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ABSTRACT

Interaction analysis, a system for observing and coding the verbal interchange between a teacher and his pupils, is used to study spontaneous teaching behavior and to help teachers modify their behavior. Trained observers classify teacher statements according to; a) acceptance of student feelings; b) use of praise and encouragement; c) acceptance of student ideas; d) use of questions; and e) use of lecture, direction, or criticism. Two additional categories relate to the verbal behavior of students and one category covers the contingency of silence or confusion in the classroom. Inferences drawn from a tabulation of the teacher's statements are discussed in a feedback session. In modifying teacher behavior through the use of interaction analysis, steps must be taken regarding: a) training of observers and participating teachers in the use of the technique; b) clarification of the participating teacher's self-development goals; c) construction of comparison situations involving a planned change of behavior and scheduling two or more observations to assess evidence of change; d) the collection of other evidence of behavior change. To reduce distortion of teacher behavior while being observed, it is suggested that: a) an observer be in the classroom only when invited; b) the status and power difference between a teacher and observer be at a minimum; and c) the feedback session follow a logical plan of inquiry. (See related document SP 007 826.) (HMD)

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INTERACTION ANALYSIS AND INSERVICE TRAINING

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What is Interaction Analysis?

Interaction analysis is a system for observing and coding the verbal interchange between a teacher and his pupils. The assumption is made that teaching behavior and pupil responses are expressed primarily through the spoken word as a series of verbal events which occur one after another. These events are identified, coded so as to preserve sequence, and tabulated systematically in order to represent a sample of the spontaneous teacher influence.

The most important criterion which any coding system must meet before it can be considered satisfactory is that a trained person can decode the data in order to reconstruct those aspects of the original behavior which were encoded, even though he was not present at the observation. A part of this article will describe inferences which can be made from a blind analysis of coded data.

Interaction analysis has been used to study spontaneous teaching behavior and it has also been used in projects which attempt to help teachers modify their behavior. In the first instance there may be a long period of time between observations and the analysis of the data.

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The data can be punched on IBM cards as they are collected over a period of several months, but a computer program to tabulate and analyze the data may be used only after all the observations have been completed. On the other hand, when interaction analysis data are collected in order to provide a teacher with information about his own behavior as a part of preservice or inservice training, then it may be advantageous to code directly into a desired tabulation form so that interpretations can be made at the earliest moment after the teaching episode is completed. This article will be more concerned with the procedures of interaction analysis which can be used during preservice and inservice training, and less concerned with applications in more basic research projects.

A possible goal of an inservice training program might be to discover whether the spontaneous patterns of verbal communication which are observed are, or are not, consistent with the intentions of the teacher. In such a program, the assumption is made that modifying behavior in order to make it more consistent with intent will, in most instances, result in an improvement. The model toward which behavior is modified is created by the teacher attempting to change.

An inservice training program can also be designed in which all participating teachers attempt to make similar modifications, for example, developing more skill in making full use of the ideas which are expressed by pupils during classroom discourse. Here the model could be justified from the results of research which made use of interaction analysis ( ), but special care would be necessary in designing activities which would help teachers accept and understand the

desirability of such modifications. In brief, the value orientation would be that the quality of classroom instruction is improved when the ideas expressed by pupils are more adequately recognized, clarified, used in some step of a logical analysis, thus giving the pupils a more active part in the learning activities.

In nearly all applications of interaction analysis it is desirable to collect other kinds of data such as pupil attitudes, pupil achievement, and perceptions of the teaching situation held by the teacher and the pupils. These additional data permit the development of theory and explanation.

The resources of such a program, as with all inservice activities, require money in order to obtain time, space, and assistance for those who are participating. A number of steps can be anticipated. (a) Prospective observers and participating teachers must be trained to use the technique. This usually requires six to twelve hours under the direction of a qualified observer. (b) Personal, self-development goals must be clarified by the participating teachers. (c) Each teacher-observer team must set up comparison situations involving a planned change of behavior and two or more observations should be scheduled so that evidence of change can be assessed. (d) Plans to collect other types of information must be completed. (e) Social-skill training sessions, based on interaction analysis categories, are often helpful, especially when they are incorporated in the observation training. Such training often helps teachers set personal goals for changing their behavior. (f) Plans will be necessary to provide incentives for teachers and to maintain the

momentum of the program, once it is started. (g) Care must be taken to insure freedom from threat, to make sure that the voluntary aspects of participation are genuine, and to avoid superimposing the program as an excessive demand on teachers who may already be too busy.

