A COMPARISON OF THE EFFECTS OF FOUR MICRO-TEACHING ENVIRONMENTS ON FOURTH-GRADE PUPILS' COPING BEHAVIOR AND VERBAL RESPONSE

DISSERTATION

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

Carrie Sybil Waldrop, B. A., M. Ed.
Denton, Texas
August, 1970
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CHAPTER I

INTRODUCTION

The effects of the physical environment on pupils' learning have long been emphasized. Micro-teaching, which is being used in a variety of ways in teacher education, utilizes at least four teaching environments. Research investigators employing micro-teaching techniques largely ignore the effects of exposed video-taping equipment, technicians, and/or audiences on pupils' behavior.

The kind and magnitude of pupil distraction before the television camera eye remain unknown. It is unknown whether behavior of students being video taped is a self-conscious performance or an everyday life occurrence. Yet unanswered is whether the presence of observers is less distracting than the presence of video-taping equipment and technicians. Unexposed cameras and technicians may produce less distraction, but the awareness of "being on the air" may also be a factor (21, p. 29).

This study investigated experimentally at the fourth-grade level the effects upon pupils' coping behavior and verbal response of four micro-teaching environments: (a) controlled teaching environment (Micro-Teaching Laboratory) in which video-taping equipment, technicians, and audience
are unexposed, (b) environment in which video-taping equipment and technicians are exposed, (2) environment which contains only an audience, and (d) environment in which video-taping equipment, technicians, and audience are exposed.

Statement of the Problem

The problem of this study was to determine the effects of four teaching environments used in micro-teaching on fourth-grade pupils' coping behavior and verbal response.

Purpose of the Study

The purpose of this study was to compare the effects of four micro-teaching environments on fourth-grade pupils' coping behavior and verbal response and to determine if one micro-teaching environment is more appropriate than another.

Hypotheses

The following hypotheses were tested in this study:

I. There will be significant differences among the pupils' mean scores obtained in the four micro-teaching environments on measures of
   A. coping behavior,
   B. quantity of verbal response,
   C. quality of verbal response.

II. The significant differences found in pupils' mean scores in Hypothesis I will show the controlled teaching environment (Micro-Teaching Laboratory) more appropriate than
(a) the environment in which there is only an audience, (b) the environment in which there are exposed video-taping equipment and technicians, and (c) the environment in which there are exposed audience, video-taping equipment, and technicians.

III. There will be no significant difference found between pupils' mean scores obtained in the environment in which there is only an audience and pupils' mean scores obtained in the environment in which there are exposed video-taping equipment and technicians on measures of

A. coping behavior,
B. quantity of verbal response,
C. quality of verbal response.

IV. There will be a significant difference between the pupils' mean scores obtained in the environment in which there is only an audience and pupils' mean scores obtained in the environment in which there are exposed audience, video-taping equipment, and technicians on measures of

A. coping behavior,
B. quantity of verbal response,
C. quality of verbal response.

V. The significant difference found between pupils' mean scores in Hypothesis IV will show the environment in which there is only an audience more appropriate than the environment in which there are exposed audience, video-taping equipment, and technicians.
VI. There will be a significant difference between the pupils' mean scores obtained in the environment in which there are exposed video-taping equipment and technicians and pupils' mean scores obtained in the environment which includes audience, video-taping equipment, and technicians on measures of
A. coping behavior,
B. quantity of verbal response,
C. quality of verbal response.

VII. The significant difference found between pupils' mean scores in Hypothesis VI will show the environment in which there are exposed video-taping equipment and technicians more appropriate than the environment which includes exposed audience, video-taping equipment, and technicians.

Significance of the Study

Professional organizations, secular foundations, the federal government, and some state universities have accelerated the study of innovative planning for the improvement of teacher education. Micro-teaching is an innovation frequently mentioned (12). Nine proposals, out of the eighty proposals submitted, have been accepted by the United States Office of Education under the funding title, "Comprehensive Undergraduate and Inservice Teacher Education for Elementary Teachers." Each of the nine proposals includes the use of video-taping processes and micro-teaching (9, 10, 11, 19).
Since the inception of micro-teaching at Stanford University in 1963, the technique has become widely known and widely used (1, 4).

Allen and others (2), Allen and Eve (3, p. 182), Borg (6), Baird (5), Fortune (13), and Goldwaite (15) refer to the provision in micro-teaching of a "controlled" practice or laboratory environment for real teaching in which the complexities of the classroom are reduced.

Conflicting reports as to the effects of the presence of audience, video-taping equipment, and technicians call to question whether micro-teaching does, in fact, provide for experimental control and manipulation of variables.

The needs for minimizing the effects of the presence of microphones, video-taping equipment and/or audience have been pointed out by Borg (7), Goldwaite (15), and Harder (16). Medley and Mitzel in Handbook of Research on Teaching refer to the possibility that pupils may behave differently in the presence of observers (17).

Researchers have evidenced only informal concern with pupils' behavior during micro-teaching. The major emphasis has been placed on increasing teacher effectiveness. Cooper (8) suggests that one approach toward analyzing teaching is to look at both pupil and teacher behaviors. Ultimately, effective teaching is determined by what happens to the pupils (12, 14, 17, 20). Allen (4, p. 53) states that one of
the unresearched areas in micro-teaching is "the effect of the experience on the micro-teaching student."

A survey of research studies on micro-teaching reveals that no research has been conducted on the effects of the micro-teaching environment on pupil's behavior. Assuming that environment does make a difference in pupils' behavior, there is no basis to know whether one micro-teaching environment is more appropriate than the other with respect to pupils' coping behavior and verbal response. The recency of the concept of micro-teaching and the lack of quantitative measures to observe pupils' coping behavior have, undoubtedly, contributed to this void.

To ascertain the most appropriate micro-teaching environment in terms of pupils' behavior, a recent instrument with a unique emphasis on pupils' motor and nonverbal behavior was combined with a widely used verbal interaction instrument. (The instruments, Coping Analysis Schedule for Educational Settings and Flanders' System of Interaction Analysis, are further described in Chapter III.)

Additional significance was given this study since it represented basic research dealing with pupils' behavior in the micro-teaching setting. Insofar as can be determined, not only was this the first research study to use CASES in a micro-teaching setting but the first time to couple Flanders' Interaction Analysis System with CASES in a research study.
Definition of Terms

For the purpose of this study the following definitions have been formulated:

1. **Micro-teaching** denotes a scaled-down teaching encounter in which a student teacher taught a fifteen-minute science lesson to a group of four fourth-grade pupils (two boys and two girls).

2. **Micro-class** identifies the four fourth-grade pupils (two boys and two girls) who participated as the pupils in the micro-teaching.

3. **Micro-teacher** is a student teacher enrolled in a science-methods class who volunteered to teach a micro-class.

4. **Micro-student** is a fourth-grade pupil who was taught in a micro-class.

5. **Video-taping equipment** includes the video camera, microphones, video recorder, and monitor.

6. **Micro-Teaching Laboratory** is a portable, physical facility which was especially designed to house a micro-teaching performance. (See Appendix A, page 76, for a description.)

7. **Controlled teaching environment** denotes the environment used in micro-teaching which eliminates the visible presence of audience, technicians, and video-taping equipment as part of the experimental teaching situation.
8. Demonstration teaching refers to a teacher teaching a small group of children before an audience of student teachers to emphasize some method or skill in teaching.

9. Flanders' System of Interaction Analysis is an observation instrument used to code the verbal behavior of teachers and pupils into categories. (See Appendix B.)

10. Coping behavior is an assessment of a pupil's verbal, motor, and nonverbal responses classified according to the categories in A Coping Analysis Schedule for Educational Settings (CASES). (See Appendix C.)

11. A Coping Analysis Schedule for Educational Settings (CASES) is an observation instrument used to classify into categories a pupil's behavior, with emphasis on motor and nonverbal characteristics.

Limitations of the Study

This study was limited to quantitative and qualitative analyses of fourth-grade pupils' coping behavior and verbal response in four micro-teaching environments on thirty-two micro-teaching occasions. Eight student teachers and thirty-two pupils were involved.

Assumptions

The basic assumptions of this study were

1. that the four science lessons had equivalent motivational interest, and
2. that pupil-initiated talk represented a more qualitative aspect of verbal classroom behavior than teacher-initiated pupil response.
CHAPTER BIBLIOGRAPHY


CHAPTER II

REVIEW OF RELATED LITERATURE

The review of the related literature pertaining to the present study is organized into three sections:

1. Literature on micro-teaching related to the need for the study

2. Literature relevant to the effects of teaching environment on pupils' behavior

3. Literature pertinent to student-teacher talk.

Literature on Micro-teaching Related to the Need for the Study

Although less than a decade has passed since micro-teaching was first introduced at Stanford University, the technique has been used extensively. A survey in the spring of 1969 of the chairmen of secondary education departments of the 442 National Council for Accreditation of Teacher Education (NCATE) accredited colleges revealed that, of the 420 responding, 176 indicated that micro-teaching was being used (57). In a national survey of student teaching programs in 1968, it was found that micro-teaching is used in about one-half of all teacher education programs (2, p. xiii).

Not only is micro-teaching being used in the pre-service and inservice training of teachers and college professors but
in the training of counselors, ministers, business executives, and Peace Corps volunteers (2). In several of these settings, it is necessary that children be used.

While the majority of the research studies have been done at the secondary level (1, 7, 8, 11, 24, 40), an increasing number of studies at the elementary level is being reported (14, 16, 34, 35, 52).

