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PATTERNS OF TEACHER-STUDENT INTERACTION IN SELECTED

JUNIOR HIGH SCHOOL GENERAL MUSIC CLASSES

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
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By

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CHAPTER I

INTRODUCTION AND PROBLEM

Introduction

Educational researchers are seemingly in general

agreement that the direct, systematic observation of

teachers while they are engaged in the act of teaching,

is a fruitful means of identifying those behaviors which

are desirable in teaching, and they place high priority

on classroom observation techniques as topics for future

research. Medley and Mitzel have stated:

> Certainly there is no more obvious approach
> to research in teaching than direct observation
> of the behavior of teachers while they teach
> and pupils while they learn.[1]

Smith and Meux, who have conducted much research

in the area of systematic observation of classroom

behaviors, have suggested:

> If very little is known about a phenomenon,
> the way to begin an investigation of it is to

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[1]D. M. Medley and H. E. Mitzel, "Measuring Class-
room Behavior by Systematic Observation," Handbook of
Research on Teaching (N. L. Gage, ed.) (Chicago: Rand
McNally and Co., 1963), p. 247.

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observe and analyze the phenomenon itself. It must be ... . classified into its various elements.[2]

From a lifetime of research in classroom interaction, Withall has inferred that:

> The teacher's impact on the learners derives less from her teaching technique and methods than from the professional and personal values she brings to the classroom as they are revealed and communicated by her classroom interaction with learners.[3]

While recognizing the value of questionnaires, method studies, expert's judgements, and global assessments of the characteristics of teachers as ancillary tools, Withall maintains that, ". . . it is through the difficult and demanding methods of situational studies in live classrooms that the break-throughs in education will come."[4]

Openshaw has undertaken a comprehensive review of literature in the broad field of teacher-student classroom behaviors. He concluded that:

> There is a growing conviction among several investigators that to understand teaching and learning, efforts must be focused on the further illumination of the dynamics of the classroom.

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[2] B. O. Smith and M. O. Meux, A Study of the Logic of Logic of Teaching (Urbana, Ill.: University of Illinois, 1962), p. 8.

[3] John Whithall, "Mental Health--Teacher Education Research Project," Journal of Teacher Education, XIV (September 1963), p. 324.

[4] Ibid., p. 323.

The procedures and approaches used by different researchers to study this problem vary widely, but at the present state of knowledge about teaching-learning, this variety is both reasonable and desirable. Currently, there is insufficient data to support strong knowledge claims about teacher-learner interaction.[5]

A conference of teacher educators and researchers, sponsored recently by The Ohio State University, encouraged the, ". . . relative efficiency of concentrating knowledge development activities on phenomena largely unexplicated or outside teacher education curricula now, such as teacher and learner behavior . . . ."[6] The conference further identified teacher behaviors as a high priority area among points of entry for the researcher in teacher education.[7]

Research conducted during the past two decades has produced a number of category systems for use in the systematic observation of classroom behaviors. The early systems of Withall,[8] Lippet and

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[5]Karl Openshaw, Development of a Taxonomy for the Classification of Teacher Classroom Behavior, (Columbus, Ohio: The Ohio State University, 1967), p. 142.

[6]Frederick R. Cyphert and Ernest Spaights, An Analysis and Projection of Research in Teacher Education, (Columbus, Ohio: The Ohio State University, Cooperative Research Project, No. F-015, 1964), p. 300.

[7]Ibid., p. 303.

[8]John Withall, "The Development of a Technique for the Measurement of Social-Emotional Climate in the Classrooms," Journal of Experimental Education, XVII (1949), pp. 347-361.

White,[9] and Anderson[10] form some of the foundations upon which the later systems of Flanders,[11] Medley and Mitzel,[12] Hughes,[13] Smith,[14] Bellack,[15] Taba[16] and Openshaw[17] were built.

[9]R. Lippet and R. K. White, "The Social Climate of Children's Groups," Child Behavior and Development, Ed. R. G. Barker, J. S. Kounin, and H. F. Wright. (New York: McGraw-Hill Book Co., 1943), pp. 485-508.

[10]H. Anderson and E. Brewer, "Studies of Teacher's Classroom Personalities: Dominant and Socially Integrative Behaviors of Kindergarten Teacher," Applied Psychology Monographs, VI (1945).

[11]Ned Flanders, Helping Teachers Change Their Behavior, (Ann Arbor, Michigan: School of Education, University of Michigan, 1963).

[12]D. M. Medley and H. E. Mitzel, "Some Behavioral Correlates of Teacher Effectiveness," J. of Educ. Psych., L (December, 1959), pp. 239-246.

[13]Marie Hughes, Development of the Means for the Assessment of the Quality of Teaching in the Elementary Schools, (Salt Lake City: University of Utah Press, 1959).

[14]B. O. Smith and M. O. Meux, op. cit.

[15]A. A. Bellack, J. R. Davitz in collaboration with H. W. Kliebard and R. T. Hyman, The Language of the Classroom: Meanings Communicated in High School Teaching (New York: Teachers College, Columbia University, Cooperative Research Project, No. 1497, 1963).

[16]Hilda Taba, Samual Levine and Freeman F. Elzey, Thinking in Elementary Education (San Francisco: San Francisco State College, Cooperative Research Project, No. 1574, 1964).

[17]Karl Openshaw, op. cit.

The systematic observation of teacher behaviors has been conducted in a varied range of subject and grade areas. Elementary grades exclusively have been the subject of studies by Anderson and Brewer,[18] Medley and Mitzel,[19] Bowers and Soar,[20] and Perkins.[21] The middle grades were studied by Cornell,[22] while Hughes[23] studied both elementary and secondary classrooms. The exclusive interest in the study of classroom behaviors in the junior high grades was expressed in the work of Withall (art),[24]

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[18]H. Anderson and E. Brewer, op. cit.

[19]D. M. Medley and H. E. Mitzel, "A Technique for Measuring Classroom Behavior," J. of Educ. Psych. IL (April, 1958), pp. 86-92.

[20]Norman Bowers and Robert Soar. Studies in Human Relations in the Teacher-Learner Process, (Columbia, S.C.: University of South Carolina, Cooperative Research Project, No. 8143, 1961).

[21]Hugh V. Perkins, "A Procedure for Assessing the Classroom Behavior of Students and Teacher," American Educational Research Journal, I (November, 1964), pp. 249-260.

[22]Francis G. Cornell, Charles M. Lindvall and Joe L. Saupe, An Exploratory Measurement of Individuality of Schools and Classrooms, (Urbana, Ill.: Bureau of Educational Research, University of Illinois, 1952).

[23]Marie Hughes, op. cit.

[24]John Withall, "An Objective Measurement of a Teacher's Classroom Interaction," J. of Educ. Psych. XLVII (April, 1956), pp. 203-212.

Amidon,[25] Flanders (Mathematics and Social Studies),[26,27] and Miller (Home Economics).[28] Senior high school teachers and classrooms were systematically observed by Wright (Mathematics),[29] Anderson,[30] Smith (English, Social Studies, Mathematics and Science),[31] Bellack (Problems of Democracy),[32] and Evans (Biological Science).[33]

[25]Edmund Amidon and Ned Flanders, "The Effects of Direct and Indirect Teacher Influence on Dependent-prone Students Learning Geometry," J. of Educ. Psych. LII (1961), pp. 286-291.

[26]Ned Flanders, "Teacher and Classroom Influences on Individual Learning," paper delivered at the 7th Curriculum Research Institute of the A.S.C.D., 1961.

[27]Ned Flanders, Teacher Influence, Pupil Attitude and Achievement, (Washington, D.C.: Cooperative Research Monograph No. 12, Government Printing Office, 1965).

[28]George L. Miller, "An Investigation of Teaching Behavior and Pupil Thinking," (Unpublished Doctoral dissertation, University of Utah, 1964).

[29]E. Muriel J. Wright, "Development of an Instrument for Studying Verbal Behaviors in a Secondary School Mathematics Classroom," J. of Exp. Educ., XXVIII (December, 1959), pp. 103-121.

[30]John Anderson, "Student Perceptions of Teacher Influence," (Unpublished Doctoral dissertation, University of Minnesota, 1960).

[31]Smith and Meux, op. cit.

[32]Bellack, et. al., op. cit.

[33]Thomas P. Evans, "Exploratory Study of the Verbal and Non-Verbal Behaviors of Biology Teachers and Their Relationship to Selected Personality Traits," (Unpublished Doctoral dissertation, The Ohio State University, 1968).

Interaction Analysis, as conceived by Flanders, was used in relation to student teacher performance by Kirk,[34] Amidon,[35] and Hough,[36] in-service training of practicing teachers by Flanders,[37] high school physics by Pankratz,[38] high school biology classes by Gold[39] and elementary instrumental music classes by Snapp.[40]

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[34]Jeffry Kirk, "The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers," (Unpublished Doctoral dissertation, Temple University, 1964).

[35]Edmund Amidon, "The Use of Interaction Analysis at Temple University," The Study of Teaching, Ed. Dean Corrigan, (Washington,D.C.: The Association of Student Teaching, 1967), p. 42.

[36]John B. Hough, "A Study of the Effects of Five Experimental Treatments in the Development of Human Relations Skills and Verbal Teaching Behaviors of Pre-Service Teachers," (Mimeographed) (Columbus, Ohio: The Ohio State University, College of Education, 1965).

[37]Ned Flanders, Helping Teachers Change Their Behavior, (Ann Arbor: School of Education, University of Michigan, 1963).

[38]Roger S. Pankratz, "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Physics," (Unpublished Doctoral dissertation, The Ohio State University, 1966).

[39]Louis L. Gold, "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Biology," (Unpublished Doctoral dissertation, The Ohio State University, 1966).

[40]David Snapp, "A Study of the Accumulative Musical and Verbal Behavior of Teachers and Students in Fifth Grade Instrumental Music Classes," (Unpublished Masters thesis, The Ohio State University, 1967).

The Problem

While evidence indicates that systematic observations of classroom discourse are productive research endeavors, and studies have been made in many grade levels and subject areas, the interactive behaviors in music class-rooms have not been analyzed objectively through systematic observation. Although total teacher-student interaction was a concern of this study, the analysis of those teacher-student verbal interactive behavior patterns found in selected junior high school general music class-rooms was the primary objective.[41]

Through the application of Interaction Analysis techniques to selected junior high school general music classes, this study sought answers to the following questions:

1. What patterns of teacher-student interaction can be observed in junior high school general music classes?

   a. Do patterns of teachers rated as most effective differ from patterns of teachers rated least effective?

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[41]The principal means of collecting data was the "Observation System for the Analysis of Classroom In-struction," a sixteen category modification by Hough, of the Flanders Interaction Analysis Scale. The Hough Scale, together with the rationale for its use in this study, and a complete description of Interaction Analysis, is found in Chapter III.

       b.   Do patterns vary among teachers rated as
            most effective?

       c.   Do patterns vary among teachers rated as
            least effective?

       d.   Do patterns of individual teachers vary
            from one class session to the next?

2. Are there differences between the patterns of teacher-student interactions in junior high school general music classrooms and patterns of teacher-student interactions in classrooms other than music?

The following null hypotheses were tested. (The terminology is that associated with the Flanders Interaction Analysis concept, in general, and the Hough modification, in particular).

1. There is no significant difference between the amount of time spent in each of the scale's sixteen categories by most effective and least effective teachers.

2. There is no significant difference between the amount of time spent in each of the category areas (A-H) by most effective and least effective teachers.

3. There is no significant difference in the ratio of indirect teacher talk (categories 1-5) to direct teacher talk (categories 6-9) in most effective and least effective teachers.

4. There is no significant difference in the ratio of direct teacher talk (categories 6-9) to student

talk (categories 10-12) in most effective and least effective teachers.

6. There is no significant difference in the amount of time spent in steady-state cells (indicating sustained patterns) against the amount of time spent in transitional cells (indicating a move from one category to another) in most effective and least effective teachers for their total pattern.

> a. There is no significant difference in the ratio of steady-state cells to transitional cells for each of the categories in most effective and least effective teachers.

7. There is no relationship between the patterns of interaction of most effective teachers.

8. There is no relationship between the patterns of interaction of least effective teachers.

9. There is no relationship between the patterns of interaction of a given teacher from one class session to another.

Assumptions

1. The teacher's verbal behaviors in the general music classroom are consistent with the teacher's total behavior patterns.

That the study of non-verbal behaviors might yield significant knowledges about the teaching act is not denied. Studies of Perkins,[42] Evans,[43] Bonney,[44] Cornell,[45] and Waimon and Hermanowicz,[46] included the observation of verbal, as well as non-verbal, or the exclusive concentration on non-verbal behaviors. The recent development of video-taping equipment creates the means of avoiding live observations when systematically recording behaviors, and the concentration on behaviors beyond the verbal limitations. It provides a more accurate method of reviewing the classroom repeatedly in making the analysis. However, in spite of these advantages, objectivity in the recording of non-verbal behaviors has not yet been satisfactorily demonstrated.

In the absence of any evidence to the contrary, with regard to the general music classroom, this assumption is based on the conclusions of Withall,[47]

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[42]Perkins, op. cit.

[43]Evans, op. cit.

[44]Merl E. Bonney, "Social Behavior Differences between Second Grade Children of High and Low Sociometric Status," J. of Educ. Res. XLVIII (March, 1955), pp. 481-495.

[45]Cornell, et. al., op. cit.

[46]Morton D. Waimon and Henry J. Hermanowicz, A Conceptual System for Prospective Teachers to Study Teaching Behavior, (Normal, Ill.: Illinois State University, 1965).

[47]John Withall, "The Development of a Technique for the Measurement of Social-Emotional Climate in the Classrooms," J. of Exp. Educ., XVII (1949), p. 349.

Smith, who suggested that, "teaching behavior is primarily verbal,"[48] and Flanders, who not only found verbal behaviors adequate samples of total behavior, but, further, that the teacher's verbal statements are consistent with his non-verbal behaviors, in fact, his total behavior.[49]

2. General music classrooms, while generally different from the more academic classrooms, are often verbally oriented to the point of making them equally analyzable by techniques employed in other classrooms. Thus, it is further assumed that the performance classroom (choir, band, orchestra) would not be appropriate for similar analysis due to the unique and rather specialized nature of instruction employed there, and the extended period of time during which no verbal interaction would take place.

3. The composite evaluation ratings of music supervisors in the system from which the sample was selected, is an adequate evaluation of the sample. In a review of studies relating to the evaluation of music teachers, Benner stated:

[48]Smith, op. cit., p. 3.

[49]Ned Flanders, Teacher Influence, Pupil Attitude and Achievement, (Washington, D.C.: U.S. Government Printing Office, 1965), p. 12.

There seems to exist in the literature of
teaching success, the consensus that ratings
by administrative and supervisory personnel
operate as reliable measures. Operationally,
the teacher is successful to the extent he is
perceived to be successful by those who
officially exercise evaluative judgements.[50]

This assumption on the adequacy of the evaluations
of supervisory personnel alone is further based on the
findings of Benner in that there was relatively low
correlation between the evaluations of music supervisors,
principals and superintendents. Building, or unit
administrative personnel tend to judge a music teacher's
success from a different perspective than the music
supervisor or administrator, who not only tends to be
more interested in the musical worth of a teacher's
work, but also is more objective in the evaluation of
the teacher in terms of the relative success or failure
observed in other teachers.

Definitions

1. Systematic Observation.--Systematic Observation
refers to the live and/or taped observation of classroom
discourse, with a resultant classification of observed
behaviors according to a system of categories.

2. Interaction Analysis.--Interaction Analysis is
the term used to describe the systematic observation of

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[50]Charles Benner, "The Relationship of Pre-Service
Measures to Ratings of Music Teachers," (Unpublished
Doctoral dissertation, The Ohio State University, 1963),
p. 32.

interactions between the teacher and students in the
classroom discourse, and more specifically in reference
to the Flanders concept of identifying verbal behaviors.
A detailed description of the Flanders concept of
interaction analysis, together with the Hough modifications
of Interaction Analysis, is given in Chapter II.

Delimitations

1. While the Hough scale accounts categorically
for non-verbal behaviors, this study was primarily one
of the identification of teacher-student verbal inter-
active behaviors, and no attempt was made to identify
which of many types of activities each specifically
recorded non-verbal behavior represented, beyond those
specified in the scale.

2. This study was limited to the nine teachers in
the sample. In view of the restricted sample, no attempt
was made to relate the results parametrically.

3. Only one school system was used in the selection
of the sample, for reasons outlined in Chapter III.

4. Classrooms taped in this study were limited to
seventh and eighth grade general music classes.

5. The researcher did not make personal value
judgements on the quality of teaching in any of the
observed and recorded class sessions. The comparative
effectiveness of the teachers, as the result of

supervisory evaluation necessary through the design of the study, was the only attempt at assessing quality.

6. This study was primarily one of description, although inferences of a prescriptive nature are suggested.

7. Content, subject matter, or the topical nature of the verbal discourse was not of concern in this study.

Importance of Study

This chapter has established the importance of this study through the presentation of research evidence supporting the need for the direct, systematic observation of classrooms as a means of further developing knowledges of a descriptive nature so that perspective recommendations might be made in the training of teachers, and in improving the qualities and techniques of practicing teachers. While there has been ample research effort in the systematic observation of the classrooms in many subjects and grade levels, using a variety of scales and techniques, the paucity of studies dealing with the interaction between the music teacher and the music student raises questions that should be the concern of the conscientious music educator. Curriculum specialists in music have long been concerned with the content of music courses, and outlines of material presented in the general music class. But,

because there has been so little interest in the analysis
of interactive behaviors in the general music classroom,
little is known of the effect certain types of teacher
behaviors may have on the control of student behaviors,
the eliciting of positive student responses, the develop-
ment of a healthy environment for music learning, or the
development of the appreciation of music by students. It
was to these concerns that this study was directed.

CHAPTER II

REVIEW OF RELATED LITERATURE

There has been considerable research in the area of teacher behaviors, and teacher-student classroom interaction. This chapter reviews the significant studies that contributed to the development of Interaction Analysis, the principles of Interaction Analysis as conceived by Flanders, studies using Interaction Analysis as the means of collecting data, modifications of the original Flanders Scale, representative studies and systems dealing with aspects of classroom observation other than the Flanders Interaction concept, and the three studies found to be most nearly alligned with the identification of the behaviors of music teachers.

Development of Interaction Analysis

Early Studies

For nearly two decades, researchers have sought to identify the permissive teacher and the dominating teacher in order to determine the effect of such teaching on their respective students. They have identified these two polarities of teaching behaviors in a variety of ways, but

inevitably, on the one hand, some teachers tend to be permissive in the classroom, to allow and expect a certain amount of student initiated, spontaneous behavior and to create a classroom environment that could be called democratic, in that the teacher is not necessarily the completely dominant factor. On the other hand, some teachers demand strict attention to a formal, regimented, and strictly controlled procedure, with little attention focused on activities or objects other than the teacher and the class content material. These teachers conduct themselves in a domineering, autocratic manner, never allowing the classroom focus to stray too far from themselves as the central controlling element. Classrooms of the democratic variety are often characterized by seemingly chaotic conditions, with children moving about freely, and entering into discussion and dialogue without fear of reprisals. The tightly controlled classroom is characterized by a structured and controlled orderliness, and considers the mastery of subject matter at hand to be the unquestioned objective or goal.

Withall established a precedent in identifying a continuum scale to measure a teacher's verbal statements as being learner-centered or teacher-centered. His seven point classification system was presented as follows:

Learner-centered

1. learner-supportive statements or questions

2. acceptant or clarifying statements or questions

3. problem-structuring statements or questions

Continuum

4. neutral-structuring statements evidencing no supportive intent

Teacher-centered

5. directive statements or questions

6. reproving, disapproving or disparaging statements or questions

7. teacher-supportive statements or questions

The scale was intended as a means of coding and typing transcripts of taped sound recordings of classroom behaviors of the teacher. Withall's conclusions made a significant impact on later studies. Among these conclusions, he found that:

1. Dependency of the learner upon the teacher is undesirable.

2. Giving opportunity to the learner for free choice is desirable.

3. Verbal expression of understanding by the teacher facilitates problem-solving.

4. There is a consistency in the kind of atmosphere the same teacher creates in his classroom over a period of time.

5. Teacher-centered patterns tend to produce anxiety in students and reduce the student's subsequent ability to recall material.[1]

Somewhat earlier, Lippet and White had concluded that incidence of what they called, "aggressive learner behavior," or the willingness, desire or motivation that students have to learn, in autocratically taught groups, was either very high or very low when compared to democratically taught groups. In those autocratic groups where student agression was low, it showed a marked increase when the teacher left the room. When a teacher was in the room, the work output of students was about the same for democratic and autocratic groups, but when the teacher left the room, there was a significant drop in work output by the autocratic groups, but little change in the output of democratic groups.[2]

In a series of studies initiated around 1945, Anderson sought to relate the significance of what he called "teacher-dominant" and "teacher-integrative" contacts while conducting live observations of teachers

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[1] John Withall, "The Development of a Technique for the Measurement of Social-Emotional Climate in the Classrooms," J. of Exp. Educ., XVII (1949), pp. 347-361.

[2] R. Lippet and R. K. White, "The Social Climate of Children's Groups," Child Behavior and Development, Ed. R. G. Barker, (New York: McGraw-Hill Book Co., 1943), pp. 485-508.

in pre-school and kindergarten classes. His research
extended over several years, and in a later study, he
concluded that, "integrative behaviors in one child
induced integrative behavior in the companion, domination
incited domination, and integration and domination were
psychologically different."[3] With regard to teacher-
student relations, his research indicated that integration
in the teacher induced integrative behavior in the child.
Children with the more dominating teacher showed
significantly higher frequencies of non-conforming
behavior, directly supporting the hypothesis that
domination incites, not only resistance, but submission
and atrophy.[4]

Flanders System of Interaction Analysis

Probably the most widely used application of the
democratic-autocratic, or permissive-dominant principle
in the description of classroom behaviors, is the Flanders
System of Interaction Analysis.[5] Flanders, using the
basic Withall formula, in the initial stages of the
development of his concepts, suggested that teacher-centered

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[3]H. Anderson, Creativity and Its Cultivation, (New
York: Harper and Brothers, 1959), p. 132.

