THE EFFECT OF STUDY SESSIONS IN FLANDERS SYSTEM OF INTERACTION

ANALYSIS ON THE CLASSROOM COMMUNICATION PATTERNS

OF A GROUP OF TEAM TEACHERS

A THESIS

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ABSTRACT

The literature has revealed a need for studies which might indicate whether or not a knowledge of the Flanders System of Interaction Analysis motivates teachers to make changes in their classroom verbal communication patterns. At present, most of the research has been conducted with student teachers, supervisors of student teachers, and classroom teachers working with student teachers. If teacher training institutions can use the Flanders System as an instrument for developing desirable verbal performances in teacher trainees, then, can the same system not be utilized as a technique to help certified teachers change their verbal behavior patterns?

Accordingly, this study attempted to determine the answers to the following questions:

1. Would teacher familiarity with the Flanders System result in an increase in the amount of indirect influence in their verbal patterns?

2. Would any increase in the amount of indirect verbal behavior be more evident in the verbal patterns of teachers with less than three years teaching experience than in the patterns of teachers with more than three years teaching experience?

The sample was made up of nine certified teachers who were teaching in two Winnipeg Junior High Schools. These nine teachers were all members of a teaching team.

Each of the subjects was observed while teaching a lesson and the verbal interaction in the classroom was categorized according to the Flanders' method. A communication pattern of the lesson was developed

in the form of a ten by ten matrix. A series of three study sessions in Flanders System of Interaction Analysis was held with each of the three teams of teachers in the sample. A second set of observations was made after the completion of the study sessions. A third set of observations was made after a time interval of approximately two weeks from the second set of observations.

Statistical comparisons were made between the communication patterns of the pre-treatment observations and the two post-treatment observations.

Comparisons of the information provided in the three sets of classroom observations revealed the following points:

1.   The nine teachers, as a group, used significantly more indirect verbal behavior following the study sessions in Flanders System of Interaction Analysis.

2.   There was no significant difference in the amount of increase of indirect influence in the classroom verbal communication patterns of teachers with less than three years teaching experience compared with teachers with more than three years teaching experience.

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CHAPTER I

THE PROBLEM

NEED FOR THE STUDY

Administrators are constantly concerned with the problem of
how to obtain improvement of instruction within their schools.   One
method frequently employed is in-service training.   However, there is
no guarantee and often much doubt as to how effectively the ideas
presented in an in-service program will actually stimulate the parti-
cipants to make positive changes in their behavioral patterns.   It is
usually accepted that all the training periods and suggestions are of
little value unless the teacher decides to incorporate the ideas into
his particular situation in an attempt to produce more effective
classroom learning.[1]   Thus any change in a teacher's classroom behavior
will be dependent upon an internalization by that teacher.   He must
perceive a need for change and recognize that a response to motivation
is possible.

The major method of carrying out the functions associated with
teaching students is verbal communication.   In general, verbal inter-
action appears to occupy about sixty-seven per cent of the time used
for a classroom lesson.   Of this amount, approximately sixty-seven
per cent is teacher talk and the remaining thirty-three per cent is

[1]Ned A. Flanders, "Teacher Behavior and In-service Programs,"
Interaction Analysis: Theory, Research, and Application, (Don Mills:
Addison Wesley Publishing Co., 1967), p. 257.

student talk.[2] This being the case, it is quite evident that any

persons concerned about developing programs of instructional improve-

ment must give some attention to the types of verbal interaction that

are occurring in the classrooms. This seems to indicate that there

is a need for providing objective information to teachers about their

classroom verbal behavior. This type of information could be valuable

to the teacher in two ways. First, it would be evidence by which a

teacher might gain insights about certain aspects of his verbal

behavior and thus make his own judgments about them. Second, inter-

pretations about the information by the teacher might result in an

internalized perception and recognition of a need for change. The

question that evolves from the foregoing discussion is: "How can a

classroom teacher be provided with objective evidence which will help

him to become aware of the verbal behavior that has occurred in his

classroom?"

The Flanders System of Interaction Analysis is a technique by

which the classroom verbal behavior is categorized and specific pat-

terns of communication revealed. The information is given in the

form of a matrix containing one hundred cells. The question that

points to the need for this study is whether or not this matrix inform-

ation and a knowledge of the Flanders System will provide teachers

with insights about verbal communication and act as motivation for

change.

It is assumed in this study that most teachers would prefer an

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[2]Ned A. Flanders, "Analysing Teacher Behavior as Part of the
Teaching Learning Process," Educational Leadership, XIX (December,
1961), p. 178.

indirect verbal pattern rather than a direct verbal approach in their classrooms. However, most teachers are not aware of the actual emphasis that they tend to place upon either pattern within their classrooms.

A survey of the research literature pertaining to the use of the Flanders System of Interaction Analysis indicates that studies have been conducted with student teachers, supervisors of student teachers, and classroom teachers who work with student teachers. However, very little research appears to have been done in examining the possible use of the Flanders System as a means of helping regular classroom teachers or teachers who work in teams to improve their classroom verbal behavior. If teacher training institutions can use the system as an instrument for developing desirable verbal performances in teacher trainees, then, can the same system not be utilized as a technique to help certified teachers change their verbal behavior patterns?

PURPOSE OF THE STUDY

The purpose of this study is to try to determine to what extent teacher understanding of the ten categories used in the Flanders System of Interaction Analysis will result in a change in classroom verbal communications by the teachers. The Flanders System yields information for identifying change in a communication pattern in the form of an I/D Ratio. This I/D Ratio indicates the amount of indirect teacher influence that has occurred compared to the amount of direct teacher influence. It is calculated by dividing the total number of tallies

for indirect teacher talk (Categories 1-4) by the total number of tallies designating teacher talk (Categories 1-7). A percentage figure thus obtained can be used as objective information for a teacher's consideration.

To carry out the investigation proposed in this study, two hypotheses will be tested:

I. Teacher familiarity with Flanders' categories will result in increased indirect influence.

II. The increase in indirect verbal behavior will favor teachers with three years or less teaching experience.

As a brief explanation of these hypotheses, the following reasoning is submitted: First, by assuming that most teachers prefer the indirect verbal pattern in their teaching, it would seem logical to conclude that these same teachers will employ the ideas relating to indirect influence when they become more aware of them. Second, teachers with more than three years of teaching experience will probably have established teaching patterns which they may be reluctant to change.

METHOD OF THE STUDY

The initial step in the method involved a survey of the literature on interaction analysis, the Flanders System of Analysis, and research reports concerning various projects experimenting with possible practical uses of the Flanders method. A brief summary of some of the pertinent studies is given in Chapter II.

The writer attended a workshop conducted by Dr. H. E. May at

the University of Manitoba on November 13 and 14, 1967. The workshop
was designed to give the participants a working knowledge of the
Flanders System of Interaction Analysis. The categories were learned
and information given on how these are applied during classroom
observations. Practice in recording the verbal interactions of class-
rooms was given by means of taped classroom lessons.

The writer's training program was completed outside the work-
shop setting. The technique for classifying verbal communications
according to the Flanders System of categories was acquired through
daily one hour practice sessions involving the use of taped classroom
lessons of various types. These sessions commenced during the latter
part of December and continued until mid-February. Thereafter,
similar, but shorter sessions, were carried out at fairly regular
weekly intervals as a means of maintaining consistency in timing and
in categorizing.

The problem was investigated by means of a single factor experi-
mental design involving a single group of subjects. The independent
variable was teacher training sessions designed to give the teachers
an understanding of the ten categories which make up the Flanders
System and, to give them information regarding the interpretation of
matrices compiled from classroom observations of verbal interaction.
The dependent variable was the verbal teaching pattern of the teacher
derived from data obtained by means of classroom observations.

The group of subjects consisted of nine Junior High School
teachers in the Winnipeg School Division who were participating in
the team teaching of language arts or social studies. An observation

of their instructional method was made, at which time, their verbal behavior was classified by the writer according to the ten categories in the Flanders System. An I/D Ratio was calculated for each set of data. Following the first observation, each team of teachers was given training sessions designed to provide them with a knowledge of the ten categories as well as a method of interpretation of data derived from the observations of their classrooms. A second observation was made after the training sessions. The new I/D Ratios were calculated and compared with the original ones to determine whether or not any significant changes had occurred. A discussion was held with each teacher when the information was given to them. A third observation of their classroom lessons was made and a third set of I/D Ratios calculated for the purpose of making further comparisons.

An analysis of the data and the I/D Ratios from the three sets of observations was then carried out. This information was used to test the two hypotheses proposed in this study.

<div align="center">LIMITATIONS OF THE STUDY</div>

This study is limited to the investigation of the possible use of the Flanders System of Interaction Analysis as a means of improving teacher verbal behavior. The sample includes only teachers who are members of a team. The subjects of instruction were language arts and social studies. It was not the intention of this study to include any other teaching subjects taught by these same teachers. Similarly, seminar groups and large group instruction within the team teaching framework were excluded. The observations of instructional methods

in terms of verbal behavior were limited to small group instructional

classes or regular classroom groups.

The amount of time required to make classroom observations and

to provide study sessions on interaction analysis for the teachers is

a limiting factor governing the size of the group to be used as sub-

jects in this study. Due to the fact that the sample size is small, and

the participation of the subjects voluntary, prompted by their inter-

est in the study, the group may not necessarily be representative

of the population of teachers in team teaching. Therefore, the find-

ings of this study can only be interpreted as being descriptive of

the sample itself. Any further generalizations would require extreme

caution taking into consideration the limitations inherent in this

study.

DEFINITIONS OF TERMS USED

Terms used frequently in this study which may need clarifica-

tion for some readers are listed:

Team Teaching. Team teaching is interpreted as an approach in

which two or more teachers plan, present, direct, and evaluate a

course of studies with a common group of students.

Small Group Instruction. This refers to that phase of team

teaching in which students are grouped in terms of less than regular

classroom number for some specific instructional purposes.

Flanders System. This term is used in reference to the Flanders

System of Interaction Analysis developed by Ned A. Flanders in the

early 1950's. It is the method that was used to categorize teacher

and student verbal interaction during classroom sessions.

Direct Teacher Influence. Direct Teacher Approach. These two terms are used interchangeably to designate a teacher's verbal behavior that matches Categories Five to Seven inclusively in the Flanders System. (See Figure 1, p. 31 for a description of these categories.)

Indirect Teacher Influence. Indirect Teacher Approach. These two terms are used interchangeably to designate a teacher's verbal behavior that matches Categories One to Four inclusively in the Flanders System. (See Figure 1, p. 31 for a description of these categories.)

I/D Ratio. This term refers to the ratio of indirect teacher communications to direct teacher communications in the classroom. This ratio is calculated by taking the total number of tallies for indirect teacher talk (Categories 1-4) and dividing by the total number of tallies for teacher talk (Categories 1-7). The percentage figure thus obtained, indicates the amount of the actual teacher talk that is of the type that encourages student participation in the classroom verbal interaction. The greater the value of the I/D Ratio figure, then the more indirect a teacher's verbal behavior has been. Similarly, the smaller the value of the I/D Ratio, then the more direct a teacher has been in his classroom verbal pattern.

OUTLINE OF THE PRESENTATION

A review of related works regarding research projects which have used the Flanders System of Interaction Analysis as a tool is presented in Chapter II. The procedures used in carrying out the

study are outlined in Chapter III. This includes a description of the sample, method of selection, the experimental procedures, and a discussion on the instrument used. Chapter IV contains the presentation of data and statistical treatment of the data. Chapter V presents a brief summary of the study, conclusions, and implications.

CHAPTER II

REVIEW OF RELATED RESEARCH LITERATURE

The purpose of this chapter is to give a brief summary of the research work that illustrates some of the possible uses of the Flanders System of Interaction Analysis. It is noted that most of the literature has been written during the last ten years. The Education Index lists the topic heading "Interaction, Process Analysis" for the first time in its 1963 edition.[1] There appear to be ample published studies on the uses of Flanders Interaction Analysis Technique with student teachers. However, very few writings were found to deal specifically with the use of the system as a means of effecting changes in the classroom communication patterns of qualified teachers. Similarly, there are few reports concerning other possible uses of the method in education.

The approach in this chapter is to review the writings under given headings. An attempt is made to indicate the conclusions and trends that seem to be significant in each case. First, there is an outline of two research projects that illustrates attempts to develop systems of categories as instruments for measuring classroom climate. This is followed by a review of some of the pertinent studies on the use of the Flanders System with student teachers. The third section is concerned with works pertaining to the effects of in-service training of teachers in the Flanders method. This is followed by a review

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[1]Minnie A. Sang (ed.), The Education Index, (New York: The H. W. Wilson Company, 1963), XIII, p. 441.

of literature on direct and indirect teacher influence. The fifth

area of concern involves other practical uses in education of the

Flanders System of Interaction Analysis.

Two Category Systems Developed Prior to 1950

One of the earliest studies designed to develop a technique

for categorizing teacher verbal behavior was done by Harold H. Anderson

in 1939.[2] He set up a list of twenty-four categories in terms of what

he viewed to be dominative and integrative verbal contacts by teachers

with kindergarten children. The instrument was tested by having two

observers use the categories for recording the verbal contacts of

three teachers who were working with three different kindergarten

groups. It was found that the two observers were in high agreement

in recognizing a contact as well as in categorizing it as having been

dominative or integrative. Thus it was felt that the instrument could

be used as a means of obtaining data for the purpose of describing a

teacher's classroom personality.

John Withall[3] used seven categories for classifying teacher

verbal behavior in an attempt to measure social-emotional climate in

the classroom. The two broad classifications covered by the categories

were teacher talk that was learner-centred and teacher talk that was

teacher-centred. He concluded that classroom climate could be described

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[2]Harold H. Anderson, "The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children," Interaction Analysis: Theory, Research, and Application, (Don Mills: Addison-Wesley Publishing Co., 1967), pp. 4-23.

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

through the use of his climate index for categorization of teacher

statements and that trained observers could be in adequate agreement

in the use of the criteria.

Undoubtedly the research done by Anderson, Withall, and others

prior to 1950 influenced Ned A. Flanders in his development of a ten

category system of interaction analysis. His system designates the

first four categories as indicative of indirect teacher influence in

the classroom interaction while categories five to seven inclusive

indicate direct teacher influence. He added two categories for student

talk and one category for occasions when no verbal interaction occurred

during a three second period of time. It is the Flanders System that

is used in this study and thus the remainder of this chapter concen-

trates on the research done by Flanders and his associates as well as

the research carried out by several other investigators.