The invention of the video recorder has provided new dimensions in teacher education through the analysis of the interaction in teaching-learning events. That it has tremendous potential is unquestioned, yet its use is not without problems (28). The succeeding research studies cite the distracting effects of video-taping equipment and/or audience. In an investigation by Borg in which student teachers and elementary pupils were used, an attempt was made to reduce the distraction of video-taping equipment. On different occasions the video-tape recorder, monitor, and operator were positioned in each of three locations: to the side of the classroom, just outside the door of the classroom, at the rear of the room. Borg concluded, "There seems little doubt that the presence of the camera and microphones changes the classroom situation." To reduce the distraction, two alternatives, untried because of the limitation in equipment and classrooms, were suggested: (1) using hidden cameras and (2) placing cameras in the room with the children for several days before the actual video-taping session (16, p. 9).
Scheuler (49, p. 29) suggests, "Remote control devices may obviate the necessity of having camera operation in the telecasting room and may reduce the possibility of serious distraction. ..."

In a study by Goldwaite (25) in which micro-teaching was utilized in the pre-service education of science teachers, it was noted that the presence of the investigator and the video-recording equipment undoubtedly had some limiting effect on both the student teacher and pupils.

Harder (26) contends that the use of the video tape as a supervisory technique causes high anxiety in both the teachers and the students. He doubts the authenticity of classroom behavior which is video taped. The question is posed, "Is pupil behavior altered through the use of video tape?"

Contrary to the references made to the distracting effects of video-taping equipment and cameramen, Allen (2, p. 59) asserts, "The compactness of the portable video-tape recorder and the lack of a great deal of ancillary equipment mitigate the initial uneasiness of the trainees." While Allen found the effects of the extraneous stimuli in the micro-teaching environments negligible, it should be noted that micro-students used by Allen were paid students in secondary school who were trained to perform a service and who were informed that discipline problems would not be tolerated.
Perhaps the hiring of students and the prescribed discipline required of the students have contributed to the attack on the realism of micro-teaching which Johnson (32) describes. Teaching four or five cooperative and able students or teaching laboratory students might be said to be unreal. Not only should student teachers teach pupils of the anticipated age of pupils to be taught, but according to Young (59) the students should be representative of the students the teacher will teach in the actual classroom. The present study was concerned with the effects of the various micro-teaching environments on the behavior of representative pupils.

While video-taping processes provide an added dimension to the micro-teaching concept, they are not a necessary adjunct. Micro-teaching can be performed before an audience, as in demonstration teaching which antedated the coining of the term "micro-teaching" and the teach-critique-reteach procedure. When children are placed in this setting, the effect of the presence of the audience on children's behavior is called to question.

In Handbook of Research on Teaching, Medley and Mitzel state

The objection that teachers and pupils may not behave in exactly the same way when observers are present as they behave when no observer is present has no completely satisfactory answer (38, p. 249).
A review of the literature reveals that micro-teaching has taken place in at least four environments: (1) in the presence of an audience as in demonstration teaching (58); (2) in the presence of video-taping equipment and technicians (a setting used in the college in which the present research was conducted); (3) in the presence of an audience, usually a methods class with the instructor, plus video-taping equipment, and technicians (2, 25); and (4) in a controlled teaching environment in which cameras, video-taping equipment, technicians, and audience are not exposed to the micro-teacher and micro-students (52).

The foregoing, conflicting reports concerning the effects upon the pupils of the ancillary equipment and people used in the different micro-teaching environments prompted the need for this study. It might be well at this point to look at the literature and research concerning the effects of environment upon pupils' behavior.

**Literature Relevant to the Effects of Teaching Environment on Pupils' Behavior**

The importance of the environment is a fundamental principle of learning. Mitchell writes

...it is generally assumed that the school learning environment is a potent force in determining the nature and quality of pupil motivation, the characteristics and direction of the instructional process, and the ultimate effectiveness of pupil learning (41, p. 1).
Although it is theorized that numerous forces in the environment influence learning, there is little research dealing with the nature and extent of environmental forces operating in the learning environment.

Efforts are made to relate school building design to learning theory (37, p. 5). Boles says

Conscientious planners have long averred that environment—both physical and social—contribute to learning and that any effective learning environment must be planned to fit a specific program (13, p. 259).

Richardson, in The Environment of Learning, discusses the effects of the physical layout of the classroom on the process of communication between pupils and between pupils and teacher (46).

Studies have been performed on the effects of the lighting (38) and thermal systems (27) in the public school on pupils’ behavior. One study was designed to determine if learning could be improved by controlling the environment at the individual student's level. Over 900 subjects from technical-vocational schools, area community colleges, and high schools of Iowa were used in the study. To control the subjects' environment, an apparatus with a visual shield and an audio-blocking control was employed. Neither the visual control shield nor the audio-blocking control making use of commercial ear pods to restrain sound was effective in improving learning (55).
The many facets of the child's physical environment have their effects upon children's attention. For purposeful learning to take place the pupil must attend to the learning activity (42, p. 77). The importance of attention and its value for learning has been appreciated for centuries. Bugelski states

To be sure that the learner is learning what we want him to learn, we must remove all irrelevant stimuli and make sure that he is responding to the relevant ones. This is what teachers mean by attention (19, p. 158).

Although it is theorized that attention is vital to learning, research is needed to determine the exact role of attention as an element in learning and the effects of kinds and degrees of distraction on attention. While this study was not designed to test the effects of the four environments on learning per se, it was assumed that distraction deters learning.

A paucity of research exists on the effects of distraction which is commonly defined as "that which diverts attention." It is generally assumed that distractive elements produce a limiting environment and thereby debilitate learning. Daniel (21) investigating the effects of six environmental conditions on freshman students' study of general material found all six conditions to have some distracting effects. Hovey (30) in a study of the effects of general distraction on the higher thought processes of sophomore students found the effect of distraction during nineteen
minutes of intense work under severe distraction was slight, although a few reported considerable strain. In a study by Baker (9), it was disclosed that the effect of distraction could be biased by suggestion.

Sax (47, p. 297) states that no empirical evidence is available to determine the effect that the presence of a microphone has on respondents in a counseling situation. Kahn and Cannell (33, p. 240) indicate that the presence of the microphone may make the interviewer more nervous than the respondent.

If the presence of a microphone alters behavior in a counseling situation, how much more would the behavior of participants be altered in the presence of microphones, video-tape recorder, monitor, cameras, technicians, and/or audience. Although the purpose of micro-teaching is to enable the student teacher to gain specific skills in the teaching act, what is happening to the learner should be the criterion for micro-teaching effectiveness. Concern has been expressed about the "risk" to pupil learning when pupils are taught by a novice. Kallenbach (35) cites Bush and Allen who state that micro-teaching provides for the practice of teaching "under optimum conditions for the trainees and without endangering the learning of pupils." While the teacher is the significant factor in the teaching process, the environments employed in micro-teaching may be deterrents to learning. At present the so-called "controlled" practice
environments used in micro-teaching are operating without empirical evidence of the impact of the environments' extraneous stimuli upon the pupils' coping behavior. At this time a look at what is meant by coping behavior seems in order.

Spaulding (53, p. 69), who uses the term "coping" in the name of an instrument which he has constructed, defines coping behavior variously as "... a way of coming to terms with the world ... adaptation ... a way of dealing with a situation ... a method of managing the environment."

Bruner (18, p. 129) states, "Coping respects the requirements of problems we encounter while respecting our integrity." In this definition coping has a positive connotation, but according to Spaulding, coping behavior can be desirable, undesirable, or inappropriate.

When efforts to cope require an inordinate absorption in problems or events outside the learning situation, the possibility of learning the task at hand is altered.

A person's coping behavior is significant to total school adjustment and to the nature and extent of learning (53, p. 68). In a pilot study of sixty children from low-income families during the school year 1968-1969, Spaulding noted that the greatest problems occurred when the proximity of noise and movement in one work area interfered with the work in another area. "Distracting movement and noise were major deterrents to effective communication in the
instructional centers." During the following year the physical location of work stations was such that verbal instruction areas were removed from such areas as art, dramatic play, and construction (54).

Though it is generally understood that distraction alters the learning situation, no research has been done to compare the distractive effects upon pupils' behavior of the extraneous stimuli employed to implement the micro-teaching concept.

This research compared the effects of four environments used in micro-teaching to determine which environment was more desirable in terms of pupils' coping behavior and verbal response.

Since this study was concerned with the effects of micro-teaching environments on quantity and quality of student talk, the next section is devoted to the literature related to student-teacher talk.

Literature Pertinent to Student-teacher Talk

While little credence is given the maxim, "Teaching is telling," teaching and talk are not incompatible. Flanders (23, p. 1), recognizing the existence of nonverbal communication, regards verbal communication as the major means of implementing the teaching act. Smith (58, p. 3) states, "... most of the knowledge which we teach in school is expressed in words and other symbolic forms and that apart from
the language system, there would be little or no knowledge
to teach at all."

Othanel Smith's concept of teaching, as "a system of
actions intended to induce learning," calls attention to two
sets of behaviors, those of the teacher and those of the
learner. Learning necessitates pupil involvement (50, 51).

Barr (10) summarized the results of twenty years of
work by saying, "Teaching effectiveness may be essentially
a relationship between teachers, pupils, and other persons
directly concerned with the educational undertaking." By re-
relationship, he was referring to the interaction of teacher
and student. "Verbal behavior," writes Hughes (31, p. 26),
"is, of course, the most continuous and pervasive of teacher
behavior in the classroom."

Numerous observational systems for the analysis of
classroom interaction (4, p. 8) have been constructed in an
attempt to ascertain the circumstances under which learning
is maximized. With the advent of these systems, increased
attention has been given to the significance of the propor-
tion of student-teacher talk and the amount of student-
initiated talk.

Flanders (22, p. 178) suggests that "the rule of two-
thirds" is applicable to the verbal interaction of the average
classroom. About two-thirds of the time while classes are in
session, someone is talking. When someone is talking, about
two-thirds of the time it is the teacher. When the teacher
is talking, about two-thirds of the time he will be lecturing, giving directions, and criticizing students.