[4]Ibid., p. 136.

[5]Edmund J. Amidon and Ned A. Flanders, The Role of
Teacher in the Classroom, (Minneapolis: Paul S. Amidon
and Associates, Inc., 1963).

behaviors foster more negative feelings on the part of
students, and result in higher anxiety and greater concern
with inter-personal problems than student-centered
behaviors.[6] Conversely, student-centered behaviors are
characterized by greater concern with learning problems.

The initial formulations of the matrix analysis of
classroom verbal interaction, upon which the Flanders
concept is built, took place in New Zealand during the
summer of 1957, from observations which took place in
elementary classrooms.[7] Since that time, the system has
grown, not only to enjoy widespread acceptance, but, also
to share in substantial criticism and abuse.

Of the ten categories in the scale, four are
ascribed to Indirect Influence Teacher Talk, or those
descriptive behaviors that show a teacher as being
receptive to student ideas, feelings, or responses.
These behaviors correspond to what earlier researchers
had called permissive or democratic behaviors. Three
categories are related to Direct Influence Teacher Talk,
indicating that a teacher is the dominant dialogue figure,

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[6]Ned A. Flanders, "Personal-Social Anxiety as a
Factor in Experimental Learning Situations," J. of Educ.
Res., XLV (October, 1951), pp. 100-110.

[7]Edmund J. Amidon and John B. Hough, Interaction
Analysis: Theory, Research and Application, (Reading,
Mass.: Addison-Wesley Publishing Co., 1967), p. vii.

corresponding to what earlier researchers considered as dominant or autocratic. Flanders went further than previous efforts in describing classroom environments, when he included behaviors of students in his category system, and considered the relationship, or the interaction of teacher and student verbal behaviors as centrally essential in determining classroom climate. Of the three remaining categories, two are related to student behaviors. They are Student Responses and Student-Initiated Talk. The tenth is Noise, Silence, or Confusion, during which time no distinct verbal interaction is taking place. The complete Flanders Scale, as it was originally conceived, is given in Figure 1.

In the use of the Flanders System of Interaction Analysis, each category is assigned a number, representing a specific category, and not a continuum, or rating scale. The observer, while observing the classroom in process, records the number of the category he sees every three seconds, generally in columns of twenty numbers, to approximate the twenty categories he should record every minute. If he observes more than one behavior in the three second period, he records the additional one also. The three second forced selection period is not adhered to precisely, but is the means by which trained observers are able to account for all verbal interactions

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

Fig. 1.--Summary of Categories Used in the Flanders Interaction Analysis Technique.

STUDENT TALK	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.

Fig. 1.--Continued

that transpire, and gives the system an element of standardization in total category recordings. If prolonged periods occur, during which time no verbal interactions are observed, recording stops, until such time as classroom interaction resumes. Such events that would require the halting of recording procedures might be the teacher being called from the room, public address system activity, or someone coming into the room to talk to the teacher, necessitating the halt in class procedures.

After the classroom verbal behaviors have been recorded, and the observer has a series of numbers in columns of twenty, the interaction is recorded onto a

10 x 10 cell matrix. A sample matrix is shown in Figure
2, with the following ten numbers recorded:

10
6
1
1
4
8
10
7
6
10

The numbers, representing specific observed
behaviors, are recorded by pairs to account for the
interaction between two types of verbal behaviors.
The first two numbers (10-6) are represented by a
tally mark in the cell formed by the intersection of
the tenth row and the sixth column. The second pair
of numbers (6-1) are represented by a tally mark in the
cell formed by the intersection of row six and column
one. The third pair of numbers (1-1) are represented
by a tally mark in the cell formed by the intersection
of row one and column one. The process is continued
until all the observed and recorded numbers are placed
similarly in the matrix. Once recorded completely, the
columns are totaled and analysis proceeds. It is possible
to determine the percentage of time spent in each of the
ten categories, and also the ratios between various
sections and subdivisions.[8]

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[8]Interaction Analysis procedures are more fully ex-
plained in the materials section of Chapter III.

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

Fig. 2.--Sample Matrix (Flanders)

Applications of Interaction Analysis

The Flanders System of Interaction Analysis has traditionally been used as a means of collecting data on verbal interactive behaviors, and as a means of providing preservice teachers and in-service teachers a feedback system regarding their verbal behaviors while teaching, and the effect of those behaviors on the learning of their students.

Conclusions from the application of the Flanders Scale have generally supported the notion that the

indirect, permissive, or democratically managed classroom, produces the atmosphere, climate or environment most conducive to student achievement. Students of indirect teachers in eighth grade mathematics and science classes were rated higher in achievement.[9] Furst and Amidon found significant differences in verbal interactive behaviors when comparing subject matter. They found that the verbal behaviors of teachers of social studies were more indirect than those of the teachers of either arithmetic or reading in the elementary grades.[10]

In a complex study, a group of student teachers and a group of public school cooperating teachers were taught the Flanders System of Interaction Analysis. A similar group of student teachers and public school cooperating teachers were taught a course in learning theories. Four separate combination groups of cooperating teachers and student teachers, trained with one different course, were formed for the pre-service periods of student teaching.

1. Interaction Analysis student teachers with Interaction Analysis cooperating supervisors.

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[9]Edmund J. Amidon and Ned A. Flanders, "The Effects of Direct and Indirect Teacher Influence on Dependent-prone Students Learning Geometry," J. of Educ. Psych., LII (1961), pp. 286-291.

[10]Norma Furst and Edmund Amidon, "Teacher-Pupil Inter-action Patterns in Elementary School," reported in Amidon-Hough, Interaction Analysis, (Reading, Mass.: Addison-Wesley Publishing Co., 1967), p. 167.

2. Learning theories student teachers with learning theories cooperating supervisors.

3. Interaction Analysis student teachers with learning theories cooperating supervisors.

4. Learning theories student teachers with Interaction Analysis cooperating supervisors.

The study produced results supporting previous interaction applications, and further, found that student teachers trained in Interaction Analysis exhibited traits more like those active, practicing in-service teachers whose students scored higher in achievement tests, than student teachers trained in learning theories.[11]

An experimental study by Kirk found that Interaction Analysis taught to pre-service student teachers produced teachers who talked less, permitted more student initiated talk, and accepted more student ideas than student teachers taught in the traditional manner.[12]

Modifications of the Flanders Scale

While the Flanders System of Interaction Analysis has been one of the most popular research tools of its type, it has not been exempted from criticism within the area of educational research. The speculation that the

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[11]Edmund Amidon, "The Use of Interaction Analysis at Temple University," The Study of Teaching, Ed. Dean Corrigan, (Washington, D.C.: The Association for Student Teaching, 1967), pp. 42-54.

[12]Jeffry Kirk, "The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers," (Unpublished Doctoral dissertation, Temple University, 1964).

Flanders Scale is not as comprehensive, in its brevity, as is ideally necessary for the description of classroom behavior, has led to several modifications, some of which are noted here.

Amidon and Hunter Modification.[13]--Amidon and Hunter have modified the original Flanders Scale (see Figure 3) to account for the types of praise a teacher uses (2a, 2b, 2c), the means by which a teacher accepts student ideas (3a, 3b, 3c), the type of question a teacher asks (4a, 4b, 4c, 4d), the nature of the teacher's criticism (7a, 7b, 7c), the types of student responses and initiated student talk (8a, 8b, 8c and 9a, 9b, 9c), and the sub-division of category 10 into Silence or Confusion (10a, 10b).

The ten basic categories of the original Flanders Scale are preserved, with only the sub-categories added. However, due to the increased scope of the scale, analysis would be made on a 24 x 24 cell matrix--one cell for each major category and sub-category--rather than the 10 x 10 cell matrix used by Flanders.

Hough Modification.--The first Hough modification (1965) consisted of thirteen categories.[14] In addition

[13]Edmund Amidon and John Hough, Interaction Analysis: Theory, Research and Application, (Reading, Mass.: Addison-Wesley Publishing Co., 1967), p. 388.

[14]John B. Hough, "A Study of the Effects of Five Experimental Treatments in the Development of Human Relations Skills and Verbal Teaching Behaviors of Pre-Service Teachers," The Ohio State University, College of Education (mimeographed, 1965).

Teacher Talk	1.	Accepts feeling
	2.	a. Praises
		b. using public criteria
		c. using private criteria
	3.	Accepts idea through:
		a. description
		b. inference
		c. generalization
	4.	Asks:
		a. cognitive memory question
		b. convergent question
		c. divergent question
		d. evaluative question
	5.	Lectures
	6.	Gives direction
	7.	a. Criticizes
		b. using public criteria
		c. using private criteria

Student Talk	8.	Response:
		a. description
		b. inference
		c. generalization
	9.	Initiative:
		a. description
		b. inference
		c. generalization

| | 10. | a. Silence |
| | | b. Confusion |

Fig. 3.--Modified Categories of Amidon and Hunter

to the ten Flanders categories, these categories were included:

1. A sub-classification of the Flanders category 5 (5-6), to distinguish between teacher initiated lecture and teacher answer to student question.

2. A sub-classification of the Flanders category 7 (8-9), to distinguish between corrective feedback and personalized criticism and sarcasm.

3. A sub-classification of the Flanders category 9 (10-11), to distinguish between student's questions and declarative, emitted responses. The complete category listings for this modification scale are found in Figure 4.

The second modification of the Flanders System of Interaction Analysis undertaken by Hough (Observation System for Analysis of Classroom Instruction)[15] subdivided the Flanders category 10 (Silence or Confusion) into three non-verbal categories:

1. Directed practice or activity (13)

2. Silence or contemplation (14)

3. Demonstration (15)

The final category, Confusion and Irrelevant Behavior (16), was added by Hough as a substitute for the Flanders category 10, and is always used as the first and last recorded number of any matrix design, since each number is paired with the succeeding number. It was assumed originally by Flanders that this category (Flanders 10) represents how a class realistically begins and ends,

[15]Amidon and Hough, op. cit., pp. 151-153.

INDIRECT TEACHER TALK

1. ACCEPTS FEELING: accepts and clarifies the feeling tone of students in a non-threatening manner. Feelings may be positive or negative. Predicting and recalling feelings are also included.

2. PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, "uh-huh" or "go on" are included.

3. ACCEPTS OR USES IDEAS OF STUDENTS: clarifying, building on, developing and accepting ideas of students.

4. ASKS QUESTIONS: asking a question about content or procedures with the intent that the student should answer.

DIRECT TEACHER TALK

5. LECTURES: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions.

6. ANSWERS STUDENT QUESTIONS: direct answers to questions regarding content or procedures asked by students.

7. GIVE DIRECTIONS: directions, commands or orders to which a student is expected to comply.

8. CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from a non-acceptable to an acceptable pattern; bawling out someone; stating why the teacher is doing what he is doing so as to achieve or maintain control; rejecting or criticizing a student's opinion or judgement.

9. CORRECTIVE FEEDBACK: telling a student that his answer is wrong when the incorrectness of the answer can be established by other than opinion, i.e., empirical validation, definition or custom.

Fig. 4.--Hough Modification (1965) of Flanders Scale

	10.	STUDENT TALK-RESPONSE: talk by students in response to requests or narrow teacher questions. The teacher initiates the contact or solicits student's statement.
STUDENT TALK	11.	STUDENT TALK-EMITTED: talk by students in response to broad teacher questions which require judgement or opinion. Student declarative statements emitted but not called for by teacher questions.
	12.	STUDENT QUESTIONS: questions concerning content or procedure that are directed to the teacher.

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

Fig. 4.--Continued

and it also gives a category number with which the second number and the next to the last number may be paired. The entire Hough Category System may be found in Figure 5.

All modifications of the Flanders System of Interaction Analysis, as reported here, are designed so as to be adaptable to the original category system, in order to facilitate any transfer by observers already proficient in the Flanders system, and to make possible inter-correlative comparisons of the results of studies using each set of category modifications. The modifications are not designed as a rejection of the Flanders original,

OBSERVATION SYSTEM FOR THE ANALYSIS
OF CLASSROOM INSTRUCTION

Indirect Teacher Verbal Influence

1. AFFECTIVE CLARIFICATION AND ACCEPTANCE - Includes the acceptance, clarification and recognition of students emotional stress. Statements which deal in a non-evaluative way with student emotions and feelings, i.e., fear, anger, anxiety, happiness, pleasure, etc., are included in this category. Such statements may recall or predict student feelings or may be a reaction to current emotional states of students. Statements of encouragement which do not praise or reward or do not deny expressed student feelings are also included in this category.

2. PRAISE AND REWARD - Includes statements with a positive value orientation directed at student behavior. Statements which praise or reward for previous or predicted future behavior are included in this category. Also included are statements which indicate teacher agreement with student behavior and thus by implication express teacher feelings regarding the value of the behavior.

3. COGNITIVE AND SKILL CLARIFICATION AND ACCEPTANCE - Includes statements which show acceptance of, or are designed to clarify, student ideas or performance, but are non-evaluative. Statements which repeat or paraphrase what a student has said or are designed to help the student think through what he has said or done are included in this category. Also included are such statements as "um-hum," "go on" and "OK," when such statements are not said with an inflection that connotes praise or do not represent habitual teacher behavior.

4. TEACHER QUESTIONS - Includes questions to which answers are expected, but do not serve the function of other categories. Such questions may be about content or procedure or may ask for student opinion regarding content or procedure.

Fig. 5.--Hough Category System

5. RESPONSE TO QUESTIONS - Includes direct answers to student questions. Such answers may give information or opinion but must be response which answer or are directed toward answering student question.

Teacher Direct Influence

6. INITIATES INFORMATION OR OPINION - Includes all statements regarding content or process which give information or opinion. Also included in this category are rhetorical questions.

7. CORRECTIVE FEEDBACK - Includes statements that are designed to indicate the incorrectness or inappropriateness of behavior so that the student sees that his behavior is incorrect or inappropriate. Such teacher statements are restricted to cognitive or skill areas in which behavior can be considered correct or appropriate by definition, generally accepted convention or can be empirically validated as being a fact.

8. REQUESTS AND COMMANDS - Includes directions, requests and commands to which compliance is expected. Questions which begin by a student's name are classified under this category as is the mentioning of a student's name at the end of a question when the student does not indicate readiness to answer the question.

9. CRITICISM AND REJECTION - Includes statements which criticize or reject student ideas or behavior without reference to clearly identifiable authority external of teacher opinion or feeling (i.e., definition, common convention or empirically validatable fact). Also included in this category are sarcasm, and rejection or denial of student feelings.

Student Verbal Behavior

10. ELICITED RESPONSES - Includes conforming responses to narrow questions, commands and request and all responses which are highly predictable as a function of their having been previously associated with a specific stimulus or class of stimuli. Also included are incorrect responses to narrow questions, commands or requests, and such statements as "I don't know" and unison responses either verbal or non-verbal.

Fig. 5.--Continued

11. EMITTED RESPONSES - Includes responses to broad questions or requests which have not been previously associated with specific stimuli or a class of stimuli. Also included are statements of opinion, feeling and judgement.

12. STUDENT QUESTIONS - Includes comments which ask for information, procedure or opinions of the teacher or another student.

Silence (Non-Verbal Behavior)

13. DIRECTED PRACTICE OR ACTIVITY - Includes all non-verbal behavior requested or suggested by the teacher. Working problems, silent reading, etc., are included in this category.

14. SILENCE AND CONTEMPLATION - Includes all instances of silence during which students are not overtly working on problems, reading, etc. Silence following questions, periods of silence interspersed with teacher or student talk are also included in this category as are periods of silence intended for purposes of thinking.

15. DEMONSTRATION - Includes periods of silence when chalk board, felt board, pictures, filmstrips, motion pictures, etc., are being used to present information or when a non-verbal demonstration is being conducted by the teacher.

Non-functional Behavior

16. CONFUSION AND IRRELEVANT BEHAVIOR - Includes all occasions when more than one person is talking and neither person can be understood (excepting unison responses) or when the noise level in the class is so high that the person who is speaking cannot be understood. Also included in this category is confused behavior in response to a command or direction, irrelevant comments that have no relation to the purposes of the classroom and non-functional periods of silence such as when the teacher answers and talks on the classroom telephone.

Fig. 5.--Continued

but, rather, as a means of enhancing the adequacy of the Flanders interaction concept. All other analytical devices, some of which are described in the procedures section of Chapter III, have been preserved.

Interaction Analysis Summarized

The dimension of teacher behavior that would identify a teacher as an autocratic or democratic, dominant or permissive teacher, and culminating in what Flanders called the direct or indirect teacher, interacting with types of student behaviors, and identifying verbal behaviors exclusively, were features of the Flanders Interaction Analysis System. While recognized as a compact, convenient, and extremely flexible scale, and used extensively by educational researchers, the Flanders system was, likewise, criticized for its inability to identify many important and more discrete classroom behaviors. These criticisms supported the assets of the Flanders concepts, but provided the initiative for the modification, in various ways, of the original Flanders Scale.

The background of the development of the Flanders concept of interaction analysis, brief descriptions of studies using the Flanders Scale, and modifications of the scale have been reviewed in this section.

Other Studies in Classroom Behaviors

While the large quantity of research in teacher and student behaviors, summarized in the previous section, deals with the dominant versus permissive aspect of controlling the environment of a classroom, several studies have been conducted motivated by other emphases. In conducting research on teacher and classroom behaviors, a reasonably comprehensive knowledge of a variety of efforts is desirable for a more objective approach. This section briefly outlines a representative group of these studies.

Designed as an instrument with which a single observer could analyze the single classroom, the OScAR (Observation Schedule and Record) System of classification has been adapted and modified a number of times. OScAR seeks to relate the emotional climate of the classroom to teacher effectiveness. Its originators found a positive correlation between emotional climate and reading growth, group problem-solving, pupil-teacher rapport and teacher self-rating.[16]

Hughes, in attempting to determine the function, for the learner, of identifiable verbal teaching behavior,

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[16] D. M. Medley and H. E. Mitzel, "Some Behavioral Correlates of Teacher Effectiveness," J. of Educ. Psych., L (December 1959), pp. 239-246.

through a concentration on teacher actions and the student's perception of those actions, found that in using seven major categories (controlling, imposition, facilitating, content development, response, and positive and negative affectivity), the thirty-five elementary teachers in her sample spent far too much time in activities which were involved with controlling the class (20-40 per cent). No greater time was spent in content development (20-40 per cent).[17]

Although, they were interested in the degree with which a teacher operates within the realm of logic, Smith and Meux designed their observational studies around the classification of the verbal behavior of teachers which could be detected from the typescripts of audio-tape recordings of classroom procedures in the senior high subjects of English, Social Studies, Mathematics, and Science. By definition, logical operations are the forms of verbal behavior taken as the teacher shapes the subject matter in the course of instruction.[18] The observed classes were divided into

[17]Marie Hughes, Development of the Means for the Assessment of the Quality of Teaching in the Elementary Schools, (Salt Lake City: University of Utah Press, 1959).

[18]B. O. Smith and M. O. Meux, A Study of the Logic of Teaching, (Urbana, Ill.: University of Illinois, Cooperative Research Project, No. 258, 1962), p. 50.

units of discourse--Episodes, implying a verbal exchange
between two or more people, and the Monologue, in which
only one speaker was active. Within those two units
of discourse, it was decided that there were three
basic types of verbal exchanges:

1. Instructing--the speaker intends to elicit a
response, explain, define, in order to produce a specific
effect.

2. Informing--tells how to perform a specific
operation.

3. Praising--approving or disapproving, commending
or reprimanding; resulting in emotional rather than
cognitive response from students.

Beyond the episode and monologue, and the three
basic types of verbal behavior, a complex series of
entries, based on these classifications, was developed,
including thirteen distinct categories (defining, des-
cribing, designating, stating, reporting, substituting,
evaluating, opining, classifying, comparing, conditional
inferring, explaining, and directing or managing class-
room). Because of its complexity, and apparent over-
lapping of many of these verbal entries, it was difficult
to obtain reasonably or consistently satisfactory inter-
judge agreements, either in the classification of the
episodes versus monologues, or in the sorting and classify-
ing of the entries themselves.

In seeking to isolate patterns of achievement in high school "Problems of Democracy" classes, Bellack conducted research of a more descriptive than prescriptive nature. He regarded teaching as a game, the controlling factors of which are a series of verbal maneuvers that describe what teachers and students do pedogogically while playing the game. These four basic verbal maneuvers are:

1. Structuring
2. Soliciting
3. Responding
4. Reacting

Although the study made use of the pre-test and post-test design in measuring student achievement, perhaps of equal interest and significance to this study, was the data which show the fifteen teachers included in the sample were observed making forty per cent more moves, and seventy-five per cent more verbal lines than the total of the 345 students in the sample.[19]

The Openshaw taxonomy of teacher behaviors divides those behaviors into four major dimensions:

1. Source dimension, indicating the origin of the encounter.

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[19]A. A. Bellack and J. R. Davitz, et al., The Language of The Classroom: Meanings Communicated In High School Teaching, (New York: Teachers College, Columbia University, 1963).

2. <u>Direction</u> dimension, indicating to whom the encounter is focused.

3. <u>Function</u> dimension, indicating the purpose of the encounter, and

4. <u>Sign</u> dimension, indicating the means of communication.

Each dimension is broken further into an extremely complex series of categories. The taxonomy was applied to films and video tape recordings of live classroom discourse that were made available to the examiner. One feature of the Openshaw taxonomy, absent in many of the other studies, is the reliability check of the scale. Inter-observer reliability coefficients were not impressive, however, possibly due to the complexity of the taxonomy as an observational tool.[20]

This brief review of representative studies in teacher-student classroom behaviors outside the Flanders concept, was undertaken to show the scope and range of some diverse efforts of researchers in describing class-room environment. The complex designs of the scales described in this section are in marked contrast with the conciseness and manageability of the most complex modi-fications of the Flanders scale.

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[20]Karl Openshaw, <u>Development of a Taxonomy for the Classification of Teacher Classroom Behavior</u>, (Columbus, Ohio: The Ohio State University, 1967).

