FOR PRETEST AND POST-TEST I/D RATIOS

	Pretest	Post-Test	t	p
Mean	.54	.72	-3.82	.001
SD	.19	.16		

Examination of Table III shows a t value of -3.82. The change was statistically significant, and the research hypothesis was accepted.

Hypothesis 1b stated that at the end of the experimental period students would show significantly more self-initiated talk. Data relative to hypothesis 1b are presented in Table IV.

TABLE IV

MEANS AND STANDARD DEVIATIONS FOR PRETEST AND POST-TEST CATEGORY NINE--TALLIES

	Pretest	Post-Test	t	p
Mean	36.40	47.44	-1.71	N/S
SD	22.68	38.65		

The data for hypothesis 1b indicated a movement toward more student self-initiated talk. However, the t value was

not statistically significant, and the research hypothesis was rejected.

Hypothesis 2 of this study was concerned with teachers' attitude toward in-service education. Hypothesis 2 stated that the faculty would exhibit a significantly more positive attitude toward in-service education at the end of the study. A semantic differential was employed to measure the degree of attitude change.

Intercorrelation matrices were computed for the pretest and post-test semantic differential ratings. The resulting intercorrelation matrix for the pretest appears in Table V. The intercorrelation matrix for the post-test appears in Table VI.

The two 19 x 19 intercorrelation matrices were subjected to a principle axes factor analysis and rotated according to the varimax criterion. It was felt that the factorial structure of the instrument might change to some degree between pretest and post-test. Consequently, it was decided to factor analyze the pretest and post-test separately (rather than as a pooled group) and accept as valid evaluative scales those scales that were found to be evaluative on both analyses.

There are limitations to the interpretation of any factor analysis that is based on a small number of cases. However, since the same concept was being rated twice by thirty-two subjects and if the factorial structure of the two ratings were similar, additional validity regarding the factoral composition and stability could be assumed.

TABLE V

PRETEST INTERCORRELATION MATRIX FOR
IN-SERVICE EDUCATION CONCEPT

	Scale	1	2	3	4	5	6	7
1.	Pleasant--Unpleasant	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2.	Nice--Awful		.14	.57	.34	.45	.61	.25
3.	Hot--Cold			.40	.72	.50	.51	.25
4.	Hazy--Clear				-.04	.59	.56	.04
5.	Encouraging--Discouraging					.17	.55	.17
6.	Rational--Irrational						.04	.06
7.	Shallow--Deep							.40
8.	Stimulating--Dull							
9.	Repetitious--Varied							
10.	Flexible--Rigid							
11.	Valuable--Worthless							
13.	Bad--Good							
14.	Active--Passive							
15.	Fair--Unfair							
16.	Relaxed--Tense							
17.	Strong--Weak							
18.	Calm--Agitated							
19.	Uncertain--Certain							

TABLE V--Continued

8	9	10	11	12	13	14	15	16	17	18	19
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
.45	.34	.74	.17	.35	.51	.18	.70	-.05	.44	.63	.65
.59	.53	.50	.01	.40	.43	.33	.22	.11	.38	.20	.42
.40	.08	.54	.38	.58	.28	.45	.55	.55	.49	.50	-.03
.19	.07	.30	.33	.40	.76	.43	.23	.29	.51	.61	.56
.70	-.10	.20	.47	.71	.68	.23	.43	.36	.46	.44	.37
.35	.33	.18	.31	.32	.50	-.04	.26	.25	.41	.56	.35
.27	.04	.49	.53	.44	.53	.41	.03	.55	.30	.49	.56
	.67	.29	.34	.42	.26	.30	.58	.46	.62	.37	.28
		.64	.47	.33	.09	.48	.18	.19	.42	.37	.35
			.28	.70	.06	.66	.64	.37	.61	.28	.29
				.45	.12	.41	.52	.17	.48	.52	.63
					.69	.67	.64	-.03	.37	.43	.36
						.15	.62	.27	.18	.43	.47
							.14	.08	.35	.27	.41
								.66	.30	.49	.25
									.38	.48	.60
										.31	.43
											.17