While the first part of the rule holds for the superior classroom, the remaining parts are somewhat modified. Teacher talk comprises about 50 to 60 per cent of the talking time. When the teacher is talking only about 40 per cent is classified as lecturing, direction giving, and criticizing, while about 60 per cent is characterized by asking questions, clarifying and utilizing student ideas, giving praise and encouragement (22, p. 178).

Flanders (3), whose system calculates an indirect-direct ratio of verbal interaction, has found that the indirect pattern of teacher influence facilitates verbal participation by students and permits the teacher to gain insight into pupils' perceptions. The indirect pattern of influence (signified by a high proportion of tallies in Categories one through four) is generally thought to be a liberating force for pupils' response to the teacher and pupils' initiated talk; whereas, the direct pattern of influence (characterized by a high proportion of tallies in Categories five through seven) is considered to have a restricting effect on pupils' verbal response (20).

Mutually supportive results have been found that pupils of teachers classified as indirect have more desirable attitudes toward other pupils and school (5, 56), and higher
achievement in school (23) than did pupils of teachers char-
acterized by direct verbal patterns.

Schneyner (48, p. 369), summarizing the results of the few studies in reading which utilized the verbal interaction analysis, indicated that effective pupil achievement is associated with a high proportion of pupil involvement.

Morrison (43) studied the interaction in three types of elementary classroom reading situations to determine the one resulting in the greater pupil-teacher involvement.

Research studies employing the interaction analysis system have found (1) that in a study of underachieving above-average ability fifth-grade students, lecturing and criticizing (classified as direct teacher behaviors) were associated with reduced reading comprehension (45); (2) that vocabulary gains were related to the teacher's encouragement of freedom of expression (classified as indirect behavior) (48); and (3) in analysis of the teacher-pupil verbal interaction in sixty-four fifth-grade classes that the teacher's verbal pattern induced more pupil-centered activity with an increase in the intellectual level of the class (29).

Although Aschner relates that student-initiated talk has a healthy connotation, she confines the term to the in-
tellectual dimensions (6). Flanders uses Category nine (student talk-initiation) to denote any and all student-
initiated talk (3).
Borg and others (16) and Sparks (52) evidenced concern in modifying teacher behavior so as to decrease teacher participation and raise the level and amount of student participation.

These studies support the need for teacher behaviors which provoke greater student response and, specifically, student-initiated response. The effects of indirect or direct influence of the teacher on the student may have a counterpart in the effects of a facilitating or limiting environment. Assuming that quantity of student talk and quality of student talk (student-initiated talk) are significant in the teaching-learning situation magnifies the need to determine which environment in the micro-teaching setting would maximize the students' freedom to respond to the teacher and other students and to initiate talk.

Summary

The review of the literature related to this study reveals that micro-teaching is being widely used not only in teacher education programs but in a variety of ways in which children are involved.

Micro-teaching has taken place in at least four environments. In three of these environments video-taping processes are used while in the other environment an audience is visible.

That the presence of video-taping equipment, technicians, and/or audience is distracting to both student teacher and
pupils has been reported on several occasions. On the other hand, negligible effects have been reported when the secondary micro-students were paid or cautioned of dismissal in the event of discipline problems.

Theoretically, environment is paramount to pupils' behavior and learning. Yet, no research has been done to determine the differential effects on pupils' behavior of the environments used in micro-teaching.

Coping behavior which reveals how a person manages his environment takes into account the interaction of the pupil with unrelated stimuli. Until recently no method of quantitative analysis of coping behavior which included the motor and nonverbal behaviors was available.

Numerous observational systems have been introduced to determine the effects of classroom interaction on pupils' attitudes and achievement. These instruments have been used in an attempt to learn the optimal conditions for learning.

Research studies have established that the indirect influence of the teacher permits more student response and more student-initiated talk, while the direct influence of the teacher restricts student response and student-initiated talk. Mutually supportive studies indicate that the indirect pattern of teacher influence has a positive effect on students' achievement and attitude toward work and school. Like that of the teacher, the environment may also have a positive
and facilitating effect or a negative and limiting effect on students' verbal response.

If teacher effectiveness is judged by the amount of student involvement, that is, the quantity of and quality of student talk elicited, then it seems to follow that the environment which permits the greater amount of student and student-initiated talk is the more desirable.

The area of pupil behavior in the micro-teaching setting is ripe for research. Means for determining quantitative differences between pupil's behavior in the micro-teaching environments are needed. This study was planned to produce data on pupils' coping behavior, quantity of verbal response, and quality of verbal response in four micro-teaching environments.
CHAPTER BIBLIOGRAPHY


CHAPTER III

PROCEDURES FOR COLLECTING AND TREATING DATA

This chapter contains a portrayal of the subjects, the procedures used for obtaining data, a description of the data gathering instruments, the means used in analyzing data, and the statistical treatment of the data.

Subjects

Sixteen subjects (eight boys, eight girls) were randomly selected from each of two fourth-grade classes in a southeastern Oklahoma school. This school population was composed of the most representative cross-section of students of any of the schools in the city. Thirty-one of the subjects were Anglo-American; one was Navajo Indian. These two fourth-grade classes were originally constituted by random assignment. A total of thirty-two students and eight student teachers (volunteers from two college classes in elementary science methods) composed the sample. An alternate from each class was randomly selected in anticipation of the absence of any subject. At the first session, an alternate attended and continued throughout the study.

The sixteen students from one class were randomly assigned by sex so that two boys and two girls comprised each of four micro-classes. The ordinal position of these
four micro-classes was determined by the random assignment of a number from one through four.

The sixteen students from the other class were randomly assigned by sex so that two girls and two boys composed each of the remaining four micro-classes. Random assignment of a number from five through eight determined the ordinal position of these four micro-classes.

This stratified random sample enabled each student to be in a micro-class made up of his own classmates.

Each student teacher was randomly assigned a number ranging from one through eight which designated the number of the micro-class which she taught for the duration of the experiment. Each teacher taught four lessons, one in each micro-teaching environment, to the assigned micro-class.

An audience consisted of at least eight students and/or faculty and staff associated with a southeastern Oklahoma college.

Procedures for Obtaining Data

Data were collected during a four-week period. The subjects were transported by school bus to the college where they were greeted and escorted by a student teacher to the lounge, especially provided for the children during the run of the experiment. Uniform instructions were given each group of sixteen students upon their initial arrival. (See Appendix D.) In the lounge the micro-students received
name tags and waited with their assigned micro-teacher until the time for the micro-teaching session to begin.

When the micro-students entered the room in which they were taught, it was their first and only experience in that particular environment. The door to the Micro-Teaching Laboratory was placed immediately adjacent to the door of the college classroom, an arrangement which precluded the necessity of the micro-students seeing the assembled audience, the cameramen, and the video-taping equipment. The micro-students were aware of the presence of the audience and they knew that they were being video taped. While the Micro-Teaching Laboratory was designed to eliminate the audience, the video-taping equipment, and technicians from the teaching environment, it should be noted that on careful observation, it was possible for the micro-students to see the lens of the cameras positioned near the round plexiglass windows in one side panel of the Lab. Room arrangements for the micro-teaching sessions may be viewed in Appendix E.

A micro-teacher taught the assigned micro-class in each of the four micro-teaching environments. This meant that four children from the same elementary school class remained with the same teacher throughout the experiment. Each micro-teaching lesson consumed at least fifteen minutes. If the lesson, for any reason, exceeded fifteen minutes, only the first fifteen minutes of video tape were coded. Micro-classes One, Two, Three, and Four were taught simultaneously each
Tuesday and Thursday for a two-week period. During the succeeding two weeks, micro classes Five, Six, Seven, and Eight were taught simultaneously each Tuesday and Thursday. All micro-classes were taught at 1:30 in the afternoon.

Four science lessons were selected from Part D of the American Association for the Advancement of Science teaching materials (Xerox, Educational Division, 600 Madison Avenue, New York, New York 10022). The following lessons were selected: Inferring 3—Observations and Inferences, Predicting 4--The Suffocating Candle, Observing 4--Perception of Sound, Communication 11--Describing Location. The teachers used the activities as ordered in the lesson plan to prepare a fifteen-minute lesson. These materials were selected because each lesson followed the same sequence of procedure, utilized the process approach, and provided for pupil involvement. The AAAS materials have been widely field tested on at least three occasions and modified making full use of the recommendations of tryout teachers (5). The subjects had not had prior experience with the AAAS materials.

To control for possible serial effects in treatments and lesson interest, a Greco-Latin Square design was used to order the micro-classes and micro-lessons (/?, p. 515). The design is more fully controlled than the regular counterbalance design (1) since each subject was obtained from a class which was originally constituted by random assignment and (2) since each subject was randomly assigned from his class to a
micro-class. The Greco-Latin Square used for micro-classes 1 through 4 during the first four teaching occasions was replicated for micro-classes 5 through 8 during the last four teaching occasions.