Observation Procedures and Matrix Interpretation

Given ten categories, shown in Table One, all verbal statements are classified at least once every three seconds by a trained observer. The events are coded by using the arabic numbers from one to ten which are written down in such a way as to preserve the original sequence. The data can then be tabulated in a table of ten rows and ten columns which is called a matrix.

Such a series is entered into a matrix two at a time. The first number of each pair indicates the row of the matrix, the second the column. The first pair consists of the first two numbers. The second pair consists of the second and third numbers, and thus overlaps the first pair. All tallies enter the matrix as a series of overlapping pairs.

With one tally approximately every three seconds, there are 100 tallies for five minutes, 1200 tallies per hour. Twenty minutes, or about 400 tallies, provide a matrix with sufficient data for a number of inferences about verbal communication.

In a sustained observation of a teacher covering six to eight one-hour visits, it is necessary to tabulate separate matrices for

TABLE ONE

CATEGORIES OF INTERACTION ANALYSIS

TEACHER TALK	Response	1.* *ACCEPTS FEELING:* accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included. 2.* *PRAISES OR ENCOURAGES:* praises or encourages student action or behavior. Jokes that release tension, but at the expense of another individual; nodding head, or saying "um hm?" or "go on" are included. 3.* *ACCEPTS OR USES IDEAS OF STUDENTS:* clarifying, building, or developing ideas suggest by a student. As teacher brings more of his own ideas into play, shift to category five.
		4.* *ASKS QUESTIONS:* asking a question about content or procedure with the intent that a student answer.
	Initiation	5.* *LECTURING:* giving facts or opinions about content or procedures; 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	Response	8.* *STUDENT TALK--RESPONSE:* talk by students in response to teacher. Teacher initiates the contact or solicits student statement.
	Initiation	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.

different types of classroom activities. Each matrix should represent either a single episode of class activity or any number of homogeneous episodes that are combined. We use five activity categories for junior high school academic subjects; they are: routine procedures, discussion of new material, discussion to evaluate student performance or products of learning, general discussion, and the supervision of seatwork or group activities. Different activity categories may be useful for a self-contained elementary school classroom. In any case, the purpose of tabulating the data in several different matrices, instead of in just one total matrix, is determined by the purposes of observation and the range of expected classroom activities.

In the case of the inservice training of teachers, data are tabulated into separate matrices in such a way as not to mask the comparison to be made. To illustrate, suppose the comparison is between two samples of teaching behavior, one before and one after several weeks of social skill training. Keeping the data in homogeneous activity matrices will help to avoid false conclusions. For example, a decrease, increase or no change in certain categories, when the two matrices are compared, may be due to the differences in the learning activities observed, rather than due to changes in teaching behavior which resulted from inservice training. Grouping the data to represent homogeneous learning activities helps to avoid such confusion.

A tabulated matrix divides into special areas for interpretation that are shown in Table Two. Particular questions can be answered by comparying tallies within and between these areas. Here are some examples.

TABLE TWO

AREAS OF MATRIX ANALYSIS

CATEGORY	CLASSIFICATION	CATEGORY	1	2	3	4	5	6	7	8	9	10	Total
ACCEPTS FEELING	RESPONSE	1	Area E			"Content Cross"				Area H			
PRAISE		2											
STUDENT IDEA		3											
ASKS QUESTIONS	INITIATION	4											
LECTURES		5											
GIVES DIRECTIONS		6						Area F					
CRITICISM		7											
STUDENT RESPONSE		8	Area G_1					Area G_2		Area I			
STUDENT INITIATION		9											
SILENCE		10											
		TOTAL	Area A				Area B			Area C		Area D	
			Response			?(s)	Initiation			Student Talk		Silence	

Areas A (1+2+3+4), B (5+6+7), C (8+9), and D (10) can be used to find the percent time the teacher talks, the pupils talk, and time spent in pauses, silence, and confusion. Comparisons between Areas A & B provide information about the relative balance between initiating and responding within teacher talk. Initiating teacher talk is more directive, tends to support the use of teacher authority, and restricts pupil participation. Responsive teacher talk is more indirect, tends to share authority, and expands pupil participation.