TABLE VI

POST-TEST INTERCORRELATION MATRIX FOR
IN-SERVICE EDUCATION CONCEPT

	Scale	1	2	3	4	5	6	7
1.	Pleasant--Unpleasant	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2.	Nice--Awful		.55	.69	.45	.42	.40	.61
3.	Hot--Cold			.60	.74	.72	.66	.74
4.	Hazy--Clear				.38	.64	.48	.43
5.	Encouraging--Discouraging					.66	.50	.81
6.	Rational--Irrational						.53	.49
7.	Shallow--Deep							.72
8.	Stimulating--Dull							
9.	Repetitious--Varied							
10.	Flexible--Rigid							
11.	Impractical--Practical							
12.	Valuable--Worthless							
13.	Bad--Good							
14.	Active--Passive							
15.	Fair--Unfair							
16.	Relaxed--Tense							
17.	Strong--Weak							
18.	Calm-Agitated							
19.	Uncertain--Certain							

TABLE VI--Continued

8	9	10	11	12	13	14	15	16	17	18	19
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
.84	.74	.70	.61	.27	.19	.12	.55	.42	.30	.60	.80
.62	.76	.75	.58	.50	.10	.68	.26	.53	.50	.35	.64
.54	.65	.73	.62	.75	.18	.00	.65	.05	.31	.62	.42
.46	.52	.74	.61	.69	.40	.40	.28	.41	.25	.58	.64
.73	.45	.48	.53	.67	.28	.65	.55	.30	.56	.23	.49
.48	.76	.47	.59	.76	.47	.58	.58	.43	.28	.78	.36
.70	.52	.59	.37	.67	.33	.45	.49	.46	.23	.12	.79
	.75	.37	.64	.51	.29	.61	.50	.57	.41	.58	.29
		.60	.44	.43	.07	.62	.58	.42	.63	.56	.55
			.51	.60	.22	.55	.51	.51	.51	.73	.57
				.54	.26	.54	.45	.37	.38	.69	.68
					.34	.45	.52	.29	.39	.64	.73
						.61	.32	.48	.31	.59	.54
							.37	.15	.61	.43	.46
								.51	.34	.62	.42
									.35	.44	.69
										.58	.38
											.59

Table VII shows the factor loadings on the in-service education concept on the pretest.

TABLE VII

PRETEST FACTOR LOADINGS ON THE CONCEPT IN-SERVICE EDUCATION

Scales	I	II	III	IV
Pleasant--Unpleasant	.73	.06	.18	.29
Nice--Awful	.47	.20	.33	.60
Hot--Cold	.27	.40	.24	.65
Hazy--Clear	.12	.76	.12	.17
Encouraging--Discouraging	.67	.05	.55	.13
Rational--Irrational	.23	.01	.73	.42
Shallow--Deep	.31	.79	.01	.21
Stimulating--Dull	.70	.43	.22	.06
Repetitious--Varied	.05	.52	.64	.10
Flexible--Rigid	.23	.11	.52	.24
Impractical--Practical	.25	.83	.15	.18
Valuable--Worthless	.78	.23	.10	.39
Bad--Good	.12	.41	.01	.76
Active--Passive	.59	.01	.47	.21
Fair--Unfair	.42	.00	.59	.20
Relaxed--Tense	.15	.02	.84	.07
Strong--Weak	.78	.36	.32	.12
Calm--Agitated	.28	.09	.88	.03
Uncertain--Certain	.12	.83	.83	.07

Table VIII shows the factor loadings of the in-service education concept on the post-test.

TABLE VIII

POST-TEST FACTOR LOADINGS ON THE CONCEPT IN-SERVICE EDUCATION

Scales	I	II	III	IV
Pleasant--Unpleasant	.64	.18	.35	.41
Nice--Awful	.68	.00	.18	.43
Hot--Cold	.41	.20	.40	.36
Hazy--Clear	.46	.28	.27	.48
Encouraging--Discouraging	.73	.12	.14	.23
Rational--Irrational	.73	.21	.16	.40
Shallow--Deep	.14	.03	.84	.09
Stimulating--Dull	.82	.16	.13	.33
Repetitious--Varied	.17	.79	.14	.16
Flexible--Rigid	.40	.10	.05	.62
Impractical--Practical	.69	.13	.25	.39
Valuable--Worthless	.44	.18	.45	.61
Bad--Good	.51	.20	.26	.71
Active--Passive	.78	.22	.20	.25
Fair--Unfair	.24	.14	.05	.84
Relaxed--Tense	.57	.50	.17	.28
Strong--Weak	.33	.00	.27	.80
Calm--Agitated	.20	.61	.26	.64
Uncertain--Certain	.35	.04	.15	.73