**Treatments**

- **T<sub>1</sub>**—controlled teaching environment (Micro-Teaching Laboratory) in which video-taping equipment, technicians, and audience are not a part of the teaching environment.
- **T<sub>2</sub>**—environment in which video-taping equipment and technicians are exposed.
- **T<sub>3</sub>**—environment which contains only an audience.
- **T<sub>4</sub>**—environment in which video-taping equipment, technicians, and audience are exposed.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>T&lt;sub&gt;1&lt;/sub&gt;</th>
<th>T&lt;sub&gt;2&lt;/sub&gt;</th>
<th>T&lt;sub&gt;3&lt;/sub&gt;</th>
<th>T&lt;sub&gt;4&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>First teaching occasion</td>
<td>1 A</td>
<td>2 B</td>
<td>3 C</td>
<td>4 D</td>
</tr>
<tr>
<td>Second teaching occasion</td>
<td>2 D</td>
<td>1 C</td>
<td>4 B</td>
<td>3 A</td>
</tr>
<tr>
<td>Third teaching occasion</td>
<td>3 B</td>
<td>4 A</td>
<td>1 D</td>
<td>2 C</td>
</tr>
<tr>
<td>Fourth teaching occasion</td>
<td>4 C</td>
<td>3 D</td>
<td>2 A</td>
<td>1 B</td>
</tr>
<tr>
<td>Fifth teaching occasion</td>
<td>5 A</td>
<td>6 B</td>
<td>7 C</td>
<td>8 D</td>
</tr>
<tr>
<td>Sixth teaching occasion</td>
<td>6 D</td>
<td>5 C</td>
<td>8 B</td>
<td>7 A</td>
</tr>
<tr>
<td>Seventh teaching occasion</td>
<td>7 B</td>
<td>8 A</td>
<td>5 D</td>
<td>6 C</td>
</tr>
<tr>
<td>Eighth teaching occasion</td>
<td>8 C</td>
<td>7 D</td>
<td>6 A</td>
<td>5 B</td>
</tr>
</tbody>
</table>

**Fig. 1**—Greco-Latin square experimental design

**Micro-lessons**

- A—Lesson 1
- B—Lesson 2
- C—Lesson 3
- D—Lesson 4
Micro-classes*

1--Micro-class No. 1  
2--Micro-class No. 2  
3--Micro-class No. 3  
4--Micro-class No. 4  
5--Micro-class No. 5  
6--Micro-class No. 6  
7--Micro-class No. 7  
8--Micro-class No. 8  

*Each micro-teacher was randomly assigned a number to coincide with the number of the micro-class. The micro-teacher taught the assigned micro-class in each of the four micro-teaching environments as ordered in the Greco-Latin Square.

Data Gathering Instruments

A Coping Analysis Schedule for Educational Settings (CASES) was utilized to measure pupils' coping behavior. This system can be used by "live" observers in an educational setting or by observers in a "delayed" observation as in the use of video-tape recordings. This system is unique in its emphasis on motor and nonverbal behaviors of pupils. CASES, composed of thirteen categories, is a time-sampling technique in which observers code with a time period ranging from three to ten seconds. The thirteen categories are grouped into three classifications: desirable, inappropriate, unacceptable. (See Appendix F, for a classification of categories.)

Inter-rater reliability of observations of representative types of children during several thirty- or forty-minute periods is reported to range from .78 to .96.
Concurrent validity has been established using academic achievement as a criterion measure.

The instrument was constructed by Robert L. Spaulding in 1966, and the manual was made possible through validity studies conducted by the Durham Education Improvement Program at Duke University which was supported by a grant from the Ford Foundation (4, 6).

The Flanders' System of Interaction Analysis (1965) was used in a modified form to obtain a proportion of student talk to total talk and a proportion of student-initiated talk to total-student talk. The modification consisted of coding only one behavior every three seconds (i.e., the one that takes up most of the time) rather than coding every different behavior during that interval. This change was used to increase the accuracy of coding over time.

This system contains ten categories: seven categories for teacher talk, two categories for student talk, and one category for silence or confusion. The two student categories are student responding to teacher (category 8) and student-initiated talk (category 9). Category combinations utilized as variables in this study were total-student talk, total-teacher talk, and a total of teacher and student talk. The observer recorded the appropriate category number every three seconds. Data were used to determine the proportion of student talk to total talk and the proportion of student-initiated talk to total-student talk.
According to Flanders (2, p. 72) an inter-rater reliability of .64 to .76 was achieved by a three-member observer team in six to ten hours of practice, as judged by Scott's reliability coefficient. Scott's method can be estimated rapidly, is not affected by low frequencies, and is sensitive at a high level of reliability (2, pp. 25-27).

A copy of the Flanders' System of Interaction Analysis can be viewed in Appendix B.

Analysis of Data

Live observations were made in Treatment 3. Coding was done via video-tape recordings in the other three treatments. The four observers who used Coping Analysis Schedule for Educational Settings were experienced elementary teachers who were graduate students in the college in which the experiment took place. They were trained in approximately seven hours by coding written specimen descriptions and video-tape recordings. The observer who coded the micro-teaching sessions using the Flanders' System of Interaction Analysis was a trained observer who taught at the college where the experiment was performed.

Each child was observed individually in each of the four-treatment conditions to establish quantitative measures on thirteen categories of coping behavior. The coders recorded the appropriate category of coping behavior every three seconds for fifteen minutes. Category combinations
were grouped into desirable, inappropriate, and unacceptable behavior. To obtain the proportion of undesirable behavior, the category combinations for inappropriate and unacceptable behavior were combined. Proportions of desirable and undesirable behavior were established and means obtained on coping behavior in each of the four treatments.

Each teaching session was coded with the Flanders' System of Interaction Analysis in a modified form to determine a proportion of student talk to total talk and the proportion of student-initiated talk to the total-student talk. The observer using the Flanders' instrument coded verbal interaction every three seconds for a period of fifteen minutes.

A total of student talk was found by adding the tallies in categories eight and nine. A total of all tallies in categories one through nine constituted the total amount of talk. A proportion of student talk was determined by dividing the total tallies in categories eight and nine by a total of the tallies in categories one through nine. A significantly higher proportion of student talk to total talk was considered more appropriate.

A proportion of student-initiated talk to total-student talk was determined by dividing the tallies recorded in category nine by the total tallies recorded in categories eight and nine. A significantly higher proportion of student-initiated talk to total-student talk was considered more appropriate.
Statistical Treatment of Data

Three-criterion measures involved in this study were pupils' coping behavior, quantity of pupils' verbal response, and quality of pupils' verbal response. To test the tenability of Hypothesis I, separate analyses of variance were run on the three-criterion measures to test for significant differences in means of pupils' scores under four experimental treatments. When significant F values of .05 or less were found, the Fisher's t test, which tests for significant differences between all possible pairs of means, was used to determine the tenability of research Hypotheses II, III, IV, V, VI, and VII (3, p. 103).
CHAPTER BIBLIOGRAPHY


CHAPTER IV

EXPOSITION AND ANALYSIS OF DATA

The purpose of this study was to determine the relative appropriateness of four micro-teaching environments for fourth-grade pupils. This chapter presents the methods and data used to calculate the reliability and validity of the observers. Data on coping behavior, quantity of verbal response, and quality of verbal response are compiled and discussed. The findings from the statistical analysis of data over treatments and the findings from the analysis of data between all combinations of treatments as they relate to hypotheses will be discussed separately. The concluding sections present discussions of hypothesized and non-hypothesized data along with the chapter summary.

Methods and Data Used to Establish Observer Reliability

Before measuring coping behavior, inter-observer reliability was established on the four observers who used CASES. As recommended by Spaulding (2, pp. 78-80), the observers individually coded sixty episodes (coded specimens of behavior) of two different kinds of pupils directly from the television monitor. The episodes recorded by one observer were compared with the episodes of each of the other observers. A star was
placed alongside of each episode which two observers had recorded in agreement. Using this method, inter-rater reliability was established between every possible combination of observers. If episode number three described behavior similar to another observer's episode number six, these recordings were considered in agreement; whereas, if episode number three described behavior similar to the other observer's episode number eight, then the two episodes were not considered in agreement. As a rule-of-thumb, episodes considered in agreement were no further apart than four episodes. The number of starred episodes (episodes agreed on) were counted and used in the following formula to compute inter-observer reliability:

\[
\text{percentage of agreement} = \frac{\text{no. of episodes agreed on}}{\text{total number of episodes of Observer A} + \text{Observer B}} \times 100
\]

The four observers in this study worked to establish .85 inter-rater reliability which is an acceptable level for making inferences from the data.

The observers, experienced elementary teachers in the graduate program of the college where the study took place, practiced together for approximately seven hours coding behavior from video-tape recordings and written specimen descriptions.

The coefficients of reliability established by the observers using CASES are shown in Table I. It can be observed from this table that inter-observer reliability for all
possible pairs of observers exceeded the .85 level which is considered acceptable.

TABLE I
INTER-OBSERVER RELIABILITY COEFFICIENTS
OF CODERS USING CASES

<table>
<thead>
<tr>
<th>Observers</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.95</td>
<td>.87</td>
<td>.88</td>
</tr>
<tr>
<td>2</td>
<td>...</td>
<td>.87</td>
<td>.88</td>
</tr>
<tr>
<td>3</td>
<td>...</td>
<td>...</td>
<td>.87</td>
</tr>
</tbody>
</table>

Also established on the observers using CASES was another form of reliability obtained by comparing the observers' coding of forty written specimen descriptions of behavior with a set standard. In this case the set standard was coded specimen descriptions of behavior by the designer of the instrument (2, pp. 70-76). Scores on the reliability described above represent proportion of correctly coded descriptive specimens of behavior. Reliability scores of the four observers were .98, .90, .98, and .93.

Prior to measuring the quantity and quality of verbal response with the Flanders' System of Interaction Analysis, intra-observer reliability was established. To establish reliability, the observer coded from Session 4, Exercises 1 and 2 of the Flanders' practice audio-tapes on two different
occasions. Table II records the data used to compute the reliability by the Scott method (1, p. 28).