Area E is a block of nine cells that indicates the continued use of acceptance and praise, constructive reaction to pupil feeling, and clarifying, accepting and developing pupil ideas, as well as transitions among these three categories while the teacher is talking. In any inservice training program devoted to increasing the teacher's attention to ideas expressed by pupils, before and after comparisons would require an analysis of these nine cells. In fact, an inservice training program which attempted to teach more subtle differences in the teacher's reaction to pupil ideas might require subdividing Category Three in order to note the presence and absence of various types of Category Three statements. For example, 3-1 -- merely repeats to show that the pupil ideas were heard; 3-2 -- reacts to specific pupil ideas, but only in terms of the teacher's perceptions of these ideas; 3-3 -- reacts to specific pupil ideas, but reactions incorporate the perceptions of one or more pupils; and 3-4 -- stimulate a reaction to a pupil's ideas by asking questions so that other pupils react. In effect, Category Three is expanded into four categories for a special purpose. This would result in a 13 x 13 matrix instead of a 10 x 10 matrix.

Area F is a block of four cells that indicates the continued use of directions and criticism and transitions between these two categories. The two transition cells are particularly reliable indicators of discipline problems. Shifting from directions to criticism is tallied in the 6-7 cell, and indicates that expected compliance is judged unsatisfactory by the teacher. Shifting from criticism back to directions, the 7-6 cell, indicates a return to more directions after criticism.

Areas G_1 and G_2 are particularly interesting because they isolate the immediate response of the teacher at the moment students stop talking. One aspect of teacher flexibility can be discovered by comparing the balance of indirect and direct statements shown in G_1 and G_2 with those found in Areas A and B. The difference between superficial, short, perfunctory praise or clarification, and praise or clarification that is more carefully developed is easily seen by comparing the tallies in Area G_1 with those in E, particularly the 2-2 and 3-3 cells.

Area H indicates the types of teacher statements that trigger student participation. Responses to the teacher are found in column 8; statements initiated by the student in column 9. As one might expect, there is usually a heavy loading of tallies in the 4-8 cell. High frequencies in this cell and the 8-4 cell, but not in the 8-8 cell, often indicate rapid drill.

Area I indicates sustained student participation. These may be lengthy statements by a few students, or student-to-student communication.

So-called "steady state" cells fall on the diagonal from cell 1-1 to 10-10. Tallies here indicate that the speaker persists in a particular communication category for longer than three seconds. All other cells are transition cells moving from one category to another.

Outlined in the center of Table Two by dash lines is the content cross. The total number of tallies in this area, compared with tallies not in this area, gives a very crude indication of the content orientation of the class activity.

In addition to making use of the areas just described, the following procedure can be followed to interpret a matrix.

First, locate the single cell within the ten rows and columns which has the highest frequency. The pair of events, represented by the cell, is the most frequently occurring and can be used as a starting point in reconstructing the interaction.

Second, from this highest frequency cell, you start forward or backward, in terms of sequence, to begin a sequence diagram. The row of any cell indicates the most likely third event, that is, the event which is more likely to follow, given an original pair of events designated by the highest frequency cell. The column, on the other hand, indicates which event most probably preceeded the pair of events in question. The flow of events is properly represented when the eye scans the matrix in a clockwise rotation. Should the highest frequency fall into a transition cell, not a steady state cell, the row or column of either number in the pair can be studied to retrace or advance the sequence of events.

An example of matrix interpretation will be shown later in this article. Skill in matrix interpretation, however, is not likely to develop from reading this article, which serves only to propose guidelines. For that matter, skill in observation cannot develop from reading about how it is done. All aspects of interaction analysis require practice in order to develop skill. It is the opposite of a spectator sport.

Feedback and Consultation with Teachers

The purpose of feedback is to provide a teacher with information about his verbal statements which permits a comparison with some standard or model of what should have happened. Without purposive comparisons which are planned in advance of the observation, the reactions of the person receiving the information may be reduced to incidental speculations or points of interest that happen to be noticed.

To be useful as a model or standard, one's intentions must be specified in terms of frequencies to be found in the cells of the matrix. Thus, if the teacher wishes to practice providing more extended praise, he will expect to find an increase in the 2-2 cell of the matrix, one situation compared to another. If a teacher decides he would like to stimulate more pupil talk in which ideas are initiated by pupils, he might study column 9 in the matrix to see what events trigger these pupil statements. In a program of inservice training in which all teachers attempt to increase the utilization of ideas expressed by pupils, attention will be directed to column 3 and row 3 of the matrix.