Behaviors of Music Teachers

Researchers in music education have expressed little interest in the systematic observation of teacher-student behaviors in the music classroom. One conclusion of a comprehensive synthesis of competent research in music education was, "No studies have been (found) devoted specifically to the analysis of music teacher characteristics, per se."[21] This synthesis included research conducted through 1962. In a review of literature since 1962, only one study was found which sought to identify teacher-student behaviors in the instruction of music. That study, and two studies reported in the Schneider-Cady synthesis, are briefly outlined in this section.

In the only Flanders modification applied directly to music instruction, Snapp essentially expanded the original Flanders scale to include one teacher-musical activity category and four student-musical activity categories. It was applied to fifth grade instrumental music classes. Each of the nine teachers was observed and taped in a total of three class sessions. In those

[21]Erwin H. Schneider and Henry L. Cady, Evaluation Synthesis of Research Studies Relating to Music Education, (Columbus, Ohio: The Ohio State University, Cooperative Research Project, No. E-016, 1965), p. 112.

environments, this study sought to appraise and analyze
musical and verbal behaviors of teachers and students
involved.

Since the entire study involved only seventeen
hours of recorded observations, all in small groups of
students, it is difficult to assess the results. Among
the more interesting results, however, were that (1) teacher
lecturing and group musical activities occupied the most
amount of class time, (2) teacher activities were direct
nearly twice as often as they were indirect, (3) teachers
tended to react in an indirect manner in response to
student activities, and (4) considerable praise by the
teacher was used.[22] The complete listing of the
categories in this modification is found in Figure 6.

The directness of the teacher behaviors in a
fifth grade instrumental music class is no more
surprising than it would be in any other music classroom
whose principal objective is musical performance. No
implication of the appraisal of quality teaching or of
student musical growth was made, nor intended in the Snapp
study.

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[22]David Snapp, "A Study of the Accumulative Musical
and Verbal Behavior of Teachers and Students in Fifth
Grade Instrumental Music Classes," (Unpublished Masters
thesis, The Ohio State University, 1967), pp. 91-93.

SNAPP MODIFICATION

	Category Number		Description of Behavior
T	1.		ACCEPTS FEELINGS: accepts and clarifies the feeling tone of the student
E			in a nonthreatening manner. Feelings may be positive or negative, and
A		I	expressed verbally or musically. Predicting and recalling feelings are also
C		N	included.
H	2.	D	PRAISES OR ENCOURAGES: praises or encourages student action or behavior.
E		I	Jokes that release tension, not at the expense of another individual, nodding
R		R	head or saying "uh-huh" or "go on" are included.
		E	
	3.		ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or
		C	suggestions of students or implied
B		T	musical ideas as expressed through student musical activities.
E			
H	4.		ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
A			
V	5.		MUSICAL ACTIVITIES: playing an instrument, clapping, singing, tapping of
		D	foot, or any other form of physical
I		I	movement which demonstrate elements pertinent to the music process.
O		R	
R	6.	E	LECTURES: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions.
		C	
	7.	T	GIVES DIRECTION: directions, commands, or orders with which students are expected to comply.

Fig. 6.--Snapp Modification of Flanders Scale

Category Number		Description of Behavior

TEACHER BEHAVIOR

| 8. | DIRECT | CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from a non-acceptable to an acceptable pattern; "bawling out" someone; stating why the teacher is doing what he is doing so as to achieve or maintain control; rejecting or critizing a student's thought or deed. |

STUDENT

| 9. | | STUDENT TALK-RESPONSE: talk by students, in response to teacher. Teacher initiates the contact or solicits student's statement. |
| 10. | TALK | 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. |

BEHAVIOR

11a.	MUSICAL ACTIVITIES	INDIVIDUAL MUSICAL ACTIVITIES: those activities undertaken by one student which involve some form of physical movement and are pertinent to the process of making music, such as playing an instrument, clapping, singing, tapping of foot, etc.
11b.		INDIVIDUAL MUSICAL ACTIVITIES-CONDUCTED: the same student activities as category 11a except that they are performed while the teacher is conducting.
12a.		GROUP MUSICAL ACTIVITIES: the same musical activities as category 11a except that a group of students is involved.
12b.		GROUP MUSICAL ACTIVITIES-CONDUCTED: the same musical activities as category 11a except that a group of students performs while the teacher is conducting.

Fig. 6.--Continued

Category Number	Description of Behavior
13.	SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

Fig. 6.--Continued

In the only study reported by Schneider and Cady, which was directly concerned with teacher behaviors, Fenton sought to identify behaviors characteristic of superior music teachers by means of procuring, and analyzing, written reports of critical incidents submitted by a large sample of teachers. Although the study was competently conducted within the scope of its design, the fourteen categories derived from the critical incidents were not assimilated from live, on-the-scene observations, nor any kind of preserved recordings of classroom discourse, and could not realistically have been credited to systematic observation technique.[23]

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[23]Winnifred L. Fenton, "Effectiveness of Music Teachers Identified Through Behavioral Criteria: A Basis for Redirection in Teacher Education," (Unpublished Doctoral dissertation, Wayne State University, 1957), pp. 154-156.

Burmeister conducted a survey to determine how people felt about music education, and more directly, what students liked most, and what they liked least about the way their music teacher taught. Although the study sought to measure general qualifications, Burmeister found that personality factors and behaviors were consistently liked more by students than musician-ship and skill factors.[24] This would lead to the speculation that content of music classes of a general nature might be of secondary importance to the method with which it is handled by the teacher. General music might be effectively taught to the extent that the approach of the teacher appeals to the students.

Conclusions from the Review of Literature

This chapter contains a review of the technique of Interaction Analysis as conceived by Flanders and expanded and developed by others through applications of the scale in diverse research designs, and by means of various modifications of the original scale. It also contains brief descriptive references to repre-sentative studies into aspects of classroom environment

[24]Clifton A. Burmeister, "A Study of Community Attitudes Toward Music Education in the Public Schools of Selected Communities of Missouri," (Unpublished Doctoral dissertation, University of Kansas, 1955), p.90.

other than those inherent in the Flanders concept of
interaction. Finally, it refers to the three studies
found in the literature which are most closely alligned
with the behaviors of music teachers in the music
classroom.

There seems to be some evidence that reasonably
reliable data collecting instruments applied to class-
room discourse reveal that conditions controlled by
the indirect, democratic, student-centered or reasonably
permissive teacher are generally those that tend to
produce an atmosphere most conducive to student growth
and development in the subject matter or grade level
concerned.

The review of literature has not shown this to
be the case with music instruction. There is some
evidence that the subject with which classroom discourse
is dealing may influence the patterns of behavior which
a teacher will use in the control of the classroom.
Teachers in certain subject areas tend to be more
autocratic or direct than teachers in other areas.
Questions which could be raised by music educators from
a review of research literature on classroom behaviors,
come from the relative sparseness of descriptive or
experimental studies on classroom behaviors in the field
of music education derived from systematic observation.

CHAPTER III

MATERIALS, SAMPLE, AND PROCEDURES

Materials

Data Collecting Instrument

The Hough Observation System for the Analysis of Classroom Instruction, a sixteen category modification of the original ten category Flanders System of Interaction Analysis, was selected as the principal data collecting instrument to be used in this study for the following reasons:

1. The design of the study required a scale devised primarily for the identification of verbal behaviors. No such scale has been formulated for general music classrooms. Therefore, the Hough modification, although not intended necessarily for music classes, or at least never tried in that area, was selected upon the acceptance of assumption No. 1 (Chapter I), that verbal behaviors in general music classrooms, as in other classrooms, are consistent with total behavior, and assumption No. 2 (Chapter I), that general music classes are often verbally oriented

to the point of making them equally analyzable by techniques employed in other classrooms.

In addition, because of extended periods of non-verbal behaviors in the general music classroom by both the teacher and students, such as singing, playing or listening, it was felt neither the original Flanders scale, or any subsequent modifications prior to the second Hough modification would be adequate to handle total verbal and non-verbal behaviors. The Hough Observation System for the Analysis of Classroom Instruction divides the Flanders Category 10 (Silence and Confusion) into three distinct non-verbal categories, permitting the identification of those basic non-verbal behaviors particularly characteristic of the general music class. For example, the Hough category 13 (Directed practice or activity) was applied to those activities suggested by the music teacher, such as group singing and/or listening, writing at the student's desks or the student writing on the board. While these activities do not exactly fit the description of "silence or confusion," they represent those activities in the music room that correspond to the teacher directed activities in other types of classrooms. The Hough category 14 (Silence and contemplation) was used as a means of identifying a period of time when there was

silence, but the function of those periods was intended as a means of producing responses that require something more than immediate or extemporaneous answers to questions. Hough's category 15 (Demonstration) was assigned to the non-verbal behaviors of the teacher while she was demonstrating something on the piano, with the voice, etc.

So while the "silence" section of the Hough category system is not silence in the literal sense in all cases, in so far as the verbal behavior patterns are concerned, it is. Additionally, the Hough category system provided the means by which class tapes could be accepted or rejected based on the degree to which the class was verbally or non-verbally dominated. Classes that produced a matrix which was characterized by over fifty per cent of a single non-verbal behavior were not included in the final analysis. Over half of the total observed behaviors in each class had to be of a verbal nature in order that a specific class session could be included in the analyzed data.

2. Built into the Flanders System of Interaction Analysis Matrix, and preserved in all other modifications, including this Hough modification, is the potential for the analysis of large, general areas of interaction behaviors. A sample matrix, showing those areas of

interaction, is found in Figure 7. The characteristics of each area are described by Hough as follows:[1]

> Area A contains all instances of extended indirect influence. For example, when a teacher uses extended praise or extended acceptance, tally marks will be plotted in this area, as will instances of transition from one indirect category to another, e.g., shifts from answering student questions to praise.

> Area B contains all instances of extended indirect influence. For example, when a teacher uses extended lecture or extended directions, tally marks will be plotted in this areas, as will instances of transition from one direct category to another, e.g., shifts from lecture to criticism of student behavior.

> Area C contains all instances of student talk following teacher talk. All cells in area C are transition cells, that is they indicate the beginning of student talk following teacher talk. For example, when a student responds to a teacher's question, the beginning of such a response would be entered in this area as would student responses to directions or corrective feedback.

> Area D contains all instances of extended student talk. For example, when a student continues to talk for an extended period of time, tally marks will be plotted in this area, as will all instances of transition from one student talk category to another, e.g., shifts from an emitted response to asking the teacher a question.

> Area E contains all instances of teacher talk following student talk. All cells in area E are transition cells, that is they indicate the beginning of teacher talk following student talk. For example, when a teacher praises a student's answer this would be entered in this area as would teacher criticism or acceptance of student response.

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[1] Edmund J. Amidon and John B. Hough, Interaction Analysis: Theory, Research and Application. (Reading, Mass.: Addison-Wesley Publishing Co., 1967), pp. 156-157.

Fig. 7.--Sample Matrix (Hough)

Area F contains all instances of silence following
either teacher or student talk. All cells in
area F are transition cells, that is they indicate
the beginning of periods of silence following talk.

Area G contains all instances of extended silence.
For example, if a teacher tells the class to think
about something for a few minutes, their silence
would be indicated in area G.

Area H contains all instances of teacher or student
talk following silence. For example, if a teacher
has asked a question and this question has been
followed by silence and he asks the question again,
the initiation of the second question, following
the silence, would be plotted in area H.

Teacher Evaluation Form

Although this study was not primarily one of the
evaluation of the quality of music teaching, it was
structured in such a way as to make mandatory a pre-
study evaluation of the teachers in the sample. This
was accomplished by having the three music supervisors
of the system from which the sample was selected, make
independent evaluations of the quality of teaching
performed by each of the teachers in the sample, using
a teacher rating form designed for this study. A copy
of the Music Teacher Evaluation Form is presented in
Figure 8.

The study did not seek teacher evaluations from
those in positions other than music supervisor, such as
superintendents or principals, primarily because of the
varying value standards imposed on the quality of music

MUSIC TEACHER EVALUATION FORM

Teacher's Name_____

Code No._____Evaluator No._____

Directions: Check one place for
        each item. Do not total
        your score.

	Very Strong	Strong	Average	Weak	Very Weak
I TEACHER' ORGANIZATION AND PLANNING					
1. Teacher plans class session - - -					
2. Teacher seeks to sequentially develop student skills and understandings, based on previous music experiences of student - - - - -					
II PERSONAL CHARACTERISTICS OF TEACHER					
1. Teacher's active enthusiasm for teaching general music - - - - -					
2. Teacher's interest in new ideas and teaching techniques - - - - -					
3. Teacher's support of in-service programs and/or interest in personal training - - - - - - - -					
4. Personal musicianship of teacher-					

Fig. 8.--Form Used for Evaluating Teaching
        Effectiveness

	Very strong	Strong	Average	Weak	Very weak
III MUSIC IN THE TEACHER'S SCHOOL					
1. Teacher creates healthy atmosphere for music in the total school program - - - - - - - - -					
2. Teacher seeks to relate music to other curricular subject areas -					
IV TEACHER'S INTEREST IN STUDENTS					
1. Teacher seeks to relate musical experiences of students to contemporary experiences and cultures of students - - - - - -					
2. Teacher encourages student contact with contemporary music events - - - - - - - - - - - - -					
3. Teacher is interested in and/or sympathetic toward extra-school popular music idiom of students-					
4. Teacher seeks to develop students overall abilities and understandings of music and not just performance skills - - - - - - - - -					
V ATTITUDES OF STUDENTS					
1. Student's enthusiasm toward music-					
2. Student's attitude toward teacher-					
Column totals					
Grand total					

Fig. 8.--Continued

instruction. Benner found low correlations between ratings of music teachers by superintendents, principals and music supervisors.[2] The perspective of the music supervisor was accepted as the most adequate evaluation of the work of the teachers in the sample.

Each of the three music supervisors completed an evaluation form for each teacher in the sample. There were no inter-supervisor consultations, and the completed forms were sealed in separate envelopes. Rankings, for purposes of testing the null hypotheses, were determined after all data were collected in order to avoid any possible bias on the part of the researcher.

In determining the ratings of the teachers, those responses placed in the "very strong" column received a value of 5; those in the "strong" column, a value of 4; those in the "average" column, a value of 3; those in the "weak" column, a value of 2; and those in the "very weak" column, a value of 1. The cumulative total score of all three supervisor evaluations represented the total for each teacher. The highest score, thus determined, was the highest rated teacher in effectiveness; the lowest score, the least effective teacher, and

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[2]Charles Benner, "The Relationship of Pre-Service Measures to Ratings of Music Teacher," (Unpublished Doctoral dissertation, The Ohio State University, 1963), p. 32.

all the other teachers ranked in a continuum from top to bottom. In testing the null hypotheses, the data collected from the three highest rated teachers were analyzed against the data of the three lowest rated teachers, in addition to the inter-comparisons of the matrices of each teacher against other appropriate teachers or groups of teachers. Results of the teacher evaluation are given in Table 1.

Inter-supervisor ratings were tested for their degree of concordance, or agreement through the use of the Kendall Coefficient of Concordance: W, a statistical measure which tests the degree of agreement by means of a scale from .000 (no concordance, or agreement) to 1.000 (perfect concordance, or agreement) between more than two sources of scores or, in this case, evaluations. Siegel has suggested further that the significance of that agreement or concordance may be measured by reverting the W value to a chi square (X^2) value, and referring to any chi square table, with df = N-1.[3] The Kendall Coefficient of Concordance: W value of .77, with a X^2 value of 18.48 indicates that the three supervisor ratings had a high rate of agreement, in spite of the fact they were done independently.

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[3]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, (New York: McGraw-Hill Book Co., Inc., 1956), pp. 229-238.

TABLE 1

SUPERVISOR RATING SCORES, CUMULATIVE TOTAL SCORES,
AND FINAL RANKINGS OF TEACHERS IN HIGH,
MID-RANGE, AND LOW SAMPLES

Teacher No.		Supervisors and Ratings			Totals	Rank
		1*	2*	3*		
High	728	59	73	73	205	1
	593	60	70	68	198	2
	609	55	72	70	197	3
Mid	691	59	68	50	177	4
	155	66	50	57	173	5
	460	49	65	58	172	6
Low	379	43	56	54	153	7
	448	34	48	47	129	8
	174	36	46	37	119	9

*The three supervisor's ratings resulted in a
Kendall Coefficient of Concordance: W = .77, which
produced a chi square value of 18.48, significant at
the .02 level of confidence with df = 8.

The socio-economic environment of the schools was
not considered directly in this study. However, it
apparently was not an influence on the evaluations of
the teachers by the supervisors. Two of the three
high-rated teachers taught in lower-middle class schools,
while the third high-rated teacher taught in an upper-
class school. Of the three low-rated teachers, one

taught in an upper class school, while the other two taught in middle class schools.

Sample

Sample Selection and Size

The teachers comprising the sample were selected from the staff of a large, metropolitan school system in the state of Ohio. A single city school system was selected primarily so that basic, over-all standardizations in objectives of general music classes might be assumed, rather than to select the sample from scattered, random communities, whose objectives might vary to a great extent. The school system selected offers required music participation through the seventh and eighth grades, with elective music in grades nine through twelve. Students in the seventh and eighth grades who are not members of the band, orchestra, or choir are automatically enrolled in general music classes, which meet twice weekly for a total of eighty minutes. While the content of general music classes varies according to the individuality and creativity of each teacher, allowing for a certain element of autonomy, each teacher, throughout the year, is expected to expose the students in the music classes to a number of city-wide activities which

include: (a) a composers contest (in which all students are encouraged to participate), (b) youth concerts, (c) a city-wide festival of music in May, (d) regular concerts by the local symphony orchestra, (e) musical assemblies by professional musical ensembles, and (f) concert and recital series sponsored by cultural groups in the city, including opera, ballet and symphony orchestra.

Regular classroom activities throughout the city include the preparations for those city-wide events, studies in singing and in human voice production, history of music, the development of music reading skills, some instrumental music experiences, and the development of individual appreciation of music.

Approval of the project by the Director of Music Education and the Superintendent of Schools was obtained before any contacts were made with teachers in the system.

Since the systematic observation of classroom procedures depended upon the willingness of selected teachers to have an observer and/or tape recorder in the classroom, the element of cooperation was, of necessity, basic to the sample selection. Willingness to participate, however, was not considered sufficient in itself. A teacher was not considered for the project

if they were, (1) in their first year of teaching, (2) an experienced teacher, but in the first year of teaching in the system, (3) an experienced teacher, but in the first year of teaching in the building in which they were teaching at the time the sample was selected.

These criteria for teacher selection were established prior to sample selection procedures. Potential teachers then were identified through consultations with administrative and supervisory personnel.

There were twenty music teachers in the system who were employed to teach full or part-time junior high school general music. Of that number, eight were eliminated because they were either new to the system or were teaching in buildings which were new to them. One other teacher was eliminated because she was transferred to a senior high school after she had initially been accepted into the project. Another teacher was not considered because of her apparent lack of interest in the project. One teacher was not included because of her objections to having her classes recorded on tape.

Thus, the final sample included nine teachers, who were divided according to the outcome of the

teacher rating device, into the three most effective
teachers, the three least effective teachers, and the
three teachers whose evaluation scores fell in the
middle of the continuum, and who were classified as
those of normal, or mid-range effectiveness.

Each teacher was assigned a three digit code
number after they were accepted into the final sample.
This number was used to identify the teacher throughout
all class tapings, tape analysis, teacher matrices,
and in the teacher evaluation activity. There was no
significance attached to the selection or assignment
of teacher code numbers. Both the selection of the
numbers and their assignment to teachers was accomplished
through a randomization process to insure objectivity.
It was felt that anonymity could best be preserved
through this means of identification, and it was
through the assurance of complete anonymity that each
teacher in the sample agreed to cooperate through their
participation.

Classroom Selection

Classrooms in which selected teachers were
teaching, and from which the recorded data were
collected, were those in which, (1) the public perform-
ance of the music that was studied was not the primary

objective of instruction, and (2) no more than fifty per cent of a single class session was devoted to the basically uninterrupted period of time during which only one non-verbal activity was demonstrated or carried on, such as singing, playing or listening, making it impossible to observe verbal interactive behaviors during that extended period.

Compliance with the first classroom specification was assured through personal contacts with the teachers in determining what classes in their individual schedules were appropriately titled, general music classes, and not choirs, glee clubs or vocal ensembles. The second requirement of classes was impossible to ascertain prior to actual analysis of the observation. If a particular class session failed to fulfill the second specification, and included over fifty per cent of a single, non-verbal class activity, the tape of that session was discarded and additional classes recorded from the schedule of that teacher.

Procedures

Collecting and Analyzing Data

All nine teachers agreed to allow the researcher to arrive unannounced for taping sessions. The chief advantage for not pre-arranging the scheduled

observations was in the prevention of any special preparation, conscious or unconscious on the part of the teachers, if a planned session had been arranged. The confidence of the teachers in this respect was gained through assurances that anonymity would be honored and respected; that no one, outside those in direct contact with the study would have access to the tapes, and that the treatment and handling of all tapes and data would be realized through the assigned code numbers.

Each teacher was recorded a minimum of ten times. If, for reasons such as not fulfilling project specifications or mechanical breakdown in recording equipment, it was found the initial sessions did not provide sufficient data from a particular teacher, additional tapes were made in order that each teacher's composite matrix would reflect ten recorded class sessions of a satisfactory nature.

An AIWA Executive Solid State Transistorized portable tape recorder was used in all the taping. This machine resembles an attache case when closed, and can be operated in that manner. It was possible to either conceal the machine from the students vision, or at least disguise it in such a manner that very few students realized that they were being recorded.

In order to eliminate observer bias in analyzing the tapes, the researcher set up the recorder prior to the start of the class session, started the machine by activating a switch on the microphone, and left the room. The researcher returned at the close of each class to turn the machine off, and affix additional tape for any subsequent class recordings. In subjecting the tapes to analysis, the researcher heard the tapes for the first time without benefit of having seen either the teacher teaching, or the class in progress. This procedure forced the inclusion of superfluous material at both ends of the tapes, but in the analysis of the tapes, the actual recording of categories began with the start of instruction in each case.