TABLE II
DATA USED TO CALCULATE INTRA-OBSERVER
RELIABILITY BY SCOTT'S METHOD

<table>
<thead>
<tr>
<th>Category</th>
<th>Observation 1</th>
<th>Observation 2</th>
<th>% 1</th>
<th>% 2</th>
<th>% Diff.</th>
<th>(Av.%)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>18</td>
<td>9.9</td>
<td>9.1</td>
<td>0.8</td>
<td>8.903</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2.1</td>
<td>1.5</td>
<td>0.6</td>
<td>6.032</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>47</td>
<td>25.0</td>
<td>24.4</td>
<td>0.6</td>
<td>6.821</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>58</td>
<td>28.6</td>
<td>29.4</td>
<td>0.8</td>
<td>8.410</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>5</td>
<td>2.6</td>
<td>2.5</td>
<td>0.1</td>
<td>0.065</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2</td>
<td>5.5</td>
<td>1.0</td>
<td>5.5</td>
<td>5.006</td>
</tr>
<tr>
<td>8</td>
<td>36</td>
<td>32</td>
<td>18.7</td>
<td>16.2</td>
<td>1.5</td>
<td>3.045</td>
</tr>
<tr>
<td>9</td>
<td>14</td>
<td>23</td>
<td>7.3</td>
<td>11.7</td>
<td>4.4</td>
<td>4.903</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>9</td>
<td>5.2</td>
<td>4.6</td>
<td>0.6</td>
<td>0.240</td>
</tr>
<tr>
<td>Totals</td>
<td>192</td>
<td>197</td>
<td>99.9</td>
<td>100.4</td>
<td>9.9</td>
<td>22.525</td>
</tr>
</tbody>
</table>

The Scott coefficient "pi" is computed by the following formulas:

\[ \pi = \frac{P_o - P_e}{1 - P_e} \quad (1) \]
\[ P_e = \sum_{i=1}^{k} P_i^2 \quad (2) \]

\( P_o \) represents the proportion of agreement, while \( P_e \)
represents the proportion of agreement expected by chance.
\( P_e \) is found by squaring the average proportion of tallies for
Observation 1 and Observation 2 in each category and summing
these over all the categories. In formula 2, \( k \) represents
the number of categories, and \( P_i \) represents the average pro-
portion of tallies for Observations 1 and 2 falling into each
category. $Pi (T)$ is the result of dividing the amount by which the tallies of two observations exceed chance agreement by the amount by which perfect agreement exceeds chance (1, pp. 25, 26). $P_o$ is found by subtracting the total in the "% Diff." column as shown in Table II from 100.

The intra-observer reliability computed by the Scott method was .87. A coefficient of .85 is an acceptable standard for making inferences from the data (1, pp. 28, 72).

To establish inter-observer reliability, the observer coded from the practice audio-tapes produced by Flanders, the originator of the instrument used. The resulting data were subjected to the Scott method. In Table III there is a presentation of the data used to compute inter-observer reliability by the Scott coefficient.

**TABLE III**

DATA USED TO COMPUTE INTER-OBSERVER RELIABILITY BY SCOTT'S METHOD

<table>
<thead>
<tr>
<th>Category</th>
<th>Observer (A)</th>
<th>Flanders' Audio-Tape (B)</th>
<th>% A</th>
<th>% B</th>
<th>% Diff.</th>
<th>(Av.%)$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>21</td>
<td>11.1</td>
<td>10.6</td>
<td>0.5</td>
<td>1.177</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>7.4</td>
<td>8.1</td>
<td>0.7</td>
<td>0.003</td>
</tr>
<tr>
<td>4</td>
<td>42</td>
<td>42</td>
<td>22.1</td>
<td>21.2</td>
<td>0.9</td>
<td>4.687</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>46</td>
<td>23.7</td>
<td>23.2</td>
<td>0.5</td>
<td>5.499</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>16</td>
<td>5.3</td>
<td>5.1</td>
<td>0.2</td>
<td>2.700</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>10</td>
<td>7.4</td>
<td>8.1</td>
<td>0.7</td>
<td>0.003</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>41</td>
<td>20.0</td>
<td>20.7</td>
<td>0.7</td>
<td>4.141</td>
</tr>
<tr>
<td>9</td>
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<td>2</td>
<td>1.1</td>
<td>1.0</td>
<td>0.1</td>
<td>0.011</td>
</tr>
<tr>
<td>10</td>
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<td>19</td>
<td>8.9</td>
<td>9.6</td>
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<td>0.855</td>
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<tr>
<td>Totals</td>
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<td>198</td>
<td>100.1</td>
<td>100.0</td>
<td>4.3</td>
<td>17.243</td>
</tr>
</tbody>
</table>
When the data in Table III were used in the formulas recorded on page 47, the Scott coefficient for inter-observer reliability was .95.

Findings from Statistical Analysis of Data Over Treatments

Research Hypothesis I stated that there would be significant differences among pupils' mean scores received in four micro-teaching environments on measures of coping behavior, quantity of verbal response, and quality of verbal response.

The research hypotheses were tested in the null form. Only one of the research hypotheses, Hypothesis III, was stated in the null form.

The means and standard deviations for all subjects on each of the criterion measures are presented in Table IV. To determine if significant differences existed among the means for the four treatments, these data were subjected to further analysis. For this purpose, a one-way analysis of variance was run on each of the criterion measures: coping behavior, quantity of verbal response, and quality of verbal response.

Hypothesis I-A predicted significant differences among pupils' mean scores on coping behavior obtained in the four micro-teaching environments. In Table V there is shown the analysis of variance data for coping behavior. The F ratio of 4.90 reveals that the differences among the mean scores on coping behavior in the four micro-teaching environments
TABLE IV
MEANS AND STANDARD DEVIATIONS FOR QUANTITATIVE MEASURES OF TOTAL
SUBJECTS IN FOUR MICRO-TEACHING TREATMENTS

<table>
<thead>
<tr>
<th>Measure</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Coping Behavior</td>
<td>93.34</td>
<td>7.41</td>
<td>84.06</td>
<td>11.51</td>
</tr>
</tbody>
</table>

*T1 = controlled teaching environment (Micro-Teaching Laboratory).
*T2 = environment in which video-taping equipment and technicians are exposed.
*T3 = environment which contains only an audience.
*T4 = environment in which video-taping equipment, technicians, and audience are exposed.
would not likely have occurred by chance. The F value is significant at the .01 level of confidence; therefore, the null hypothesis was rejected and the research Hypothesis I-A was not rejected.

### TABLE V

**SUMMARY OF ANALYSIS OF VARIANCE ON COPING BEHAVIOR IN FOUR MICRO-TEACHING ENVIRONMENTS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sums of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2220.63</td>
<td>3</td>
<td>740.21</td>
<td>4.90*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>18730.34</td>
<td>124</td>
<td>151.05</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20950.97</td>
<td>127</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence.

Hypothesis I-B stated that there would be significant differences among mean scores on quantity of verbal response obtained in the four micro-teaching environments. Table VI contains a summary of the analysis of variance for quantity of verbal response. The F ratio of 1.31 was not significant at the .05 level of confidence. There were no significant differences in quantity of verbal response in the four environments. Thus, the null hypothesis was not rejected, and the research Hypothesis I-B was rejected.
TABLE VI
SUMMARY OF ANALYSIS OF VARIANCE ON QUANTITY OF VERBAL RESPONSE IN FOUR MICRO-TEACHING ENVIRONMENTS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sums of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td>396.34</td>
<td>3</td>
<td>132.11</td>
<td>1.31*</td>
</tr>
<tr>
<td>Within Treatments</td>
<td>2816.13</td>
<td>28</td>
<td>100.58</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3212.47</td>
<td>31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level of confidence.

In Hypothesis I-C it was stated that there would be significant differences on quality of verbal response in the four treatments. The analysis of variance data on quality of verbal response is presented in Table VII.

TABLE VII
SUMMARY OF ANALYSIS OF VARIANCE OF QUALITY OF VERBAL RESPONSE IN FOUR MICRO-TEACHING ENVIRONMENTS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sums of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td>2153.13</td>
<td>3</td>
<td>717.71</td>
<td>2.01*</td>
</tr>
<tr>
<td>Within Treatments</td>
<td>10016.75</td>
<td>28</td>
<td>357.74</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12169.88</td>
<td>31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level of confidence.

The F ratio of 2.01 was not significant at the .05 level of confidence. An F ratio of 2.05 is necessary to attain
significance at the .05 level of confidence. The null hypothesis was not rejected and the research Hypothesis I-C was rejected. While the findings refute the research hypothesis, the F ratio was large enough to state that a trend was evident. This can be noted by an inspection of the group mean scores in Table IV which will be discussed in the next section on findings between groups.

Findings from Statistical Analysis of Data Between All Combinations of Treatments

Hypothesis II predicted that the significant differences in coping behavior, quantity of verbal response, and quality of verbal response would show the controlled teaching environment (Micro-Teaching Laboratory) more appropriate than (a) the environment in which there was an audience, (b) the environment in which there were exposed video-taping equipment and technicians, and (c) the environment in which there were exposed video-taping equipment, technicians, and audience.

An examination of the data recorded in Table V reveals that there were significant differences among mean scores on coping behavior in the four environments. These data were subjected to the Fisher's $t$ test to determine if significant differences existed between Treatment 1 (Micro-Teaching Laboratory) and each of the other three treatments.

The results of the Fisher's $t$ procedure are illustrated in Table VIII for the difference between means in Treatment 1 (Micro-Teaching Laboratory) and Treatment 2 (exposed video-
taping equipment and technicians). The interpretation of the $t$ for a one-tailed test was utilized since direction of the quantitative measures between treatments was hypothesized.

The Fisher's $t$ test shows that the Micro-Teaching Laboratory produced a significantly higher proportion of desirable coping behavior than did Treatment 2. This significance was at the .01 level of confidence.