Most inservice training programs can achieve some success in bringing selected concepts and value orientations to the attention of teachers, these are matters of awareness. Evidence that such awareness has been implimented through overt behavior requires an objective assessment of spontaneous teaching behavior.

The assessment of the spontaneous behavior must be reasonably objective in order to be reliable. Unfortunately, interaction analysis is not free of bias and error, probably about one out of every ten classifications of an experienced observer is incorrect. Interaction analysis data can be and probably are more objective, when dealt with in summary form, compared with most other procedures for making judgements about spontaneous teaching behavior. Judgements about events which occur within time segments of only a few seconds and which must be repeated agin and again tend to become more consistent with practice. Furthermore, noting the presence or absence of a short event is not a procedure which lends itself as easily to distortion and bias.

No matter how objective, reliable and valid an assessment procedure, the results will be distorted if the behavior itself is distorted. Unfortunately, merely anticipating observation might cause non-representative behavior to appear, not to mention the observation experience itself. Below are some policies and suggestions which we have found helpful in reducing the tendency of a teacher to put on an act while being observed.

First, an observer should be in the classroom only when invited by the teacher.

Second, the invitation should be based on a plan of inquiry which was developed by the teacher and observer prior to any classroom visits.

Observation should produce information which is relevant to some problem or question which is considered important to both participants. Thus, a teacher participating in an inservice training program which proposes to improve the way pupil ideas are handled during classroom discussion may be curious about this aspect of interaction before and after training. Such a question might involve creating two similar lesson plans in which a teacher would be confronted with opportunities to react to pupil ideas. One lesson would be observed before training and the second lesson after training. The plan could be embellished to provide greater insights by collecting additional data. For example, predictions about pupil perceptions, teacher perceptions, pupil attitudes and similar phenomina could be made, one lesson compared with the other. Then, instead of merely counting the incidence of constructive teacher reactions to ideas expressed by pupils, certain theories about the consequences of such teacher behavior might be investigated.

Third, the status and power difference between the observer and the teacher should be at a minimum. Another teacher who is a best friend might make the most appropriate observer, providing skill in observation is present.

Fourth, the conference to provide feedback should follow a logical plan of inquiry. All the relevant data should be at hand and referred to in terms of questions to be answered and not in terms of idle curiosity. It often helps to have two or more matrices, since this facilitates the making of comparisons out of which theoretical explanation grows. A single matrix more often stimulates opinions about what is "good"and "bad",

illustrated by the question, "Do you think the lesson was satisfactory?" Such questions place the observer in an awkward position, since he must express a general judgement. In this position he cannot be an equal partner in the inquiry process. On the other hand, when a hypothesis about behavior is being investigated and professional competence of the teacher is not in the foregroung, the analysis of data is more systematic and unwanted defensive distractions are less likely to occur.

Fifth, the entire procedure including planning, execution, and analysis usually works more smoothly when the teacher, as well as the observer, has had approximately equal experience in observation. For example, setting up hypotheses, designing two comparable lesson plans, and knowing where to look in a matrix for the proper information are phases of the experience which should be shared by two partners who are equally competent. When the observer is more experienced and competent, the teacher defers and becomes the dependent member of the team. Both members of the team should have had previous experience in both teaching and observation.

Illustrations of Practical Procedures

For purposes of illustration, let us assume that the goal of inservice training is to increase the teacher's skill in making use of ideas expressed by pupils. In an article as short as this one, only four aspects of such an inservice training program will be mentioned. First, some initial performance data provides a before traing performance

pattern for which subsequent observation data can be compared. Second, skill training procedures can be closely correlated to observation procedures. Third, data in addition to interaction analysis is helpful in deciding whether or not a change in behavior is an improvement. And fourth, more advanced training designs and more complex data collection procedures will be necessary to pu· progress beyond the initial results. Each of these four topics will be discussed in turn.

Initial performance data -- might be in the form of a short observation during a class discussion. Table Three shows a matrix of a teacher which will now be interpreted to show how the observer and teacher make an initial diagnosis before training. The same data, of course, can serve as a before training standard in order to determine whether change has occurred.