Taping of the classes of teachers in the sample began early in the school year, and continued for a period of five months. Prior to the actual beginning of the project, several tapes of general music classes from schools and sources other than those in the sample were procured to provide the researcher ample time and materials with which to achieve observer accuracy and reliability.

Statistical Treatment of Data.--Since the data collected in this study were not obtained by means of a randomly selected sample, appropriate nonparametric

statistical measures were selected for the testing of
the null hypotheses. In testing for significance of
difference, the measure selected for the testing of
null hypotheses Nos. 1, 3, 4, 5 and 6a was the Mann-
Whitney U test (a rank test), which, according to
Siegel is, ". . . one of the most powerful of the non-
parametric tests and . . . most useful alternative to
the parametric 't' test when the researcher wishes to
avoid the 't' test's assumptions."[4]

The percentage of time spent in each category by
the teachers judged most effective was tested for
significance of difference from the percentage of time
spent in each category by the teachers judged least
effective (H_o 1). The ratios for individuals were
determined by the percentage of time spent in the
appropriate region or category-group by each teacher,
divided by the percentage of time spent in the other
appropriate region or category-group by that teacher
(H_o 3, 4, 5, 6a). The percentage of time spent in each
of the areas of the scale (A-H) by teachers judged most
effective was tested for significance of difference from
the percentage of time spent in each area by teachers

[4]Sidney Siegel, Nonparametric Statistics for the
Behavior Sciences, (New York: McGraw-Hill Book Co.,
Inc., 1956), p. 116.

judged least effective through the use of the Mann-
Whitney U test (H_o 2). The data in null hypothesis
No. 6 is nominal, and not appropriate to the Mann-
Whitney U test. Therefore, the significance of
difference in this case was tested by means of the chi
square. To test the pattern relationships (H_o 7-9),
the Kendall Coefficient of Concordance: W, was
employed with the data collected from each teacher in
the sample.

Validity and Reliability

Validity.--In systematic observation, a category
system is considered valid to the extent that it ade-
quately identifies those behavioral characteristics
specified by the design of the study using it. Evidence
of validity inefficiency in the original Flanders ten-
category scale has been manifest in the many modifications
which have been made, while preserving, in all cases,
the compactness, convenience and manageability of the
Flanders interaction analysis concept.

In this study, the Hough sixteen category Ob-
servation System for the Analysis of Classroom Instruction
was the category system determined most valid and
appropriate because of its ability to identify so many
of the behaviors characteristic of general music classes,

both verbal and non-verbal, while preserving the inter-action concept of manageability.

There was some evidence of validity inefficiency in the recording of specific non-verbal behaviors in this study. But, in view of the fact that non-verbal behaviors were not the principal concern of this study, this was not considered a vital factor. Recommendations for additional modifications of the Hough system, as it would be applied to further research in general music, are presented in Chapter V.

Reliability.--The reliability of a behavioral scale is the degree with which it can be objectively applied to identical classroom situations by different observers, producing similar results. There are two methods of producing reliability figures that are traditionally used in the development and use of behavioral scales. The first involves two or more observers familiarizing themselves with a scale and making observations of the same classroom events or periods, and correlating the results of their analysis. The second method of establishing reliability involves the assumption that an established scale is as reliable as the observer is competent at using it. This last system has been consistently used when developing observers in the use of the Flanders interaction analysis concept, and the modifications of that system.

Audio tape recordings of portions of class sessions are available, and have been standardized for use with the various interaction analysis scales. Four known studies have used the standards for the Hough, Observation System for the Analysis of Classroom Instruction, in training observers. These studies were those by Pankratz,[5] Hanney,[6] Gold,[7] and Hough.[8] Reliability is estimated by means of the Scott formula, a statistical procedure suggested by Flanders.[9] This technique is outlined in Figure 9. It produces a reliability range from the low of .000 to the high of 1.000. All four of the studies mentioned here produced reliability estimates above .80, considered highly satisfactory.

[5]Roger Pánkratz, "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Physics," (Unpublished Doctoral dissertation, The Ohio State University, 1966), p. 164.

[6]Robert Joseph Hanney, "The Relationship between Selected Personality Characteristics and Teacher Verbal Behavior," (Unpublished Doctoral dissertation, The Ohio State University, 1966), p. 55.

[7]Louis L. Gold, "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Biology," (Unpublished Doctoral dissertation, The Ohio State University, 1966), p. 156.

[8]John B. Hough, A Study of the Effects of Five Experimental Treatments in the Development of Human Relations Skills and Verbal Teaching Behaviors of Pre-Service Teachers, (Columbus, Ohio: The Ohio State University (mimeographed), 1965), p. 9.

[9]Ned Flanders, Teacher Influence, Pupil Attitude and Achievement, (Washington, D.C.: Government Printing Office, 1965), pp. 25-27.

ESTIMATING RELIABILITY IN INTERACTION ANALYSIS

All subsequent modifications of the original Flanders System of Interaction Analysis have preserved the statistical treatment for estimating reliability that was suggested by Flanders, consisting of the Scott formulae as follows:

Scott calls his coefficient "pi" and it is determined by these two formulae:

Formula I: $\qquad \pi = \dfrac{P_o - P_e}{1 - P_e}$

P_o is the proportion of agreement with a standard which is found by subtracting the total percentage of disagreement from 100 per cent.

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

Formula II: $\qquad P_e = \displaystyle\sum_{i=1}^{k} p_i^2$

In Formula II, there are $\underline{k}$ categories and P_i is the proportion of tallies falling into each category.

Fig. 9.--Estimation of Reliability: Scott Formula

In this study, tape recording was selected as the principal means of data collecting for a number of reasons, not the least of which was in the estimation of reliability. The question of bias, in the case of an observer whose professional background has been partially spent in the field being observed in this study, might be raised. Objectivity in recording behaviors might be influenced in a number of ways by familiarity with the subject field. If observations were live, and made entirely by one observer, it would be difficult to assess his reliability beyond his initial estimate of accuracy in pre-study activities, and no standards are available with which an observer can estimate his reliability in recording behaviors in a general music class. Even if other observers made their analysis from audio tapes that were recorded at the same time the chief observer was making his own live observations, the secondary observers would not have a similar perspective from which to make their analysis, because they were never in visual contact with the classroom environment in question. Therefore, in determining reliability in this study, initial observations and analysis were made from tape recordings, and all subsequent analyses that were necessary in estimating reliability of the principal observer, were made from the same tapes. Neither the

principal observer, nor secondary observer had the benefit of seeing any of the classes in operation.

Prior to analyzing tapes of the teachers in the sample, the researcher analyzed tapes obtained from sources other than the sample teachers and in subject areas other than music. The purpose was to develop proficiency in using the Hough Scale. This pre-study period culminated in achieved reliability estimates above .80 on the standardized tapes of classroom procedures.

Proficiency in the use of the scale in general music classrooms was achieved through extensive practice on tapes made in the classrooms of teachers other than those included in the sample. In the re-analysis of selected tapes, separated by a two week period of time, during which other practice tapes were being analyzed, it was found the observer-researcher in this study could achieve analysis-re-analysis reliability estimates consistently in the .85-.90 range, and tally totals differring no more than five to seven per cent from one analysis to another. It was not until this reliability in the recording speed and category selection was established that the analysis of collected tapes from the sample was started.

While the study was in progress, the researcher found value in the systematic re-analysis of tapes after a period of three to four weeks, resulting in a consistent reliability estimate within the .80-.90 range, demonstrating continuing reliability of a satisfactory nature.

However, in order to establish the researcher's objectivity and accuracy in the use of the scale beyond the internal personal use of the scale, an outside, neutral observer, who was familiar with the Flanders interaction analysis concept, was asked to achieve and demonstrate similar trial reliability. A researcher, whose work has previously been cited in this study,[10] subsequently analyzed two randomly selected tapes previously analyzed by the principal observer, producing satisfactory inter-observer reliability estimates ranging from .78 to .85.

The summaries of all reliability estimates are presented in Appendix A.

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[10]David Snapp, see pp. 44-48.

CHAPTER IV

PRESENTATION OF ANALYSIS OF DATA

This chapter summarizes all the data pertaining
to patterns of interaction collected in the study,
presents the statistical testing of the null hypotheses
listed in Chapter I, and makes some comparisons of data
collected in this study with that collected in other
studies using similar data collecting instruments.

Patterns of Interaction

The total number of observed class sessions, and
the total number of tallies for each of the three most
effective teachers and each of the three least effective
teachers is given in Table 2. This table also shows
the percentage of time each teacher spent in sustaining
patterns, indicating the tendency to remain within one
specific category for extended periods of time, and
transitional behaviors, indicating a tendency to move
from one category to another.

Variance in the total number of tallies can be
explained in a number of ways. Class periods vary in
length, instruction often does not begin at the same

TABLE 2

TALLY TOTALS AND PERCENTAGE OF TIME SPENT IN
SUSTAINING AND TRANSITIONAL BEHAVIORS IN
HIGH-RATED AND LOW-RATED TEACHERS

Teacher No.		No. Tapes	Tallies	Sust.	Trans.
High	728	10	6620	38.30	61.70
	593	10	5683	55.24	44.76
	609	10	5955	65.36	34.64
Total		30	18258	53.35*	46.65*
Low	379	10	6133	66.61	33.39
	448	10	5970	60.64	39.36
	174	10	4962	49.67	50.33
Total		30	17065	59.62*	40.38*

*Denotes percentages in composite matrix for high
and low rated teachers.

time due to interruptions, or class management activities
at the start of the period, and some teachers require
more tallies due to the frequent use of more than a
single tally behavior in a three second period.

Three other teachers were also observed an equal
amount of time, but their data are not included in this
chapter because of the nature of the design of this

study, whereby interest was expressed in terms of the two polarities of the effectiveness of teachers.

Table 3 presents the percentage of time spent in each category for the composite high-rated teachers and the composite low-rated teachers.

TABLE 3

PERCENTAGE OF TIME SPENT IN EACH OF THE SIXTEEN
CATEGORIES OF THE HIGH-RATED AND LOW-RATED
COMPOSITE MATRICES

Category Description	Percentage of Time	
	Comp.High Teacher	Comp.Low Teacher
Indirect Teacher Influence		
1. Affective Clarification	0.03	0.08
2. Praise and Reward	3.31	3.13
3. Skill Clarification and Accept.	0.48	0.63
4. Teacher questions	7.60	7.51
5. Response to question	0.52	1.24
Direct Teacher Influence		
6. Lectures	14.89	24.00
7. Corrective Feedback	2.02	1.87
8. Requests or Commands	15.78	8.79
9. Criticism and Rejection	3.05	2.66
Student Verbal Behaviors		
10. Elicited Responses	6.36	8.23
11. Initiated Responses	1.48	1.75
12. Student Questions	1.29	1.23
Silence (Non-Verbal)		
13. Directed Practice	29.83	24.11
14. Silence and Contemplation	1.63	2.44
15. Teacher Demonstration	5.91	8.68
Non-functional Behavior		
16. Confusion, Irrelevant Behavior	5.49	4.20

The percentage of time spent in the various Areas (A-H) for high-rated and low-rated teachers is given in Table 4.

TABLE 4

COMPOSITE PERCENTAGE OF TIME SPENT IN AREAS
A-H BY HIGH AND LOW-RATED TEACHERS

Area	Description	Percentage of Time	
		Comp.High Teachers	Comp.Low Teachers
A	Extended Indirect Influence	3.77	3.75
B	Extended Direct Influence	22.89	26.71
C	Teacher Talk followed by Student Talk	6.15	6.44
D	Extended Student Talk	1.92	4.18
E	Student Talk followed by Teacher Talk	5.07	6.64
F	Teacher or Student Talk Followed by Silence	9.31	6.41
G	Extended Silence	27.42	28.61
H	Silence followed by Teacher or Student Talk	8.91	5.78

The percentage of time spent by each high-rated teacher and each low-rated teacher in the eight areas (A-H) is summarized in Table 5.

TABLE 5

COMPARISON OF PERCENTAGE OF TIME SPENT
IN AREAS A-H BY HIGH AND LOW
RATED TEACHERS

Area	Description	Teacher	No.	Percentage	Total
A	Sustained Indi-rect Teacher Influence	High	728 593 609	4.75 5.62 .70	
SUSTAINING					11.07
		Low	379 448 174	4.69 3.73 2.53	
					10.95
B	Sustained Direct Teacher In-fluence	High	728 593 609	19.71 25.23 21.76	
SUSTAINING					66.70
		Low	379 448 174	22.53 40.54 15.52	
					78.59
C	Student Talk Following Tea-cher Talk	High	728 593 609	9.01 6.61 1.96	
TRANSITIONAL					17.58
		Low	379 448 174	4.93 8.42 5.71	
					19.06
D	Sustained Student Talk	High	728 593 609	2.04 3.24 .51	
SUSTAINING					5.79
		Low	379 448 174	3.44 6.03 2.82	
					12.29

TABLE 5--Continued

Area	Description	Teacher	No.	Percentage	Total
E	Teacher Talk Following Stu- dent Talk	High	728 593 609	15.62 7.09 1.96	
					24.67
	TRANSITIONAL	Low	379 448 174	5.15 8.29 6.53	
					19.97
F	Non-Verbal Be- haviors Follow- ing Teacher or Student Talk	High	728 593 609	11.46 6.79 9.23	
					27.48
	TRANSITIONAL	Low	379 448 174	6.24 3.20 10.44	
					19.88
G	Sustained Non- Verbal Be- haviors	High	728 593 609	16.97 26.53 40.60	
					84.10
	SUSTAINING	Low	379 448 174	39.17 14.49 32.75	
					86.41
H	Teacher or Stu- dent Talk Fol- lowing Non- Verbal Behaviors	High	728 593 609	11.13 6.29 8.64	
					26.06
	TRANSITIONAL	Low	379 448 174	4.43 3.04 11.09	
					18.56

Table 6 shows the total composited percentage of time spent in sustained and transitional areas by the high and low-rated teachers.

TABLE 6

COMPARISON OF TOTAL PERCENTAGES IN SUSTAINED
AREAS (A-B-D-G) AND TRANSITIONAL AREAS (C-
E-F-H) BY HIGH-RATED AND LOW
RATED TEACHERS

Sustained Area Total		Transitional Area Total	
High-Rated	167.66	High-Rated	95.79
Low-Rated	188.24	Low-Rated	77.47

The total percentage of time spent in transi-
tional and sustaining cells, for individual categories
in a teacher's composite matrix for each high-rated and
low-rated teacher is summarized in Table 7.

TABLE 7

COMPARISON OF PERCENTAGE OF TIME SPENT IN SUSTAINING
AND TRANSITIONAL CELLS BY HIGH-RATED AND
LOW-RATED TEACHERS

High-rated Teachers			Low-rated Teachers		
Sustaining		Transitional	Sustaining		Transitional
728	38.30	61.70	379	66.61	33.39
593	55.24	44.76	448	60.64	39.36
609	65.36	34.64	174	49.76	50.33
	158.90	141.10		176.92	123.08
Ratio = 1.12			Ratio = 1.44		

The percentage of time spent in sustained and transitional Teacher Demonstration (category 15) by each of the high-rated and low-rated teachers is summarized in Table 8.

TABLE 8

COMPARISON OF PERCENTAGE OF TIME SPENT IN TRANSITIONAL
AND SUSTAINED TEACHER DEMONSTRATION BEHAVIORS
BY HIGH AND LOW-RATED TEACHERS

High-rated Teachers			Low-rated Teachers		
728	- sustained	2.27	379	- sustained	5.95
	transitional	3.04		transitional	2.01
593	- sustained	.00	448	- sustained	3.45
	transitional	1.71		transitional	1.45
609	- sustained	4.12	174	- sustained	9.65
	transitional	4.88		transitional	4.46

The summary of the percentage of time spent by each high-rated teacher and each low-rated teacher in the four major category groupings (Indirect Teacher Talk, categories 1-5; Direct Teacher Talk, categories 6-9; Student Talk, categories 10-12; Non-verbal behaviors, categories 13-15), is found on Table 9.

TABLE 9

COMPARISON OF PERCENTAGE OF TIME SPENT IN CATEGORY
GROUPINGS BY HIGH-RATED AND LOW-RATED TEACHERS

Teacher No.	Indirect Teacher	Direct Teacher	Student Talk	Non-verbal Behavior
High				
728	19.79	34.88	14.75	28.68
593	15.24	35.98	11.15	32.39
609	4.38	33.62	2.73	50.17
Low				
379	11.49	30.52	8.93	45.55
448	13.62	50.55	15.08	17.72
174	13.32	30.04	9.09	43.51

· Hypotheses Testing

In dealing statistically with the significance
levels of a given null hypotheses, using the Mann-
Whitney U test, Tate gives no lower confidence levels
than .05 and .10 for two N's of as few as three.[1]

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[1] Merle W. Tate, Nonparametric and Shortcut
Statistics in the Social, Biological and Medical Sciences,
(Danville, Ill.: Interstate Printers and Publishers,
Inc., 1957), p. 137.

Therefore, these null hypotheses were tested with that confidence level in mind.

In an effort to achieve greater confidence levels, as the result of a larger sample, data were assembled using the high-rated four teachers and the low-rated four teachers, rather than the three in each case. Parallel treatments were administered to the data, resulting in very little difference in the rejection or retention of the null hypotheses. Therefore, only the statistical treatment reflecting the three high-rated teachers and the three low-rated teachers are included in this section.

No. 1.--Null hypothesis No. 1 stated that there would be no significant difference between the amount of time spent in each of the scale's sixteen categories by most effective and least effective teachers.

None of the scale's sixteen categories produced highly significant differences, and for the most part, null hypothesis No. 1 was retained. Table 10 shows that only Teacher Requests and Commands (category 8), was significant at the .10 level of confidence, indicating that, to that extent, the high-rated teachers tended to use this category more than the low-rated teachers. According to Tate, in the Mann-Whitney U test for two samples of three each, a T value of 6 is

TABLE 10

PERCENTAGE OF TALLIES IN EACH OF THE SIXTEEN
CATEGORIES FOR HIGH AND LOW-RATED TEACHERS

Category	Sample	Range	T value	U value
1	high	.00- .07	8	2
	low	.00- .12		
2	high	1.87- 4.71	10	4
	low	2.08- 4.60		
3	high	.05- .92	10	4
	low	.12- .91		
4	high	1.90-12.99	9	3
	low	7.22- 8.03		
5	high	.56- 1.68	9	3
	low	1.19- 1.29		
6	high	12.00-16.58	9	3
	low	9.55-40.31		
7	high	1.24- 2.74	10	4
	low	1.40- 2.16		
8	high	11.92-17.60	7 (.10)*	1(.10)*
	low	5.70-14.50		
9	high	1.16- 5.63	10	4
	low	1.56- 3.83		
10	high	1.29-11.37	10	4
	low	5.67-11.71		
11	high	.59- 1.78	9.5	3.5
	low	1.61- 1.87		
12	high	.85- 1.60	10	4
	low	.55- 1.69		
13	high	21.16-40.87	9	3
	low	11.73-33.86		
14	high	.30- 2.36	9	3
	low	1.09- 3.73		
15	high	1.71- 9.00	9	3
	low	4.90-14.11		
16	high	5.23- 9.13	9	3
	low	3.02- 3.83		

* Significant at .10 level.

necessary at the .05 level of confidence, and a T value
of 7 is necessary at the .10 level of confidence.[2]

In a further attempt to compare the high and low-
rated teachers with regard to the amount of time spent
in each category, and any significant difference which
may appear in the total composite patterns, the data
on the composite high and low-rated teachers were
ranked. This resulted in a Mann-Whitney U value of 258,
considerably outside the range of 229 necessary for the
rejection of the null hypothesis even at the .20 level
of confidence.

It is safe to say that within the scope and range
of this sample, there was little significant difference
in the percentage of time spent in each category, nor
in the total composite percentages by the high and low-
rated teachers.

No. 2.--Null hypothesis No. 2 stated that there
would be no significant difference between the amount of
time spent in each of the category grouping areas (A-H),
by most effective and least effective teachers.

Table 11 shows the differences in percentage of
time spent in Area A (Extended Indirect Influence) not
to be significant. The two highest rated teachers spent

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[2]Ibid.

TABLE 11

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA A
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area A	Rank	T Value	U Value
High	728	4.75	5		
	593	5.62	6	12	3
	609	.70	1		
Low	379	4.69	4		
	448	3.73	3	9	6
	174	2.53	2		

the most time in extended indirect teacher influence,
but the third rated teacher spent the least amount of
time in that area. The null hypothesis for Area A is
retained. There is no significant difference in the
amount of time spent by the most effective teachers and
the least effective teachers of this sample in extended
indirect teacher influence.

Table 12 shows the differences in percentage of time
spent in Area B (Extended Direct Influence) not to be
significant. While considerable time was spent by all
teachers in this area, the least effective teacher spent
the least amount of time, and the teacher rated next to
lowest in effectiveness spent the most time in extended
direct influence. The null hypothesis for Area B is
retained. There is no significant difference in the

TABLE 12

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA B
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area B	Rank	T value	U value
High	728	19.72	2		
	593	25.23	5	10	5
	609	21.76	3		
Low	379	22.53	4		
	448	40.54	6	11	4
	174	15.52	1		

amount of time spent by the most effective and least
effective teachers of this sample, in extended direct
teacher influence.

Table 13 shows the differences in percentage of
time spent in Area C (Teacher Talk followed by Student
Talk) not to be significant. The top rated teacher
spent the most time in Area C, and the third rated
teacher spent the least. The null hypothesis for Area
C is retained. There is no significant difference in
the amount of time spent by the most effective and least
effective teachers of this sample, in teacher talk
followed by student talk.

TABLE 13

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA C
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area C	Rank	T Value	U Value
High	728	9.01	6		
	593	6.61	4	11	4
	609	1.96	1		
Low	379	4.93	2		
	448	8.42	5	10	5
	174	5.71	3		

Table 14 shows the differences in percentage of time spent in Area D (Extended Student Talk) to be significant, but only at the .10 level of confidence.

TABLE 14

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA D
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area D	Rank	T Value	U Value
High	728	2.04	2		
	593	3.24	4	7 (.10)*	8
	609	.51	1		
Low	379	3.44	5		
	448	6.03	6	14	1(.10)*
	174	2.82	3		

* Significant at .10 level.