Analyzing the pre- and post-test data, it was noted that in the pretest factor analysis factors I and IV were evaluative. Also factors I and IV were noted to be evaluative on the post-test. By comparing these two factor analyses, it was noted that eight scales emerged as being evaluative on both the pre-test and post-test. These scales were pleasant--unpleasant, nice--awful, encouraging--discouraging, stimulating--dull, valuable--worthless, good--bad, active--passive, and strong--weak. Mean ratings on these eight scales were taken as the pre- and post-test attitude measures for the in-service education concept.

Table IX reveals a significantly high mean difference in pre- and post-test data. Therefore, hypothesis two was accepted.

TABLE IX

MEANS AND STANDARD DEVIATIONS FOR PRETEST AND POST-TEST EVALUATIVE SCORES

	Pretest	Post-test	t	p
Mean	3.66	5.51	-5.15	.001
SD	1.24	1.21		

Summary

The purpose of this study was to determine whether learning to categorize verbal statements and receiving the results of the observations of the verbal classroom behavior would result in a significant change in teachers' verbal behavior and attitudes toward the concept of in-service education. Two techniques were used for this purpose. One was the Flanders system of interaction analysis, which has attracted increasing attention in the past ten years as an effective categorical method of observing and analyzing a teacher's verbal classroom behavior. The other technique was a semantic differential attitude measurement instrument as refined by Osgood.

The subjects were thirty-two elementary teachers in an elementary school in the Dallas Independent School District,

Dallas, Texas. All teachers received instruction in the purpose and use of interaction analysis as a system of categorizing verbal behavior and as a tool for personalizing in-service education. The twenty-five teachers who taught language arts, social studies, mathematics, health science, and art were each observed three times by two different observers over a four-month period.

Findings

The following findings were formulated from an analysis of the data collected in this study:

1. Verbal behavior of elementary teachers receiving feedback became more indirect between pre- and post-test observations. The change was statistically significant for the group at the .001 level.

2. Between the pre- and post-test observations, students showed a change in the direction of more self-initiated talk. However, the change was not statistically significant.

3. A positive shift in expressed attitude toward in-service education, as measured by pre- and post-test scores on the semantic differential, occurred in the group. The change was statistically significant at the .001 level.

Conclusions

In relation to the purposes of this study and within the limitations established, the following conclusions appear to be valid:

1. On the basis of the results of this study, it may be concluded that training in interaction analysis is effective in changing teachers' verbal behavior in the direction of indirectness. It would appear that teachers receiving feedback concerning their verbal behavior become aware of the kinds of statements they make, the effect certain statements have on students which motivates them to become more accepting of feelings, awareness of the effects of praise, and willingness to accept and use ideas of students.

2. Results of this study do not support the hypothesis that, when teachers study interaction analysis, students will use more self-initiated talk.

3. Based on the results of this study, it may be concluded that by using interaction analysis as an in-service tool teachers do become involved in a very personal way with in-service. Thus, attitudes can be changed from negative to positive with regard to the concept of in-service education.

4. Recognizing the importance of classroom climate to the learning situation, it may be concluded that teachers who have studied interaction analysis can make desired verbal changes in their own behavior and consequently change the entire classroom climate.

5. Based on the findings of this study, it is concluded that the semantic differential instrument does measure attitude, as the term is identified in research.

Recommendations

The following recommendations are made on the basis of the conclusion of this study:

1. It is recommended that there be a continuation of in-service education programs which encourage teachers to view themselves objectively and make changes in their verbal teaching patterns. This constitutes continued use of objective methods of observational systems and the feedback that these methods make possible.