Since the total tallies equals 380, one can estimate that the matrix represents about 19 minutes of interaction (100 tallies = 5 minutes, 20 tallies = 1 minute).

A number of percentages and other ratios, which help to form an initial picture, can be found at the bottom rows of Table Three. For example, the teacher talked 58.7 percent, the pupils 39.2 percent, and silence and confusion was 2.1 percent. The teacher was fairly directive, that is, he initiated more than he responded as shown by an I/D = 0.77 (divide all tallies in categories 1 + 2 + 3 + 4 by 5 + 6 + 7 to obtain this ratio). The highest cell frequencies are found in the steady state diagonal cells, such as the 5-5, the 8-8, and the 9-9 cells. This suggests that the teacher and pupils were able to continue a particular mode of expression once it started. Higher frequencies in these steady state

TABLE THREE

OBSERVATION MATRIX

CATE-GORY	1	2	3	4	5	6	7	8	9	10	Total
1	-	-	-	-	-	-	-	-	-	-	-
2	-	1	1	1	2	-	-	1	5	-	11
3	-	-	5	1	4	-	-	-	-	-	10
4	-	-	-	23	2	1	-	42	3	5	76
5	-	2	1	22	80	1	2	3	3	3	117
6	-	-	-	1	-	-	1	3	-	-	5
7	-	-	-	-	2	1	1	-	-	-	4
8	-	5	-	22	19	-	-	45	7	-	98
9	-	3	3	3	7	-	-	3	32	-	51
10	-	-	-	3	1	2	-	1	1	-	8
Total	-	11	10	76	117	5	4	98	51	8	380
%	-	2.9	2.6	20.0	30.8	1.3	1.1	25.8	13.4	2.1	100.
of	25.5				33.2			39.2		2.1	
Total	Teacher Total: 58.7							Student Total		Si-lence	

I/D - 0.77 Steady State = 49%

$I/D_{8,9}$ = 1.38 Content Cross = 70.8%

cells indicate that the tempo of exchange was slower, for example, than might occur in a drill period. All silences were three seconds or less (note no tallies in the 10-10 cell) and most pauses followed teacher questions (N = 5 in the 4-10 cell) and teacher lecture (N = 3 in the 5 - 10 cell) rather than pupil statements. In six of these eight transitions, it was the teacher who broke the pause by talking (note that N = 1 in the 10-8 and 10-9 cells). This analysis of silence supports the interpretation that the teacher tended to initiate and did not permit a pupil more than three seconds to respond.

The matrix is sometimes more easily understood when it is translated into a flow pattern illustrated in Figure One. In this diagram the most frequently occurring steady state cells are shown as rectangles and the size of the rectangle indicates the relative frequency of the pair. Transitions among these cells are indicated by arrows and the thickness of the arrow is roughly proportional to the frequency of these transitions. Anyone can learn to draw such a pattern flow diagram from a tabulated matrix. Begin with the highest frequency cell, in this case the 5-5 cell with 80 tallies. Proceed across the same row to find out the next most likely occurring events and inspect columns to identify the most likely preceding events. The arrows in Table Three illustrate the clockwise direction of flow. Thus in both the matrix and in Figure One, begin with the 5-5 cell, sustained lecturing. The next most likely event is that the teacher will ask a question. Next, pupils are most likely to respond to this question, see category eight. There are two events of almost equal probability following pupil response talk, one