**TABLE VIII**

**FISHER'S $t$ TESTS ON THE DIFFERENCES BETWEEN MEANS OBTAINED ON COPING BEHAVIOR IN FOUR TREATMENTS**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.D.</th>
<th>$t$</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>93.34</td>
<td>84.06</td>
<td>7.41</td>
<td>11.51</td>
<td>3.02</td>
<td>.01</td>
</tr>
<tr>
<td>1 - 3</td>
<td>93.34</td>
<td>90.13</td>
<td>7.41</td>
<td>10.60</td>
<td>1.05</td>
<td>N.S.</td>
</tr>
<tr>
<td>1 - 4</td>
<td>93.34</td>
<td>83.41</td>
<td>7.41</td>
<td>16.90</td>
<td>3.23</td>
<td>.01</td>
</tr>
<tr>
<td>2 - 3</td>
<td>84.06</td>
<td>90.13</td>
<td>11.51</td>
<td>10.60</td>
<td>1.97</td>
<td>N.S.</td>
</tr>
<tr>
<td>2 - 4</td>
<td>84.06</td>
<td>83.41</td>
<td>11.51</td>
<td>16.90</td>
<td>0.21</td>
<td>N.S.</td>
</tr>
<tr>
<td>3 - 4</td>
<td>90.13</td>
<td>83.41</td>
<td>10.60</td>
<td>16.90</td>
<td>2.19</td>
<td>.05</td>
</tr>
</tbody>
</table>

The finding for the Fisher's $t$ computed to test the difference between means in Treatment 1 (Micro-Teaching Laboratory) and Treatment 3 (exposed audience) is presented in Table VIII. The $t$ value of 1.05 shows that there was not a significant difference on coping behavior between Treatment 1 and Treatment 3. A look at the mean scores shows that the
Micro-Teaching Laboratory produced a higher proportion of desirable coping behavior which was in the direction stated in the hypothesis.

The Fisher's $t$ test, used for testing the difference between the means of Treatment 1 (Micro-Teaching Laboratory) and Treatment 4 (exposed video-taping equipment, technicians, and audience), is illustrated in Table VIII. The resultant $t$, significant at the .01 level of confidence, reveals that the Micro-Teaching Laboratory produced a significantly higher proportion of desirable coping behavior than did the environment with exposed video-taping equipment, technicians, and audience.

The findings indicated that the Micro-Teaching Laboratory was more appropriate in facilitating desirable coping behavior than the environments, with or without an audience, in which there were exposed video-taping equipment and technicians. The Micro-Teaching Laboratory was not more appropriate than the environment with the audience, but the higher mean obtained in the Micro-Teaching Laboratory was in the direction hypothesized. Regarding the criterion measure of coping behavior, the null sub-hypothesis (a) was not rejected while the null sub-hypotheses (b) and (c) were rejected. Research sub-hypothesis (a) was rejected and research sub-hypotheses (b) and (c) were not rejected.

An examination of the data recorded in Table VI shows that there were no significant differences among mean scores.
on quantity of verbal response in the four micro-teaching environments. However, an inspection of mean scores recorded in Table IV shows that the Micro-Teaching Laboratory effected the highest quantity of pupil talk, followed by Treatment 2 (exposed video-taping equipment and technicians) and Treatment 3 (audience) which produced the same mean proportions. Treatment 4 (exposed video-taping equipment, technicians, and audience) produced the least proportionate quantity of student-teacher talk.

The F value obtained in an analysis of variance of quality of verbal response is recorded in Table VII. While the F ratio of 2.01 did not attain significance, it was sufficiently large to state that a trend was evident. A cursory examination of Table IV reveals that the Micro-Teaching Laboratory produced the highest proportion of quality of student talk, followed in the order of decreasing proportions by the environment with exposed video-taping equipment and technicians; environment with audience; and environment with exposed video-taping equipment, technicians, and audience.

In brief, the Micro-Teaching Laboratory did not produce statistically higher proportions of student talk and quality student talk than any of the other three treatments, although on both measures of quantity and quality of student talk, it effected the highest mean proportions.

Since there were no significant differences among students' mean scores on quantity of verbal response and quality
of verbal response in the four micro-teaching environments, it cannot be stated that the Micro-Teaching Laboratory was more appropriate than any of the other three environments. With regard to the sub-hypotheses relative to quantity of verbal response and quality of verbal response, the null hypothesis was not rejected and the research Hypothesis II was rejected.

Hypothesis III-A predicted no significant differences between mean scores on coping behavior obtained in the environment with audience (Treatment 3) and the environment with exposed video-taping equipment and technicians (Treatment 2). With the Fisher's $t$ test, the difference between means in Treatment 2 and Treatment 3 on coping behavior was obtained. Since Hypothesis III-A was stated in the null form, the $t$ was interpreted from a table for a two-tailed test. The results are presented in Table VIII. The $t$ value derived was not significant at the .05 level of confidence; however, it must be pointed out that the $t$ value fell slightly short of significance. The derived $t$ value was 1.97, while the $t$ ratio required for significance at the .05 level was 2.00. It can be stated that the $t$ value was significant at the .10 level of confidence; however, on the basis of the evidence obtained, the null hypothesis was not rejected and Hypothesis III-A was sustained.

No significant difference between Treatment 2 (exposed video-taping equipment and technicians) and Treatment 3
(audience) on quantity of student talk was predicted in Hypothesis III-B. Since the resultant F value from the analysis of variance summarized in Table VI shows no significant differences among mean scores on quantity of verbal response in the four environments, it was concluded that no significant difference between Treatment 2 and Treatment 3 existed. Therefore, the null Hypothesis III-B was retained.

The testing of Hypothesis III-C, which predicted no significant differences on quality of verbal response in Treatment 2 and Treatment 3, was concluded with the analysis of variance which is summarized in Table VII. The resultant F value shows no significant differences among mean scores in the four treatments; thus, no significant difference between Treatment 2 and Treatment 3 was indicated. Although there was a greater proportion of quality of verbal response in Treatment 2 than in Treatment 3, the difference was not statistically significant. Research Hypothesis III-C, stated in the null, was retained.

A predicted difference between Treatment 3 (audience) and Treatment 4 (exposed video-taping equipment, technicians, and audience) on measures of coping behavior, quantity of verbal response, and quality of verbal response was stated in Hypothesis IV. According to Hypothesis V, the significant difference predicted was to show Treatment 3 more appropriate than Treatment 4. The F ratio recorded in the summary of the analysis of variance on coping behavior in Table V was
significant at the .01 level of confidence. The Fisher's t procedure, used to identify where the significant differences lie, shows that there was a significant difference between the means on coping behavior in Treatment 3 and Treatment 4 as shown in Table VIII. A look at the mean scores shows that the presence of an audience was more appropriate than the presence of exposed video-taping equipment, technicians, and audience in obtaining a higher proportion of desirable coping behavior. The null hypothesis was rejected and the predictions of research Hypotheses IV and V were supported on sub-hypothesis A.

The possibility of significant differences on measures of quantity of verbal response and quality of verbal response between Treatment 3 and Treatment 4 was rejected on the basis of the data presented in Tables VI and VII, respectively. The F ratio of 1.31 recorded in Table VI did not approach significance, which means that no significant differences existed between all possible comparisons of means. This was evidence that Treatment 3 did not produce a significantly higher proportion of verbal response than Treatment 4. The F value from the analysis of variance of quality of verbal response reported in Table VII shows that, while no significant differences existed, a trend was evident. Although Treatment 3 produced a higher proportion of quality student talk than did Treatment 4, the difference was not significant. The null sub-hypotheses B and C of Hypotheses IV and V were
not rejected; therefore, research Hypotheses IV and V were refuted on the sub-hypotheses B and C.

Significant differences between Treatment 2 (exposed video-taping equipment and technicians) and Treatment 4 (exposed video-taping equipment, technicians, and audience) on measures of coping behavior, quantity of student talk, and quality of student talk were predicted by Hypothesis VI. The significant differences, according to Hypothesis VII, were to show Treatment 2 more appropriate than Treatment 4 on all criterion measures. The F value in Table V shows that significant differences existed among the four treatments on the measure of coping behavior. The Fisher's t, which identifies where the significant differences lie, recorded in Table VIII shows that there was no significant difference between Treatment 2 and Treatment 4 on mean scores of coping behavior. A look at the mean scores recorded in Table VIII shows that Treatment 2 had a slightly higher mean than did Treatment 4.

It cannot be stated that Treatment 2 was more appropriate than Treatment 4 on the measure of quantity of verbal response, since the F ratio in Table VI shows no significant differences between means among all possible comparisons of treatments. In Table IV it can be noted that the mean scores in Treatments 2 and 4 were identical. Exposed video-taping equipment and technicians, with or without an audience, had the same effect on the quantity of verbal response produced.
Treatment 2 did not produce a significantly higher proportion of quality of student talk than Treatment 4 as evidenced by the F score in Table VII. Although there were no significant differences among mean scores in all treatments, the F value was sufficiently large to note the trends. In Table IV it can be seen that the mean score in Treatment 2 was numerically larger than the mean score in Treatment 4.

On the basis of the evidence obtained, null Hypotheses VI and VII were not rejected; whereas, research Hypotheses VI and VII were rejected.

Discussion of Hypothesized Data

Hypothesis I predicted a significant difference among the four environments on measures of coping behavior, quantity of verbal response, and quality of verbal response. While statistical significance was established on the measure of coping behavior, no statistical significance was obtained on the measures of quantity of verbal response and quality of verbal response. The lack of statistical significance on the measures of quantity of student talk and quality of student talk precluded the possibility of the acceptance of any further sub-hypotheses related to these two measures. It may be that environment is not a discriminating factor in the quantity and quality of verbal response produced.