Use of the Flanders System for Student Teaching

In 1960, Flanders suggested that his research up to that time

seemed to indicate that training in interaction analysis might be

valuable in helping student teachers to bridge the gap between theory

and practice more effectively.[4] One researcher who has investigated

this possibility is Edmund J. Amidon. He has used the Flanders System

of Interaction Analysis as a feedback technique in teacher training at

Temple University for several years. He makes the following comment

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[4]Ned A. Flanders, "Interaction Analysis and Teacher Education"
(Paper presented at the Conference on Recent Research and Development
in Teacher Education, The College of Education, University of Minnesota,
Minneapolis, Minnesota, December, 1960), p. 40.

to emphasize the relevance of this research:

> By getting feedback about his own behavior, a teacher can begin
> to do much the same kind of thing that the research worker does;
> that is by gaining an understanding of his teaching behavior in
> specific classes he can generalize to his total teaching role.
> Thus he can gain insight into his teaching and improve his skill
> as a teacher. Training in Interaction Analysis and, possibly,
> some other observational devices are the only methods in teacher
> education which we know actually do produce appropriate changes
> in the teaching behavior of student teachers during their student
> teaching experience.[5]

Gertrude Moskowitz[6] investigated the possibility of using the

Flanders System with co-operating and student teachers. Forty-four

secondary-education student teachers from Temple University were the

subjects. These were divided into groups in the following ways:

a) Co-operating teachers and student teachers trained in inter-

   action analysis;

b) Co-operating teachers not trained and student teachers

   trained in interaction analysis;

c) Co-operating teachers trained in interaction analysis work-

   ing with student teachers who had no training in interaction

   analysis; and

d) Neither co-operating teachers nor student teachers trained

   in interaction analysis.

Her findings were that more indirect teaching occurred in the

classrooms of student teachers and co-operating teachers that had been

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[5] Edmund J. Amidon, "Interaction Analysis Applied to Teaching,"
The Bulletin of the National Association of Secondary School Principals,
(1966), L, pp. 96-97.

[6] Gertrude Moskowitz, "Toward Human Relations in Supervision,"
The Bulletin of the National Association of Secondary Principals,
(1966), L, pp. 98-114.

trained in interaction analysis than in the other three groups.
Similarly, the interpersonal relationships between student teacher
and co-operating teacher were more positive if both had had the
training.

Moskowitz[7] carried out a later study with fourteen foreign
language student teachers at Temple University. After being trained
in Flanders Interaction Analysis, these student teachers changed
their interaction patterns by becoming more indirect. These student
teachers also exhibited more positive attitudes towards teaching
than did the control group that had no training in interaction analysis.

The research at Temple University indicates success in encour-
aging changes in the communication patterns of student teachers
through training in interaction analysis. Apparently the method of
feedback is appropriate for helping the student teachers to change
their verbal behavior to match their intentions. An additional
feature is the fostering of improved interpersonal relations between
student teachers and co-operating teachers.

Use of the Flanders System for In-service Training

Some investigations have been made regarding the use of the
Flanders System as an in-service program. The aim has been to dis-
cover if the instrument could be a tool for the improvement of instruc-
tion through improved verbal patterns in the classrooms. Three con-
cepts seem to be basic in these studies. The first concept is that

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[7] Gertrude Moskowitz, "The Effects of Training Foreign Language
Teachers in Interaction Analysis," Foreign Language Annals, (March,
1968), I, pp. 218-235.

teachers need objective feedback so that they can decide to what extent their actual classroom behavior is consistent with their original intentions. Another concept is that teachers accept the premise that indirect influence is preferable but they lack sufficient knowledge about the particular classroom actions that will contribute towards attaining this goal. The third concept is that teachers actively involved in the in-service program will be more likely to change behavioral patterns than will teachers who assume a passive role.

Flanders[8] worked with a group of fifty-five teachers in a suburban school system near Minneapolis during the 1960-61 school term. These teachers had thirty hours of in-service training devoted to studying his system of interaction analysis. Although no one pattern of verbal behavior was proposed as a model, emphasis was placed on the need for more indirect type of teacher verbal behavior in classrooms. Teachers were not told that their performances were direct or indirect but allowed to reach their own conclusions through a study of matrices derived from observations in their classrooms. The results showed that the teachers did change their patterns in the direction of more indirect influence. Indications were that the study of interaction analysis along with the matrices had provided stimulation for the teachers to make changes in accordance with the original objectives of the program.

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[8]Ned A. Flanders, "Using Interaction Analysis in the In-Service Training of Teachers," Journal of Experimental Education, (1962), XXX, pp. 313-316.

Similar conclusions were reported by Flanders[9] following a study carried out in 1963 involving fifty-one Junior High School teachers. The aim was to increase teacher flexibility of influence in the classroom and to increase the amount of teacher verbal behavior that supported pupil participation in classroom learning activities. The data from the classroom observations apparently was such that the teachers were able to assess their individual patterns and respond in a positive direction toward achieving the aims of the program.

Theodore R. Storlie[10] used training in interaction analysis as a means of in-service training for a group of teachers in several suburban school districts near Minneapolis. One group of teachers was instructed by a method that utilized direct influence techniques. A second group was instructed by a method that emphasized indirect influence techniques. These sessions continued for nine weeks. During this time it was noted that the teachers working with the instructor who used the indirect method techniques were more enthusiastic and rated the course higher than did those who received the course from the instructor using direct influence techniques.

These studies strongly suggest that Flanders Interaction Analysis can be a valuable tool for the in-service training of teachers. In each study, the teachers appeared to react favorably to the programs

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[9] Ned A. Flanders, "Teacher Behavior and In-Service Programs," Interaction Analysis: Theory, Research, and Application, (Don Mills: Addison-Wesley Publishing Co., 1967), pp. 256-261.

[10] Theodore R. Storlie, "Application of Interaction Analysis to the In-service Training of Teachers," Interaction Analysis: Theory, Research, and Application, (Don Mills: Addison-Wesley Publishing Co., 1967), pp. 262-270.

and subsequently modified their own verbal behavior as a result.

Direct Influence vs. Indirect Influence

There are no teachers who are entirely direct or entirely indirect in their classroom verbal behavior.[11] Teachers demonstrate various combinations in terms of amount of direct and indirect influence. These combinations are dependent upon the subject matter being taught, the objectives of the particular lesson, as well as the type of students with whom they are working. Generally, teachers do tend to exhibit a communication pattern that favors the direct or indirect approach. This tendency is revealed by the I/D Ratio figure obtained from the data gathered by means of classifying the teacher's classroom verbal behavior according to the Flanders System of ten categories. The question of whether one tendency is more appropriate than the other has been investigated by several researchers.

Amidon and Flanders[12] carried out a study with one hundred and forty students from St. Paul and Minneapolis schools. These students were all rated as being dependent-prone according to their scores obtained on a test devised by the two researchers. These students were separated into four groups of thirty-five. Each group received instruction in geometry by means of four different methods. The four types of instruction given were:

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[11] Ned A. Flanders, Teacher Influence, Pupil Attitudes, and Achievement (Washington: U. S. Government Printing Office, 1965), p. 9.

[12] Edmund J. Amidon and Ned A. Flanders, "The Effects of the Indirect and Direct Teacher Influence on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, (1961), LII, pp. 286-296.

1) Direct teacher influence with clear goals established;

2) Direct teacher influence with unclear goals;

3) Indirect teacher influence with clear goals established;

and   4) Indirect teacher influence with unclear goals.

Their findings showed that achievement by the dependent-prone students was evidently unaffected by their perception of the learning goal. However, the students taught by the indirect method did learn more than those taught by the direct method.

Flanders[13] reported the results of another project on the use of interaction analysis. In this case, students in seventh grade social studies and eighth grade mathematics classes were rated on achievement and attitudes. The students taught by teachers who were flexible in their communication patterns and predominately indirect, had higher academic achievement and more positive attitudes towards their school work and teachers than did the students who were taught by teachers who tended to use direct influence and who were inflexible in their communication patterns.

Another study related to the comparison of indirect and direct teacher verbal behavior was reported by Amidon and Giammatteo.[14] They used the Flanders system in an attempt to identify the characteristics of superior teachers in terms of their classroom communication patterns. The subjects were one hundred and fifty-three elementary school teachers

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[13] Ned A. Flanders, "Some Relationships Among Teacher Influence, Pupil Attitudes and Achievement," Interaction Analysis: Theory, Research, and Application, (Don Mills: Addison-Wesley Publishing Co., 1967), pp. 217-242.

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

from suburban school districts in Pennsylvania. One group was made up of thirty-three teachers in eleven school districts who had been rated superior by their administrators and supervisors. The second group of one hundred and twenty was selected at random from these same eleven districts. Each teacher was observed while teaching a language arts lesson and the communication patterns for both groups were compared. The comparisons revealed significant differences between the two groups. The superior teachers revealed more indirect verbal behavior in their classrooms than did the average group of teachers. For example, the matrices of the superior teachers showed that they accepted the feelings of their students three times more often than did the normative group. The normative group tended to criticize and assert their authority about twice as much as did the superior teachers.

The evidence presented by investigators relating to the value of indirect influence in teachers' communication patterns tends to be positive. That is, teachers who use this approach predominately in their classrooms tend to elicit better attitudes and achievement from their students than do the teachers who do not usually exhibit this form of communication. The teachers who are rated highest by their administrators seem to be those who have developed the ability to utilize the communication acts that are rated as indirect in the Flanders system of categories.

Other Suggested Uses of the Flanders System in Education

Recently, several researchers have begun to explore the possibilities of utilizing the Flanders System of Interaction Analysis in

various ways. Moskowitz suggests that principals should acquire a

working knowledge of the system as a method of improving interpersonal

relationships between them and their teaching staffs.[15] Cunningham

proposes that the system has potential as a means of supervision and

evaluation of science teachers.[16] Norma Furst and Edmund Amidon

discovered that elementary school teachers at different grade levels

demonstrate significant differences in their verbal behavior while

teaching reading at these levels.[17] Lambert, Goodwin, and Roberts[18]

used the system as a means of identifying the interpersonal relation-

ships between members of a teaching team. Amidon, Kies, and Palisi[19]

indicate that group involvement in interaction analysis by teachers

within a school is useful in sensitizing the personnel to verbal

behavior and thus improve classroom instructional processes as well

as staff interpersonal relationships.

Investigations, such as those mentioned above, are attempts to

consider other potential uses of the Flanders System. Indications

are that new avenues of interest are being developed for utilization

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[15]Moskowitz, op. cit., p. 113.

[16]John D. Cunningham, "Interaction Analysis: A Useful Tech-
nique for Research and Science Supervision," Science Education, (1967),
LI, p. 27.

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

[18]Philip Lambert, William L. Goodwin, and Richard F. Roberts,
"A Note on the Use of Flanders Interaction Analysis," The Journal of
Educational Research, (1965), LVIII, pp. 222-224.

[19]Edmund J. Amidon, Kathleen M. Kies, and Anthony T. Palisi,
"Group Supervision: A Technique for Improving Teacher Behavior," The
Education Digest, (1966), XXXII, pp. 18-21.

of this research tool.

RELATIONSHIP OF THE REPORTED LITERATURE TO THIS STUDY

The findings of the reported studies appear to suggest several implications worth noting. First, there seems to be ample evidence that the Flanders System of Interaction Analysis is an instrument that can provide reliable data on the verbal behavior of teachers in their classrooms. This information can be used as objective feedback to the teachers. Second, teachers that are in the habit of being indirect in their verbal approach tend to experience better student achievement and attitudes towards school than do those teachers who have a tendency to use the direct verbal approach. Third, pre-service teachers trained in the Flanders technique demonstrate positive changes in their teaching methods. Fourth, the Flanders System can be a valuable tool for in-service training of certified teachers. Thus the imaginative research of Flanders, Amidon, and others has established a firm foundation for further investigation in the use of this particular method of interaction analysis.

The four concepts mentioned above are basic to this study. They seem to suggest that familiarity with the basic mechanics of the Flanders System of Interaction Analysis will significantly alter elements of individual teaching communication patterns. Another implication is that there is sufficient evidence to indicate that the indirect verbal approach is superior to the direct verbal approach and that any change in the direction of more use of the former means improved instruction in the classroom.

This study attempts to investigate whether or not teams of teachers significantly change their classroom verbal patterns after they have had study sessions on the Flanders system of categories. The degree of change is identified by means of their respective I/D Ratios calculated from the tallies made during observations of classroom lessons.

This study differs from those cited in this chapter in several ways. The in-service programs mentioned were with large groups of teachers; the in-service study sessions in this study are with individual teams of three teachers each. Furthermore, the former programs usually involved training the teachers to the point that they could act as individual observers while the latter only attempts to encourage a general familiarity with the ten categories of the Flanders system.

CHAPTER III

PROCEDURES FOR CARRYING OUT THE STUDY

The procedures used in carrying out this study are discussed
under headings in the following order:

1. Subjects in the study.

2. Method of selecting the sample for the study.

3. Procedures for the first set of classroom observations.

4. Instrument for the classroom verbal behavior classification.

5. Procedures followed for the study sessions in Flanders
   System of Interaction Analysis.

6. Procedures for the second set of classroom observations.

7. Procedures for the third set of classroom observations.

8. Treatment of results.

SUBJECTS IN THE STUDY

As indicated in Chapter I, a single factor experimental design
was used to investigate the problem. The sample was a group of nine
teachers who were teaching at the junior high school level in the
Winnipeg School Division #1. Each of the nine teachers was a member
of a team teaching group within their respective schools. Thus the
sample was made up of three teams having three teachers each. Two of
the teacher teams were in one school making up a social studies team
and a language arts team. The third was a social studies team working
in the second school. There were two female teachers and seven male
teachers involved in this study. Five of the teachers had less than

three years of teaching experience while four of the teachers had taught for more than three years.

METHOD OF SELECTION

Since the area of interest lay with those who were members of a teaching team, the selection of teachers to participate in the study was limited to schools that had team teaching projects in operation. The writer limited the selection of the sample to junior high schools within Winnipeg School Division No. 1. It was also decided that the purposes of this study would best be served if the teams of teachers taught either social studies or language arts.

Mr. G. T. Macdonell, Assistant Superintendent of Winnipeg Schools (Secondary), gave the writer verbal permission to conduct this study in the Winnipeg Schools. He also provided a list of Winnipeg Junior High Schools that had team teaching projects as part of their organizational structure. The list included the names of the personnel involved in these teams.

The writer decided to approach as many principals of these schools as were necessary to gain the co-operation of three teams of teachers. A verbal description of the study was given to each principal in an attempt to gain permission to discuss the experiment with teams of teachers in his school. The discussion about the study was to arouse their interest and to encourage their participation as subjects.

Mr. O. E. Holmes, principal of Andrew Mynarski Junior High School, was first approached. He expressed an interest in the proposed study and made arrangements for the writer to discuss the matter with

the language arts team and the social studies team. Both teams volunteered to become participants in the project.

Mr. G. Newfield, principal of Hugh John Macdonald Junior High School, was approached next. He expressed an interest in the study and arranged a meeting between the writer and the school's social studies team. The result of the meeting was that three more teachers volunteered to act as subjects in the study. Since the required number of teams had agreed to take part, no other school principals were approached.

There were several reasons for selecting team teachers as the subjects in this study. First, team teachers are frequently required to teach lessons with their colleagues in attendance as observers. This fact seemed to suggest that the presence of an observer during classroom instruction would not greatly disturb either teacher or students. Second, classroom lessons taught within the team teaching structure are designed for specific purposes by the team group. This planning is usually done well in advance of the actual presentation of the lesson. Thus the observer had the opportunity to arrange for classroom visits without causing any timetabling inconveniences within the school. Third, each team group had time available for group planning and conferences. Thus arrangements were possible in which all team members were present for the seminar study sessions in Flanders System of Interaction Analysis. Fourth, team planning sessions are often utilized for discussions on instructional improvement within the team itself. This type of experience by these teachers provided the type of climate in which instructional methods could be

openly discussed.