The top rated teacher tended to allow less extended student talk than the lower rated teachers. The null hypothesis for Area D may be rejected, but only at the .10 level of confidence. To that extent there is a significant difference in the amount of time spent by most effective and least effective teachers in extended student talk. However, no teacher spent substantially more than six per cent of total time in this area.

Table 15 shows the differences in percentage of time spent in Area E (Student Talk followed by Teacher

TABLE 15

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA E
FOR HIGH AND LOW-RATED TEACHERS

Teacher No.		Area E	Rank	T Value	U Value
High	728	15.62	6		
	593	7.09	4	11	4
	609	1.96	1		
Low	379	5.15	2		
	448	8.29	5	10	5
	174	6.53	3		

Talk) not to be significant. Considerable range is obvious. The top rated teacher spent over fifteen per cent in this area, while the third rated teacher spent less than two per cent. The null hypothesis for Area E

is retained. There is no significant difference in the amount of time spent by the most effective and least effective teachers of this sample, in student talk followed by teacher talk.

Table 16 shows the differences in percentage of time spent in Area F (Teacher or Student Talk followed by Silence, or Non-Verbal Behaviors) not to be significant. The null hypothesis for Area F is retained. There is no significant difference in the amount of time spent by the most effective and least effective teachers of this sample, in non-verbal behaviors following student or teacher talk.

TABLE 16

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA F
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area F	Rank	T Value	U Value
High	728	11.46	6		
	593	6.79	3	13	2
	609	9.23	4		
Low	379	6.24	2		
	448	3.20	1	8	7
	174	6.53	5		

It should be recalled that there are several different general regions of non-verbal behaviors in

this area, including teacher demonstration, silence or
contemplation or a student deliberating on a teacher's
question, and teacher directed activities. The rela-
tively low incidence in this area is not surprising
in view of the vast amount of time spent in Area G
(Extended Silence, or Non-verbal Behaviors). Most
non-verbal behaviors tend to be extended.

Table 17 shows the differences in percentage of
time spent in Area G (Extended Silence, or Non-Verbal
Behaviors) not to be significant. While considerable
time was spent in this area by all teachers, the third

TABLE 17

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA G
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area G	Rank	T Value	U Value
High	728	16.97	2		
	593	26.53	3	11	4
	609	40.60	6		
Low	379	39.17	5		
	448	14.49	1	10	5
	174	32.75	4		

rated teachers used the most, and the first and second
rated teachers used the least with the exception of the
eighth rated teacher. The null hypothesis for Area G is

retained. There is no significant difference in the amount of time spent by the most effective and least effective teachers of this study, in extended silence, or non-verbal behavior.

Table 18 shows the differences in percentage of time spent in Area A (Teacher or Student Talk following Silence, or Non-verbal Behaviors) not to be significant.

TABLE 18

COMPARISON OF PERCENTAGE OF BEHAVIORS IN AREA H
FOR HIGH AND LOW-RATED TEACHERS

Teacher	No.	Area H	Rank	T Value	U Value
High	728 593 609	11.13 6.29 8.64	6 3 4	13	2
Low	379 448 174	4.43 3.04 11.09	2 1 5	8	7

The eighth rated teacher spent the least amount of time in this area, while the highest rated teacher spent the most. The null hypothesis for Area H is retained. There is no significant difference in the amount of time spent by the most effective and least effective teachers of this sample, in teacher or student talk following silence or non-verbal behaviors.

No. 3.--Null hypothesis No. 3 stated that there would be no significant difference in the ratio of indirect teacher talk (categories 1-5) to direct teacher talk (categories 6-9) in most effective and least effective teachers.

The ratio was determined by dividing the percentage of time spent in the indirect influence categories by the percentage of time spent in the direct influence categories for each teacher. Table 19 shows that by means of the Mann-Whitney U test, a U value was

TABLE 19

COMPARISON OF RATIOS OF INDIRECT TEACHER INFLUENCE
TO DIRECT TEACHER INFLUENCE IN HIGH AND LOW-
RATED TEACHERS

Teacher No.		Ratio	Rank	T Value	T Value
High	728	.57	6		
	593	.42	4	11	5
	609	.13	1		
Low	379	.37	3		
	448	.27	2	10	4
	174	.45	5		

calculated which was of insufficient magnitude to reject the null hypothesis. There is no significant difference in this ratio between high and low-rated teachers in this sample.

No. 4.—Null hypothesis No. 4 stated that there would be no significance between the ratio of direct teacher talk (categories 6-9) to student talk (10-12) in most effective and least effective teachers. The ratio was produced by dividing the percentage of time spent in direct teacher talk by the percentage of time spent in student talk. Table 20 shows that by means of the Mann-Whitney U test, a U value was calculated which was of insufficient magnitude to reject the null hypothesis. There is no significant difference in this ratio between high and low-rated teachers in this sample.

TABLE 15

COMPARISON OF RATIOS OF DIRECT TEACHER INFLUENCE TO
STUDENT TALK IN HIGH AND LOW-RATED TEACHERS

Teacher No.		Ratio	Rank	T Value	U Value
High	728	2.36	1		
	593	3.23	2	9	6
	609	12.32	6		
Low	379	3.42	5		
	448	3.35	4	12	3
	174	3.30	3		

No. 5.—Null hypothesis No. 5 stated that there would be no significance in the ratio of indirect teacher influence (categories 1-5) to student talk

(categories 10-12) in most effective and least effective teachers. The ratio was produced by dividing the percentage of time spent in indirect teacher talk by the percentage of time spent in student talk. Table 21 shows that by means of the Mann-Whitney U test, a U value was calculated which was of insufficient magnitude to reject the null hypothesis. There is no significant difference in this ratio between high and low-rated teachers in this sample.

TABLE 21

COMPARISON OF RATIOS OF INDIRECT TEACHER INFLUENCE TO STUDENT TALK IN HIGH AND LOW-RATED TEACHERS

Teacher	No.	Ratio	Rank	T Value	U Value
High	728	1.34	3	13	2
	593	1.37	4		
	609	1.60	6		
Low	379	1.29	2	8	13
	448	.90	1		
	174	1.46	5		

No. 6.--Null hypothesis No. 6 stated that there would be no significance in the amount of time spent in steady state cells (indicating sustained patterns) against the amount of time spent in transitional cells (indicating a move from one category to another) in most effective and

least effective teachers for their total patterns. Table 22 shows the data analyzed by means of a 2 x 2 chi square table. A chi square value of sufficient magnitude to reject the null hypothesis was achieved. The most effective teachers in the sample tended to spend more time in transitional cells in relation to the total behavioral tallies than the less effective teachers.

TABLE 22

CHI SQUARE TEST OF SIGNIFICANCE OF DIFFERENCE BETWEEN AMOUNT OF TIME SPENT IN STEADY STATE AND TRANSI-TIONAL CELLS IN HIGH AND LOW-RATED TEACHERS

	Sustaining	Transitional	
High	O = 9740 E = 10293 $O-E$ = 553 $(O-E)^2$ = 305809 $\frac{(O-E)^2}{E}$ = 29.71	O = 8518 E = 7938 $O-E$ = 580 $(O-E)^2$ = 336400 $\frac{(O-E)^2}{E}$ = 42.38	18258
Low	O = 10174 E = 9620 $O-E$ = 554 $(O-E)^2$ = 306916 $\frac{(O-E)^2}{E}$ = 31.90	O = 6891 E = 7444 $O-E$ = 553 $(O-E)^2$ = 305809 $\frac{(O-E)^2}{E}$ = 29.71	17065
	19914	15409	35323

The chi square value was highly significant at the .001 level of confidence, producing a value of 133.70, when only the value of 10.83 was necessary at df = 1.

No. 6a.--Null hypothesis No. 6a, stated that there would be no significant difference in the ratio of steady state cells to transitional cells for each of the sixteen categories for most effective and least effective teachers. The ratio was produced by dividing the percentage of time spent in steady cells by the percentage of time spent in transitional cells in each category for each of the most effective and least effective teachers. Table 23 shows that two categories, Student Response (category 10) and Teacher Demonstration (category 15), were significantly different at the .05 level of confidence, while one category, Student Initiative (category 11) was significantly different at the .10 level of confidence. The null hypothesis was rejected for those three categories at the indicated levels, and accepted for all others. There is a significant difference in the ratio of steady state cells to transitional cells for most effective teachers and least effective teachers in Student Response (category 10), Student Initiative (category 11), and Teacher Demonstration (category 15).

TABLE 23

COMPARISON OF RATIOS OF STEADY STATE CELL BEHAVIORS
TO TRANSITIONAL CELL BEHAVIORS FOR EACH
CATEGORY OF HIGH AND LOW-RATED TEACHERS

Category	Teacher No.	Ratio	Rank	T Value	U Value
1.	Insufficient data from any teacher				
2.	High 728	.06	2.5		
	593	.09	5	13.5	1.5
	609	.21	6		
	Low 379	.06	2.5		
	448	.01	1	7.5	7.5
	174	.07	4		
3.	High 728	.17	3.5		
	593	.37	5	10	5
	609	.00	1.5		
	Low 379	.75	6		
	448	.17	3.5	11	4
	174	.00	1.5		
4.	High 728	.20	2		
	593	.46	6	9	6
	609	.07	1		
	Low 379	.44	5		
	448	.30	4	12	3
	174	.29	3		

TABLE 23--Continued

Category	Teacher No.		Ratio	Rank	T Value	U Value
5.	High	728	.58	5		
		593	.20	2	10.5	4
		609	.28	3.5		
	Low	379	1.11	6		
		448	.28	3.5	10.5	4
		174	.05	1		
6.	High	728	1.38	2		
		593	2.68	4	9	6
		609	2.67			
	Low	379	.12	3		
		448	.59	6	11	4
		174	.10	2		
7.	High	728	.07	1		
		593	.19	4	10	5
		609	.22	5		
	Low	379	.12	3		
		448	.59	6	11	4
		174	.10	2		
8.	High	728	.76	2		
		593	.97	5	10	5
		609	.79	3		
	Low	379	1.11	6		
		448	.94	4	11	4
		174	.64	1		
9.	High	728	.85	5		
		593	1.03	6	13.5	1.5
		609	.57	2.5		
	Low	379	.46	1		
		448	.57	2.5	7.5	7.5
		174	.65	4		

TABLE 23--Continued

Category	Teacher No.		Ratio	Rank	T Value	U Value
10.	High	728	.08	1		
		593	.31	3	6 (.05)*	9
		609	.15	2		
	Low	379	.59	5		
		448	.64	6	15	0 (.05)*
		174	.42	4		
11.	High	728	.33	2		
		593	.80	4	7 (.10)*	8
		609	.00	1		
	Low	379	.68	3		
		448	.83	5	14	1 (.10)*
		174	.92	6		
12.	High	728	.34	3		
		593	.35	4	9	6
		609	.11	2		
	Low	379	.41	5		
		448	.49	6	12	3
		174	.06	1		
13.	High	728	1.68	1		
		593	6.41	4	8	7
		609	5.90	3		
	Low	379	13.47	6		
		448	7.50	5	13	2
		174	4.29	2		

*Significant at indicated level

TABLE 23--Continued

Category	Teacher No.		Ratio	Rank	T Value	U Value
14.	High	728	.30	3	13	2
		593	.34	4		
		609	.66	6		
	Low	379	.21	5	8	7
		448	.25	1		
		174	.41	2		
15.	High	728	.75	2	6 (.05)*	9
		593	.01	1		
		609	.84	3		
	Low	379	2.96	6	15	0(.05)*
		448	2.38	5		
		174	2.16	4		

*Significant at indicated level.

Nos. 7 and 8.--Null hypotheses Nos. 7 and 8 stated that there would be no relationship between the patterns of interaction of the most effective teachers (H_o 7), and the patterns of interaction of the least effective teachers (H_o 8). The composite matrix of each high-rated teacher was submitted to a Kendall Coefficient of Concordance: W test with the other two high-rated teachers (H_o 7). Likewise, the composite matrix of each low-rated teacher was submitted to a similar test of concordance: W, with the other low-rated teachers (H_o 8).

This formula was used to calculate the W value:

$$W = \frac{s}{(1/12)k^2 (N^3 - N)}$$

where,

s = sum of squares of the observed deviations from the mean

k = number of sets of observation periods, or number of teachers involved

N = number of categories

$(1/12)k^2 (N^3 - N)$ = the maximum possible sum of squared deviation, or the sum which would occur with perfect agreement in k rankings.[3]

Siegel further suggests that once the W value of concordance has been calculated, the significance of that figure may be tested by determining the chi square (X^2) value using the following formula:

$$X^2 = k(N-1)W$$

The significance, thus measured, may be determined by consulting any chi square table, with df = N - 1.[4]

The critical value of chi square necessary to reject the null hypothesis at the .001 level of confidence, with df = 15, is 37.70. Table 24 shows

[3]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, (New York: McGraw-Hill Book Co., Inc., 1956), p. 231.

[4]Ibid., p. 236.

TABLE 24

COMPARISON OF KENDALL COEFFICIENT OF CONCORDANCE: W
AND X^2 SIGNIFICANCE FOR BEHAVIOR PATTERNS
IN HIGH AND LOW-RATED TEACHERS

Teacher Group	W value	X^2 value		df
High Group	.97	43.65	(.001)*	15
Low Group	.94	42.30	(.001)*	15
Combined	.93	83.70	(.001)*	15

*Significant at .001 level.

that tests of concordance: W for both high and low
samples produced chi square critical values above that
which is necessary for rejection. Table 24 further
indicates a highly significant chi square value = 83.7
if Nos. 7 and 8 are combined. The null hypotheses Nos. 7
and 8 are rejected.

Thus, within the limitations of this sample, there
are significant relationships between the interaction
patterns among high-rated teachers, interaction patterns
among low-rated teachers, and between interaction patterns
of high and low-rated teachers when combined.

No. 9.--Null hypothesis No. 9 stated that there
would be no relationship between the interaction patterns
a given teacher achieves from class to class. The ten

matrices of each teacher were submitted to individual

Kendall Tests of Concordance: W to determine the

consistency of each teacher's behaviors from class to

class. Table 25 show all three high-rated teachers,

and all three low-rated teachers exhibiting character-

istics of consistency through the ten classes observed.

TABLE 25

COMPARISON OF KENDALL COEFFICIENT OF CONCORDANCE: W
AND X^2 SIGNIFICANCE FOR THE DEGREE OF CONSTANCY
IN HIGH AND LOW-RATED TEACHERS

Teacher No.		W value	X^2 value		df
High	728	.87	130.5	(.001)*	15
	593	.73	109.5	(.001)*	15
	609	.76	114.0	(.001)*	15
Low	379	.71	106.5	(.001)*	15
	448	.62	93.0	(.001)*	15
	174	.91	136.2	(.001)*	15

*Significant at the .001 level.

All six achieved W values of such high concordance as

to result in chi square values greatly in excess of

that needed for rejection of the null hypothesis at the

.001 level of confidence. There is evidence that within

this sample, all teachers tend to remain constant in their

total behavior patterns from class to class. Null

hypothesis No. 9 is rejected as it applies to the three
high-rated teachers and the three low-rated teachers in
this sample.

Comparison With Other Interaction Patterns

The previous application of Interaction Analysis
techniques to a variety of situations prompts the
researcher to place the results of one study against
that collected in another study using similar data
collecting instruments. This section summarizes the
results of the Pankratz physics classroom study, the
Amidon-Giammatteo elementary classroom study, and the
Snapp elementary instrumental music class study, in
light of the results of this study.

The study by Pankratz used the same category
system as this study, and analyzed the interaction
patterns of the five most effective, and five least
effective high school physics teachers in the total
sample, based on six classroom observations per teacher.[5]

1. Both physics and music teachers were pre-
dominantly direct in behavior, although both high and
low-rated teachers in the physics sample were about

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[5]Robert Pankratz, "Verbal Interaction Patterns in
the Classrooms of Selected Science Teachers: Physics,"
(Unpublished Doctoral dissertation, The Ohio State Uni-
versity, 1966).

twenty per cent higher than the high and low-rated music teachers.

2. The high-rated physics teachers exhibited two and a half times as much indirect teacher talk as the high-rated music teachers, while both the low-rated physics teachers and low-rated music teachers had less than fifteen per cent indirect teacher talk.

3. The music teachers used more non-verbal behaviors, which can be explained through the high incidence of teacher directed activity (category 13). That category was assigned whenever the teacher directed the class to perform some sort of non-verbal behavior, including singing, playing or listening.

4. The physics teachers showed more significant difference between the composite high-rated and composite low-rated teachers. In a Spearman Rank Correlation of the Pankratz categories between his composite high-rated teachers and his composite low-rated teachers, a P (rho) = .79 was achieved. Between the high-rated and low-rated music teachers, a P (rho) = .98 was achieved, demonstrating the tendency of both high and low-rated music teachers to exhibit behavioral patterns of an extremely high rate of similarity. A rank correlation of the composite of high-rated music teachers and the composite of high-rated physics teachers produced a P (rho) = .04. Between the two

sets of low-rated teachers, a P (rho) = .46 was achieved, both being low to extremely low in correlation. Using the high-rated music and physic teachers, and the low-rated music and physics teachers, a Kendall Coefficient of Concordance: $W = .59$ was achieved, with a X^2 value of 34.40. The figure was not significant.

5. Figure 10 shows that Pankratz' high-rated physics teachers used sustained behavior considerably more than the high-rated music teachers in this study. Likewise, the low-rated physics teachers used slightly more sustaining behaviors than the low-rated music teachers. However, in spite of the fact that both physics and music teachers used substantially less transitional behavior, as a group, both high and low-rated music teachers used more transitional behaviors than their physics correlates.

An Amidon-Giammatteo study used the Interaction Analysis concept with a large sample of elementary teachers classified as superior or average. The following conclusions were noted,[6] followed by the corresponding data from this study:

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[6] Edmund Amidon and Michael Giammatteo, "The Verbal Behaviors of Superior Elementary Teachers," Interaction Analysis: Theory, Research and Application, (Reading, Mass.: Addison-Wesley Publishing Co., 1967), p. 186.
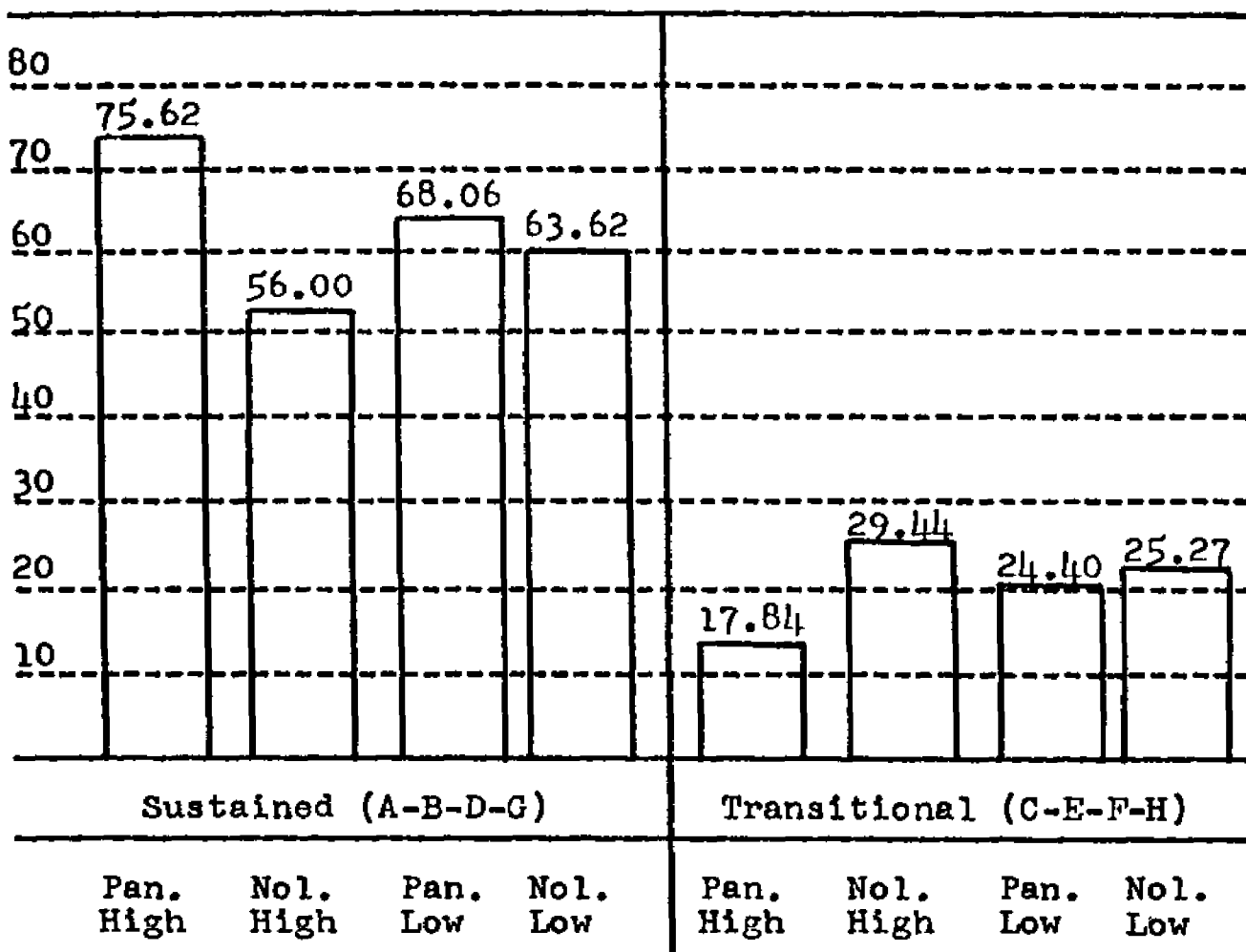
Fig.10.--Sustained vs. Transitional Areas
(Pankratz-Nolin)

1. Praise and Encouragement (category 2) was used about equally by high and average teachers, but more often following Student Initiative (category 11) by the superior teachers.