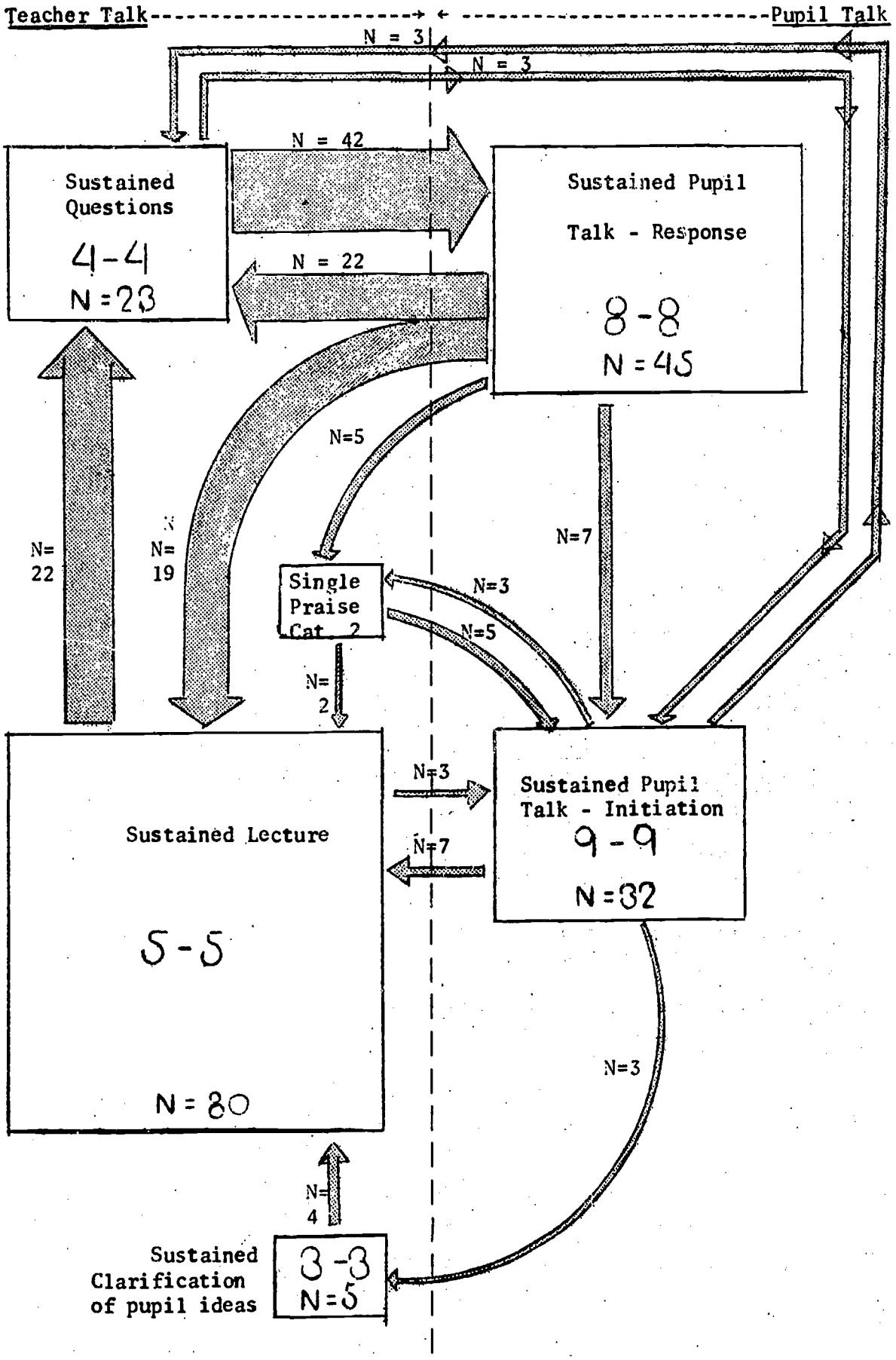

Figure One

Initial Flow Pattern Before Training

is that the teacher will ask another question and the other is that the teacher will lecture. The four transitions shown by the heavy arrows in Figure One account for most of the interaction: these are, 5-4, 4-8, 8-4 and 8-5. Other transitions do occur, but the transitions just listed and their associated steady state cells account for 285 tallies or about 75 percent of the entire observation.

Many things could be said about this pattern of interaction, but by far the most certain inference is that in the event that this teacher increased his use of category three, it could be clearly seen in the matrix. The use of category three, especially the 3-3 cell, is below average for a classroom teacher. After training along these lines a second matrix and flow pattern diagram could be made as a comparison with this initial performance.

Specific social skill training exercises -- can be conducted which are closely correlated with interaction analysis. A training skill exercise might involve three or four people who take turns providing certain patterns of verbal statements while responding spontaneously to the statements of others in the group. The person being trained is designated as the actor, one other person is the observer, and the rest are reactors or foils who provide spontaneity. Different assignments are given to the actor which he then carries out by interacting with his foils. The observer *keeps* a record of the communication by coding within the ten categories. The assignment can be given in terms of the categories, for example, the actor is asked to produce a 4-8-4-8-4-8-4-8 etc., sequence. An actor might be asked to choose a topic and produce any sequence which

is relevant to teaching and is related to the goals of the training.