Although science and mathematics subjects are also taught by teams of teachers in Winnipeg Junior High Schools, the nature of these subjects is such that a large percentage of the verbal interaction is lecture and question type. For the purposes of this study, it was assumed that the language arts and social studies classes would produce the type of verbal interaction possibilities that would be helpful in carrying out this particular investigation.

PROCEDURES FOR THE FIRST SET OF CLASSROOM OBSERVATIONS

Each teacher participating in the study was asked to select a teaching lesson which might be suitable for observation in terms of recording the verbal interaction. They were requested to select any type of lesson and with any class or group, but to be prepared to teach a similar type of lesson with the same group or class on two future occasions. They were told that the writer would be present as an observer and that the verbal interaction between them and their students would be classified by means of a series of numbers. No explanation was given regarding the type of verbal interaction that each number represented. They were also informed that a pattern of their verbal interaction would be made available to them following the study sessions. Each teacher was also requested to select lessons in which a minimum of twenty minutes of verbal interaction would be taking place. They were informed that the maximum length of time in which tallying would be done would be twenty-five minutes.

The first teacher was observed on January 31, 1968 and the

ninth teacher was observed on February 29, 1968. One instructor

selected a lesson in current events, two social studies teachers

selected review lessons, two social studies teachers chose lessons in

which new work was being introduced, and the three language arts mem-

bers also chose this type of lesson. One member of a social studies

team decided to teach introductory lessons in language arts.

During the observations of these lessons, the writer tabulated

the verbal interaction of the teachers and students in accordance

with the list of ten categories designed by Ned A. Flanders. Numbers

representing each type of verbal interaction were written on a tally

sheet at the rate of one for every three second interval. More than

one number was written per three seconds if during the interval there

occurred a distinct change in the verbal interaction between teacher

and students. Following the observations, each teacher was asked to

estimate the percentage of time that they felt had been occupied by

teacher talk, student talk, and periods of silence, during the lesson.

A sample tally sheet is provided in Appendix D.

Each set of tallies was key punched on IBM computer cards and

then processed by the IBM Model 360-65 Computer at the University of

Manitoba. The computer program was designed to prepare a matrix for

each set of observations. Thus the computer output contained a ten-

column by ten-row matrix with the following calculations:

  a) Total number of tallies for each of the ten categories.

  b) The percentage figure that each total represented in rela-

      tion to the total interaction.

  c) The percentage figure representing teacher talk.

d) The percentage figure representing student talk.

e) The I/D Ratio figure. (Indirect teacher talk/direct teacher talk).

A sample computer output sheet is provided in Appendix E.

INSTRUMENT FOR THE CLASSROOM VERBAL INTERACTION CLASSIFICATION

The instrument used for recording verbal behavior during the classroom observations was the Flanders System of Interaction Analysis. It is a technique of systematic observation in which the trained observer classifies the communication events every three seconds into one of ten categories. Thus the observer writes down the number representing the verbal behavior completed in the last three seconds while simultaneously assessing the verbal behavior occurring in the next three-second period. Any distinct changes during a three-second interval would be tallied as well. Therefore, an observer tallies at the rate of twenty to twenty-five numbers per minute. The tempo of recording is kept as steady as possible. The series of numbers are tallied in consecutive order as they occur so that the original sequence of events is preserved. The observer also makes a notation of any unusual circumstances that have interrupted the recording of tallies or episodes that are of special interest for later interpretation of the pattern. Whenever there is an extended period of more than fifteen seconds of silence, the observer stops tallying until verbal interaction starts again. No tallies are made during the period of time when a teacher is dealing with administrative routine. Similarly, no recording is done while students are involved in individualized seat work or in

group activities.

Of the ten categories, seven of them designate types of Teacher Talk. A further subdivision is established by separating the seven Teacher Talk Categories into indirect and direct teacher influence. Categories One to Four are referred to as indirect influence. They represent the types of verbal behavior, on the part of the teacher, that tend to increase student freedom to participate in the verbal aspect of the classroom lesson. Generally, teacher statements that demonstrate an acceptance of student feelings, praise or encouragement, acceptance of student ideas, and questions requiring student responses, are of the indirect nature.

Categories Five, Six, and Seven are referred to as direct teacher influence. They are the types of teacher verbal behavior that tend to decrease student participation in the verbal interaction of the classroom. These three categories represent instances in which a teacher is lecturing or giving information, giving directions to the students, criticizing students or justifying his authority.

Student Talk in the classroom is represented by Categories Eight and Nine. Category Eight is used when students respond to teacher questions. When students initiate questions or discussion, then Category Nine is used. If a student elaborates in his reply to a teacher question, then this type of verbal behavior is also considered as belonging to the ninth category.

When a period of silence occurs for three seconds or longer, then the observer records a ten. Similarly, noise or confusion in the class for intervals of three seconds or more are indicated by

Category Ten. A more complete description of the ten categories is given in Figure 1, page 31.

Several "ground rules" were followed as a means of maintaining consistency in categorizing classroom verbal behavior. These "ground rules" were suggested by Amidon and Flanders[1] in their prepared manual on interaction analysis. The following list of rules are the ones found to be most helpful by the writer:

1. If more than one category occurs during the three second interval, then all categories used in that interval are recorded. If no change occurs within three seconds, repeat that category number.

2. Directions are statements that result (or are expected to result) in observable behavior on the part of children.

3. When the teacher calls on a child by name, the observer ordinarily records a 4.

4. If there is a discernible period of silence (at least 3 seconds), record one 10 for every 3 seconds of silence, laughter, board work, etc.

5. When the teacher repeats a student answer, and the answer is a correct answer, this is recorded as a 2.

6. When the teacher repeats a student idea and communicates only that the idea will be considered or accepted as something to be discussed, a 3 is used.

7. If a student begins talking after another (without the teacher's talking), a 10 is inserted between the 9's or 8's to indicate

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[1]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom (Minneapolis: Association for Productive Teaching, Inc., 1967), pp. 24-30.

FIGURE   1

CATEGORIES FOR INTERACTION ANALYSIS

T E A C H E R T A L K	INDIRECT INFLUENCE	1.* ACCEPTS FEELINGS: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included. 2.* PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included. 3.* ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas suggested by a student. As teacher brings more of his own ideas into play, shift to category five. 4.* ASK QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5.* LECTURING: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions. 6.* GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply. 7.* CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK		8.* STUDENT TALK--RESPONSE: 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 period of confusion in which communication cannot be understood by the observer.

* There is NO scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

the change of student.

8.   Statements such as "Uh huh, yes, yeah, all right, okay," which occur between two 9's are recorded as 2 (encouragement).

9.   A teacher joke, which is not made at the expense of the children, is a 2.   If the joke makes fun of a child, then it is coded as a 7.

10.   Rhetorical questions are not really questions; they are merely part of lecturing techniques and should be categorized as 5's.

11.   A narrow question is a signal to expect an 8.   If the student gives a specific predictable answer, this is an 8.   If the child expands, documents, or justifies his answer, the observer should begin tallying 9's.

12.   An 8 is recorded when several students respond in unison to a narrow question.

As indicated earlier, the above list of ground rules set out by Amidon and Flanders, were used as guide lines during the observations of classroom lessons.   Adherence to these helped in deciding upon the category in which to tally certain specific communication occurrences.

The total number of tallies from each separate observation are placed into a ten-column by ten-row matrix thus producing a graphic picture of the lesson.   The matrix can be studied and analyzed for specific features that are revealed.   The number tallies are entered into the matrix in pairs.   For example, the following sequence of numbers is listed to demonstrate the method of entering numbers into a matrix:

```
                            10  ) 1st pair
                             5
          2nd pair  (        5
                             5  ) 3rd pair
          4th pair  (        5
                             4
                             8  ) 5th pair
                             2
                             3
                             4
                             8
                            10
```

Each pair of numbers is tabulated into the matrix. The first pair
(10 and 5), would be represented by a mark in the cell that is in
row 10 and at column 5. The second pair (5 and 5) would be repre-
sented by a mark in the matrix cell in row 5 at column 5. The third
pair of numbers (5 and 5) would be indicated by a mark in the same
cell as the second pair of numbers. The fourth pair (5 and 4) is
tabulated by placing a mark in the matrix cell in row 5, at column 4.
This procedure continues until all the number tallies have been
entered into the cells of the matrix.

   When all of the tallies have been entered into the matrix, the
next step is to total each column of the matrix. These figures indi-
cate the number of occasions in which each type of communication
event was perceived by the observer during the observation. Then
each column total is divided by the total number of tallies made.
This gives a percentage figure indicating the percentage of time in
which each type of communication was used. Similarly, the percentage
of Student Talk and Teacher Talk are calculated as well as an I/D
Ratio. Figure 2 on page 34 illustrates the above procedure.

   The process of tabulating the tally numbers into a matrix can
be very time consuming when it involves a list of four hundred or

FIGURE   2

OBSERVATION MATRIX

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											
2			′ 1								
3				′ 1							
4								″ 2			
5				′ 1	″ 2						
6											
7											
8		′ 1								′ 1	
9											
10					′ 1						
TOTAL TALLIES	-	1	1	2	2	--	--	2	1	1	10
PERCENTAGE	-	10	10	20	20	-	-	20	10	10	100
%	Teacher Talk __60%__					STUDENT TALK __30%__					(OTHER) __10%__

I/D RATIO (1-4 ÷ Total of 1-7)   __66.7%__

more numbers.   Therefore, the use of a computer program to do the
calculating by means of the IBM 360-65 Computer at the University of
Manitoba reduced the time required to complete matrices.   This method
also resulted in an accurate tabulation.

PROCEDURES FOLLOWED FOR THE STUDY SESSIONS IN FLANDERS
SYSTEM OF INTERACTION ANALYSIS

Upon completion of the initial classroom observations, a series
of three study sessions in Flanders System of Interaction Analysis was
held with each team of teachers.   The format was seminar in structure
allowing discussions to take place during and after the presentation
of information.   Each session lasted from one-half hour to one hour.
The purpose of the study sessions was to provide types of information
to the participating teachers so that they might develop an under-
standing of classroom communications in terms of the Flanders set of
ten categories.   Thus the teachers were offered the opportunity to
examine and discuss the kinds of communications recognized by these
categories.   The teachers were also given guidelines on how to inter-
pret matrices made from classroom observations.   Below is a detailed
outline of each of the seminar sessions that were held:

1. First Study Session - The purpose of this session was to acquaint
    the teachers with the basic concepts underlying interaction
    analysis and the Flanders System in particular.   It was also
    the aim of this session to give the teachers information con-
    cerning the ten categories established by Flanders.   This
    included what the number tallies represented, and how the

classroom communications are categorized.

Accordingly, each teacher was given a copy of a six-page excerpt taken from a paper delivered by Edmund Amidon to the American Educational Research Association.[2] These pages were read by the group and several pertinent points brought to their attention. A discussion followed in which the writer attempted to clarify any areas questioned by the teachers.

Following the discussion, each teacher was given a summary sheet which outlined the ten categories established by Flanders along with a brief description of each category. Each of the points on the sheet was reviewed carefully. This included Teacher Talk in terms of direct and indirect influence and the corresponding types of teacher statements classified under each. Similarly, the types of student statements classified under Student Talk were reviewed. The teachers were given an opportunity to discuss the categories and to ask questions about any item that they felt required some clarification. A copy of the six-page excerpt and summary sheet is provided in Appendix A.

2. Second Study Session - The aims of this session were to review the key concepts on interaction analysis that were introduced during the first study session, to help the teachers become better acquainted with the types of classroom communications represented by the Flanders ten categories, and to give the

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[2]Edmund Amidon, "The Observational Technique of Interaction Analysis," (Paper delivered at the American Educational Research Association, Chicago, February, 1963).

teachers practice in recognizing these types of communications.

At the beginning of the session, the writer reminded the group about the various aspects of interaction analysis discussed at the previous session. The teachers were requested to review the summary sheet on Flanders' ten categories. Then a twenty minute tape recording entitled "The U-2 Plane Incident" was played. The group was asked to listen to this current events lesson with their summary sheets before them for reference as an aid for identifying the types of communication that occurred in the taped lesson. While the taped lesson was being played, the writer brought the group's attention to several of the types of communication and the category number that would be used in identifying these in accordance with the Flanders System.

Following the playing of the taped lesson, each teacher was given a typescript copy of the verbal communications that had occurred from the twenty-first second of the lesson through to the end of the four hundred eighty-sixth second. The typescript showed the statements made by both teacher and students as well as every three second interval marked. For each three second interval, there was a corresponding category number identifying the Flanders' classification of the communication that had occurred during the interval. A copy of this typescript is provided in Appendix B.

3. Third Study Session - The purposes of this session were to give the teachers information on how they might interpret a matrix

formed from data collected by means of the Flanders Observa-
tional Technique and to give each the matrix made from the
observation of his or her classroom lesson.

The teachers were given a two-page outline which listed
several suggestions and general comments about interpretation
of the information provided in each matrix. A copy of this
two-page outline is provided in Appendix C.

The writer allowed time for the members of the group to
read the material given to them. Then brief explanatory
remarks were made and each was given a copy of the matrix
depicting the communication pattern that had occurred during
the initial classroom observation of his or her lessons. It
was emphasized that the matrix information was not an evalua-
tion of their teaching performance but merely a means by which
they could identify certain aspects of the communications in
their classroom for that particular lesson. Therefore, any
evaluation would necessarily be self-evaluation.

It was observed by the writer, that none of the indivi-
duals receiving the matrix demonstrated any outward sign that
they felt threatened by the information presented to them.
Generally, they expressed a sincere interest in the results
and appeared to welcome the opportunity to study the results.

The above mentioned study sessions were held in accordance with
the schedule outlined below:

1. First Study Session - Team A - February 28, 1968

                              Team B - March 1, 1968

                              Team C - March 5, 1968

2. Second Study Session - Team A - March 7, 1968

                                         Team B - March 7, 1968

                                         Team C - March 13, 1968

3. Third Study Session - Team A - March 15, 1968

                                         Team B - March 15, 1968

                                         Team C - March 20, 1968

During the course of these sessions, emphasis was placed on the types of Teacher Talk rather than the amount. Constant reference was made to the meaning of the I/D Ratio and how this indicated the use of categories 1-4 types of statements compared to the use of categories 5-7 types of statements.

Each study session was held after approximately a one-week time interval. This was done to allow the teachers time to think about the material presented to them at each session, to discuss it with their colleagues if they desired, and to consider the information in relation to class lessons being taught.

PROCEDURES FOR THE SECOND OBSERVATION

Upon the completion of the three study sessions with each group, the teachers were requested to consider a time that would be available for a second observation of their lessons for the purpose of obtaining a second communication pattern. They were reminded to teach a lesson similar in objectives to the lesson taught for the initial observation.

These observations commenced on March 25, 1968 and completed on April 10, 1968. Thus there was a time lapse of five to twenty-one

days between the end of the study sessions and the second round of observations. It was assumed that this was sufficient time for the teachers to internalize any of the insights gained from the orientation talks on the Flanders System and from an examination of data matrix on the verbal behavior observed in their classroom situations.