Music.--Praise and Encouragement was also used equally by high and low-rated music teachers, but neither used it as much as three and a half per cent, and the difference between its frequency of use following Student

Initiative was negligible, in neither case occurring as much as one per cent.

2. Lecture (category 6) was used forty per cent of the time by all teachers, and slightly more in the average group. It was found that the superior teachers had their lectures interrupted with Student Questions (category 12) more often than the average group.

Music.--Lecture was used nearly twice as often among low-rated teachers (24 per cent to 14 per cent). The low-rated teachers had their lectures interrupted more often by student questions than the high-rated teachers, but neither figure was as high as one-half of one per cent.

3. Teacher Direction or Command (category 8) was found to be used twice as much by regular teachers.

Music.--Teacher Direction or Command was found to be used twice as much by the high-rated teachers (8.79 per cent to 15.78 per cent).

4. Student Initiative (category 11) was found to be used twice as much by superior teachers.

Music.--Student Initiative was used equally among the high and low-rated teachers, but none of the teachers used this category more than two per cent.

5. Student talk (categories 10-12) accounted for fifty-two per cent of the time in the superior teacher's

classrooms, and forty per cent in the average teacher's classroom. At the same time, Teacher Talk (categories 1-9) accounted for forty per cent of the time in the superior teacher's classrooms and fifty-two per cent of the time in the average teacher's classroom.

Music.--Teacher activities (categories 1-9) accounted for nearly the same amount of time as in the Amidon-Giammatteo study (40 per cent high: 50 per cent low), but student talk accounted for only 9.13 per cent in high-rated teachers and 11.21 per cent in low-rated teachers. This would somewhat be equalized if Teacher Directed Activity (category 13) were placed in student activity. It is basically a non-verbal behavior, but is carried on by the student at the direction of the teacher.

The only study found which used Interaction Analysis with music teachers and music classes was the Snapp study, which used a slightly modified Flanders scale to measure the behaviors of instrumental music teachers in fifth grade instrumental music classes.[7] While no attempt to evaluate patterns of teaching of superior or inferior music teachers was made, the data found in that study is presented here because it is the only direct correlate in music. The material does not

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[7]David Snapp, "A Study of the Accumulative Musical and Verbal Behavior of Teachers and Students in Fifth Grade Instrumental Music Classes," (Unpublished Masters Thesis, The Ohio State University, 1967), p. 80.

directly contribute to the answer to the question of the relationship of patterns of interaction in music teachers and patterns of interaction in subjects other than music. But, the classrooms from which the Snapp material was drawn are considered a contrast to the nature of the general music classrooms from which the data in this study were taken. Although, the subject is common in the two sets of classrooms, the function of the teacher in the instrumental music class is considered to be different from the function of the teacher in the general music classroom.

Snapp.--1. Teacher behavior accounted for nearly sixty per cent of all classroom interaction, and was nearly twice as often direct teacher behavior.

Nolin.--1. While teacher behaviors (categories 1-9) accounted for only 47.68 per cent of total behaviors in the high-rated teachers, and 49.91 per cent of total behaviors in the low-rated teachers, if Teacher Demonstration (category 15), a non-verbal, but clearly teacher-centered behavior, were added to that, the total would be close to the sixty per cent found in the Snapp study. Teacher behaviors in this study, however, were direct more than three times as often in both high and low-rated teachers.

Snapp.--2. Criticism was used only five per cent of the time by the teachers in this study, and was not generally used for the maintaining of class order.

Nolin.--2. There were two categories that could have been interpreted as criticism in the Snapp respect-- Criticism (category 9) and Corrective Feedback (category 7). Corrective feedback was not used in this study as a means of maintaining class order or control, but Criticism was seldom used for any other purpose. These two categories, when combined, totalled very close to five per cent in both high and low-rated teachers.

Snapp.--3. The highest single form of teacher behavior was Giving Instruction (category 7, in Snapp scale).

Nolin.--3. The highest incidence of teacher verbal behavior in the high-rated teachers also was the giving of direction (category 8 - 15.78 per cent), but only slightly more frequently used than Lecture (category 6 - 14.89 per cent). In the low-rated teachers, however, Give Direction (category 8), was used only a third as often as Lecture (8.79 per cent to 24.00 per cent).

Summary

This chapter has presented all the interaction analysis data collected in this study, the testing of

the null hypotheses stated in Chapter I, and a comparison
of the data collected in this study with data collected
in other studies by means of identical or similar data
collecting instruments.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a brief summary of the problem and procedures of this study, the answers to the questions posed in Chapter I, a synthesis of salient findings, and recommendations based on the findings.

Summary

This study has sought to measure the teacher-student interaction patterns in selected junior high school general music classrooms. Nine music teachers were selected from the staff of a public school system in a large metropolitan city in Ohio. The nine teachers selected represented that portion of the general music teaching staff of the system who fulfilled the criteria for sample selection outlined in Chapter III. Audio-tape recordings of ten different class sessions for each teacher were obtained, and analyzed by means of Hough's Observation System for the Analysis of Classroom Instruction, a sixteen category modification of the ten category, Flanders Interaction Analysis scale.

While the study was in progress, the three music supervisors of the system were asked to make independent and confidential evaluations of the teachers in the sample, using a form developed specifically for this study. After all the data were collected, the results of the evaluations established the three teachers judged to be the most effective, the three teachers judged to be the least effective, and the three teachers judged to be of average effectiveness. The data collected from the three teachers rated as most effective, and the three teachers rated least effective were used in the final analysis.

The recorded behaviors for each teacher were summarized on an Interaction Analysis matrix for each class session, and a composite matrix reflecting the behaviors observed in all ten classes. The individual matrix of each recorded class session, the composite matrix for the ten class sessions of each teacher, the composite matrix for the high-rated teachers, and the composite matrix for the low-rated teachers were used in the testing of the stated hypotheses to determine what similarities or differences might be detected in the interactive behaviors of the selected junior high school general music teachers and classrooms.

The data collected in this study also were compared to that collected in other studies using identical or similar procedures or data collecting instruments to determine what similarities or differences might be detected between the interactive behaviors of general music teachers and teachers of other subjects.

While thirty additional class sessions were taped from the three teachers whose evaluation placed them in the middle range of effectiveness, these data were not included in the analysis because of the study design whereby behavior patterns were sought only among teachers identified as being at opposite polarities of effectiveness.

Conclusions

This section provides the answers to the questions posed in Chapter I, based on the testing of the stated null hypotheses, and a synthesis of the salient findings of this study.

Answers to Questions

Question No. 1. What patterns of teacher-student interaction can be observed in junior high school general music classes?

a. Do patterns of teachers rated as most effective differ from patterns of teachers rated less effective?

Null hypotheses Nos. 1-6a all dealt with the definition of those differences. No completely significant pattern difference could be found between the most effective and least effective teachers in terms of an entire pattern of interaction. The differences as they occurred within categories and sections of teacher matrices are summarized as follows:

1. The most effective teachers used nearly twice as much Teacher Requests or Commands (category 8) as the less effective teachers (15.78 per cent to 8.79 per cent). This difference was found to be significant at the .10 level of confidence (See Table 3, p. 79).

2. At the same time, the most effective teachers were using ten per cent less Lecture (category 6) and five per cent more Teacher Directed Activity (category 13). It is interesting to note that both items, while not testing to the point of being significantly different in this sample, certainly bear substantial differences. The item used less by the most effective teachers, was a direct, or teacher-centered category, and that used more by the most effective teachers was a student-centered activity (See Table 3, p. 79).

3. While neither the percentage of time spent in Extended Indirect Teacher Talk (Area A) or Extended Direct Teacher Talk (Area B) for the high or low-rated teachers was significantly different, it should be pointed out that both the high and low-rated teachers spent between seven and eight times as much time in Extended Direct Teacher Talk (Area B) as they did in Extended Indirect Teacher Talk (Area A). A pattern consistancy was nearly achieved when it was observed that the two highest-rated teachers spent the most time in Extended Indirect Teacher Talk (Area A). But, the third rated teacher spent the least amount of time in that area. It is legitimate to speculate that a larger sample might have produced a significant difference in this factor (See Table 4, p. 80; Appendix B).

4. Another parallel may be drawn as the result of the data in the Teacher Asks Question Category (category 4). The two highest rated teachers again spent more time than the other teachers in this category (12.99 per cent to 10.11 per cent respectively), but, again the third rated teacher was lowest in time spent in this category (1.90 per cent) (See Appendix B).

5. The areas of verbal interaction between student and teacher are Area E (Teacher talk following student talk) and Area C (Student talk following teacher talk).

Although no significance may be attached to differences in high and low-rated teachers in this sample, it may be noted that the highest rated teacher spent more time than any other teacher, in either high or low-rated group, in both Areas E and C, separately and when combined. However, there was such a range within the high-rated teachers, that when both these areas were summed for each teacher in the high and low-rated group, the high-rated teachers were not substantially higher than the low-rated teachers (42.35 per cent to 39.03 per cent). Thus, it may be noted that, although the highest rated teacher in this sample established a substantial pattern of teacher-student verbal interaction, the pattern was neither maintained in the other high-rated teachers, nor contrasted in the low-rated teachers (See Table 5, p. 81; Appendix B).

6. Areas A, B, D and G are sustaining areas, indicating the lack of transfer from one category to another category outside that area, and Areas C, E, F and H are transitional areas, indicating the movement from one category to another category outside the area. It may be noted that, while very little significance may be attached to the difference encountered in these areas by high and low-rated teachers, the teacher rated the most effective, spent more time than any other

teacher in all four transitional areas. Further, that
same teacher spent next to the least amount of time in
three of the four sustaining pattern areas, and in the
fourth, Area A (extended, or sustained indirect teacher
talk), was next to the highest in time spent. Thus, it
may be observed that the highest rated teacher in this
sample tended to spent more time than other teachers in
the sample, in transitional behaviors, and less time in
sustaining patterns, the lone exception being in Extended
Indirect Teacher Talk, where the highest rated teacher
spent more time than any other teacher, with one exception
(See Table 5, p. 81; Appendix B).

One other consistancy in that regard may be observed
in that the seventh rated teacher (third from lowest)
was consistantly next to lowest in percentage of time
spent in transitional areas, and either fourth or fifth
in all four sustaining areas.

The percentage of time spent by each of the high-
rated teachers in the sustaining areas (A, B, D, and G)
totaled 167.66 per cent, while the total percentage of
time spent in sustaining areas by the three low-rated
teachers totaled 188.24 per cent. At the same time, the
high-rated teachers spent considerably more time in
transitional areas (C, E, F and H) than the low-rated

teachers (95.79 per cent for high-rated teachers to 77.41 per cent for low-rated teachers). (See Table 6, p. 83).

7. The tendency of high-rated teachers to utilize transitional behaviors in individual cells and categories, in addition to the larger, more comprehensive areas of analysis, was further supported by the chi square test of significance of difference in the rejection of null hypothesis No. 6. Four of the six teachers in the high and low-rated groups spent more time in sustaining behavior cells than in transitional behavior cells. The only teacher with a substantially larger percentage of time in transitional cells than in sustaining cells, was the highest rated teacher. The lowest rated teacher had barely over half of the recorded behaviors in transitional cells (50.33 per cent). All the rest of the teachers were more often sustaining than transitional. The total percentage of time spent by the three high-rated teachers in sustaining cells amounted to 158.90 per cent, to 141.10 per cent spent in transitional cells, producing a ratio of 1.12. At the same time, the low-rated teachers spent a total of 176.92 per cent of the time in sustaining cells to 123.08 per cent in transitional cells, producing a ratio of 1.44.

So while both high and low-rated teachers spent more time in sustaining cells than in transitional cells, the ratio produced by those two factors indicated that the low-rated teachers spent considerably more time in sustaining cells and considerably less time in transitional cells than did the high-rated teachers (See Table 7, p. 84).

8. There were three categories in which the ratio of steady state, or sustaining cells to transitional cells produced a difference which was tested to be significant within each category. The three categories were Student Response (category 10), Student Initiative (category 11) and Teacher Demonstration (category 15).

An examination of the data shows that Student Initiative (category 11) was not used by any of the teachers in excess of two per cent, and is hardly worth considering a factor. The highest rated teacher was found to use Student Response (category 10) the greatest amount and also had the greatest difference between transitional and sustaining behavior in that category (.90 per cent sustaining to 10.47 per cent transitional), but the consistency among the high-rated teachers was not maintained. The third highest rated teacher used the least amount of behaviors in this category (.17 per cent sustaining to 1.12 per cent transitional). All six teachers spent substantially more time in transitional behavior than sustaining behavior in this category.

Teacher Demonstration (category 15) produced some interesting results. All three of the highest rated teachers spent more time in transitional teacher demonstration behaviors than in sustaining teacher demonstration behaviors. All three low-rated teachers, on the other hand, spent more time in sustained teacher demonstrations than in transitional teacher demonstration.

To the extent of this sample of teachers, the most effective teachers were observed spending less time in the sustained teacher demonstration behaviors than in transitional teacher demonstration behaviors. That pattern was totally reversed for the least effective teachers (See Table 23, p. 101; Table 8, p. 84).

b. Do patterns vary among teachers rated as most effective?

The rejection of null hypothesis No. 7 established the fact that the teachers in this sample who were rated as most effective tended to produce interaction patterns with a very high degree of concordance.

The most notable difference was between the patterns of the two most effective teachers and the pattern of the third-rated teacher. While all three teachers spent nearly the same amount of time in Direct Teacher In-fluence (categories 6-9), with minimal variances between those four categories, the third rated teacher spent

nearly double the time of the highest rated teacher in Teacher Directed Activity (category 13), while the highest rated teacher spent nearly ten times as much time in Student Response (category 10), and nearly seven times as much in total Student Talk (categories 10-12) as the third rated teachers (See Table 9, p. 85; Appendix B).

Another rather obvious difference among the matrix patterns of the high-rated teachers, was the degree of activity in sustained and transitional patterns. The highest rated teacher spent considerably more time in transitional behaviors, while the third-rated teacher spent nearly twice as much time in sustaining behaviors, more nearly like the pattern of two of the three low-rated teachers (See Table 7, p. 83; Appendix B).

c. Do patterns vary among teachers rated least effective?

The rejection of null hypothesis No. 8 established the fact that the teachers in this sample who were rated as least effective tended to produce interaction patterns with a high degree of concordance, over-all. However, there were some marked contrasts.

The percentage of time difference spent by all three teachers in the low-rated group was not substantial in Indirect Teacher Influence (categories 1-5). But,

in the other three major divisions, the eighth-rated
teacher spent twenty per cent more time in Direct Teacher
Behaviors (categories 6-9) than either of the other two
low-rated teachers, nearly double the amount of time spent
in Student Talk Behaviors (categories 10-12) as the other
two low-rated teachers, and considerably less than half as
much time in Non-Verbal Behaviors (categories 13-15) as
the other two low-rated teachers.

While the pattern of sustaining and transitional be-
haviors was nearly parallel for the seventh and eighth-
rated teachers, or nearly two to one in both cases, and
bearing resemblance to that of the third-rated teacher,
the lowest-rated teacher had a sustaining-transitional
pattern very similar to the second-rated teacher, both near
the fifty per cent mark in both sustaining and transitional
behaviors (See Table 7, p. 83; Appendix B).

d. Do patterns of individual teachers vary from one class session to the next?

The rejection of null hypothesis No. 9 established
the fact that within this sample, none of the individual
teachers in the high-rated group or the low-rated group
demonstrated significant variance in interaction patterns
from one class session to the next. The patterns for
each of the six teachers tended to remain consistant
throughout all ten observed class sessions (See Table 25,
p. 108).

Question No. 2. Are there differences between the patterns of teacher-student verbal interaction in junior high school general music classrooms and patterns of teacher-student verbal interaction in classrooms other than music?

Through the presentation and analysis of the data in Chapter IV, there appears to be very little direct connection between the interaction patterns of the music teachers used in this study, and teachers of subjects other than music analyzed by means of Interaction Analysis. The only tendency which seems to appear in each set of data is that music teachers, and teachers of subjects other than music which were reported in this study, all tend to be more direct, or autocratic in their behavior than indirect, or democratic. This study also established the fact that, as in the case of most other Interaction Studies, while indirectness in behavior may be desirable, the teacher, to varying degrees, still dominates the classroom.

Synthesis of Findings

This section contains a synthesis of salient findings from this study presented in three dimensions:

1. The findings based on the direct-indirect dimension,

2. The findings based on the transitional-sustaining dimension, and

3. The findings based on miscellaneous dimensions of both teacher and student behaviors.

Direct-Indirect Dimension.--The direct behaviors of teachers are those behaviors where attention is called upon the teacher as the central, controlling element in the classroom. It has been called the teacher-centered or autocratic type of behavior. The Hough Scale categorically accounts for direct teacher behaviors in categories 6-9. The indirect behaviors of teachers are those behaviors that are student-centered, permissive or democratic in nature. The Hough Scale categorically accounts for indirect teacher behaviors in categories 1-5.

1. While the composite matrices of both high and low-rated teachers show nearly fifty per cent indirect and direct teacher behaviors, all six teachers in the high and low-rated groups were predominately direct in their teaching behaviors. The six teachers were anywhere from one and a half times to eight times as often direct in their behaviors as they were indirect (Appendix B).

2. Flanders studies have suggested consistently that indirect behaviors are desirable. The two highest rated teachers in this study had the highest incidence of indirect behavior, but the composite of the high-rated teachers was not significantly higher than the composite matrix of the low-rated teachers, due to the incidence of less than five per cent indirect behaviors by the third rated teacher. The highest ratio, indicating the smallest differential between the percentage of time spent in indirect behaviors and the percentage of time spent in direct behaviors, was by the highest rated teacher (Appendix B).

3. Of the direct behavioral categories, the low-rated teachers spent nearly three times as much time in Lecture (category 6) as in Teacher Direction (category 8). The high-rated teachers, on the other hand, spent more time in category 8 than they did in category 6, but only by less than one per cent (See Table 3, p. 79).

4. While it was found that instrumental music teachers were predictably direct twice as often as they were indirect, the composite matrices of general music teachers showed that they were direct in their behaviors more than three times as often as they were indirect.

There is evidence in this study that general music
teachers may be more autocratic or domineering in the
conduct of their classes than instrumental music
teachers.

5. Due to the predominance of non-verbal behaviors
in the general music classroom, the teachers in this
sample showed less direct and indirect behaviors than
physics teachers observed with the same instrument.

Transitional-Sustaining Dimension.--When a teacher
remains in one particular category for more than three
seconds, the behavior is said to be sustaining. When
the behavior pattern shows a tendency to change from
one behavioral category to another, the behavior is said
to be transitional. A teacher can be sustaining within
one category, or within an area or group of categories.
For example, if a teacher is lecturing for a period of
time, the behavior is sustaining. If a teacher
fluctuates between lecturing, giving directions and
criticizing, the behavior is sustaining direct, because
that teacher has not changed to behaviors outside of
direct teacher talk.

1. When considering individual categories and
total matrices of all teachers, behavior was sustaining
more often than it was transitional. But, the ratio of
sustained to transitional behaviors was considerably

higher (1.44-1.12) in the low sample, indicating a wider differential between sustained and transitional behaviors. In other words, high-rated teachers in this sample tended to be transitional more often, and sustaining less often than the teachers who were judged to be less effective (See Table 7, p. 83).

2. Four of the broad category areas are sustaining areas (A, B, D, G), and four are transitional (C, E, F, H). All teachers spent more time in sustaining areas than in transitional areas. But, the ratio of sustaining to transitional behaviors was higher for the low-rated teachers (2.44-1.77), indicating a wider differential between time spent in sustaining areas and time spent in transitional areas. In other words, high-rated teachers in this sample tended to spend more time in transitional areas, and less time in sustaining areas than the low-rated teachers (See Table 6, p. 83).

3. The highest rated teacher spent the most amount of time in the four transitional areas (C. E, F, H) and was second to highest in the sustaining area A (extended indirect behavior). This same teacher spent less time than all but one of the other teachers in the other three sustaining behavior areas (G, D, G). Two of those transitional areas (E, C) are the areas of interaction between the student and the teacher. The highest

rated teacher spent more time in those behavior areas than any other teacher in the sample. By contrast, the seventh rated teacher was next to lowest in time spent in all four transitional areas (C, E, F, H) (See Table 5, p. 81).

4. One of the categories that tested a significant difference in the ratio of sustaining cell behavior to transitional cell behavior in the high and low-rated teachers, was in Teacher Demonstration (category 15), basically a non-verbal behavior, but teacher-centered none-the-less. Of the total time spent in this category, all three high-rated teachers tended to be more transitional than sustaining, while all three low-rated teachers tended to be more sustaining than transitional (See Table 8, p. 84).

Miscellaneous Dimensions.--While the two previous dimensions form the major portion of the findings of this study, there are a number of other findings that cannot be grouped under one heading, nor included under one of those two.

1. The music teachers in this sample all demonstrated behavioral patterns largely devoid of major deviations from class session to class session. This study was conducted over a period of five months and none of the teachers showed tendencies to vary their

behaviors, regardless of the subject content of the
class. Withall had suggested earlier that teachers tend
to remain constant in their verbal patterns.[1] If one
can use this sample, it is apparently true with music
teachers, also.

2. The music teachers were even more constant in
their behavior patterns than the Pankratz physics
teachers.[2]

3. The general music classes in this sample
were, to a much greater degree, non-verbal in character
than classes of other subjects measured with the same
category system. However, no class with over fifty per
cent of a single non-verbal activity was used in this
study, although some were encountered. The singing,
playing and listening activities, so characteristic of
general music classes, in addition to board and desk work
equally characteristic of other types of classes, accounted
for the large quantity of time spent in Teacher Directed
Activities (category 13).

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[1] John Withall, "The Development of a Technique for
the Measurement of Social-Emotional Climate in the Class-
rooms," J. of Exp. Educ., XVII (1949), pp. 347-361.

[2] Roger Pankratz, "Verbal Interaction Patterns in
the Classrooms of Selected Science Teachers: Physics,"
(Unpublished Doctoral dissertation, The Ohio State
University, 1966).