2. The development of in-service programs, in which teachers are encouraged to observe and record each other's classroom behavior, discuss the results openly and freely, and make suggestions for change, is further recommended.

3. Continued use of the semantic differential instrument as an adequate and reliable measure of attitude is recommended.

4. Further research should be continued in this area. Some possible areas for research would include

   a. Continued development and improvement of objective observational systems

   b. A follow-up study on the subjects who participated in this study for the purpose of determining if the teachers are continuing with an indirect teaching style

   c. Studies which explore the bases for assessing student reaction to teachers who have studied interaction analysis

d. Studies similar to the present study but with the added dimension of video-tape as the means of feedback, which would allow teachers to record their own teaching behavior.

APPENDIX

APPENDIX A

FLANDERS SYSTEM FOR CATEGORIZING VERBAL BEHAVIOR

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

STUDENT TALK	8. STUDENT TALK--RESPONSE: a student makes a predictable response to teacher. Teacher initiated the contact or solicits student statement and sets limits to what the student says. 9. STUDENT TALK--INITIATION: talk by students which they initiated. Unpredictable statements in response to teacher. Shift from 8 to 9 as student introduces own ideas.
	10. SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

APPENDIX B

Rate the Following

"In-Service Education"

Pleasant ___: ___: ___: ___: ___: ___: ___: Unpleasant

Nice ___: ___: ___: ___: ___: ___: ___: Awful

Hot ___: ___: ___: ___: ___: ___: ___: Cold

Hazy ___: ___: ___: ___: ___: ___: ___: Clear

Encouraging ___: ___: ___: ___: ___: ___: ___: Discouraging

Rational ___: ___: ___: ___: ___: ___: ___: Irrational

Shallow ___: ___: ___: ___: ___: ___: ___: Deep

Stimulating ___: ___: ___: ___: ___: ___: ___: Dull

Repetitious ___: ___: ___: ___: ___: ___: ___: Varied

Flexible ___: ___: ___: ___: ___: ___: ___: Rigid

Impractical ___: ___: ___: ___: ___: ___: ___: Practical

Valuable ___: ___: ___: ___: ___: ___: ___: Worthless

Bad ___: ___: ___: ___: ___: ___: ___: Good

Active ___: ___: ___: ___: ___: ___: ___: Passive

Fair ___: ___: ___: ___: ___: ___: ___: Unfair

Relaxed ___: ___: ___: ___: ___: ___: ___: Tense

Strong ___: ___: ___: ___: ___: ___: ___: Weak

Calm ___: ___: ___: ___: ___: ___: ___: Agitated

Uncertain ___: ___: ___: ___: ___: ___: ___: Certain

APPENDIX C

Semantic Differential Instruction Sheet

The purpose of this study is to measure the meanings of certain things to various people by having them judge them against a series of descriptive scales. In taking this test, please make your judgments on the basis of what these things mean to you.

Here is how you are to use these scales:

If you feel that the concept at the top of the page is very closely related to one end of the scale, you should place your check-mark as follows:

Fair _X_ : ___ : ___ : ___ : ___ : ___ : ___ : Unfair

or

Fair ___ : ___ : ___ : ___ : ___ : ___ : _X_ : Unfair

If you feel that the concept is quite closely related to one or the other end of the scale (but not extremely), you should place your check-mark as follows:

Fair ___ : _X_ : ___ : ___ : ___ : ___ : ___ : Unfair

or

Fair ___ : ___ : ___ : ___ : ___ : _X_ : ___ : Unfair

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the thing you are judging.

If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely irrelevant, unrelated to the concept, then you should place your check-mark in the middle space.

Fair ___: ___: ___: _X_: ___: ___: ___: Unfair

Do Not Look Back and Forth Through the Items

Make each item a separate and independent judgment. Work at a fairly high speed through this test. Do not worry or puzzle over individual items. It is your first impression, the immediate "feeling" about the items, that is needed. On the other hand, please do not be careless because your true impressions are needed.

BIBLIOGRAPHY

Books

Amidon, Edmund, Project Director, The Effects of Teaching Interaction Analysis to Student Teachers, Cooperative Research Program, Project Number 2873, Office of Education, U. S. Department of Health, Education, and Welfare, 1966.