The second set of observation tallies was processed by computer to form matrices. A copy of the teacher's individual matrix was given to each teacher within one or two days of the observation in their respective classes. The writer made no attempt to make value judgments to the teacher in terms of whether the second pattern was better or worse than the first one. Any value judgments were left to the discretion of the teacher. The teachers were reminded to make their comparisons in terms of what they considered to be their objectives for their particular lesson. They were also referred to the two-page outline containing suggestions for matrix interpretation. This outline had been provided during the third study session. If the teacher had any questions about particular aspects of the matrix, the writer attempted to provide the necessary clarifications.

PROCEDURES FOR THE THIRD OBSERVATION

Similar instructions, as outlined for the first and second observations, were given to the teachers for the third set of observations. These commenced on April 25, 1968 and were completed during the middle of May. In all cases, there was at least a three-week time interval between the second and third observations. The majority of observations was done with a one-month interval between the two

sets of observations.

As with the two previous sets of observations, the numerical tallies were tabulated into matrices by means of computer. A copy of the individual matrix was given to the teacher as soon after the observation as possible. Again, no attempt was made by the writer to offer value judgments to the teachers concerning their particular communication patterns.

TREATMENT OF THE RESULTS

The presentation of the results in this study are given in Chapter IV. The calculation of these results was done by means of the IBM 360-65 Computer at the University of Manitoba. This required the use of three different computer programs.

The first program was designed to distribute the numerical tallies, recorded during the classroom lesson observations, into a ten-row by ten-column matrix. The computer output also showed the total number of tallies in each column of the matrix, the percentage figure for each column, the percentage of teacher talk, the percentage of student talk and the I/D Ratio figure. A sample of the computer output is provided in Appendix E.

To test Hypothesis I, the means of the I/D Ratios obtained from the initial and post-treatment observations of the sample were compared. The level of significance was found by applying the method for significance of the difference between two means for correlated samples. The procedure was as outlined by Ferguson[3] using the

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[3] George A. Ferguson, _Statistical Analysis in Psychology and Education_ (New York: McGraw-Hill Book Co., 1966), pp. 169-170.

following formula:

$$t \text{ (two-tailed test)} = \frac{\Sigma D}{\sqrt{[N \Sigma D^2 - (\Sigma D)^2]/N-1}}$$

The t test described has the basic assumption that the population from which the sample is drawn has a normal distribution. Although there are tests for normality, these are not very sensitive for small samples.[4] Since the number in this study's sample is nine, no test for normality was applied. Therefore, it was assumed that the population of teachers from which the sample was drawn was normally distributed.

The second computer program used in this study was designed to calculate the t-score according to the above formula. The level of significance selected for the acceptance of Hypothesis I in this investigation was the .05 level. To obtain the level of significance, Table B in the Ferguson text[5] was used.

For further comparisons, the I/D Ratios of the first and third observations were tested for level of significance by using the same method described above. Similarly, the I/D Ratios obtained from the second and third observations were treated by means of the same procedure. The .05 level of significance was selected for these two tests.

To test Hypothesis II, a comparison was made between the I/D Ratios obtained from the initial and post-treatment observations of

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[4]Ibid., p. 169.

[5]Ibid., p. 406.

the two sub-groups within the sample, i.e. teachers with less than
three years of teaching experience and teachers with more than three
years teaching experience. The level of significance was tested by
applying the method for significance between two means for independent
samples. This procedure is outlined by Ferguson[6] making use of the
following formula:

$$t \text{ (two-tailed test)} = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{s^2/N_1 + s^2/N_2}}$$

The third computer program used in this study was designed to
calculate the t-score for uncorrelated samples according to the above
formula. The level of significance selected for the acceptance of
Hypothesis II in this investigation was the .05 level. To obtain the
level of significance, Table B in the Ferguson text[7] was used.

The next phase in the analysis of the data obtained in this
study, was an examination of some of the detailed changes in the com-
munication patterns of the teachers. In all cases, the significance
level was calculated for the difference between two means for corre-
lated samples and the formula used to test Hypothesis I was the statis-
tical procedure. The following sets of data were tested:

1. The percentage of Student Talk in the initial observations
    and the percentage of Student Talk in the second observa-
    tions.

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[6] Ibid., pp. 167-168.

[7] Ibid., p. 406.

2. Amount of Student Talk in first set of data compared to the amount in the third set.

3. The percentage of Teacher Talk in Category 5 (lecturing, giving facts and opinions, etc.) for the first observations and the percentage of Teacher Talk in Category 5 for the second set of observations.

4. Amount of Teacher Talk in Category 5 for the first set of data compared with the amount in the third set.

5. The percentage of Teacher Talk in Category 4 (questioning) for the initial observations and the percentage of Teacher Talk in Category 4 for the second set of observations.

6. The percentage of Teacher Talk in Category 4 for the second set of observations and the percentage of Teacher Talk in Category 4 for the third set of observations.

A significance level of .05 was used for all of the tests.

CHAPTER IV

RESULTS OF THE STUDY

The presentation of results follows the general plan suggested
by the statement on the proposed treatment of results in Chapter III.
The findings are presented under three specific headings in the
following order:

1. Results pertinent to the question of whether or not signi-
   ficant changes occurred in the classroom communication
   patterns of the teachers.

2. Results pertinent to the question of whether or not one
   group responded with more significant change than the
   other group.

3. Results pertinent to a detailed examination of several
   aspects of the communication patterns.

Results Pertinent to the Question of Whether or Not Significant
Changes Occurred in the Classroom Communication Patterns of the
Teachers

In order that Hypothesis I might be tested, a comparison was
made between the I/D Ratios obtained from the communication patterns
revealed during the first and second classroom observations. The
difference between the two means was tested for significance using
the test for correlated samples. The data are presented in Table I.

The observed t-score is significant at the .05 level of signi-
ficance. It is noted that the observed t-score is well above the
required value for .05 level of significance. The results tend to

TABLE I

COMPARISON OF I/D RATIO SCORES FOR THE
FIRST AND SECOND OBSERVATIONS

Teacher	First Observation	Second Observation	Difference
A	42.8	69.4	-26.6
B	24.9	30.7	- 5.8
C	27.2	34.5	- 7.3
D	45.5	58.0	-12.5
E	14.5	41.4	-26.9
F	43.7	69.7	-26.0
G	43.6	73.7	-30.1
H	34.7	29.4	5.3
I	30.5	38.0	- 7.5

N = 9 $\overline{X}_1$ = 34.2 $\overline{X}_2$ = 49.4   Mean Diff. = -15.2

. . . .

d.f. = 8   t = -3.6742

support Hypothesis I which stated that teacher familiarity with the
Flanders Categories would result in increased indirect influence in
the classroom verbal behavior patterns of the teachers.

To test whether the changes would continue to be evident at a
later date, a similar comparison was made between the I/D Ratios of
the first set of observations and the third set of observations. These
data are shown in Table II.

TABLE II

COMPARISON OF I/D RATIO SCORES FOR THE
FIRST AND THIRD OBSERVATIONS

Teacher	First Observation	Third Observation	Difference
A	42.8	72.1	-29.3
B	24.9	53.7	-28.8
C	27.2	58.8	-31.6
D	45.5	61.4	-15.9
E	14.5	60.9	-46.4
F	43.7	83.3	-39.6
G	43.6	62.4	-18.8
H	34.7	62.0	-27.3
I	30.5	45.1	-14.6

N = 9 $\overline{X}_1 = 34.2$ $\overline{X}_2 = 62.2$ Mean Diff. = -28.0

....

d.f. = 8   t = -7.9313

The observed t-score is very much above the required t-score
for significance at the .05 level. It is noted that results indicate
that there was no regression towards the original I/D Ratio figures
but rather a continued increase toward still further use of indirect
influence by the teachers.

For further comparisons associated with Hypothesis I, the I/D
Ratios for the second set of observations and for the third set of

observations were compared. This was done to determine whether the changes toward more indirect communications between these two sets of observations were statistically significant. Table III lists the data comparisons.

TABLE III

COMPARISON OF I/D RATIO SCORES FOR THE
SECOND AND THIRD OBSERVATIONS

Teacher	Second Observation	Third Observation	Difference
A	69.4	72.1	- 2.7
B	30.7	53.7	-23.0
C	34.5	58.8	-24.3
D	58.0	61.4	- 3.4
E	41.4	60.9	-19.5
F	69.7	83.3	-13.6
G	73.7	62.4	+11.3
H	29.4	62.0	-32.6
I	38.0	45.1	- 7.1

N = 9	$\overline{X}_1$ = 49.4	$\overline{X}_2$ = 62.2	Mean Diff. = -12.8

. . . .

d.f. = 8 t = -2.8182

The observed value of t for the difference between the two means is significant at the .05 level. It is noted that the teachers continued to use a greater amount of indirect influence in their

classroom communication patterns.

Results Pertinent to the Question of Whether or Not One Group Responded with More Significant Change Than the Other Group

The sample was made up of two sub-groups. Teachers A, B, C, and D were teachers who had more than three years of teaching experience. Thus they were classified as Group I. Teachers E, F, G, H, and I were teachers who had less than three years of teaching experience. These individuals were classified as Group II.

In order that Hypothesis II might be tested, a comparison was made between the amount of increase in the I/D Ratio figures of Group I with the amount of increase in the I/D Ratio figures of Group II. The figures indicating the amount of increase were derived from the I/D Ratio scores of the first and second set of observations. Table IV presents this data.

The test for significance between the difference of means for independent samples was applied. The observed t-score is well below the required value for significance at the .05 level. It is noted that the data do not tend to support Hypothesis II which stated that the teachers with less than three years of teaching experience (Group II) would demonstrate a greater increase towards more indirect verbal behavior in the classroom than would the teachers with more than three years of teaching experience (Group I).

A further comparison was made of the two sub-groups in the sample by comparing their respective I/D Ratio figure increases between the first and third observations. The same procedure was used as described above. The pertinent data are shown in Table V.

TABLE   IV

COMPARISON OF THE AMOUNTS OF I/D RATIO INCREASE
FOR GROUP I AND GROUP II TEACHERS

	Teacher	First Observation	Second Observation	Increase
	A	42.8	69.4	26.6
	B	24.9	30.7	5.8
Group I	C	27.2	34.5	7.3
	D	45.5	58.0	12.5
	E	14.5	41.4	26.9
	F	43.7	69.7	26.0
Group II	G	43.6	73.7	30.1
	H	34.7	29.4	0
	I	30.5	38.0	7.5

$N_1 = 4$ $N_2 = 5$ $\overline{X}_1 = 13.05$ $\overline{X}_2 = 18.10$

Mean Difference = 5.05   d.f. = 7   t = 0.632

$t_{.05}$ (d.f. = 7) is 2.365

The observed t-score is well below the required value for significance at the .05 level. These results tend to further substantiate that there is a lack of support for the acceptance of Hypothesis II.

TABLE V

COMPARISON OF THE AMOUNTS OF I/D RATIO INCREASE
BETWEEN THE FIRST AND THIRD OBSERVATIONS

	Teacher	First Observation	Third Observation	Increase
	A	42.8	72.1	29.3
	B	24.9	53.7	28.8
Group I	C	27.2	58.8	31.6
	D	45.5	61.4	15.9
	E	14.5	60.9	46.4
	F	43.7	83.3	39.6
Group II	G	43.6	62.4	18.8
	H	34.7	62.0	27.3
	I	30.5	45.1	14.6

$N_1 = 4$ $N_2 = 5$ $\overline{X}_1 = 26.4$ $\overline{X}_2 = 29.3$

Mean Difference = 2.9   d.f. = 7   t = 0.391

$t_{.05}$ (d.f. = 7) is 2.365

Results Pertinent to a Detailed Examination of Several Aspects of the

Communication Patterns

Since there was a significant increase in the amount of indirect

influence used by the teachers following the study sessions, an exam-

ination of the percentages of Student Talk was made to determine

whether or not there had been a corresponding increase in this aspect

of the classroom communication patterns. Accordingly, a comparison

was made between the amounts of Student Talk revealed during the

first and second sets of classroom observations. The analysis of the

data is given in Table VI.

TABLE   VI

COMPARISON OF THE AMOUNTS OF STUDENT TALK FOR THE
FIRST AND SECOND OBSERVATIONS

Teacher	First Observation	Second Observation	Difference
A	19.4	40.7	-21.3
B	14.8	11.9	2.9
C	11.2	12.3	- 1.1
D	24.9	31.2	- 6.3
E	11.9	25.5	-13.6
F	17.6	36.4	-18.8
G	34.0	38.8	- 4.8
H	18.7	27.3	- 8.6
I	17.5	19.0	- 1.5

$N = 9$ $\overline{X}_1 = 18.9$ $\overline{X}_2 = 27.0$ Mean Diff. = -8.1

. . . .

d.f. = 8 $t = -2.9470$

The results shown in Table VI are significant at the .05 level.

The amount of Student Talk increased significantly in conjunction

with the increased use of indirect influence by the teachers in their

verbal behavior.

A further examination of this point was made by a comparison of the amounts of Student Talk revealed in the first and third set of communication patterns.   The data are given in Table VII.

TABLE   VII

COMPARISON OF THE AMOUNTS OF STUDENT TALK FOR THE
FIRST AND THIRD OBSERVATIONS

Teacher	First Observation	Third Observation	Difference
A	19.4	36.0	-16.6
B	14.8	25.2	-10.4
C	11.2	38.0	-26.8
D	24.9	35.4	-10.5
E	11.9	31.9	-20.0
F	17.6	46.7	-29.1
G	34.0	37.0	- 3.0
H	18.7	36.7	-18.0
I	17.5	25.5	- 8.0

$N = 9$ $\quad \overline{X}_1 = 18.9 \quad \overline{X}_2 = 34.7 \quad$ Mean Diff. = -15.8

$d.f. = 8 \qquad t = -5.4676$

The observed t-score is well above the required level for significance at the .05 level.   The results illustrate an increase in student participation when there is an increase in indirect verbal

behavior by the teachers.

To determine whether or not the teachers reduced significantly the amount of time used in giving facts, lecturing, etc., a comparison was made between the percentages in Category Five for the first and second set of observations. The corresponding set of data is shown in Table VIII.

TABLE VIII

COMPARISON OF THE AMOUNTS OF TIME USED FOR CATEGORY FIVE

Teacher	First Observation	Second Observation	Difference
A	33.7	15.6	18.1
B	56.1	54.1	2.0
C	54.4	51.2	3.2
D	30.6	20.1	10.5
E	52.7	32.6	20.1
F	36.3	16.1	20.2
G	34.2	12.7	21.5
H	36.9	37.5	- .6
I	37.9	42.1	- 4.2

N = 9 $\bar{X}_1$ = 41.4 $\bar{X}_2$ = 31.3 Mean Diff. = 10.1

d.f. = 8 t = 2.9745

The results shown in Table VIII are significant at the .05 level. It is noted that the teachers lectured significantly less

following the study sessions on the Flanders System of Interaction Analysis.

The same procedure was followed to make a comparison of the figures representing Category Five in the first and third set of classroom observations. Table IX presents this information.