4. Student Talk (categories 10-12) accounted for
an extremely low amount of behaviors. The most fre-
quently used student talk was the Student Response or
Answer to Teacher Question (category 10). No teacher
allowed, expected or received as much as two per cent
in either Student Initiated Talk (category 11) or
Student Questions (category 12).

Recommendations

These recommendations are based on the results
of the analysis of the data collected in this study,
and are aimed in part, toward possible future research
in this area, and also, toward the potential of this
material in the preparation of music teachers.

1. The sample size in this study was small. It
could have been no larger due to the restrictive criteria
placed on teacher selection. The sample was selected
from a single large city school system in order to gain
some over-all characteristics of standardization of
purpose and objectives in general music classes. The
nine teachers selected for this sample represented
that portion of the general music teachers in the system
who could fulfill the specified requirements of the
study, and who were willing to participate.

However, due to the small sample size, it was impossible to use confidence levels greater than .05 for the acceptance or rejection of most null hypotheses. A sample size of twelve or fifteen would have increased confidence level potential to .01 or .001.

The broader base of specifications, with more generalized restrictions on objectives, and spread over an entire urban county, would produce a sample of more ideal proportions. There is some evidence in this study that a high and low-rated sample of five to ten teachers may have produced significant differences in behaviors between the two samples.

2. While the evaluation of teachers is a logical way to attempt the identification of desirable characteristics in the teaching of music, the evaluation really should be made on the basis of, either musical development, or attitudinal growth in the students. Existing instruments, or developed instruments could be used that would measure those factors so that the traits of teachers responsible for the attitude and/or ability growth of students might be identified.

3. Audio-tape recording has again been demonstrated as a valid and reliable means of observing classroom behaviors. The only improvement might be in the use of video-tape recording equipment.

4. If video equipment is used, a means of identifying various types of non-verbal behaviors should be integrated into the present scale. Even with audio equipment, Teacher Directed Activity (category 13) should be sub-divided into enough categories so that each of the basic activities found under category 13 (singing, playing, listening, board work, etc.) might be identified. Although, no effort was made to differentiate between those types of activities in this study, it might be possible that the verbal behaviors of the general music teacher are regulated somewhat by the type of non-verbal behaviors the class is asked to perform.

5. It was assumed prior to the conduct of this study, that the performance classroom (band, orchestra or choir) would not be appropriate to analysis through the use of a behavioral scale design primarily to measure verbal behaviors, because of the autocratic dominance of the performance classroom teacher. However, in view of the overwhelming directness of most general music teachers, the study of the performance teacher may be speculated as a potentially valid research endeavor, particularly if the identification of non-verbal behaviors could be more discrete.

Although, it must be recognized that the sample
size in this study restricts the universal application
of its results so far as music teacher education is
concerned, a number of suggestions may be made to the
profession, if those sample size restrictions place
the suggestions in proper perspective.

1. There is some evidence that music teachers
judged to be most effective tend to avoid static
behavioral patterns, resulting from remaining in a
single category, group of categories or area of
analysis for extended periods of time. To the contrary,
the teachers judged most effective in this study tended
to be transitional more often than the less effective
teachers, in that they moved more frequently from one
category to another. To the extent that the results
of this study may be interpreted, the transitional
characteristic of the superior teaching observed in
this study, may be a desirable one to encourage in the
preparation of general music teachers.

2. It was an observation of this study that a
desirable characteristic in the general music teacher
might be the moderate practice of a teacher demonstration
behaviors. The teachers in this study judged to be most
effective tended to use teacher demonstrations as a more

transitional behavior, practiced in moderation, and, when used, as a behavior integrated with other behaviors. Teacher demonstration behaviors included such things as playing the piano, the teacher singing to illustrate a point, or any other activity where a teacher performs a non-verbal demonstrative act.

3. The desirability of indirect teacher influence, or the democratic influence of the teacher suggested by previous Flanders Interaction Analysis applications, apparently is not quite so highly desirable in music teachers. A music teacher can be effective while being centrally direct, or autocratic in character. The one teacher in this study rated as most effective, did exhibit a higher degree of indirect behaviors, even though the same teacher was considerably more direct than indirect in total behavior pattern.

APPENDIX A

OBSERVER RELIABILITY CHECKS

RELIABILITY CHECK No. 1

Situation No. 1   10 minutes   199 tallies

Cat.	Stand.% A	Nolin % B	Snapp % C	A-B diff	A-C diff	B-C diff
1.	.5	.0	.5	.5	.0	.5
2.	2.0	1.5	2.5	.5	.5	1.0
3.	4.0	3.0	4.5	1.0	.5	1.5
4.	5.0	5.0	4.5	.0	.5	.5
5.	.0	.0	.0	.0	.0	.0
6.	81.0	79.3	82.2	1.7	.8	2.9
7.	1.0	1.0	1.0	.0	.0	.0
8.	.0	.5	.0	.5	.0	.5
9.	.0	.0	.0	.0	.0	.0
10.	5.0	5.5	5.0	.5	.0	.5
11.	.0	.0	.0	.0	.0	.0
12.	.0	.0	.0	.0	.0	.0
13.	.0	.0	.0	.0	.0	.0
14.	.0	.0	.0	.0	.0	.0
15.	1.0	3.5	.0	2.5	1.0	3.5
16.	.5	.5	.5	.0	.0	.0
Total	100.0	99.8	100.7	7.2	3.3	10.9

Reliability:

Nolin	=	.79
Snapp	=	.89
Inter-observer agreement	=	.70

RELIABILITY CHECK No. 2

Situation No. 2   15 minutes   305 tallies

Cat.	Stand.% A	Nolin % B	Snapp % C	A-B diff	A-C diff	B-C diff
1.	.5	.5	.5	.0	.0	.0
2.	3.5	3.0	3.6	.5	.1	.6
3.	4.0	4.0	5.9	.0	1.9	1.9
4.	5.0	6.0	5.6	1.0	.6	.4
5.	2.5	2.3	2.3	.2	.2	.0
6.	23.0	21.6	23.0	1.4	.0	1.4
7.	2.0	2.0	1.6	.0	.4	.4
8.	26.0	26.6	23.0	.6	3.0	3.6
9.	.5	.5	.5	.0	.0	.0
10.	11.0	10.8	10.2	.2	.8	.6
11.	3.0	1.6	4.0	1.4	1.0	2.4
12.	3.0	4.0	3.0	1.0	.0	1.0
13.	12.5	12.5	12.5	0.0	0.0	0.0
14.	.0	.0	1.6	.0	1.6	1.6
15.	3.0	4.0	2.6	1.0	.4	1.4
16.	.5	1.0	.5	.5	.0	.5
Total	100.0	100.4	100.4	7.8	10.0	15.8

Reliability:

Nolin   = .90
Snapp   = .89
Inter-observer agreement   = .70

RELIABILITY C..ECK No. 3

Music Tape No. 379-5   34 minutes   651-682 tallies

Category	Nolin Percentage A	Snapp Percentage B	A-B Disagree.
1.	0	0	0
2.	2	1	1
3.	3	3	0
4.	4	4	0
5.	0	0	0
6.	18	21	3
7.	2	1	1
8.	7	8	1
9.	1	0	1
10.	3	3	0
11.	1	1	0
12.	0	0	0
13.	50	53	3
14.	3	3	0
15.	3	0	3
16.	3	3	0
Total	100	101	13

Reliability:

Inter-observer agreement   =   .78

RELIABILITY CHECK No. 4

Music Tape No. 728-7   39 minutes   780-851 tallies

Category	Nolin Percentage A	Snapp Percentage B	A-B Disagree
1.	0	0	0
2.	2	1	1
3.	7	7	0
4.	9	10	1
5.	1	1	0
6.	23	25	2
7.	0	0	0
8.	1	1	0
9.	2	2	0
10.	8	7	1
11.	0	0	0
12.	1	1	0
13.	37	40	3
14.	0	0	0
15.	5	2	3
16.	4	4	0
Total	100	101	11

Reliability:
Inter-observer agreement   =   .85

RELIABILITY RE-CHECK No. 1

Music Tape No. 174-3   29 minutes   580-586 tallies

Category	Percentage 1st Analysis A	Percentage 2nd Analysis B	A-B Disagree.
1.	0	0	0
2.	4	3	1
3.	0	1	1
4.	10	10	0
5.	1	1	0
6.	17	20	3
7.	3	3	0
8.	15	14	1
9.	4	3	1
10.	10	10	0
11.	2	1	1
12.	1	1	0
13.	16	15	1
14.	2	2	0
15.	11	12	1
16.	4	3	1
Total	100	99	11

Reliability:

Inter-observer agreement   =   .87

RELIABILITY RE-CHECK No. 2

Music Tape No. 379-3   32 minutes   652-658 tallies

Category	Percentage 1st Analysis A	Percentage 2nd Analysis B	A-B Disagree.
1.	0	0	0
2.	3	2	1
3.	1	1	0
4.	9	9	0
5.	1	0	1
6.	25	29	4
7.	2	2	0
8.	6	6	0
9.	0	0	0
10.	13	13	0
11.	2	2	0
12.	0	0	0
13.	26	26	0
14.	3	2	1
15.	7	7	0
16.	1	0	1
Total	99	99	8

Reliability:

Inter-observer agreement   =   .90

APPENDIX B

COMPOSITE MATRICES AND MATRIX
ANALYSES FOR HIGH AND
LOW SAMPLE

COMPOSITE MATRIX FOR HIGH SAMPLE
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.00	.00	.00	.01	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.29	.04	.90	.00	.53	.03	.76	.05	.07	.06	.03	.28	.01	.09	.08
3	.00	.00	.15	.09	.00	.13	.01	.04	.01	.02	.01	.00	.01	.00	.01	.01
4	.00	.07	.00	1.83	.00	.31	.08	.37	.09	4.05	.05	.11	.32	.95	.19	.08
5	.00	.00	.01	.05	.32	.23	.03	.14	.06	.02	.05	.09	.07	.01	.03	.04
6	.00	.19	.01	1.24	.01	10.26	.02	1.04	.20	.28	.28	.19	.20	.03	.73	.25
7	.00	.06	.01	.35	.00	.26	.23	.35	.06	.19	.00	.02	.26	.02	.13	.05
8	.00	.17	.01	.97	.00	.60	.05	7.30	.34	.15	.10	.22	3.78	.11	1.51	.58
9	.01	.03	.02	.19	.00	.16	.01	.55	1.46	.07	.04	.05	.15	.01	.12	.20
10	.00	1.34	.12	.43	.00	.81	.63	.64	.13	.97	.10	.03	.08	.04	.08	.07
11	.01	.08	.10	.08	.07	.22	.04	.10	.04	.00	.41	.09	.04	.01	.02	.10
12	.01	.02	.00	.02	.10	.03	.00	.04	.01	.01	.02	.29	.01	.01	.00	.02
13	.00	.87	.00	.67	.00	.40	.77	2.14	.22	.00	.07	.07	23.90	.01	.19	.50
14	.00	.02	.00	.27	.01	.13	.02	.10	.03	.40	.01	.01	.10	.40	.01	.03
15	.00	.09	.00	.33	.00	.53	.02	1.35	.08	.08	.20	.02	.63	.01	2.17	.11
16	.00	.08	.01	.27	.00	.28	.03	.85	.27	.05	.08	.07	.07	.01	.64	3.37
T	.03	3.31	.48	7.60	.52	14.89	2.02	15.78	3.05	6.36	1.48	1.29	29.83	1.63	5.91	5.49
	11.94					35.74				9.13			37.37			5.49

N = 18,258

MATRIX ANALYSIS FOR HIGH SAMPLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Area A

   N tallies 688

   % total   3.77

Area C

   N tallies

     1122

   % total

     6.15

Area F

   N tallies

     1699

   % total

     9.31

Area B

   N tallies 4179

   % total 22.89

Area E

   N tallies 925   % total 5.07

Area D

  N 350

  % 1.92

Area H

   N tallies 1626   % total 8.91

Area G

  N 5006

  % 27.42

Sustaining   = 53.35%

Transitional = 46.65%

N = 18,250

COMPOSITE MATRIX FOR LOW SAMPLE
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.04	.01	.01	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.00	.00
2	.00	.14	.13	.67	.01	.69	.08	.45	.07	.13	.04	.06	.23	.01	.12	.11
3	.00	.00	.18	.12	.00	.18	.02	.01	.01	.02	.02	.00	.00	.00	.00	.00
4	.00	.02	.01	1.97	.02	.36	.00	.23	.11	3.65	.06	.08	.02	1.75	.08	.08
5	.00	.01	.00	.03	.38	.35	.06	.12	.04	.00	.05	.15	.04	.01	.03	.06
6	.00	.10	.04	1.85	.00	18.34	.04	.90	.30	.24	.46	.39	.11	.03	.88	.39
7	.00	.06	.02	.29	.01	.40	.15	.18	.04	.33	.02	.00	.03	.04	.06	.06
8	.01	.06	.00	.40	.00	.36	.01	4.04	.32	.28	.09	.08	1.80	.01	.91	.47
9	.00	.05	.00	.18	.00	.27	.02	.35	.99	.12	.10	.06	.02	.02	.11	.23
10	.01	1.57	.16	.79	.00	1.11	.98	.24	.08	3.01	.05	.02	.02	.02	.02	.13
11	.01	.06	.07	.20	.08	.33	.06	.04	.03	.00	.77	.05	.00	.01	.02	.04
12	.00	.01	.00	.08	.63	.06	.01	.02	.01	.01	.01	.26	.00	.00	.01	.02
13	.01	.73	.00	.26	.00	.22	.36	.55	.07	.01	.00	.02	21.30	.00	.12	.29
14	.00	.19	.00	.40	.08	.24	.03	.04	.05	.36	.00	.00	.00	.52	.04	.01
15	.00	.06	.00	.21	.00	.52	.03	1.14	.12	.01	.05	.02	.47	.01	6.15	.93
16	.00	.06	.01	.26	.03	.57	.02	.47	.42	.06	.02	.04	.07	.01	.13	1.38
T	.08	3.13	.63	7.51	1.24	24.00	1.87	8.79	2.66	8.23	1.75	1.23	24.11	2.44	8.68	4.20
	12.59					37.32				11.21			35.23			4.20

N = 17,065

MATRIX ANALYSIS FOR LOW SAMPLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

```
       1   2   3   4   5    6   7   8   9   10  11  12   13  14  15  16
   1 ┌─────────────────────┐              ┌────────────────┬──────────────────┐
   2 │ Area A              │              │ Area C         │ Area F           │
   3 │   N tallies   639   │              │   N tallies    │   N tallies      │
   4 │   % total    3.75   │              │    1098        │    1093          │
   5 │                     │              │   % total      │   % total        │
   6 └──────────┬──────────┴──────────┐   │    6.44        │    6.41          │
   7            │ Area B              │   │                │                  │
   8            │   N tallies 4558    │   │                │                  │
   9 ┌──────────┴─────────────────────┴───┤                └──────────────────┤
  10 │ Area E                             │ Area D                            │
  11 │   N tallies  1133   % total 6.64   │   N   713                         │
  12 │                                    │   %  4.18                         │
  13 ├────────────────────────────────────┴──────────┬───────────────────────┤
  14 │ Area H                                         │ Area G                │
  15 │   N tallies   986   % total 5.78               │   N  4882             │
  16 └────────────────────────────────────────────────┤   %  28.61            │
                                                      └───────────────────────┘
```

Area A
  N tallies   639
  % total   3.75

Area B
  N tallies 4558
  % total   26.71

Area C
  N tallies 1098
  % total   6.44

Area F
  N tallies 1093
  % total   6.41

Area E
  N tallies 1133   % total 6.64

Area D
  N   713
  % 4.18

Area H
  N tallies   986   % total 5.78

Area G
  N 4882
  % 28.61

Sustaining   = 59.62%
Transitional = 40.38%
           N = 17,065

MATRIX FOR TEACHER No.728 (High Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.00	.00	.00	.02	.02	.02	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.26	.02	1.37	.00	.60	.14	1.32	.03	.02	.06	.06	.45	.02	.12	.09
3	.00	.00	.05	.06	.00	.09	.02	.06	.00	.00	.00	.00	.02	.00	.00	.00
4	.00	.06	.00	2.21	.00	.51	.11	.74	.05	6.61	.08	.11	.81	1.13	.39	.09
5	.00	.00	.00	.06	.62	.23	.03	.21	.05	.05	.11	.17	.06	.00	.03	.08
6	.00	.20	.00	2.00	.00	6.96	.02	1.11	.12	.05	.24	.18	.32	.05	.66	.14
7	.00	.12	.02	.50	.00	.35	.18	.51	.11	.24	.00	.05	.51	.06	.17	.03
8	.00	.21	.00	1.82	.00	.60	.06	7.60	.33	.29	.23	.33	4.60	.27	1.19	.30
9	.02	.05	.02	.18	.00	.08	.03	.49	1.17	.03	.06	.05	.12	.02	.08	.11
10	.00	1.90	.11	1.94	.00	1.25	.86	1.28	.14	.90	.15	.06	.09	.05	.17	.05
11	.03	.06	.12	.12	.11	.30	.06	.18	.08	.00	.45	.02	.09	.02	.03	.06
12	.02	.02	.00	.03	.93	.00	.00	.06	.02	.03	.02	.41	.02	.02	.00	.00
13	.00	1.52	.00	1.49	.00	.35	1.14	1.35	.27	.00	.15	.06	13.27	.02	.14	.27
14	.00	.02	.00	.42	.00	.14	.03	.24	.03	.41	.03	.02	.27	.15	.00	.06
15	.00	.20	.00	.51	.00	.35	.03	1.02	.03	.18	.11	.03	.47	.02	2.27	.08
16	.00	.09	.00	.26	.00	.17	.03	.41	.11	.02	.09	.05	.06	.02	.06	1.44
T	.07	4.71	.34	12.99	1.68	12.00	2.74	17.60	2.54	11.37	1.78	1.60	21.16	2.21	5.31	2.80
	19.79					34.88				14.75			28.68			2.80

N = 6,620

MATRIX ANALYSIS FOR TEACHER No. 728 (High Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

```
        1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16

 1   ┌─────────────────────────┐          ┌──────────────────┬──────────────────┐
 2   │ Area A                   │          │ Area C           │ Area F           │
 3   │   N tallies  315         │          │   N tallies      │   N tallies      │
 4   │   % total    4.75        │          │     599          │     761          │
 5   │                          │          │   % total        │   % total        │
     ├──────────────┬───────────┤          │     9.01         │     11.46        │
 6   │              │ Area B    │          │                  │                  │
 7   │              │   N tallies 1311      │                  │                  │
 8   │              │   % total    19.72    │                  │                  │
 9   │              │           │          │                  │                  │
     ├──────────────┴───────────┴──────────┼──────────────────┤                  │
10   │ Area E                              │ Area D           │                  │
11   │   N tallies  1038   % total  15.62  │   N  135         │                  │
12   │                                     │   % 2.04         │                  │
     ├─────────────────────────────────────┴──────────────────┼──────────────────┤
13   │ Area H                                                  │ Area G           │
14   │   N tallies  740    % total  11.13                      │   N  1126        │
15   │                                                         │   % 16.97        │
16   └─────────────────────────────────────────────────────────┴──────────────────┘
```

Area A
  N tallies 315
  % total   4.75

Area B
  N tallies 1311
  % total   19.72

Area C
  N tallies 599
  % total   9.01

Area D
  N 135
  % 2.04

Area E
  N tallies 1038   % total 15.62

Area F
  N tallies 761
  % total   11.46

Area G
  N 1126
  % 16.97

Area H
  N tallies 740   % total 11.13

Sustaining   = 38.30%
Transitional = 61.70%
         N = 6,620

154

MATRIX FOR TEACHER No. 593 (High Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.25	.11	1.23	.00	.56	.07	.23	.12	.21	.07	.00	.14	.00	.05	.05
3	.00	.00	.25	.19	.00	.30	.02	.07	.04	.05	.04	.00	.00	.00	.02	.04
4	.00	.14	.00	3.18	.02	.33	.12	.16	.19	4.09	.09	.09	.09	1.53	.05	.49
5	.00	.00	.02	.05	.18	.33	.02	.11	.09	.00	.02	.07	.14	.04	.02	.04
6	.00	.12	.04	1.14	.02	12.08	.00	.86	.35	.14	.44	.30	.14	.04	.33	.25
7	.00	.02	.02	.49	.00	.21	.30	.21	.07	.32	.00	.00	.11	.00	.04	.09
8	.00	.12	.02	.60	.00	.60	.07	5.86	.58	.14	.05	.19	2.35	.04	.79	.61
9	.00	.02	.04	.37	.00	.25	.00	.93	2.86	.19	.04	.07	.32	.02	.21	.40
10	.00	1.91	.26	1.26	.00	.67	.84	.35	.18	1.88	.11	.02	.12	.09	.09	.23
11	.00	.12	.16	.11	.04	.12	.02	.09	.04	.00	.77	.05	.02	.00	.00	.12
12	.00	.00	.00	.02	.79	.09	.00	.02	.00	.00	.04	.37	.00	.00	.00	.04
13	.00	.30	.00	.21	.00	.32	.28	1.56	.30	.00	.02	.16	24.50	.00	.09	.58
14	.00	.05	.00	.54	.02	.16	.04	.02	.07	.79	.00	.00	.00	.60	.02	.05
15	.00	.00	.00	.28	.00	.21	.02	.68	.14	.04	.00	.00	.32	.00	.00	.18
16	.00	.09	.02	.44	.00	.35	.05	.77	.60	.14	.04	.11	.07	.00	.00	2.16
T	.00	3.14	.92	10.11	1.07	16.58	1.85	11.92	5.63	7.99	1.73	1.43	28.32	2.36	1.71	5.23
	15.24					35.98				11.15			32.39			5.23