The activity of a training exercise follows a model in which an actor attempts a particular pattern, his foils provide a spontaneous setting, and the observer keeps a coded record of what happens. Some training episodes may last only a few minutes, others are longer. Each episode is followed by a discussion of the performance and ways that it can be improved. While this kind of activity can easily degenerate into superficial play acting, especially when first attempted, it is also true that serious and interested participants can use this technique to practice producing certain patterns of behavior under increasing difficult circumstances and make progress in the self control of spontaneous behavior.

Learning how to make full use of the ideas expressed by pupils is a goal to which spontaneous skill training exercises can easily be adapted. It is possible to gain practice in listening carefully, in listing ideas expressed by another person, in summarizing ideas which have just been expressed, in building questions on ideas expressed by others, and to teach pupils to initiate their own steps in problem solving by showing a pupil how his ideas are related to a problem.

Skill practice sessions become more realistic when they are closely related to classroom practice sessions. After one or two initial observations an observer and teacher may discuss the relationships between the teacher's intention and the patterns which appear on several matrices. Skill practice sessions are then designed to emphasize a personal goal of the teacher based on discrepancies revealed by the matrix. If the training activities are custom built to the needs of the teacher, and

if he sees them as relevant to his own professional development, then he is more likely to approach the training sessions with serious intent and a sense of optimism concerning personal development. It also helps when classroom patterns begin to change in a desired direction as a result of skill practice sessions.

Usually, the assignments of actor, foil and observer are rotated during skill practice sessions. In this way a teacher not only becomes familiar with the coding system of interaction analysis, he also obtains some degree of observer proficiency. He also learns to accept and develop the perceptions that others have of his behavior.

The primary purpose of these training episodes is to practice producing certain patterns of statements, to translate concepts about teaching into spontaneous behavior patterns, to learn how to assess such patterns, and to discuss how these various pattenrs appear in classroom teaching. Many variations of training exercises can be directed toward these goals making them useful for inservice training.

Deciding when a change is an improvement -- usually requires data in addition to interaction analysis. For example, merely giving a teacher instructions to "go in there and produce more threes", much like a football coach, is quite likely to increase the incidence of category three. This change may take place, however, without any insight into the teaching process and may possibly be seen as either inappropriate or not realistic by the pupils.

Utilizing the ideas expressed by pupils during classroom discourse involves several pedagogically sound principles. One such principle is

that this kind of teacher behavior stimulates the perception among pupils that each pupil is free to express his ideas. Simple paper and pencil reaction sheets, to be filled out by pupils old enough to read and write, can be used to assess pupil perceptions immediately following a practice session in which the teacher tries to accept and clarify pupil ideas. When both the observer's records and the pupils' average perceptions from a paper and pencil instrument indicate greater expression and use of pupil ideas, then the additional evidence provides greater confidence that the change is an improvement.

Another pedagogical principle is that a pupil learns to cluster ideas becuase they are similar and then abstract the cluster with an appropriate label through directed practice in expressing his ideas. A second observer can keep an inventory of separate ideas expressed by pupils, he can note instances in which the pupils, instead of the teacher, noticed a cluster, and finally, he can record whether the teacher or the pupils supplied an appropriate label to a given cluster. This additional evidence also helps to show whether a change in teacher behavior is, or is not, an improvement.

Pushing training beyond superficial change -- usually requires special category systems of interaction analysis. For example, the dividion of category three, mentioned earlier on page eight, can provide a record of different kinds of teacher reactions to the ideas expressed by pupils. A similar expansion of categories eight and nine will show variations in the different kinds of pupil statements. Often the expansion of teacher talk categoires can provide more intricate and

difficult social skill training assignments. Working back and forth between more elaborate category systems and more complex spontaneous social skill training assignments helps a teacher understand principles of pedagogy in terms of his own behavior. Unless a teacher can act out his insights about teaching, these insights are of little use for the improvement of instruction.

Summary

The use of interaction analysis in an inservice training program places an emphasis on the analysis of spontaneous verbal behavior. This emphasis helps to translate ideas about teaching into classroom application.

For those who would like to try classifying verbal statements, but are inexperienced, a number of references are listed at the end of this article which include suggestions for beginning.

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