The controlled teaching environment was predicted to be more appropriate than any of the other three environments
according to Hypothesis II. The Micro-Teaching Laboratory was more appropriate in producing a higher proportion of desirable coping behavior than the two environments, with or without an audience, in which there were exposed video-taping equipment and technicians. The controlled teaching environment was not more appropriate than the environment with a visible audience with respect to the proportion of desirable coping behavior produced. It may be that the presence of the small audience of eight people had a restraining effect on pupils' coping behavior. Supporting this possibility is the fact that the environment with the audience produced the smallest mean score on quantity of verbal response and the next to the smallest mean score on quality of verbal response.

Although null research Hypothesis III was sustained on the measure of coping behavior, the .10 level of confidence attained between the means in Treatment 2 (exposed videotaping equipment and technicians) and Treatment 3 (exposed audience) signified a trend. The practical significance of this trend causes a greater expectancy of a higher proportion of desirable coping behavior in the presence of an audience than in the presence of exposed video-taping equipment and technicians.

For the purpose of this study any student-initiated talk was considered quality student talk. No distinction was made between disruptive or unrelated talk and desirable and related pupil talk. In this light the proportion of quality of pupil
talk might be associated with freedom to talk. Thus a question is raised as to the effectiveness with which quality of pupil talk was measured.

Hypotheses IV-A and V predicted a significant difference between mean scores on coping behavior obtained in the environment with exposed audience and the environment with exposed audience, plus video-taping equipment and technicians. The portions of the hypotheses relating to coping behavior were accepted.

The environment with a visible audience has been shown to be at least as appropriate as the other environments in producing desirable coping behavior. A reason which may partially account for this should be considered. A classroom with an audience of eight adults may have approximated environments in which the subjects had had prior experiences. Another factor should be investigated. According to the observers' verbal reports it was easier to distinguish behavior in "live" observations than in delayed observations via videotape recordings. If this be true, the observations made during "live" performance were more precise and stringent. This would lead to an assumption that every episode of undesirable behavior was easily detected and recorded. If such specific behavior as eye movements were more difficult to detect from video-tape recordings, this might mean that the audience is more appropriate in comparison with the other environments than the results indicated.
Hypotheses VI-A and VII predicted a significant difference between mean scores on coping behavior obtained in Treatment 2 and Treatment 4. In Treatment 2 there were exposed video-taping equipment and technicians. Treatment 4 included the extraneous stimuli present in Treatment 2 plus an exposed audience. No significant difference occurred between the treatments. Since an audience may not represent a novel stimulus, this might partially account for the fact that the addition of the audience did not significantly change the coping behavior.

Whenever the findings of these data are discussed, it should be remembered that the results were obtained with pupils who had only one experience in each of the four environments. The pupils had not seen the treatment rooms prior to the time of the micro-lesson. Thus, the results can only have implications for initial experiences in each of the four micro-teaching environments.

Discussion of Non-Hypothesized Data

Although not hypothesized in this study, the data collected were subjected to the Fisher's $t$ test to determine the possibility of statistical significance between mean scores by sex on coping behavior over treatments and within treatments. The means, standard deviations, and Fisher's $t$ tests obtained are shown in Table IX.

Measures on coping behavior by sex did not vary significantly within any of the four treatments. A cursory
### TABLE IX

**Means, Standard Deviations, and Fisher's t Tests Obtained from Quantitative Measures on Coping Behavior by Sex in Four Micro-Teaching Treatments**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Treatments*</th>
<th>Total Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment 1</td>
<td>Treatment 2</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Female</td>
<td>95.00</td>
<td>6.58</td>
</tr>
<tr>
<td>Male</td>
<td>91.69</td>
<td>7.82</td>
</tr>
<tr>
<td></td>
<td>1.26</td>
<td>1.58</td>
</tr>
</tbody>
</table>

*Treatment 1 = controlled teaching environment (Micro-Teaching Laboratory).

Treatment 2 = environment in which video-taping equipment and technicians are exposed.

Treatment 3 = environment which contains only an audience.

Treatment 4 = environment in which video-taping equipment, technicians, and audience are exposed.

**Significant at the .05 level of confidence.
examination of the mean scores in Table IX shows that within all treatments the mean scores of females were higher than the mean scores of males. While no statistical analysis was made of mean scores between treatments, male and female mean scores follow the same order of decreasing proportions of desirable coping behavior: Treatment 1, Treatment 3, Treatment 2, and Treatment 4.

When the Fisher's $t$ test was computed between mean scores by sex for the combined treatments, the $t$ value was significant at the .05 level of confidence. Females scored significantly higher on coping behavior than did males. A larger sample of subjects within treatments might increase the possibility of establishing significance.

Summary

In this chapter there are a presentation and a discussion of the methods and data used to calculate the reliability of the observers, followed by detailed analyses of statistical treatment of data over all treatments and between all possible combinations of treatments on measures of coping behavior, quantity of verbal response, and quality of verbal response.

The findings show that significant differences existed among treatments on the measure of coping behavior but that no significant differences occurred on measures of quantity of verbal response and quality of verbal response. Table X contains a summary of the sources of statistical significance.
TABLE X
FISHER'S t TESTS ON DIFFERENCES BETWEEN PAIRS OF MEANS FOR COPING BEHAVIOR

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Treatment 2</th>
<th>Treatment 3</th>
<th>Treatment 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment 1</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Treatment 2</td>
<td></td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Treatment 3</td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence.
**Significant at the .05 level of confidence.
***Trend of .10 or less.

The controlled teaching environment produced the highest proportionate amount of desirable coping behavior while the environment with exposed video-taping equipment, technicians, and audience produced the lowest proportion of desirable behavior. The same pattern was followed on the measure of quality of verbal response. The greatest quantity of verbal response was achieved in the controlled teaching environment while the smallest amount of pupil talk was produced in the presence of an audience.

Statistical analyses of the non-hypothesized data revealed that statistical differences existed by sex on measures of coping behavior over combined treatments but that no statistical differences occurred within treatments.
This research study was performed in order to investigate the effects of four micro-teaching environments on fourth-grade pupils' coping behavior, quantity of verbal response, and quality of verbal response. The micro-teaching environments compared were (1) a controlled teaching environment (Micro-Teaching Laboratory); (2) environment with exposed video-taping equipment and technicians; (3) environment with exposed audience; and (4) environment with exposed video-taping equipment, technicians, and audience. This chapter presents a summary of the methods and procedures used to collect the data, the findings of the investigation, the conclusions, the educational implications, and recommendations for future research studies.

Summary of Methods and Procedures Used to Collect Data

Thirty-two students (sixteen boys, sixteen girls) randomly selected from two fourth-grade classes participated in this four-week study. Sixteen students divided into four micro-classes each of which was composed of two boys and two girls were taught fifteen-minute science lessons. The four
micro-teaching environments and the science lessons were ordered as shown in Figure 1 (p. 37). A randomly assigned teacher taught the same class in each of the micro-teaching sessions each Tuesday and Thursday for a two-week period. The same procedure and design were replicated on the two subsequent weeks with the remaining sixteen students.

Each child's behavior was coded individually by one of four trained observers using A Coping Analysis Schedule for Educational Settings to obtain quantitative measures of coping behavior. To obtain data on quantity and quality of verbal response, Flanders' System of Interaction Analysis was employed. "Live" observers coded the behavior and interaction in the environment with exposed audience. Delayed observations were made via video-tape recordings for the behavior and interaction in the other three environments. From these observations proportions of desirable coping behavior, quantity of verbal response, and quality of verbal response were obtained for the four treatments.

To predict the occurrence of significant differences among the four treatments and between all possible comparisons of treatments, seven hypotheses were stated. A one-way analysis of variance was run on each of the criterion measures to determine the possibility of significant differences among means. If a significant F ratio resulted, the data were further treated with the Fisher's t test to determine the sources of statistical significance.
Findings

Chapter IV presents the statistical treatment employed and the data used to determine the acceptance or rejection of each hypothesis. The F value of each analysis of variance was interpreted. If the F value revealed a significant difference among treatments, the Fisher's t test was applied to determine between what pairs of means the significant difference lay. Analyses of the data resulted in the following findings:

1. Coping behavior differed significantly among the four micro-teaching environments.

2. The proportion of student talk did not differ significantly among the four treatments. The controlled teaching environment did, however, produce the highest mean proportions of the four environments.

3. No significant differences appeared among the mean scores on quality of verbal response in the four environments. The trend in evidence showed that the controlled teaching environment produced a greater proportion of quality verbal response than any of the other three environments.

4. The controlled teaching environment differed significantly on the measure of coping behavior from the environments in which there were exposed video-taping equipment and technicians, inclusive or exclusive of audience. The Micro-Teaching Laboratory resulted in the highest proportion of desirable behavior, while the environment with exposed video-
taping equipment, technicians, and audience produced the lowest proportion.

5. The measure of coping behavior obtained in the controlled teaching environment did not differ significantly from that obtained in the environment with exposed audience.

6. Coping behavior in the environment with exposed video-taping equipment and technicians (Treatment 2) and the environment with video-taping equipment, technicians, and audience (Treatment 4) did not differ significantly.

7. There was no significant difference between the environment with exposed video-taping equipment and technicians (Treatment 2) and the environment with an audience (Treatment 3) on the measure of coping behavior. While the difference between means was not significant at the .05 level of confidence, it was significant at the .10 level of confidence. The environment with the audience resulted in the greater proportion of desirable coping behavior.

8. A significant difference existed on the measure of coping behavior between the environment with audience (Treatment 3) and the environment with exposed video-taping equipment, technicians, and audience (Treatment 4). Treatment 3 produced a larger proportion of desirable coping behavior than did Treatment 4.
Conclusions

From an analysis of the findings of this investigation of fourth-grade pupils' behavior in four micro-teaching environments, the following conclusions are drawn:

1. The controlled teaching environment which eliminates the presence of video-taping equipment, technicians, and audience from the teaching environment leads to more desirable coping behavior than the environments, with or without audience, in which ancillary video-taping equipment and technicians are exposed.