TABLE IX

COMPARISON OF THE AMOUNTS OF TIME USED FOR CATEGORY FIVE
(FIRST AND THIRD OBSERVATIONS)

Teacher	First Observation	Third Observation	Difference
A	33.7	13.4	20.3
B	56.1	29.8	26.3
C	54.4	24.0	30.4
D	30.6	14.9	15.7
E	52.7	18.3	34.4
F	36.3	5.9	30.4
G	34.2	19.6	14.6
H	36.9	9.9	27.0
I	37.9	33.9	4.0

N = 9 $\overline{X}_1$ = 41.4 $\overline{X}_2$ = 18.9   Mean Diff. = 22.5

. . . .

d.f. = 8   t = 6.9605

Table IX shows an observed t-score that is very much above the required value for significance at the .05 level.

Another aspect of the communication patterns that was examined

was the amount of time used by the teachers for asking questions. This is indicated by the percentages under Category Four. Thus a comparison was made between the means for this Category found in the first and second set of classroom observations. The correspondong data are presented in Table X.

TABLE X

COMPARISON OF THE AMOUNTS OF TIME DEVOTED TO QUESTIONING
BY THE TEACHERS

Teacher	First Observation	Second Observation	Difference
A	20.1	22.6	-2.5
B	13.0	14.1	-1.1
C	12.0	15.0	-3.0
D	21.0	21.7	- .7
E	7.3	15.1	-7.8
F	22.3	26.9	-4.6
G	17.1	21.4	-4.3
H	16.6	11.2	5.4
I	11.6	15.5	-3.9

$N = 9$ $\quad \bar{X}_1 = 15.7$ $\quad \bar{X}_2 = 18.2$ $\quad$ Mean Diff. = -2.5

d.f. = 8 $\qquad$ $t = -2.0647$

$t_{.05}$ (d.f. = 8) is 2.306

Although there was an increase in the amount of questioning in

the second set of communication patterns, the amount of increase is not significant at the .05 level.

Another comparison was made between the means for Category Four of the second and third set of communication patterns. There was a significant increase in the I/D Ratio scores of these two sets of communication patterns. Therefore, it was of interest to see whether this was mainly due to the teaching verbal behavior pattern showing an increase in teacher questioning. The analysis of the data is given in Table XI.

TABLE XI

COMPARISON OF CATEGORY FOUR TOTALS IN THE SECOND AND
THIRD OBSERVATIONS

Teacher	Second Observation	Third Observation	Difference
A	22.6	25.3	-2.7
B	14.1	15.4	-1.3
C	15.0	19.9	-4.9
D	21.7	20.1	1.6
E	15.1	19.5	-4.4
F	26.9	26.2	.7
G	21.4	15.2	6.2
H	11.2	19.6	-8.4
I	15.5	16.5	-1.0

$N = 9$ $\overline{X}_1 = 18.2$ $\overline{X}_2 = 19.7$ Mean Diff. $= -1.5$

. . . .

d.f. $= 8$ $t = -1.1196$

$t_{.05}$ (d.f. $= 8$) is 2.306

The results shown in Table XI do not reach significance at the .05 level. The two comparisons illustrated in Tables X and XI tend to support the idea that the increase in the I/D Ratios, evident in the two post-treatment sets of observations, cannot be attributed merely to teachers devoting more time to questioning techniques.

CHAPTER   V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The general plan of this chapter is to present a brief summary
of this study and the procedures used. This is followed by a summary
of the results and then a discussion outlining the conclusions drawn
from these results. The final portion deals with suggested implica-
tions and comments on the possibility of future research.

SUMMARY OF THE STUDY AND PROCEDURES FOLLOWED

The purpose of this study was to investigate the effect of
study sessions in Flanders System of Interaction Analysis on the class-
room communication patterns of a group of team teachers. The sample
consisted of nine Junior High School teachers who were involved in the
team teaching of language arts or social studies. These nine teachers
made up three teams. Two of these teams were in Andrew Mynarski Junior
High School while the third team was in Hugh John Macdonald Junior High
School. Both schools are in the Winnipeg School Division No. 1. All
subjects in the sample volunteered to participate in the study. Four
of the subjects in the sample had more than three years of teaching
experience while the other five members had been teaching for less than
three years.

The study was carried out during the 1967-68 school term. The
method was to gather data by means of classroom observations during
teaching sessions by the subjects in the study. The classroom observa-
tions were the means by which communication patterns were recorded

through the use of the Flanders System of Interaction Analysis. Each teacher was observed on three different occasions. These three stages were pre-treatment observation, post-treatment observation, and final observation. The type of lessons and particular grade level observed were selected by the individual teachers with the understanding that later observations would be made under similar circumstances.

Following the pre-treatment observation, three study sessions on the Flanders System of Interaction Analysis were held with each team of teachers. The first session was designed to acquaint the teachers with some of the basic concepts underlying interaction analysis as well as to acquaint the teachers with the ten categories that comprise the Flanders System. The second session attempted to help the teachers gain further understanding of the ten categories along with some practice in identifying the types of communication illustrated in a taped classroom lesson. The third session concentrated on giving the teachers information on how to interpret certain aspects of matrices which reveal the communication patterns of classroom verbal behavior according to the Flanders System. Teachers were then given a copy of a matrix made from the tallies taken during the pre-treatment observation in their classrooms.

The post-treatment observation was made five to sixteen days after the completion of the study sessions. Each teacher was provided with a copy of a matrix depicting the communication pattern made from the observation of their particular classrooms. The final observation was made fifteen to twenty-six days after the completion of the second set of classroom observations. The teachers were again given a copy

of the matrix showing the verbal behavior that had been recorded in their particular classrooms.

The matrices, compiled from the tallies of the three sets of observations, revealed various types of information that could be treated statistically. The I/D Ratio figures were compared as a means of testing the two hypotheses that had been stated in Chapter I. Some of the percentage figures given in the matrices were compared in an attempt to examine areas of particular interest that were related to this study.

SUMMARY OF THE RESULTS

The procedures of this study were developed to test two hypotheses proposed in Chapter I. The statistical criterion established for acceptance of these hypotheses was the .05 level of significance. On this basis, the findings supported Hypothesis I but Hypothesis II was rejected. Therefore, the following statements relating to the hypotheses can be made in accordance with the findings of this study:

1) There appears to be a positive relationship between the study sessions on Flanders System of Interaction Analysis by the teachers and the subsequent increases in the amount of indirect influence revealed in the classroom verbal communication patterns of these same teachers.

2) There appears to be no significant difference in the amount of indirect influence increment between the teachers with more than three years of teaching experience and those teachers with less than three years of teaching experience.

CONCLUSIONS

The conclusions suggested in this section of the presentation are all subject to the limitations inherent in the design of the study and the procedures followed. Any generalizations beyond the interpretations descriptive of the sample must take into consideration these limitations. The fact that the sample size was small, the participants being interested volunteers, might have restricted the group in terms of being representative of the population of teachers in team teaching.

In Table I, a comparison was made between the I/D Ratio scores obtained through the first and second sets of observations. Although the .05 level of significance had been selected as the statistical criterion, the significance level reached was .01. The further comparison of I/D Ratios for the first and third sets of observations revealed a significance level of .001. Thus, it may be concluded that, as a group, the nine teachers did change very significantly their communication patterns in terms of the increased use of indirect influence. These changes are attributed to the knowledge gained by the teachers about the Flanders System of Interaction Analysis through the three study sessions held on the subject.

An examination of Table III shows that there had been a significant change in the increased use of indirect verbal behavior by the teachers during the third round of classroom visits as compared to the second round. In other words, although there had been a time interval of over one month from the study sessions to the third observation, there was no tendency to regress or remain static in terms of

an I/D Ratio level. There was a further increment in the use of

indirect verbal behavior on the part of the teachers. The conclusion

reached in this case is that the matrices were acceptable feedback to

the teachers thus prompting them to make self-evaluations and changes

in their verbal behavior patterns.

On the basis of the findings presented in Tables IV and V,

Hypothesis II stating that the increase in indirect verbal behavior

will favor teachers with less than three years of teaching experience

is rejected. It is concluded that the seminar sessions on Flanders

System of Interaction Analysis are effective in producing increased

usage of indirect verbal behavior in the classroom communications

of teachers with few or many years of teaching experience.

Tables VI and VII show comparisons of data to indicate whether

or not there had been any significant increases in the amount of

student verbal behavior as a result of the corresponding increases

in indirect influence by the teachers. It is noted that there were

very significant increases in the amount of student verbal partici-

pation. The observed t-score for the comparison of the first and

third set of communication patterns revealed a significance level of

.001. These findings tend to support the conclusion that the more

indirect influence a teacher uses in his classroom communications,

the more students are encouraged to participate verbally.

A study of Tables VIII and IX indicates that the nine teachers

changed their classroom verbal behavior by reducing significantly the

amount of time spent in lecturing and giving information to their

classes. It is concluded that the teachers exhibited more control

over their verbal behavior when they understood the Flanders System
of Interaction Analysis and thus were able to assess the matrices of
their actual classroom performances.

A comparison of the amounts of time devoted to questioning by
the teachers was made in Tables X and XI. It is interesting to note
that the teachers did generally increase the amount of time in ques-
tioning students during the lessons. However, these increases were
not significant between the first and second or second and third sets
of communication patterns. This tends to support the conclusion that
the increased I/D Ratios cannot be attributed mainly to a shift in
emphasis from Category 5 to Category 4 by the teachers. There appears
to be ample evidence indicating that the I/D Ratio figures were
increased because of more emphasis by the teachers on Categories 2,
3, and 4 combined, as well as less usage of Category 5.

IMPLICATIONS

Several implications are suggested as a result of the findings
and conclusions of this study. First, teachers generally strive to
have their students become actively involved in the verbal interaction
of the classrooms. However, they often lack the ability to control
consciously their own classroom verbal behavior to a degree that
student participation is encouraged. There is a gap between what the
teacher desires and what actually occurs. The findings of this study
suggest that teacher knowledge of the Flanders System of Interaction
Analysis along with matrix feedback does give teachers insights into
their verbal behavior in the classroom. These factors are the tools

by which self-evaluation can occur and the teachers reach the decisions as to whether or not changes should be made.

Thus, if administrators feel that communication patterns in classrooms could be improved, one method that would probably help would be in-service training for the teachers in Flanders System of Interaction Analysis.

Another implication is that administrators in schools might be better able to guide teachers towards improved communication patterns if they themselves were familiar with the observational process that is an integral part of the Flanders System. In this way, they could act as in-service leaders on the subject as well as resource personnel through which the teachers might be provided with matrices on their teaching performances.

There are also some implications in terms of further research in the area of Flanders System of Interaction Analysis and its possible uses with in-service teachers:

1) Research similar to the procedures followed in this study but involving a larger sample might reveal some significant trends.

2) Studies involving an entire school staff or certain departments within the school might prove to be useful.

3) An investigation into the long range effect of in-service training in the Flanders System on the communication patterns of experienced teachers would be worthwhile.

4) Studies with teachers working in elementary and high schools would provide further information on in-service possibilities of the Flanders System.

5) An investigation comparing the changes in communication patterns of teachers trained as observers and those teachers given in-service training would provide information about the degree of understanding of Flanders Interaction Analysis that is most effective for improvement of teacher classroom verbal behavior.

BIBLIOGRAPHY

BIBLIOGRAPHY

Amidon, Edmund J. "Interaction Analysis Applied to Teaching." The
     Bulletin of the National Association of Secondary School
     Principals, L (Dec. 1966), 93-97.

Amidon, Edmund J. "The Observational Technique of Interaction
     Analysis." Paper read at the American Educational Research
     Association, Chicago, Illinois, February, 1963.

Amidon, Edmund J., and Flanders, Ned A. "The Effects of the Indirect
     and Direct Teacher Influence on Dependent-Prone Students
     Learning Geometry." Journal of Educational Psychology, LII
     (Dec. 1961), 286-296.

Amidon, Edmund J., and Flanders, Ned A. The Role of the Teacher in
     the Classroom. Minneapolis: Association for Positive
     Teaching Inc., 1967.

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

Amidon, Edmund J., and Hunter, Elizabeth. Improving Teaching - The
     Analysis of Classroom Verbal Interaction. New York: Holt,
     Rinehart and Winston Inc., 1966.

Amidon, Edmund J., Kies, Kathleen M., and Palisi, Anthony T. "Group
     Supervision: A Technique in Improving Teaching Behavior."
     The Education Digest, XXXII, (September 1966), 18-21.

Borg, Walter R. "Teacher Effectiveness in Team Teaching." The
     Journal of Experimental Education, XXXV, (Spring 1967), 65-70.

Cunningham, John D. "Interaction Analysis: A Useful Technique for
     Research and Science Supervision." Science Education, LI,
     (February 1967), 27-32.

Ferguson, George A. Statistical Analysis in Psychology and Education.
     New York: McGraw-Hill Book Co., 1966.

Flanders, Ned A. "Interaction Analysis and Teacher Education." Paper
     presented at the Conference on Recent Research and Development
     in Teacher Education, The College of Education, University of
     Minnesota, Minneapolis, Minnesota, December 1960.

Flanders, Ned A. "Analysing Teacher Behavior as Part of the Teaching
     Learning Process." Educational Leadership, XIX, (December
     1961), 173-180.

Flanders, Ned A. Teacher Influence, Pupil Attitudes, and Achievement.
    Washington: United States Government Printing Office, 1965.

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

Flanders, Ned A. "Teacher Behavior and In-service Programs." Inter-
    action Analysis: Theory, Research, and Application. Don Mills:
    Addison-Wesley Publishing Company, 1967, 217-242.

Flanders, Ned A. "Using Interaction Analysis in the In-service Train-
    ing of Teachers." Journal of Experimental Education, XXX,
    (June 1962), 313-316.

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

Hart, M. A. "An Investigation of the Relationship Between the Study
    of Flanders Interaction Analysis and Changes in the Openness
    of Elementary Teacher Education Students." Dissertation
    Abstracts, The Humanities and Social Sciences, XXVIII, (Novem-
    ber 1967), 1718-A-1719.A.

Lambert, Philip, Goodwin, William L., and Roberts, Richard F. "A Note
    on the Use of Flanders Interaction Analysis." The Journal of
    Educational Research, LVIII, (January 1965), 222-224.

Moskowitz, Gertrude. "The Effect of Training in Interaction Analysis
    on the Attitudes and Teaching Patterns of Co-Operating Teachers
    and their Student Teachers." Unpublished Doctoral thesis,
    Temple University, Philidelphia, Penn., 1966.

Moskowitz, Gertrude. "Toward Human Relations in Supervision." The
    Bulletin of the National Association of Secondary School Princi-
    pals, L, (December 1966), 98-114.

Moskowitz, Gertrude. "The Effects of Training Foreign Language Stu-
    dents in Interaction Analysis." Foreign Language Annals, I,
    (March 1968), 218-235.

Pfeiffer, Isobel L. "Teaching in Ability Grouped English Classes:
    A Study of Verbal Interaction and Cognitive Goals." Disserta-
    tion Abstracts, The Humanities and Sciences, XXVIII, (September
    1967), 1010-A.

Rippey, Robert M. "A 1620 Fortran Program for Compiling a Flanders-
    Amidon Interaction Analysis Matrix." Educational and Psycholo-
    gical Measurement, XXV, (1965), 235-237.

Seibel, Dean W. "Predicting the Classroom Behavior of Teachers."
    Journal of Experimental Education, XXXVI, (Fall 1967), 26-32.