Amidon, Edmund J. and Ned A. Flanders, The Role of the Teacher in the Classroom, A Manual for Understanding and Improving Teacher Classroom Behavior, revised edition, Minneapolis, Minnesota, Association for Productive Teaching, Inc., 1967.

Bellack, J. P. and others, The Language of the Classroom, New York, Bureau of Publications, Teachers College, Columbia University, 1967.

Flanders, N. A., Helping Teachers Change Their Behavior, United States Office of Education, Project Numbers 1721012 and 7-32-0560-171.0, Ann Arbor, Michigan, The University of Michigan, 1963.

_____, Interaction Analysis in the Classroom: A Manual for Observers, Minnesota, College of Education, 1960.

_____, Teacher Influence, Pupil Attitudes, and Achievement, United States Office Of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 397, Minneapolis, University of Minnesota, 1960.

Gage, N. L., Handbook of Research on Teaching, Chicago, Rand McNally and Company, 1963.

Hughes, Marie M., Development of the Means for the Assessment of the Quality of Teaching Elementary Schools, Salt Lake City, University of Utah Press, 1959.

_____, "Utah Study of the Assessment of Teaching," Theory and Research in Teaching, edited by Arno A. Bellack, New York, Bureau of Publications, Teachers College, Columbia University, 1963.

Lippitt, R. and R. K. White, "The Social Climate of Children's Groups," Child Behavior and Development, edited by R. G. Barker, J. S. Kornin, and H. F. Wright, New York, McGraw Hill Book Company, 1943.

Medley, Donald M. and H. E. Mitzel, "Measuring Classroom Behavior by Systematic Observation," cited in Handbook of Research on Teaching, edited by N. L. Gage, Rand-McNally, 1963.

Osgood, Charles E., George J. Suci, and Percy H. Tannenbaum, The Measurement of Meaning, Urbana, Illinois, University of Illinois Press, 1957.

Taba, Hilda and others, Thinking in Elementary School Children, U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 1574, San Francisco State College, California, 1964.

Articles

Amidon, E. J. and N. A. Flanders, "The Effects of Direct and Indirect Teacher Influence on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, 52 (December, 1961), 286-291.

Amidon, Edmund J. and Michael Giammatteo, "Verbal Behavior of Superior Teachers," Elementary School Journal, LXV (February, 1965), 283-285.

Amidon, Edmund J., Kathleen M. Kies, and Anthony T. Palisi, "A Technique for Improving Teaching Behavior," National Elementary Principal, XLV (April, 1966), 54-58.

Amidon, Edmund and Anita Simon, "Teacher-Pupil Interaction," Review of Educational Research, 35 (April, 1965), 130-138.

Anderson, H. H., "The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children," Child Development, X (June, 1939), 73-89.

Anderson, H. H. and H. E. Brewer, "Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers," Psychological Monographs, No. 6, 1945.

_____, "Studies of Teachers' Classroom Personalities, II: Effects of Teachers' Dominative and Integrative Contacts of Children's Classroom Behavior," Psychological Monographs, No. 8, 1946.

Anderson, H. H., H. E. Brewer, and M. F. Reed, "Studies of Teachers' Classroom Personalities, III: Follow-up Studies of the Effects of Dominative and Integrative Contacts on Children's Behavior," Psychological Monographs, No. 11, 1946.

Bales, R. F., "Conceptual Framework for Analysis of Social Interaction," Journal of Experimental Education, XXX (June, 1962), 323-324.

Bellack, Arno, cited in Walter B. Waetjen, "Recent Analysis of Teaching," The Bulletin of the National Association of Secondary School Principals, L (December, 1966), 17-29.

Brinton, James E., "Deriving an Attitude Scale from Semantic Differential Data," Public Opinion Quarterly, XXV (1961), 289-295.

Cogan, M. L., "Theory and Design of a Study of Teacher-Pupil Interaction," The Harvard Educational Review, XXIV (January, 1956), 315-342.

Flanders, Ned A., "Intent, Action and Feedback: A Preparation for Teaching," Journal of Teacher Education, XIV (September, 1963), 251-260.