2. The controlled teaching environment is not more appropriate than the environment with an exposed audience on measures of coping behavior.

3. The micro-teaching environment may not be a discriminating influence in quantity of verbal response and quality of verbal response.

4. The environment with the audience, used in demonstration teaching, is equally as appropriate as the controlled teaching environment and the environment in which video-taping equipment and technicians are exposed and is more appropriate than the environment in which video-taping equipment, technicians, and audience are exposed.

5. When video-taping processes are used as a part of the teaching environment, the adjunct of an audience does not significantly change the coping behavior of students.
6. Video-taping equipment in the micro-teaching setting has distractive effects upon pupils' coping behavior.

7. The presence of video-taping equipment and cameramen in the micro-teaching environment precludes the possibility of establishing a controlled laboratory environment.

Implications

The educational implications deduced from the findings and conclusions of this study are the following:

1. Teachers using video-taping processes as an adjunct to micro-teaching should be cognizant that the presence of the ancillary equipment and the technicians necessary to implement the process alters pupils' coping behavior. The addition of an audience does not further alter the coping behavior.

2. Since a controlled teaching environment is more effective in producing desirable coping behavior than the environments which have exposed video-taping equipment and technicians, with or without an audience, the teacher should attempt to exclude auxiliary video-taping equipment and personnel from the micro-teaching environment.

3. When representative classroom students are used under typical micro-teaching conditions with exposed videotaping equipment and technicians, inclusive or exclusive of audience, difficulties with student behavior may be encountered.

4. In pre-service and inservice teacher education programs, the use of demonstration teaching before an audience
or in the Micro-Teaching Laboratory is more justifiable in terms of effects on student behavior than in the presence of video-taping equipment and technicians.

5. Teachers making use of video-taping processes to implement micro-teaching should be aware that a controlled laboratory environment cannot be established when video-taping equipment and technicians are a part of the teaching environment. The distractive effects on pupils' behavior do not permit the experimental control and manipulation of variables.

Recommendations

As a result of this study, the following recommendations for future research are projected:

1. Extended studies are needed to determine the length of time required for habituation or adjustment to each of the four micro-teaching environments.

2. An investigation should be conducted with a greater number of observations per treatment using the Flanders' System of Interaction Analysis to obtain data on quantity and quality of verbal response.

3. This study should be replicated with a modification in grade level of students to determine if the results can be generalized to elementary children.

4. When measuring quality of verbal response, more definitive measures should be used to distinguish between
student disruptive or unrelated talk and student related or contributing talk.

5. Other criterion measures such as learning and teacher-student talk patterns should be employed.

6. The effects of a larger micro-class and a larger audience should be compared with the results of this study.

7. The reliability of observations between "live" observations and those made via video-tape recordings should be investigated.
APPENDIX A

Micro-Teaching Laboratory

The Micro-Teaching Laboratory is a self-contained, portable room designed to establish a controlled environment which eliminates supervisors, technicians, and video-taping equipment as part of the micro-teaching environment. The expanded facility is approximately seven feet in width, ten feet in length, and seven feet in height. Four panels of one-way glass in the front wall facilitate observation by an unseen audience. On one side there are two portholes with plexiglass coverings to accommodate a camera view. There are two foldable tripods which support the television cameras stationed outside the Micro-Teaching Laboratory. A door in the back permits easy entrance and exit. The Micro-Teaching Laboratory has built-in air exchange, lighting, and sound systems.
### APPENDIX B

Summary of Categories for Interaction Analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEACHER TALK</strong></td>
<td>1. ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.</td>
</tr>
<tr>
<td></td>
<td>2. PRAISES OR ENCOURAGES: praises and encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying &quot;uhhuh?&quot;</td>
</tr>
<tr>
<td></td>
<td>3. ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five.</td>
</tr>
<tr>
<td></td>
<td>4. ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.</td>
</tr>
<tr>
<td><strong>INDIRECT INFLUENCE</strong></td>
<td>5. LECTURES: giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.</td>
</tr>
<tr>
<td></td>
<td>6. GIVES DIRECTIONS: directions, commands, or orders with which a student is expected to comply.</td>
</tr>
<tr>
<td><strong>DIRECT INFLUENCE</strong></td>
<td>7. CRITICIZES OR JUSTIFIES 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.</td>
</tr>
</tbody>
</table>
8. **STUDENT TALK-RESPONSE**: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.

9. **STUDENT TALK-INITIATION**: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.

10. **SILENCE OR CONFUSION**: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.
APPENDIX C*

Categories for A Coping Analysis Schedule for Educational Settings (CASES)

R. L. Spaulding

1. **Aggressive Behavior**:
   Direct attack: grabbing, pushing, hitting, pulling, kicking, namecalling; destroying property: smashing, tearing, breaking.

2. **Negative (Inappropriate) Attention-Getting Behavior**:
   Annoying, bothering, whining, loud talking (unnecessarily), attention-getting aversive noise-making, belittling, criticizing.

3. **Manipulating, Controlling, and Directing Others**:
   Manipulating, bossing, commanding, directing, enforcing rules, conniving, wheedling, controlling.

4. **Resisting Authority**:
   Resisting, delaying; passive aggressive behavior; pretending to conform, conforming to the letter but not the spirit; defensive checking.

5. **Self-Directed Activity**:
   Productive working: reading, writing, constructing with interest; self-directed dramatic play (with high involvement).

6. **Paying Close Attention; Thinking, Pondering**:
   Listening attentively, watching carefully; concentrating on a story being told, a film being watched, a record played; thinking, pondering, reflecting.

7. **Integrative Sharing and Helping:**

Contributing ideas, interests, materials, helping; responding by showing feelings (laughing, smiling, etc.) in audience situations; initiating conversation.

8. **Integrative Social Interaction:**

Mutual give and take, cooperative behavior, integrative social behavior; studying or working together where participants are on a par.

9. **Integrative Seeking and Receiving Support, Assistance and Information:**

Bidding or asking teachers or significant peers for help, support, sympathy, affection, etc., being helped; receiving assistance.

10. **Following Directions Passively and Submissively:**

Doing assigned work without enthusiasm or great interest; submitting to requests; answering directed questions; waiting for instructions as directed.

11. **Observing Passively:**

Visual wandering with short fixations; watching others work; checking on noises or movements; checking on activities of adults or peers.

12. **Responding to Internal Stimuli:**

Daydreaming; sleeping; rocking or fidgeting; (not in transaction with external stimuli).

13. **Physical Withdrawal or Passive Avoidance:**

Moving away; hiding; Avoiding transactions by movement away or around; physical wandering avoiding involvement in activities.

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Note: Categories 3, 5, 7, 8, and 9 are further coded as a or b in structured settings to indicate appropriate or inappropriate timing or location of activity (based on the teacher’s expectations for the setting). Example: 5a would be recorded when a child was painting during art period (when painting was one of the expected activities). Painting during "story time" or in an academic setting would normally be coded 5b. The code a represents behaving in a certain
coping category at the "right" time and place; b represents behaving in a certain coping category at the "wrong" time or place. What is "right" or "wrong" is based on the values and goals of the teacher or authority responsible in a given situation.
APPENDIX D

Uniform Information Given Micro-students upon Initial Arrival

In just a moment you will be assigned to a teacher. She will be your teacher each time you attend. In your class there will be four pupils, two boys and two girls. Each time you are here you will be taught a fifteen-minute science lesson. You will be in a different room for each of the four lessons. On one occasion you will be taught in a Micro-Teaching Laboratory. This is a small, portable room. While you are taught in this room, you will be video-taped and there will be an audience observing you. You will not be able to see the audience. In one room you will be video-taped by two technicians. In another room there will be just an audience. One time you will be video-taped while an audience observes you.

Name tags will be pinned on you just before each session. Please remember to return these to your teacher at the end of the lesson.

When each lesson is concluded, your teacher will walk with you to the school bus.

I appreciate your coming and hope that you will enjoy the science lessons.
APPENDIX E

Room Arrangements for Micro-teaching

Treatment 1

(Micro-Teaching Laboratory)

1. Teacher
2. Micro-class
3. Video cameras with technicians
4. Video recorder and monitor
5. Audience
6. Door of Micro-Teaching Laboratory
7. Doors into classroom
8. Microphone suspended from ceiling
Treatment 2
(Exposed video-taping equipment and technicians)

1. Teacher
2. Micro-class
3. Microphone
4. Camera and Cameraman
5. Technician
6. Video recorder and monitor
7. Doors
8. Chalk board
Treatment 3
(Exposed audience)

1. Teacher
2. Micro-class
3. Audience
4. Door
5. Chalk board
Treatment 4
(Exposed video-taping equipment, technicians, and audience)

1. Teacher
2. Micro-class
3. Microphone
4. Chalk board
5. Cameras and cameramen
6. Control panel
7. Technician
8. Doors
9. Glass panel
APPENDIX F*

Typical Classification of CASES Categories

**Desirable**

3a Appropriate Directing Others  
5a Appropriate Self-Directed Activity  
6 Thoughtful Behavior, Rapt Attention  
7a Appropriate Sharing and Helping  
8a Appropriate Social Integration  
9a Appropriate Help Seeking and Affiliation  
10 Obedient Task Orientation and Conformity to Procedures

**Inappropriate**

5b Inappropriate Self-Directed Activity  
7b Inappropriate Sharing and Helping  
8b Inappropriate Social Interaction  
9b Inappropriate Help Seeking  
11 Visual Wandering  
12 Daydreaming  
13 Physical Withdrawal or Avoidance

**Unacceptable**

1 Aggression  
2 Negative Attention-Getting  
3b Domination, Bossiness  
4 Resistance

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