Simon, Anita. "The Effects of Training in Interaction Analysis on the Teaching Patterns of Student Teachers in Favored and Non-favored Classes." Dissertation Abstracts, The Humanities and Sciences, XXVII, (June 1967), 4158.A-4159.A.

Storlie, Theodore R. "Applications of Interaction Analysis to the In-service Training of Teachers." Interaction Analysis: Theory, Research, and Application. Don Mills: Addison-Wesley Publishing Company, 1967, 262-270.

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

Zahn, Richard David. "The Use of Interaction Analysis in Supervising Student Teachers." Unpublished Doctoral thesis, Temple University, Philidelphia, Pennsylvania, 1965.

APPENDIX   A

FIRST STUDY SESSION MATERIAL

THE OBSERVATIONAL TECHNIQUE OF INTERACTION ANALYSIS

Applied to the Classroom: Procedures and Limitations*
by
Edmund Amidon
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Systems designed to analyze social interaction have been widely

used in research involving small groups and classroom situations.

Bales,[3] the sociologist, has adopted interaction techniques to study

of small face-to-face problem-solving groups. H. H. Anderson[2] in his

observation of dominative and integrative acts of teachers and child-

ren developed one of the early systems for observing teacher behavior

in classrooms. More recent research on teacher behavior by Withall,[6]

Hughes,[5] and Flanders[1] has also utilized the approach of analyzing

the interaction between teacher and children, concentrating on obtain-

ing an objective picture of this interaction. With the recording of

teacher behavior has come the idea of relating the quantified inform-

ation thus yielded to important student outcomes such as achievement

and attitudes.

The system described here, the Flanders system of interaction

analysis, has been utilized to discover some of these relationships.

In the Flanders system only verbal interaction between teachers and

pupils is analyzed because of the difficulty in reliably categorizing

non-verbal behavior. All teacher-pupil interaction is divided into

ten categories, seven of teacher talk, two of student talk, and one

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*This paper was delivered at the American Educational Research
Association, February 1963, in Chicago, Illinois.

of silence or confusion. Reference to the chart on page 3 during the reading of the following section will assist the reader in obtaining the over-all picture of the categories described in this section.

Teacher talk is recorded under one of two major headings: (a) indirect influence, and (b) direct influence. Indirect influence contains four, and direct influence three, categories. Included under the classification of indirect teacher influence are those types of teacher statements which increase student freedom to respond. Direct teacher influence refers to statements which restrict response by students.

A closer look at the categories of indirect influence reveals the exact types of teacher statements included here. Category one, acceptance of feeling, contains teacher statements communicating acceptance by the teacher of both positive and negative student feelings. Statements which judge the "goodness" or appropriateness of pupil behavior comprise Category two. These may be either praise or encouragement. Category three, acceptance of ideas, is made up of teacher statements which reflect, summarize, or clarify student ideas. Teacher questions which require children's response are assigned to Category four.

Categories of direct teacher influence reveal a contrasting type of teacher behavior. Lecture, giving information, and expressing opinion are recorded in Category five, and Category six is used for the teacher's directions to pupils. In Category seven are placed both statements of criticism and those in which the teacher justified his authority. Such statements are usually designed to change pupil behavior.

Student talk is divided into only two categories--Category eight, which is student talk in response to the teacher, and Category nine, student talk initiated by the student.

In the remaining category are recorded periods of silence or confusion. Pauses, short periods of silence, and periods during which the observer cannot determine who is talking are included in this category. Such a category is necessary because it allows the person who is doing the recording to account for every minute of the time spent in systematic observation.

A summary of the ten categories of interaction analysis with brief definitions can be found on page 3.

PROCEDURE FOR OBSERVING TEACHER-PUPIL INTERACTION

Use of the interaction analysis system involves an observer's spending several hours in a classroom observing various kinds of classroom interaction. The most typical procedure for collecting interaction data in research is presented in this section.

The observer enters the classroom and seats himself in a place where his presence will cause the least amount of distraction to the teacher and the class. He then spends from five to ten minutes observing without recording. During this time he is getting oriented to the classroom, acquiring a "feeling" for the total situation. This accomplished, he begins to record. Every three seconds he writes the category number of the teacher or student verbal behavior which he is observing at the moment. These numbers are recorded in sequence in

a column. Since the observer writes approximately 20 numbers per minute, at the end of an observational period of 15 to 20 minutes he will have recorded several long columns of numbers. Accuracy of observation and recording is of prime importance, of course, but evenness of tempo is also vital. While the observer is recording the appropriate category numbers he often records marginal notes explaining unusual happenings in the classroom. These are helpful later in interpreting the material gathered.

The observer always notes the type of class activity being observed, since obviously interaction will vary from one activity to another. Whenever the classroom activity changes so that observing is inappropriate, as, for example, when there are various groups working around the classroom, when the class members are working at their seats on individual work, or when silent reading is taking place, the observer stops recording. He then draws a line under the recorded numbers, makes a note of the new activity, and begins categorizing again, when the total class interaction resumes.

DESCRIPTION AND SUMMARY OF INTERACTION ANALYSIS DATA

One of the problems in development of classroom observation techniques has been that of providing a means of taking care of the problem of sequence in behavior. The Flanders system of interaction analysis provides a procedure for partially dealing with this problem. As the reader will recall, the observer preserves the original sequence of classroom interaction by recording the category numbers in columns. The following example demonstrates an observer's classification of a

short period of classroom interaction and then his summary of that
data for later analysis.

A social studies lesson begins in a fourth grade. The obser-
ver, who has been sitting in the classroom for several minutes in
order to gain some idea of the general climate, now starts to record.

Teacher: "Boys and girls, please open your social studies
books to page 5."

Observer classifies this as a 6, followed by a 10,
because of the period of silence and confusion during
which the children find the right page.

Teacher: "Jimmy, we are all waiting for you. Will you please
turn to page 5 in your book?"

Observer records a 7 and a 6.

Teacher: "I know now that some of you had difficulty with and
were a little upset by this chapter yesterday, but I
think that today we will find it more exciting and
interesting."

Observer records two 1's, reacting to feeling.

Teacher: "Now has anyone had a chance to think about what we
discussed yesterday?"

Observer records a 4.

Student: "I thought about this, and it seems that the reason
that we are in so much trouble in southeast Asia is that
we haven't really had a chance to learn to understand
the ways of the people who live there."

Observer records three 8's.

Teacher: "Good, John. That is a very interesting point which
I think we should examine more carefully."

Observer classifies this as a 2.

Thus the following sequence of numbers have been recorded by the
observer in this fashion:

$$
\begin{pmatrix} 10 \\ 6 \end{pmatrix}
$$
$$
\begin{pmatrix} 10 \\ 7 \end{pmatrix}
$$
$$
\begin{pmatrix} 6 \\ 1 \end{pmatrix}
$$
$$
\begin{pmatrix} 1 \\ 4 \end{pmatrix}
$$
$$
\begin{pmatrix} 8 \\ 8 \end{pmatrix}
$$
$$
\begin{pmatrix} 8 \\ 2 \end{pmatrix}
$$
$$
\begin{pmatrix} 2 \\ 10 \end{pmatrix}
$$

SOME LIMITATIONS OF THE SYSTEM

Some of the more general overall limitations of use of the Flanders system of interaction analysis are immediately evident. The system is designed for use only when the student and teacher are engaged in verbal interaction. This means that if for one reason or another the teacher is interacting in a non-verbal fashion with class members, no record is made of this interaction. Possibly in certain teaching situations this non-verbal communication is important enough to warrant attention. Further, when a teacher has the class broken into small groups in which he himself is not interacting with the children, all interaction being child to child, no effective observation is possible. If the teacher is interacting with one of the small groups, however, this group can be observed in much the same manner as would the total class. The system, moreover, can not be utilized in situations in which the teacher is using audio visual aids or other tools which make it unnecessary for him to talk.

Of the specific limitations inherent in the system, one in particular warrants attention here. Category 4 contains teacher questions--

all types of questions requiring pupil response. No allowance is made for different types of questions, for example, those broad and those narrow in scope. Length of student response, indicated by several consecutive 8's, may reflect something about the kind of question, but specific information about teacher questioning is still lacking in the matrix. Likewise there is no specific indication about student response in terms of its correctness or incorrectness. Again, the ensuing response by the teacher may (or may not) suggest the correctness of the student's reply.

The categories contained in the system, although fairly inclusive concerning teacher talk are rather more limited in the area of student participation. Supposing, for example, one student questions another student. No indication is given in the matrix, except, of course, that many consecutive 9's indicative of prolonged student conversation, might lead an interpreter to guess that some questioning had indeed occurred. Anger on the part of the student, again, may not be revealed in the matrix, except that we might expect a teacher reprimand (7) or perhaps acceptance of feeling (1) to follow. In other words, no exact interpretation of much of student verbal behavior is provided for in the system.

The Flanders system of interaction analysis, although not "the final answer," appears to have great potential as a highly significant tool for research about the teaching-learning process. Certainly information about the verbal interaction of the classroom provides a great deal of insight into the climate of the classroom, and according to research some indication of how much subject matter and what kinds

of attitude pupils are absorbing.

Educators who are considering use of this tool must ultimately base their decision concerning its use on the extent of the relationship existing between teacher's verbal interaction and pupil learning.

REFERENCES

1. Amidon, E. J. and Flanders, N. A., The Role of the Teachers in the Classroom, Group Dynamics Center, Temple University, 1962.

2. Anderson, H. H., The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children. Child Development, 1939, 10 (2), 73-79.

3. Bales, R. F., Interaction Process Analysis. Cambridge, Massachusetts, Addison Wesley, 1950.

4. Flanders, N. A., Interaction Analysis in the Classroom, University of Minnesota, 1960.

5. Romey, G. P., Hughes, M. M. et al. Progress Report of the Merit Study, Provo City Schools, August 1958. pp. xix 226.

6. Withall, J., Newell, J. M. and Lewis, W. W., Use of a Communication Model to Study Classroom Interaction, paper, American Educational Research Association, February 1961.

October 12, 1967.

CATEGORIES FOR INTERACTION ANALYSIS

TEACHER TALK	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 or recalling feelings are included. 2.* PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included. 3.* ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas suggested by a student. As teacher brings more of his own ideas into play, shift to category five. 4.* ASK QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5.* LECTURING: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions. 6.* GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply. 7.* CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK		8.* STUDENT TALK--RESPONSE: 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.

*There is NO scale implied by these numbers. Each number is classificatory, it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

APPENDIX   B

SECOND STUDY SESSION MATERIAL

```
9        S--- Well, I just can't understand how after (7) all the war-
              fare and all of the things that we've been learning about,
9,9           Russia is so (8) advanced above us and (9) here this plane
9             got into (10) Russia a couple thousand miles and they
9             didn't see it.  (11)  Of course it did get shot down, but
9             I (12) just can't understand with all their warfare how
9,10          it did get in there. (13) xx (14)

9        S--- Well, I could say that brightens our hopes for (15) retali-
9             ation, if they do attack us but (16) I wonder if they
9             didn't (17) purposely let the plane get in there so they
9,9           (18) could have an undisputed claim (19) that we were
9             spying on them.  After all the little border incident (20)
9             like some of them have been, (21) I don't know if those
9             were spying missions or not but (22) they, ah, someone's
9             always (23) been able to talk their way out of it.  So
9             they (24) possibly let the plane get in there in order so
9             they could have (25) a fool-proof case on us.

3        T--- Now Jerry's mentioned (26) that.  That perhaps the Russians
3             allowed this plane to get in there (27) deliberately so
3             that they might have an edge of some type on us (28) in
3             the propaganda war that is going on the world (29) today.
3             Ah, now this is of particu...particular (30)* importance
5             today because of the summit conference (31) that is begin-
5             ning now, Marcia, you were (32) reading about the summit
3             conference last week.  Of what importance is (33) this and
3             the plane incident? (34)*

9        S--- Well, they'll probably discuss it and they'll (35) think
9             something's, well that Russia is trying to, (36) oh, get
9             above us in some way and they're (37) trying to get,
9             they're trying to let the plane get into the (38) country
9             so they could shoot it down.  This could start (39) a
              third world war.

9        T--- All right, now (40) are there any other thoughts on this
4             plane incident?  Bill? (41)

9        S--- Well, there was some discussion on whether it (42) the
9             plane, had mechanical difficulty or ... (43)

2        T--- Now this is a good point now, go ahead ...

9        S--- Or whether it was shot down. (44)  And the Russians also
9             said that they had the plane (45) in about one piece ...
```

---

(30) There is an element of praise present, re-enforced by the
T reference to Marcia's reading, but not enough to justify using
category 2.

(34) A question growing out of a S idea is not category 4, it
is 3.

2	T---	Um Hm

9	S---	I don't see (46) how they could have had it in one piece
9,9		when it was, ah, (47) it fell from 65,000 (48) feet in
		the air.

2	T---	I see

9,9	S---	And (49) they said they were so far advanced in (50)
9		missile warfare and everything like (51) that so how
9		could the plane have gotten so far (52) into Russian
		territory?

2	T---	Um Hm (53)

9	S---	And, ah, they, there (54) is also some things they said
9		that, that probably, ah, (55) they're probably going to
9		shoot the, the (56) pilot and well, I don't think that's
9		(57) the right thing to do, they should settle it peace-
9		ably (58) and discuss it, and ...

3,4	T---	All right. Sandra you have, your (59) hand up, what
		point did you wish to add?

9,9	S---	Well, maybe (60) um, that man, I don't remember his (61)
		name right now, is it Powell?

3	T---	Who can recall the pilot's (62) name now? Marcia?

8	S---	I wouldn't (63) know.

	T---	Susan?

8	S---	Powers. (64)

	T---	Powers, that's right.

3	S---	Well, this Mr. (65) Powers, maybe he went in there on
9		purpose. (66) Instead of working with us maybe he was
9		working (67) with the Russians and maybe he was an agent
9		(68) of some type who went in there on purpose and, and
9		brought (69) all this stuff in there and go so far in
9		and, and (70) made everything plain and, and so that
9		everyone would be suspicious (71) of the United States
		and what exactly they were doing.

9	T---	Um, hm (72) -- Now this is a good point. Are there any
2,4		other thoughts on this? (73) Karen?

9	S---	Well, do they know who sent the man into (74) Russia?

3	T---	Does anyone know now who gave (75) the orders, do you recall this from your newspaper readings? (76)
8 8 8 9	S---	Secretary Herter said that he (77) wasn't going to, Secretary of State Herter (78) said that he wasn't going to reveal who sent him in, but they do (79) know that the United States didn't tell him to go. (80)
4 4	T---	Well, now the big question seems to be should we (81) have sent this pilot in in the first place? Robert? (82)
9,9 9,9 9,9 9 9 9,9 9	S---	Um, I don't think he (83) should have gone (84) through the right channels; I'm not sure he got permission from high (85) enough to go in. Ah, he (86) I know this sounds kind of (87) way out but he could've (88) gotten permission, he was going on a short (89) flight taking the plane somewhere (90) or another for repairs and had the mechanical (91) difficulty in there after he had (92) sort of snuck into Russia, and (93) just by luck had not (94) gotten shot down.
2 3 4	T---	All right, (95) now this is a good point, Robert has mentioned the mechanical (96) difficulty of it now. Any other thoughts?(97) Sharon?
9 9 9	S---	Well, even if the plane did have a (98) mechanical difficulty, if we tried to impress that upon (99) the Russians they wouldn't believe us because they are trying to find (100) something against us.
9	T---	Karen. (101)*
 9	S---	Do you think the United States would have done the same thing if there was a Russian (102) ship or a Russian plane?
9 3 3	T---	All right. (103) Now Karen has asked the question, now what would the United States have done (104) in such an instance. Kim? (105)
9 9 9 9 9	S---	Well, I think that maybe they would have, (106) well, that's the way the Russians did it, I think they probably should have (107) because if Russia wants to be, doesn't want, ah, American (108) planes flying over it and finding out different (109) things about her country then (tape goes off) (110)

---

(101) Calling on Karen is to acknowledge her right to speak and is perfunctory. The '9' refers to the previous student's statement.