N = 5,683

MATRIX ANALYSIS FOR TEACHER No. 593 (High Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

```
         1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16

 1   ┌──────────────────────────────┐        ┌──────────────────┬──────────────────┐
 2   │ Area A                       │        │ Area C           │ Area F           │
 3   │   N tallies  320             │        │   N tallies      │   N tallies      │
 4   │   % total    5.62            │        │     376          │     385          │
 5   │                              │        │   % total        │   % total        │
     └──────────────────────┬───────┴────────┤     6.61         │     6.79         │
 6                          │ Area B          │                  │                  │
 7                          │   N tallies  1435                  │                  │
 8                          │   % total    25.23                 │                  │
 9   ┌──────────────────────┴────────────────┼──────────────────┤                  │
10   │ Area E                                 │ Area D           │                  │
11   │   N tallies  403   % total  7.09       │   N  183         │                  │
12   │                                        │   %  3.24        │                  │
13   ├────────────────────────────────────────────────────────┬─┴──────────────────┤
14   │ Area H                                                  │ Area G             │
15   │   N tallies  358   % total  6.29                        │   N  1510          │
16   └─────────────────────────────────────────────────────────│   %  26.53         │
```

Sustaining   = 55.24%

Transitional = 44.76%

N = 5,683

MATRIX FOR TEACHER No. 609 (High Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.32	.00	.05	.00	.37	.02	.62	.02	.00	.05	.02	.24	.00	.08	.10
3	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.02	.00	.12	.02	.05	.00	.15	.03	1.06	.00	.13	.00	.20	.08	.00
5	.00	.00	.00	.03	.12	.13	.03	.08	.05	.00	.02	.03	.00	.00	.03	.02
6	.00	.24	.00	.47	.00	10.89	.05	1.11	.15	.02	.17	.08	.12	.02	1.20	.37
7	.00	.03	.00	.05	.00	.22	.22	.34	.00	.00	.00	.00	.13	.00	.17	.03
8	.00	.17	.00	.37	.00	.61	.03	7.19	.12	.02	.15	.13	4.21	.00	2.56	.84
9	.00	.03	.00	.03	.00	.17	.00	.24	.42	.00	.03	.05	.02	.00	.07	.10
10	.00	.17	.02	.10	.00	.44	.00	.20	.07	.17	.02	.02	.02	.00	.05	.03
11	.00	.07	.03	.02	.05	.22	.03	.03	.00	.00	.00	.22	.00	.00	.03	.13
12	.00	.03	.00	.02	.37	.02	.00	.05	.02	.00	.00	.08	.00	.00	.00	.08
13	.00	.67	.00	.20	.00	.56	.82	2.46	.08	.00	.02	.00	34.95	.00	.34	.67
14	.00	.00	.00	.10	.00	.08	.00	.02	.00	.02	.00	.00	.00	.08	.00	.00
15	.00	.05	.00	.20	.00	.86	.02	2.36	.07	.00	.03	.02	1.11	.00	4.12	.08
16	.00	.07	.00	.12	.00	.34	.02	1.41	.13	.00	.10	.07	.07	.00	.27	6.68
T	.00	1.87	.05	1.90	.56	14.96	1.24	16.26	1.16	1.29	.59	.85	40.87	.30	9.00	9.13
	4.38					33.62				2.73			50.17			9.13

N = 5,955

MATRIX ANALYSIS FOR TEACHER No. 609 (High Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Area A
N tallies 41
% total   .70

Area C
N tallies
116
% total
1.96

Area F
N tallies
548
% total
9.23

Area B
N tallies 1296
% total   21.76

Area E
N tallies   116   % total 1.96

Area D
N 25
% .51

Area H
N tallies 513   % total 8.64

Area G
N 2440
% 40.60

Sustaining   = 65.36%

Transitional = 34.64%

N = 5,955

MATRIX FOR TEACHER No. 379 (Low Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.03	.02	.02	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
2	.00	.11	.10	.75	.02	.41	.07	.29	.00	.16	.05	.03	.03	.02	.07	.05
3	.00	.00	.39	.16	.00	.21	.00	.02	.02	.00	.05	.00	.00	.00	.00	.00
4	.00	.07	.02	2.20	.00	.38	.00	.13	.08	2.84	.10	.02	.00	2.90	.05	.10
5	.00	.00	.00	.07	.73	.18	.00	.00	.02	.00	.02	.00	.02	.02	.02	.03
6	.00	.05	.10	1.09	.00	15.60	.03	.80	.13	.13	.49	.18	.15	.02	.72	.36
7	.00	.02	.02	.28	.02	.16	.15	.03	.03	.47	.02	.00	.03	.00	.07	.05
8	.00	.02	.00	.38	.00	.49	.00	3.98	.24	.13	.05	.03	1.21	.02	.62	.44
9	.00	.00	.00	.10	.00	.18	.02	.20	.49	.09	.03	.02	.05	.02	.08	.23
10	.03	1.45	.08	.65	.00	.88	.82	.11	.03	2.53	.03	.02	.02	.02	.05	.18
11	.03	.02	.16	.24	.11	.34	.03	.03	.02	.00	.65	.00	.00	.03	.00	.03
12	.00	.02	.00	.07	.00	.03	.00	.00	.00	.02	.03	.16	.00	.00	.00	.05
13	.00	.21	.00	.27	.00	.13	.13	.80	.05	.03	.00	.00	31.52	.00	.13	.41
14	.00	.07	.00	.39	.23	.20	.08	.07	.08	.28	.00	.00	.00	.65	.05	.02
15	.00	.02	.00	.23	.00	.41	.02	.60	.08	.00	.03	.02	.70	.00	5.95	.10
16	.00	.02	.02	.34	.08	.49	.05	.51	.29	.10	.03	.07	.13	.03	.15	1.47
T	.09	2.08	.91	7.22	1.19	19.99	1.40	7.57	1.56	6.77	1.61	.55	33.86	3.73	7.96	3.52
	11.49					30.52				8.93			45.55			3.52

N = 6,133

MATRIX ANALYSIS FOR TEACHER No. 379 (Low Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Area A
   N tallies   288
   % total   4.69

Area C
   N tallies
      302
   % total
      4.93

Area F
   N tallies
      383
   % total
      6.24

Area B
   N tallies   1382
   % total   22.53

Area E
   N tallies   316   % total 5.15

Area D
   N   211
   % 3.44

Area H
   N tallies   272   % total 4.43

Area G
   N   2402
   % 39.17

Sustaining   = 66.61%
Transitional = 33.39%
         N   =   6,133

MATRIX FOR TEACHER No. 448 (Low Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.03	.27	.84	.00	.85	.00	.40	.05	.07	.00	.03	.20	.00	.05	.13
3	.00	.00	.10	.13	.00	.25	.07	.00	.00	.03	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	1.99	.07	.35	.00	.20	.13	5.08	.02	.10	.05	.77	.07	.10
5	.00	.02	.00	.00	.28	.59	.00	.10	.00	.00	.12	.23	.10	.00	.00	.02
6	.00	.20	.00	3.00	.00	33.35	.03	.72	.47	.44	.50	.30	.13	.00	.77	.60
7	.00	.02	.00	.39	.00	.59	.10	.13	.00	.34	.03	.00	.00	.03	.02	.13
8	.00	.02	.00	.30	.00	.39	.00	2.76	.17	.59	.17	.12	.50	.00	.39	.45
9	.00	.10	.00	.15	.00	.39	.03	.34	1.07	.10	.07	.08	.00	.02	.03	.20
10	.00	1.84	.30	.94	.00	1.59	1.36	.30	.10	4.59	.05	.03	.03	.02	.00	.15
11	.00	.13	.03	.07	.10	.42	.12	.02	.03	.00	.85	.02	.00	.00	.00	.00
12	.00	.02	.00	.03	.84	.02	.00	.03	.00	.00	.00	.49	.00	.00	.02	.00
13	.00	.40	.00	.27	.00	.10	.07	.10	.02	.00	.00	.05	10.35	.00	.07	.08
14	.00	.00	.00	.27	.00	.22	.00	.02	.00	.37	.00	.00	.00	.22	.00	.00
15	.00	.12	.00	.08	.00	.55	.00	.23	.10	.02	.03	.02	.37	.03	3.45	.07
16	.00	.10	.00	.17	.00	.65	.00	.35	.62	.08	.03	.03	.00	.00	.03	1.01
T	.00	3.00	.70	8.63	1.29	40.31	1.78	5.70	2.76	11.71	1.87	1.50	11.73	1.09	4.90	3.02
	13.62					50.55				15.08			17.72			3.02

N = 5,970

MATRIX ANALYSIS FOR TEACHER No. 448 (Low Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

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     1  2  3  4  5   6  7  8  9   10 11 12  13 14 15  16

 1 ┌─────────────────────────┐            ┌──────────────┬──────────────────┐
 2 │ Area A                   │            │ Area C       │ Area F           │
 3 │   N tallies   222        │            │   N tallies  │   N tallies      │
 4 │   % total     3.73       │            │     502      │     191          │
 5 │                          ├─────────┐  │   % total    │   % total        │
 6 │                          │ Area B  │  │     8.42     │     3.20         │
 7 │                          │  N tallies 2420           │                  │
 8 │                          │  % total    40.54         │                  │
 9 ├──────────────────────────┴─────────┼──┴──────────────┤                  │
10 │ Area E                             │ Area D          │                  │
11 │   N tallies  494   % total  8.29   │   N  359        │                  │
12 │                                    │   % 6.03        ├──────────────────┤
13 ├────────────────────────────────────┴─────────────────┤ Area G           │
14 │ Area H                                                │   N  865         │
15 │   N tallies  181   % total  3.04                      │   % 14.49        │
16 └───────────────────────────────────────────────────────┴──────────────────┘
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Sustaining   = 60.64%

Transitional   = 39.36%

N   =   5,970

MATRIX FOR TEACHER No.174 (Low Sample)
(Per cent of total tallies)

Cat.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.08	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.30	.00	.38	.00	.83	.20	.69	.18	.16	.08	.12	.50	.02	.28	.16
3	.00	.00	.00	.04	.00	.04	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	1.65	.00	.34	.00	.38	.12	2.94	.06	.12	.00	1.49	.12	.04
5	.00	.00	.00	.02	.06	.26	.00	.28	.12	.00	.00	.24	.00	.00	.08	.16
6	.00	.04	.00	1.41	.00	3.65	.04	1.22	.32	.14	.36	.77	.04	.08	1.21	.18
7	.00	.16	.04	.18	.00	.46	.20	.42	.08	.00	.00	.00	.06	.08	.10	.00
8	.02	.18	.00	.56	.00	.56	.02	5.66	.58	.04	.04	.08	4.09	.02	1.39	.54
9	.00	.04	.00	.32	.00	.24	.00	.56	1.51	.20	.22	.10	.00	.02	.22	.36
10	.00	1.39	.08	.79	.00	.81	.75	.32	.12	1.69	.06	.00	.02	.04	.00	.06
11	.00	.04	.00	.30	.00	.20	.04	.08	.04	.00	.83	.14	.00	.00	.08	.10
12	.00	.00	.00	.16	1.15	.16	.04	.04	.02	.00	.00	.10	.00	.00	.00	.00
13	.02	1.75	.00	.26	.00	.48	.79	1.31	.16	.00	.00	.00	21.85	.00	.16	.38
14	.00	.58	.00	.58	.00	.32	.00	.04	.06	.46	.00	.00	.00	.71	.03	.00
15	.00	.06	.00	.34	.00	.62	.08	2.90	.18	.00	.08	.02	.30	.00	9.65	.12
16	.00	.06	.00	.28	.00	.58	.00	.56	.34	.00	.00	.00	.08	.00	.24	1.73
T	.12	4.60	.12	7.27	1.21	9.55	2.16	14.50	3.83	5.67	1.73	1.69	26.94	2.46	14.11	3.84
	13.32					30.04				9.09			43.51			3.84

N = 4,962

MATRIX ANALYSIS FOR TEACHER No. 174 (Low Sample)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

```
    1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16

 1  │ Area A                           │  Area C          │ Area F
 2  │   N tallies  125                 │   N tallies      │  N tallies
 3  │   % total    2.53                │    283           │   518
 4  │                                  │   % total        │  % total
 5  │                                  │    5.71          │   10.44
 6  │                   Area B         │                  │
 7  │                     N tallies  770                   │
 8  │                     % total    15.52                 │
 9  │                                                      │
10  │ Area E                                        Area D │
11  │   N tallies  432    % total  6.53              N  139│
12  │                                                % 2.82│
13  │ Area H                                        │ Area G
14  │   N tallies  550    % total 11.09             │  N  1625
15  │                                               │  %  32.75
16
```

Sustaining   = 49.67%

Transitional = 50.33%

N = 4,962

BIBLIOGRAPHY

Amidon, Edmund. "Verbal Behaviors of Superior Teachers,"
    Journal of Teacher Education, XCIII (March, 1965),
    93.

Amidon, Edmund. "The Use of Interaction Analysis at Temple
    University," The Study of Teaching. Edited by Dean
    Corrigan. Washington, D.C.: Association for Student
    Teaching, p. 42.

Amidon, Edmund and Flanders, Ned A. "The Effects of Direct
    and Indirect Teacher Influence on Dependent-prone
    Students Learning Geometry," Journal of Educational
    Psychology, LII (1961), 266-291.

Amidon, Edmund and Flanders, Ned A. The Role of the Tea-
    cher in the Classroom. Minneapolis, Minn.: Paul S.
    Amidon and Associates, Inc., 1963.

Amidon, Edmund and Giammatteo, Michael. "The Verbal Be-
    haviors of Superior Elementary Teachers." Inter-
    action Analysis: Theory, Research and Application.
    Edited by Edmund Amidon and John B. Hough. Reading,
    Mass.: Addison-Wesley Publishing Co., 1967, p. 186.

Amidon, Edmund and Hough, John B. (ed.). Interaction
    Analysis: Theory, Research and Application. Reading,
    Mass.: Addison-Wesley Publishing Co., 1967.

Anderson, H. and Brewer, E. "Studies of Teacher's Class-
    room Personalities: Dominant and Socially Integra-
    tive Behaviors of Kindergarten Teachers," Applied
    Psychology Monographs, No. 6, 1945.

Anderson, H. (ed.). Creativity and Its Cultivation. New
    York: Harper and Brothers, 1959.

Barr, A. S. Teacher Effectiveness: A Summary of Investi-
    gations. Madison, Wisc.: Dembar Publications, Inc.,
    1961.

Bellack, A. A. and Davitz, J. R. in collaboration with
H. W. Kliebard and R. T. Hyman. The Language of
the Classroom: Meanings Communicated in High School
Teaching. Co-op. Research Project No. 1497. New
York: Teachers College, Columbia University, 1963.

Benner, Charles. "The Relationship of Pre-Service Mea-
sures to Ratings of Music Teachers." Unpublished
Doctoral dissertation, The Ohio State University,
1963.

Best, John W. Research in Education. Englewood Cliffs,
N.J.: Prentice-Hall, Inc., 1959.

Biddle, Bruce (ed.). Contemporary Research on Teacher Ef-
fectiveness. New York: Rinehart and Winston, 1964.

Bonney, Merl E. "Social Behavior Differences Between
Second Grade Children of High and Low Sociometric
Status," Journal of Educational Research, XLVIII
(March, 1955), 481-495.

Bowers, Norman and Soar, Robert. Studies in Human Rela-
tions in the Teacher-Learner Process. Co-op. Research
Project No. 8143, Columbia, S.C.: University of South
Carolina, 1961.

Boyd, Robert D. and DeVault, M. Vere. "The Observation and
Recording of Behavior," Review of Educational Re-
search, XXVI, No. 5 (December, 1966), 529.

Burmeister, Clifton A. "A Study of Community Attitudes To-
ward Music Education in the Public Schools of Select-
ed Communities of Missouri," Unpublished Doctoral
dissertation, University of Kansas, 1955. (Summary
in Journal of Research in Music Education, III, No. 2
(1955), 79.

Cornell, Francis G., Lindvall, Charles M. and Saupe, Joe L.
An Exploratory Measurement of Individuality of
Schools and Classrooms. Urbana, Ill.: Bureau of Edu-
cational Research, University of Illinois, 1952.

Cyphert, Frederick R. and Spaights, Ernest. An Analysis
Projection of Research in Teacher Education. Co-op.
Research Project No. F-015, The Ohio State Univer-
sity, 1964.

Downie, N. M. and Heath, R. W. Basic Statistical Methods
(second edition). New York: Harper and Row, Publi-
shers, 1965.

Evans, Thomas P. "Exploratory Study of the Verbal and Non-Verbal Behaviors of Biology Teachers and Their Relationship to Selected Personality Traits." Unpublished Doctoral dissertation, The Ohio State University, 1968.

Fenton, Winnifred L. "Effectiveness of Music Teachers Identified Through Behavioral Criteria: A Basis for Redirection in Teacher Education." Unpublished Doctoral dissertation, Wayne State University, 1957.

Flanders, Ned A. "Personal-Social Anxiety as a Factor in Experimental Learning Situations," Journal of Educational Research, XLV (October, 1951), 100-110.

Flanders, Ned A. "Teacher and Classroom Influence on Individual Learning." Paper delivered at the Seventh Curriculum Research Institute of the ASCD, 1961.

Flanders, Ned A. "Teacher Influence in the Classroom: Research on Classroom Climate." Paper delivered at Teachers College, Columbia University, April 14, 1962.

Flanders, Ned A. Helping Teachers Change Their Behavior. Ann Arbor: School of Education, University of Michigan, 1963.

Flanders, Ned A. "Teacher Influence, Pupil Attitude and Achievement," Co-op. Research Monograph No. 12, Washington, D.C.: Government Printing Office, 1965.

Furst, Norma and Amidon, Edmund. "Teacher-Pupil Interaction Patterns in the Elementary School." Interaction Analysis: Theory, Research and Application. Edited by Edmund Amidon and John B. Hough. Reading, Mass.: Addison-Wesley Publishing Co., 1967.

Gage, N. L. (ed.). Handbook of Research on Teaching. Chicago: Rand McNally and Co., 1963.

Gold, Louis L. "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Biology." Unpublished Doctoral dissertation, The Ohio State University, 1966.

Hanny, Robert J. "The Relationship Between Selected Personality Characteristics and Teacher Verbal Behavior." Unpublished Doctoral dissertation, The Ohio State University, 1966.

Hough, John B. A Study of the Effects of Five Experimental Treatments in the Development of Human Relations Skills and Verbal Teaching Behaviors of Pre-Service Teachers. Columbus, Ohio: College of Education, The Ohio State University, 1965.

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

Hughes, William O. Planning for Junior High School General Music. Belmont, Calif.: Wadsworth Publishing Co., Inc., 1967.

Kirk, Jeffry. "The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers." Unpublished Doctoral dissertation, Temple University, 1964.

Lambert, Philip and Roberts, Richard. "A Note on the Use of the Flanders System," Journal of Educational Research, LVIII (January, 1965), 222-224.

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

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

Medley, Donald M. and Mitzel, Harold E. "Some Behavioral Correlates of Teacher Effectiveness," Journal of Educational Psychology, L (December, 1959), 239-246.

Medley, Donald M. and Mitzel, Harold E. "Measuring Classroom Behavior by Systematic Observation," Handbook of Research on Teaching, Edited by N. L. Gage. Chicago: Rand McNally and Co., 1963, p. 247.

Miller, George L. "An Investigation of Teaching Behavior and Pupil Thinking." Unpublished Doctoral dissertation, University of Utah, 1964.

Openshaw, Karl. Development of a Taxonomy for the Classification of Teacher Classroom Behavior. Columbus, Ohio: The Ohio State University, 1967.

Pankratz, Roger S. "Verbal Interaction Patterns in the Classrooms of Selected Science Teachers: Physics." Unpublished Doctoral dissertation, The Ohio State University, 1966.

Perkins, Hugh V. "A Procedure for Assessing the Classroom Behavior of Students and Teachers," American Educational Research Journal, I (November, 1964), 249-260.

Perkins, Hugh V. "Classroom Behavior and Under Achievement," American Educational Research Journal, II (January, 1965), 1-12.

Ryans, David. Characteristics of Teachers. Washington, D.C.: American Council on Education, 1960.

Schneider, Erwin H. and Cady, Henry L. Evaluation and Synthesis of Research Studies Relating to Music Education. Co-op. Research Project No. E-016, Columbus, Ohio: The Ohio State University, 1965.

Scott, W. A. "Reliability of Content Analysis: The Case For Nominal Coding," Public Opinion Quarterly, XIX, No. 3 (1955), 321-325.

Scott, W. A. and Wertheimer, Michael. Introduction to Psychological Research. New York: John Wiley and Sons, Inc., 1962.

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Co., Inc., 1956.

Smith, B. O. and Meux, M. O. A Study of the Logic of Teaching. Co-op. Research Project No. 258, Urbana, Ill.: University of Illinois, 1962.

Snapp, David. "A Study of the Accumulative Musical and Verbal Behavior of Teachers and Students in Fifth Grade Instrumental Music Classes." Unpublished Masters Thesis, The Ohio State University, 1967.

Taba, Hilda, Levine, Samuel and Elzey, Freeman P. Thinking in Elementary Education. Co-op. Research Project No. 1574, San Francisco: San Francisco State College, 1964.

Tate, Merle and Clelland, Richard C. Nonparametric and Shortcut Statistics in the Social, Biological and Medical Sciences. Danville, Ill.: Interstate Printers and Publishers, Inc., 1957.

Travers, Robert. Measured Needs of Teachers and Their Behavior in the Classroom. Final Report on Office of Education Contract, No. 444 (8029), 1961.

Waimon, Morton D. and Hermanowicz, Henry J. A Conceptual System for Prospective Teachers to Study Teaching Behavior. Paper presented to the American Educational Research Ass., Chicago, Ill., February, 1965 (Normal, Ill.: Illinois State University).

Withall, John. "The Development of a Technique for the Measurement of Social-Emotional Climate in the Classrooms," Journal of Experimental Education, XVII (1949), 347-461.

Withall, John. "An Objective Measurement of a Teacher's Classroom Interaction," Journal of Educational Psychology, XLVII (April, 1956), 203-212.

Withall, John. "Observing Behavior," Review of Educational Research, XXX (December, 1960), 496-512.

Withall, John. "Mental Health--Teacher Education Research Project," Journal of Teacher Education, XIV (September, 1963), 318-325.

Wright, E. Muriel J. "Development of an Instrument for Studying Verbal Behaviors in a Secondary School Mathematics Classroom," Journal of Experimental Education, XXVIII (December, 1959), 103-121.