_____, "Personal-Social Anxiety as a Factor in Experimental Learning Situations," Journal of Experimental Research, CLV (October, 1951), 100-110.

_____, "Using Interaction Analysis in the In-Service Training of Teachers," Journal of Experimental Education, XXX (June, 1962), 313-316.

Flanders, Ned A. and Edmund J. Amidon, "Two Approaches to the Teaching Process," Journal of the National Education Association, LI (May, 1962), 43-48.

Furst, Norma and Edmund J. Amidon, "Teacher-Pupil Interaction Patterns in the Teaching of Reading in the Elementary School," The Reading Teacher, XVIII (January, 1965), 283-287.

Gage, N. L., "A Method for 'Improving' Teacher Behavior," Journal of Teacher Education, 14 (September, 1963), 261-266.

Gallagher, James J. and Mary Jane Aschner, "A Preliminary Report on Analyses of Classroom Interaction," Merrill-Palmer Quarterly, IX (July, 1963), 183-194.

Harris, Ben M., "In-Service Growth--The Essential Requirement," Educational Leadership, XII (December, 1966), 257-260.

Husek, T. F. and M. E. Wittrock, "The Dimensions of Attitudes toward Teachers as Measured by the Semantic Differential," Journal of Educational Psychology, LIII (October, 1962).

LaShier, William S. and Paul Westmeyer, "The Use of Interaction Analysis in BSCS Laboratory Block Classrooms," The Journal of Teacher Education, XVIII (Winter, 1967), 439-446.

McCroskey, James C., "Special Reports; Scales for the Measurement of Ethos," Speech Monographs, XXIII (March, 1966), 49.

Medley, Donald M., "Experience with the OScAR Technique," Journal of Teacher Education, XIV (December, 1963), 267-273.

Medley, Donald M. and Harold E. Mitzel, "A Technique for Measuring Classroom Behavior," Journal of Educational Psychology, 49 (April, 1958), 86-92.

Mehling, Reuben, "A Simple Test for Measuring Intensity of Attitudes," Public Opinion Quarterly, XXIII (Winter, 1959-1960).

Osgood, Charles E. and Percy H. Tannenbaum, "The Principle of Congruity in the Prediction of Attitude Change," Psychological Review, LXII (January, 1955).

Perkins, Hugh V., "Climate Influences Group Learning," Journal of Education Research, XLV (October, 1951), 115-119.

Ryans, David G., "Teacher Behavior Theory and Research: Implications for Teacher Education," Journal of Teacher Education, XIV (September, 1963), 274-279.

Smith, B. Othanel, "Recent Research on Teaching: An Interpretation," The High School Journal, LI (November, 1967), 41-43.

Smith, Raymond G., "Development of a Semantic Differential for Use with Speech Related Concepts," Speech Monographs, XXVI (November, 1959), 109.

Soar, R. S., cited in E. J. Amidon, "Interaction Analysis Applied to Teaching," The Bulletin of the National Education of Secondary School Principals, L (December, 1966, 94-97.

Sweatman, Charles, "Operation: New Outlook: A Self-Assessment Method of Helping Teachers Change Their Behavior," The Clearing House, 41 (October, 1966), 2.

Tannenbaum, Percy H., "Initial Attitude toward Source and Concept as Factors in Attitude Change through Communication," Public Opinion Quarterly, XX (Summer, 1956), 12.

Waimon, Morton D., "Feedback in Classrooms: A Study of Corrective Teacher Responses," Journal of Experimental Education, XXX (June, 1962), 355-359.

Wilk, Roger E. and William H. Edson, "Predictions and Performance: An Experimental Study of Student Teachers," The Journal of Teacher Education, XL (September, 1963), 308-317.

Withall, John, "The Development of the Climate Index," Journal of Educational Research, XLV (October, 1951), 93-100.

_____, "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms," Journal of Experimental Education, XVII (March, 1949), 347-361.

Unpublished Materials

Allred, Golden Hugh, "A Study of the Personality Traits and Classroom Verbal Behavior of Senior High School Student Teachers," unpublished doctoral dissertation, University of Oregon, Eugene, Oregon, 1966.