3	T--- All right, now we've heard several different opinions on
3	this (111) problem of the Russian plane but just to
4,4	recall (112) the several items that have been mentioned,
	(113) Sharon, would you just briefly (114) tell us now
4	what has been mentioned so far so we can get all of the
	(115) thoughts together.

8	S--- Well, we don't know whether it was mechanical (116) diffi-
8	culty or shot (117) down, the reason the plane came down.
8	And we don't know whether (118) the man was sent by one
8	of our officials (119) to go over there or whether he
8	did it purposely (120) or whether it was for some other
8	reason ... (121)

S--- Hey come on, gimme it!

| 4 | T--- Any other thoughts (122) on this Sandra? |

S--- Well (123)

S--- (whispering by students) no! no! (124)

	T--- All right, boys I've had enough back there now, let's
7	settle down! (125) Sandra.

9	S--- Well, I'd like to know (126) why in the world, I mean he
9,9	would just (127) go in there, I mean it's so, (128) some-
9	one would be so scared, because he knew it was (129) fatal
9	death, I mean, he just couldn't go all the way across (130)
9	Russia and not someone see him with all those (131) diffi-
	culties and things like that ...

9,9	S--- Hey come on give it to me, (132) it gets me in such (133)
10	(whispering in the background) (134)

7	T--- All right now, just a minute. Jerry (135) stand up please.
7	Now listen. (136) It seems to me that you're a much better
7,7	student than that. (137) I know you are (138) and do you
7	want to stay around this classroom or not?

| 8 | S--- Yeah. (139) |

	T--- All right. Let's get your behavior back where it should
7	be. (140)

7	T--- Now sit down! It's extremely (141) discourteous to inter-
7	rupt this class in that way. (142) All right Sandra.

```
4       S--- Well, (143)* what kind of things did they have in that
9            plane that they wanted so much? (144)  I mean that what
9            did he have in there?  Did he (145) have anything that
             he could shoot back at them or something?
```

```
9       T--- Well, now Sandra's brought up a (146) very good point,
2            what type of information (147) do you think this air-
4            craft would be seeking anyway?  In such a (148) high
4            altitude of 65,000 feet or thereabouts? (149)  Wally?
```

```
9       S--- Well, I think (150) he might have been lookin', well,
9            you know they've got these (151) cameras with these tele-
9            photo lenses.  Well, (152) he could have just been taking
9            pictures on how they operate (153) things and stuff like
             that.
```

```
2       T--- All right, now this is a (154) good point.  Trying to
3,4          discover Russian operations. (155)  Jerry. (156)
```

```
9       S--- Another reason for sending that plane over (157) might be
9            they wanted to test the (158) effectiveness of the Russian
9            defenses to (159) see how much chance they had to get
             through there.
```

```
9       T--- Now (160) class what do you think of that?  Testing the
3,3          Russian defenses with (161) an American's life. (162)
             Marcia?
```

---

(143) The use of category four at (143) and (156) occurs by
default, mostly. During the three second interval not much else
occurred. The "4" is used because the teacher says, in effect, "What
else would you like to say, Sandra?"

APPENDIX   C

THIRD STUDY SESSION MATERIAL

SUGGESTIONS TO THE TEACHER FOR MATRIX INTERPRETATION

The matrix outlines the communication pattern that has occurred during the observation of a classroom lesson. The tallies made during the observation have been recorded into the matrix in such a way that certain facts are readily apparent. It is hoped that this objective information will help you gain some insights about the communications in that particular situation. The following comments and questions are offered as a series of steps that you might follow during the study of the matrix:

1) The matrix provides a total percentage for Teacher Talk (categories 1-7) and Student Talk (categories 8-9). How do these compare with the estimate which you gave following the observation? How do these figures compare with your objectives for that particular class and lesson?

2) Note the I/D Ratio figure. This indicates the percentage of Teacher Talk that has been indirect teacher influence, i.e. teacher statements that tend to encourage student participation. An I/D Ratio of 40.3 shows that 40.3% of the Teacher Talk was indirect and 59.7% was direct teacher influence, tending to limit student participation. Note: It is not uncommon for teachers to have predominantly direct patterns. The point to consider is what do you personally feel should be the case for this type of lesson?

3) The next part of the matrix that might be considered is the percentage of Student Talk covering categories 8 and 9. Are most student responses the expected answer in reply to a question (col.8) or do the students expand on ideas and initiate communication (col.9)?

4) The percentage figure under column 5 indicates how much class time was spent in lecturing and giving information to the class. How does this figure compare with your initial plans for this lesson?

5) Examine the percentage figure under column 4. Does this amount of questioning match your original aims set out during the lesson preparation?

GENERAL COMMENTS

a) The average teacher spends less than .5% of the class time openly considering student feelings and emotions. (Column 1).

b) The amount of class time used by teachers for encouraging and praising students averages 1-2% (Column 2)

c) The average teacher spends about 10% of the class time for using and extending student ideas. Research indicates that teachers having higher percentages in this category (column 3), tend to develop better attitudes and higher achievement in their students.

APPENDIX   D

SAMPLE TALLY SHEETS

TALLY SHEET

Page 1

Name_____   Date_____

Time_____   Subject_____

Class_____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

TALLY SHEET

Page 2

Name _____   Date _____

22	23	24	25	26	27	28	29	30	31	32	33	34	35

Total Tallies _____

Teacher's Estimate - Teacher Talk (%), Student Talk (%), Other (%)

APPENDIX   E

SAMPLE COMPUTER OUTPUT SHEET OF A MATRIX

	1	2	3	4	5	6	7
1	0	0	0	0	0	0	0
2	0	2	16	15	5	1	0
3	0	6	5	14	10	2	0
4	0	0	0	28	2	7	1
5	0	0	0	15	55	7	0
6	0	1	0	3	0	9	1
7	0	0	0	0	0	2	100
8	0	7	5	8	5	5	0
9	0	27	13	13	6	4	0
10	0	0	0	16	0	4	1
	0.0	43.	39.	112.	83.	36.	3.
	0.0	7.720	7.002	20.108	14.901	6.463	0.539

TEACHER TALK=56.732%

STUDENT TALK =35.368%

ID. RATIO = 0.614
38 0

```
   8              9             10
   0              0              0
   0              3              1
   0              2              0
  24             44             11
   2              4              0
   8              5             10                        94
   0              0              0
  42              1              5
   0             55              1
   2              5             16
  78.           119.            44.    TOTAL TALLIES
  .004           21.364          7.899  PERCENTAGES
```

APPENDIX F

MATRICES FOR THE THREE SETS OF

CLASSROOM OBSERVATIONS

Name___Teacher A_____   Date___February 2, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2				1	1			30	10		42
3		8	7					5	1		21
4		9	4	31	41	4	3	12	1	10	115
5		16	8	5	122	9	5	11	6	11	193
6		5		4	4	5		2			20
7				7	7	1	5	3		2	25
8			1	47	5		6	4		8	71
9		2		7	4		1	4	22		40
10		2	1	13	9	1	5			14	45
TOTAL TALLIES	-	42	21	115	193	20	25	71	40	45	572
PERCENTAGE	-	7.3	3.7	20.1	33.7	3.5	4.4	12.4	7.0	7.9	

%	Teacher Talk _72.7%_		S. Talk _19.4%_	(Other) 7.9%

I/D RATIO (1-4 ÷ Total of 1-7)   _42.8%_

· ·

Teacher's Estimate - Teacher Talk (60%), Student Talk (35%) Other(5%)

Name   Teacher A   Date March 29, 1968

Time

25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		2	9	17	6		1	3	13		51
3		2	16	19	4			1	16		58
4		2	4	35	4	1	2	56	31	1	136
5			4	18	65	2		1	3	1	94
6				2		2				1	5
7		1		1	1		2	2	1	1	9
8		20	10	17	7		4	18	7		83
9		24	15	27	6			1	89		162
10					1			1	2		4
TOTAL TALLIES	-	51	58	136	94	5	9	83	162	4	602
PERCENTAGE	-	8.5	9.6	22.6	15.6	.8	1.5	13.8	26.9	.7	
%	Teacher Talk 58.6%					S. Talk 40.7%				(Other) .7%	

I/D RATIO (1-4 ÷ Total of 1-7)   69.4%

. . . .

Teacher's Estimate - Teacher Talk (60%), Student Talk (35%) Other(5%)

Name Teacher A   Date May 21, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		3	9	31	2	2			6		53
3		7	20	19	5			3	6		60
4			5	51	10	1	1	56	19	8	151
5				18	47	2	1	3	9		80
6				1	1	5		1	1	2	11
7				2	1		2	4		2	11
8		16	12	18	6		5	16	10	1	84
9		27	13	5	6		1		79		131
10			1	6	2	1	1	1	1	4	17
TOTAL TALLIES	-	53	60	151	80	11	11	84	131	17	698
PERCENTAGE		8.9	10.0	25.3	13.4	1.8	1.8	14.1	21.9	2.8	
%	Teacher Talk 61.2%					S. Talk 36.0%			(Other) 2.8%		

I/D RATIO (1-4 ÷ Total of 1-7) 72.1%

. . . .

Teacher's Estimate - Teacher Talk (60%), Student Talk (35%) Other(5%)

Observation Matrix
1

Name____Teacher B_____   Date February 7, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		4		2	6			12	2		26
3			1					7			8
4		7	4	5	26		2	13		16	73
5		11	1	2	268		2	12	4	15	315
6								1			1
7		1					1	5			7
8		3		51		1	1	11		5	72
9				4			1		5	1	11
10			2	9	15			11		11	48
TOTAL TALLIES	-	26	8	73	315	1	7	72	11	48	561
PERCENTAGE	-	4.6	1.4	13.0	56.1	.2	1.2	12.8	2.0	8.6	

%	Teacher Talk 76.6%	S. Talk 14.8%	(Other) 8.6%

I/D RATIO (1-4 ÷ Total of 1-7)   24.9%

. . . .

Teacher's Estimate - Teacher Talk (85%), Student Talk (12%) Other(3%)

Name   Teacher B   Date March 25, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		6	2	7	7				1	7	30
3		1	13	5	2				1	1	23
4		2		25	4			24	5	13	73
5		1		19	242	1		2	5	11	281
6					1	2					3
7											-
8		16	5	3	4			3	1		32
9		3	2	1	8				16		30
10		1	1	13	13			3	1	15	47
TOTAL TALLIES	-	30	23	73	281	3	-	32	30	47	519
PERCENTAGE	-	5.8	4.4	14.1	54.1	.6	-	6.2	5.8	9	
%	Teacher Talk 79%						S. Talk 11.9%			(Other) 9.1%	

I/D RATIO (1-4 ÷ Total of 1-7)   30.7%

∘∘∘

Teacher's Estimate - Teacher Talk (85%), Student Talk (15%) Other(-)

Name   Teacher B   Date May 3, 1968

Time
22 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		12	5	14	4	2		7	1	2	47
3		5	24	8	11				2		50
4		1		12	3	1		40	9	5	71
5		1	6	15	95	2			6	12	137
6				1	1	2			1	2	7
7								1			1
8		24	10	11	4		1	29		1	80
9		3	5	3	6				17	2	36
10		1		7	13			3		7	31
TOTAL TALLIES	-	47	50	71	137	7	1	80	36	31	460
PERCENTAGE	-	10.2	10.9	15.4	29.8	1.5	.2	17.4	7.8	6.7	

%	Teacher Talk 68%		S. Talk 25.2%	(Other) 6.7%

I/D RATIO (1-4 ÷ Total of 1-7)   53.7%

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Teacher's Estimate - Teacher Talk (60%), Student Talk (40%) Other(-)

Name _____ Teacher C _____   Date February 7, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2			1					8	4	1	14
3		5	9	2	2			4	3	5	30
4		5	9	18	9			4	1	16	62
5		3	2	3	243			4	1	25	281
6					1						1
7									1		1
8				18		1		6	1	4	30
9		1	3	6	1			3	13	1	28
10			6	15	25		1	1	4	18	70
TOTAL TALLIES	-	14	30	62	281	1	1	30	28	70	517
PERCENTAGE	-	2.7	5.8	12.0	54.4	.2	.2	5.8	5.4	13.5	
%	Teacher Talk 75.3%					S. Talk 11.2%				(Other) 13.5%	

I/D RATIO (1-4 ÷ Total of 1-7)   27.2%

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Teacher's Estimate - Teacher Talk (80%), Student Talk (20%) Other(-)

Name   Teacher C   Date March 25, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		9	11	5	6		1		1		33
3			14	8	5			1	1	2	31
4				29	6		1	22	10	9	77
5			1	21	220	1			1	18	262
6			1		2	1					4
7					1			1			2
8		18		3	3	1		10			35
9		6	3	1	1	1			14	2	28
10			1	10	18			1	1	9	40
TOTAL TALLIES	-	33	31	77	262	4	2	35	28	40	512
PERCENTAGE	-	6.4	6.1	15.0	51.2	.8	.4	6.8	5.5	7.8	

%	Teacher Talk 79.9%	S. Talk 12.3%	(Other) 7.8%

I/D RATIO (1-4 ÷ Total of 1-7)   34.5%

Teacher's Estimate - Teacher Talk (65%), Student Talk (25%) Other(10%)

Name___Teacher C_____   Date__May 3, 1968___

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1	1				1						2
2		4	2	11	6			1	3		27
3		3	31	8	4				8		54
4		2	2	49	4			25	24	4	110
5	1	2	2	17	106	1				4	133
6				1					1		2
7											-
8		7	5	7	4			10	3		36
9		9	12	9	3	1			134	6	174
10				8	5				1	1	15
TOTAL TALLIES	2	27	54	110	133	2	-	36	174	15	553
PERCENTAGE	14	4.9	9.8	19.9	24.0	.4	-	6.5	31.5	2.7	

%   Teacher Talk _59.3%_   S. Talk _38%_   (Other) 2.7%

I/D RATIO (1-4 ÷ Total of 1-7) _58.8%_

Teacher's Estimate - Teacher Talk (35%), Student Talk (63%) Other(2%)