Anderson, J. P., "Student Perceptions of Teacher Influence," unpublished doctoral dissertation, University of Minnesota, Minneapolis, Minnesota, 1960.

Broadbent, Frank William, "An Application of the Social Judgment-Involvement Approach to Predicting Changes in the Attitudes of Student Teachers," unpublished doctoral dissertation, University of Rochester, Rochester, New York, abstraged in Dissertation Abstracts, 28 (July, 1967), 138-A.

Giammatteo, Michael C., "Interaction Patterns of Elementary Teachers Using the Minnesota Categories for Interaction Analysis," unpublished doctoral dissertation, University of Pittsburgh, Pittsburgh, Pennsylvania, abstracted in Dissertation Abstracts, 25 (1964), 2365.

Hart, Mary Anderson, "An Investigation of the Relationship between the Study of Flanders' Interaction Analysis and Changes in the Openness of Elementary Teacher Education Students," unpublished doctoral dissertation, University of Rochester, Rochester, New York, 1967.

Hill, William Morris, "The Effects of Verbal Teaching Behavior of Learning Interaction Analysis as an In-Service Education Activity," unpublished doctoral dissertation, The Ohio State University, Columbus, Ohio, 1966.

Kirk, J., "The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers," unpublished doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1964.

Lantz, Donald LeRoy, "The Relationships between Self Concepts and Teaching Behavior among Elementary Student Teachers," unpublished doctoral dissertation, University of Minnesota, Minneapolis, Minnesota, 1961, abstracted in Dissertation Abstracts, 22 (November, 1961), 1510-1511.

McLeod, Richard J., "Changes in the Verbal Interaction Patterns of Secondary Science Student Teachers Who Have Had Training in Interaction Analysis and the Relationship of These Changes to the Verbal Interaction of Their Cooperating Teachers," unpublished doctoral dissertation, Cornell University, Ithaca, New York, 1966, abstracted in Dissertation Abstracts, 28 (July, 1967), 145-A.

Moskowitz, Gertrude, "The Effect of Training in Interaction Analysis on the Attitudes and Teaching Patterns of Cooperating Teachers and Their Student Teachers," unpublished doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1966.

Nelson, Lois Ney, "The Effect of Classroom Interaction on Pupil Linquistic Performance," unpublished doctoral dissertation, University of California, Berkeley, California, 1963-1964.

Ragsdale, Elva Mae, "Attitude Changes of Elementary Student Teachers and the Changes in Their Classroom Behavior during Student Teaching," unpublished doctoral dissertation, Ball State University, Muncie, Indiana, 1967.

Schantz, Betty, "An Experimental Study Comparing the Effects of Recall by Children in Direct and Indirect Teaching Methods as a Tool of Measurement," unpublished doctoral dissertation, Pennsylvania State University, State College, University Park, Pennsylvania, 1963.

Simon, Anita, "The Effects of Training in Interaction Analysis on the Teaching Patterns of Student Teachers in Favored and Non-Favored Classes," unpublished doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1966.

Snider, Ray Merrill, "A Project to Study the Nature of Physics Teaching Using the Flanders' Method of Interaction Analysis," unpublished doctoral dissertation, Cornell University, Ithaca, New York, 1966.

Soar, R. S., "Pupil Needs and Teacher Pupil Relationships: Experiences Needed for Comprehending Reading," mimeographed paper, Temple University, Philadelphia, Pennsylvania, 1966.

Storlie, Theodore Rudolph, "Selected Characteristics of Teachers Whose Verbal Behavior Is Influenced by an In-Service Course in Interaction Analysis," unpublished doctoral dissertation, University of Minnesota, Minneapolis, Minnesota, 1961, abstracted in Dissertation Abstracts, 22 (May, 1962), 3941.

Zahn, R., "The Effects of Cooperating Teacher Attitudes on the Attitudes of Student Teachers," mimeographed paper by the author, Glassboro State College, Glassboro, New Jersey, 1964.

Zahn, Richard David, "The Use of Interaction Analysis in Supervising Student Teachers," unpublished doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1965.