Name Teacher D   Date February 7, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2				2				35	4	1	42
3		2	1		1			3	1		8
4		21	3	7	38		4	26	4	14	117
5		11	4	15	113	1	4	13	2	8	171
6					6	1		5			12
7		1		1	1		1	9	1	3	17
8		2		65	4	8	4	22		12	117
9		3		6	3			1	9		22
10		2		21	5	2	4	3	1	14	52
TOTAL TALLIES	-	42	8	117	171	12	17	117	22	52	558
PERCENTAGE	-	7.5	1.4	21.0	30.6	2.2	3.1	21.0	3.9	9.3	
%	Teacher Talk 65.8%							S. Talk 24.9%		(Other) 9.3%	

I/D RATIO (1-4 ÷ Total of 1-7) 45.5%

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Teacher's Estimate - Teacher Talk (50%), Student Talk (50%) Other(-)

Name   Teacher D   Date March 25, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		10	8	14	8		1		6	1	48
3		2	9	12	7				2		32
4		2	1	28	5	4	2	11	52	14	119
5		2		17	76	9			3	3	110
6				4	5	2	1	4	2	2	20
7				4			6	1	1	2	14
8		6		4	2	1	1	45	1	1	61
9		26	13	21	4	2	1		41	2	110
10			1	15	3	2	2		2	9	34
TOTAL TALLIES	-	48	32	119	110	20	14	61	110	34	548
PERCENTAGE	-	8.8	5.8	21.7	20.1	3.7	2.6	11.1	20.1	6.1	

%	Teacher Talk 62.7% S. Talk 31.2% (Other) 6.1%

I/D RATIO (1-4 ÷ Total of 1-7)   58%

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Teacher's Estimate - Teacher Talk (60%), Student Talk (40%) Other(-)

Observation Matrix
3

Name   Teacher D   Date May 3, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		2	16	15	5	1			3	1	43
3		6	5	14	10	2			2		39
4				28	2	2	1	24	44	11	112
5				15	55	7		2	4		83
6		1		3		9		8	5	10	36
7						2	1				3
8		7	5	8	5	5		42	1	5	78
9		27	13	13	6	4			55	1	119
10				16		4	1	2	5	16	44
TOTAL TALLIES	-	43	39	112	83	36	3	78	119	44	557
PERCENTAGE	-	7.7	7.0	20.1	14.9	6.5	.5	14.0	21.4	7.9	

%	Teacher Talk 56.7% S. Talk 35.4% (Other) 7.9%

I/D RATIO (1-4 ÷ Total of 1-7)   61.4%

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Teacher's Estimate - Teacher Talk (70%), Student Talk (30%) Other(-)

Name Teacher E

Date February 29, 1968

Time
22 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1					1						1
2				8	6					1	15
3				1	1						2
4				5	1	2		24	1	2	35
5	1			13	206	19	2	2	5	5	253
6				2	12	25	1	2	4	7	53
7					1		1		3	2	7
8		14	2	5	8		1	2		1	33
9		1		1	11		2	1	7	1	24
10					6	7		2	4	38	57
TOTAL TALLIES	1	15	2	35	253	53	7	33	24	57	480
PERCENTAGE	.2	3.1	.4	7.3	52.7	11.0	1.5	6.9	5.0	11.9	

%   Teacher Talk 76.2%   S. Talk 11.9%   (Other) 11.9%

I/D RATIO (1-4 ÷ Total of 1-7)   14.5%

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Teacher's Estimate - Teacher Talk (80%), Student Talk (15%) Other(5%)

Name **Teacher E** Date **April 5, 1968**

Time
23 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											–
2			14	7	5	1			1		28
3			6	10	8	1			1	1	27
4				20	3			16	20	11	70
5			1	12	116	11		1	5	5	151
6				3	7	8		1	2	4	25
7									1		1
8		5	3	7	2			15	3		35
9		22	3	5	5	1			43	4	83
10		1		6	5	3	1	2	7	18	43
TOTAL TALLIES	–	28	27	70	151	25	1	35	83	43	463
PERCENTAGE	–	6.1	5.8	15.1	32.6	5.4	.2	7.6	17.9	9.3	
%	Teacher Talk 65.2%						S. Talk 25.5%			(Other) 9.3%	

I/D RATIO (1-4 ÷ Total of 1-7) 41.4%

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Teacher's Estimate - Teacher Talk (75%), Student Talk (20%) Other(5%)

Name___Teacher E___   Date___May 15, 1968___

Time
20 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		4	15	21		1			2		43
3			3	10	6	1		2	2	1	25
4			2	29		2		17	24	6	80
5			1	7	51	4			9	3	75
6				3	2	7		1		5	18
7					1				1		2
8		12	2	2	4			2	1		23
9		26	2	3	6		1		66	4	108
10		1		5	5	3	1	1	3	17	36
TOTAL TALLIES	-	43	25	80	75	18	2	23	108	36	410
PERCENTAGE	-	10.5	6.1	19.5	18.3	4.4	.5	5.6	26.3	8.8	

%	Teacher Talk 59.3%		S. Talk 31.9%	(Other) 8.8%

I/D RATIO (1-4 ÷ Total of 1-7)   60.9%

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Teacher's Estimate - Teacher Talk (75%), Student Talk (20%) Other(5%)

Name   Teacher F   Date January 31, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		1						23	2		26
3		2	6				1	8	3	2	22
4		6	9	30	36		4	17	3	21	126
5		13	5	8	155		4	9		11	205
6											-
7				3			3	9		4	19
8				52	4		3	8		13	80
9				7			1		10	1	19
10		4	2	26	10		3	6	1	15	67
TOTAL TALLIES	-	26	22	126	205	-	19	80	19	67	564
PERCENTAGE	-	4.6	3.9	22.3	36.3	-	3.4	14.2	3.4	11.9	
%	Teacher Talk 70.5%						S. Talk 17.6%			(Other) 11.9%	

I/D RATIO (1-4 ÷ Total of 1-7)   43.7%

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Teacher's Estimate - Teacher Talk (54%), Student Talk (42%) Other(4%)

Name Teacher F   Date April 3, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		3	14	27	7				7		58
3		1	4	16	9			1	2		33
4		2	1	53	11			69	15	18	169
5				31	57		1	8	3	1	101
6								3	1		4
7				3	1			1		3	8
8		28	12	19	7	3	4	31	18		122
9		24	2	10	7	1	1	1	60	1	107
10				10	2		2	8	1	4	27
TOTAL TALLIES	-	58	33	169	101	4	8	122	107	27	629
PERCENTAGE	-	9.2	5.2	26.9	16.1	.6	1.3	19.4	17.0	4.3	
%	Teacher Talk 59.3%						S. Talk 36.4%			(Other) 4.3%	

I/D RATIO (1-4 ÷ Total of 1-7) 69.7%

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Teacher's Estimate - Teacher Talk (63%), Student Talk (29%) Other(8%)

Observation Matrix
3

Name __Teacher F__   Date__ April 25, 1968__

Time
24 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2			6	39	4			20	9		78
3		1	1	9	2			3			16
4			2	41	3		3	85	13	3	150
5				12	9			9	4		34
6									2	1	3
7				6	1		1	2	1	1	12
8		54	5	31	11	1	8	56	13	2	181
9		23	2	11	4	1		1	42	2	86
10				1		1		5	2	3	12
TOTAL TALLIES	-	78	16	150	34	3	12	181	86	12	572
PERCENTAGE	-	13.6	2.8	26.2	5.9	.5	2.1	31.6	15.0	2.1	

%	Teacher Talk _51.2%_		S. Talk_46.7%_	(Other) 2.1%

I/D RATIO (1-4 ÷ Total of 1-7)   _83.3%_

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Teacher's Estimate - Teacher Talk (65%), Student Talk (30%) Other(5%)

Name   Teacher G   Date February 9, 1968

Time
24 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2			1	2				14	13		30
3		4	11	1	1			5	5		27
4		12	3	27	26		1	13	5	5	92
5		6	9	5	138	2	2	5	15	2	184
6				1	2					1	4
7				2				1	2		5
8			2	36	2		2	14		1	57
9		8	1	12	13			4	85	3	126
10				6	2	2		1	1	1	13
TOTAL TALLIES	-	30	27	92	184	4	5	57	126	13	538
PERCENTAGE	-	5.6	5.0	17.1	34.2	.8	.9	10.6	23.4	2.4	

| % | Teacher Talk 63.6% | | | | | S. Talk 34% | | (Other) 2.4% |

I/D RATIO (1-4 ÷ Total of 1-7)   43.6%

Teacher's Estimate - Teacher Talk (40%), Student Talk (60%) Other(-)

Name___Teacher G_____   Date_April 1, 1968_

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		2	13	14	7			1	4		41
3		6	42	25	7	2			2		84
4		4	5	40	4	2	1	17	41	2	116
5		1	7	19	40	2					69
6				6	2	4		1		1	14
7							2			1	3
8		3		4	5	3		2	4		21
9		25	16	7	3				137	1	189
10			1	1	1	1			1		5
TOTAL TALLIES	-	41	84	116	69	14	3	21	189	5	542
PERCENTAGE	-	7.6	15.5	21.4	12.7	2.6	.6	3.9	34.9	.9	
%	Teacher Talk 60.3%					S. Talk 38.8%			(Other) .9%		

I/D RATIO (1-4 ÷ Total of 1-7)   73.7%

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Teacher's Estimate - Teacher Talk (50%), Student Talk (50%) Other(-)

Name   Teacher G   Date April 25, 1968

Time
22 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											–
2		2	19	6	5	1	1		7		41
3		3	29	14	12	1			8	1	68
4		1	1	19	4	1		30	14	2	72
5		3	4	15	55	2		1	11	2	93
6				2	1	6			2	1	12
7					1			1	2		4
8		9	6	4	3		2	8	8		40
9		23	8	10	7	1	1		84	2	136
10			1	2	5					1	9
TOTAL TALLIES	–	41	68	72	93	12	4	40	136	9	475
PERCENTAGE	–	8.6	14.3	15.2	19.6	2.5	.8	8.4	28.6	2.0	

%	Teacher Talk 61.0%	S. Talk 37.0%	(Other) 2%

I/D RATIO (1-4 ÷ Total of 1-7)   62.4%

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Teacher's Estimate - Teacher Talk (60%), Student Talk (40%) Other(-)

Name___Teacher H_____   Date_February 16, 1968_

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											−
2			1	16	13	2	1			3	36
3				1	1						2
4				9	4	2	1	54	2	22	94
5		4		19	151	5	2	3	5	20	209
6		1		5	1	11		3	2	5	28
7				5	4			1		1	11
8		27	1	21	10	3	4	17	1	2	86
9		4		1	6	1	1	1	5	1	20
10				17	19	4	2	7	5	27	81
TOTAL TALLIES	−	36	2	94	209	28	11	86	20	81	587
PERCENTAGE	−	6.3	.4	16.6	36.9	4.9	1.9	15.2	3.5	14.3	

%	Teacher Talk 67%_____				S. Talk 18.7%	(Other) 14.3%

I/D RATIO (1-4 ÷ Total of 1-7)   34.7%___

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Teacher's Estimate - Teacher Talk (80%), Student Talk (15%) Other(5%)

Name Teacher H   Date April 10, 1968

Time
24 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2			1	15	8				2	2	28
3			2	2	2				3	1	10
4				10	4	1		28	11	6	60
5				10	143	7	1	1	25	15	202
6						10	1	5	2	7	25
7		1			1		1	1	4		8
8		21	1	7	4	2	2	16	1	1	55
9		6	6	6	25		1		37	11	92
10				10	15	5	2	4	7	15	58
TOTAL TALLIES	-	28	10	60	202	25	8	55	92	58	538
PERCENTAGE	-	5.2	1.9	11.2	37.5	4.6	1.5	10.2	17.1	10.8	

%   Teacher Talk 61.9%   S. Talk 27.3%   (Other) 10.8%

I/D RATIO (1-4 ÷ Total of 1-7)   29.4%

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Teacher's Estimate - Teacher Talk (80%), Student Talk (20%) Other(-)

Name Teacher H   Date May 16, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		1		40	2	17	1	12	2	2	77
3		3	2	2			1				8
4		1		8	3	2	1	79	5	18	117
5				7	33	5	1	4	4	5	59
6				2		6		24	4	6	42
7				6	4	1	1	7	3	1	23
8		66	4	37	6	7	17	51		5	193
9		5	2	8	4		1		5	1	26
10		1		7	7	4		16	3	14	52
TOTAL TALLIES	-	77	8	117	59	42	23	193	26	52	597
PERCENTAGE	-	12.9	1.3	19.6	9.9	7.0	3.9	32.3	4.4	8.7	

| % | Teacher Talk 54.6% | | | | S. Talk 36.7% | (Other) 8.7% |

I/D RATIO (1-4 ÷ Total of 1-7) 62.0%

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Teacher's Estimate - Teacher Talk (75%), Student Talk (25%) Other(-)

Name Teacher I   Date February 16, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		1	3	4	8			1	1	10	28
3		3	1	4	3	1		2		2	16
4				8		2		42	3	6	61
5		1		22	150	4		1	2	20	200
6				1	1	15		6	2	3	28
7				1	1		3	3		3	11
8		20	9	6	7	2	7	9	1	9	70
9		2	1		8			1	9	1	22
10		1	2	15	22	4	1	5	4	37	91
TOTAL TALLIES	-	28	16	61	200	28	11	70	22	91	527
PERCENTAGE	-	5.3	3.0	11.6	37.9	5.3	2.1	13.3	4.2	17.3	

%	Teacher Talk 65.2%	S. Talk 17.5%	(Other) 17.3%

I/D RATIO (1-4 ÷ Total of 1-7)   30.5%

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Teacher's Estimate - Teacher Talk (50%), Student Talk (45%) Other(5%)

Name Teacher I   Date April 3, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											-
2		1	6	6	2			3		9	27
3			8	5	9				4		28
4				32	1			23	14	8	78
5			1	16	166	3		2	10	14	212
6					4			1			5
7											-
8		18	1	5	3	1		9	1	2	40
9		8	10	4	9				23	2	56
10			2	10	18	1		2	4	21	58
TOTAL TALLIES	-	27	28	78	212	5	-	40	56	58	504
PERCENTAGE	-	5.4	5.5	15.5	42.0	1.0	-	7.9	11.1	11.5	

%	Teacher Talk 69.4%			S. Talk 19%	(Other) 11.5%

I/D RATIO (1-4 ÷ Total of 1-7)   38%

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Teacher's Estimate - Teacher Talk (90%), Student Talk (10%) Other(-)

Name   Teacher I   Date May 1, 1968

Time
25 minutes

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL TALLIES
1											–
2		5	12	10	9			2	5	1	44
3		3	11	5	9	1		1	3	1	34
4				22	3	1	1	50	5	6	88
5		4		26	126	1		5	12	7	181
6					3	3				2	8
7				1	2		4	3	2	1	13
8		21	8	14	4	1	4	12	7	3	74
9		10	3	5	14		2		27	1	62
10		1		5	11	1	2	1	1	8	30
TOTAL TALLIES	–	44	34	88	181	8	13	74	62	30	534
PERCENTAGE	–	8.2	6.4	16.4	33.9	1.5	2.4	13.9	11.6	5.6	
%	Teacher Talk 68.9%					S. Talk 25.5%				(Other) 5.6%	

I/D RATIO (1-4 ÷ Total of 1-7)   45.1%

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Teacher's Estimate – Teacher Talk (70%), Student Talk (30%) Other(-)