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Flanders' Interaction Analysis, which classifies verbal interaction into 10 categories, was used to compare two groups consisting of seven trainable mentally retarded (TMR) classrooms each. The sample was selected from the extremes of a population of 87 TMR classrooms on the basis of their teachers' high (tending to flexibility and harmony) or low (tending to rigidity and autocracy) scores on the Minnesota Teacher Attitude Inventory (MTAI). Trained observers visited each class for 2 hours and recorded the verbal interaction used more questions ($p<.01$) and had more student response ($p<.05$); low MTAI teachers used more lecture and criticism ($p<.05$) and had more student initiated talk ($p<.01$). Teacher attitudes and measures of accepting feeling, praise, using ideas, and giving directions were not significant. Results did not yield unqualified support for the hypothesis that teachers' verbal behavior in the classroom can be predicted from MTAI scores because the stratification of teachers by MTAI scores indicated bias in the amount of teaching experience (the high subgroup had fewer years of teaching experience). A histogram compares the data with data from an earlier study using educable mentally retarded and normal subjects. Five tables and 16 references are provided. (AA)

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THE UNIVERSITY OF MICHIGAN

Studies in Language and Language Behavior

PROGRESS REPORT NO. IV

H.L. Lane, E.M. Zale, Editors

CENTER FOR RESEARCH ON LANGUAGE AND LANGUAGE BEHAVIOR

Analysis of Teacher-Pupil Verbal Interaction Patterns in Classes for the Mentally Retarded[1]

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This study used Flanders' Interaction Analysis technique to compare the verbal interaction of two groups consisting of seven trainable mentally-retarded (TMR) classrooms each. The sample was selected from a population of 87 TMR classrooms on the basis of high or low teacher scores on the Minnesota Teacher Attitude Inventory (MTAI). Observers trained in Interaction Analysis visited each class for a total of two hours. Analysis of results revealed that high MTAI teachers used more questions and had more student response. Low MTAI teachers used more lecture and criticism, and had more student-initiated talk. Results did not yield unqualified support for the hypothesis that teachers' verbal behavior in the classroom can be predicted from MTAI scores.

The efficacy of special classes for the trainable mentally-retarded (TMR) has been the subject of considerable research (Goldstein, 1956; Guenther, 1956; Johnson & Capobianco, 1957; Hottel, 1958; Peck, 1960; Cain & Levine, 1961). These studies have generally revealed inconclusive results. One plausible explanation for the null findings is that most efficacy studies did not directly consider the variance between teachers within the experimental groups. The heterogeneity of special class programs suggests the need for research on the specific patterns of pedagogical activity within these programs.

Hudson (1960) focused on the teaching methods used within special classes for the TMR. Her observational methods, while adequate for delineating types of techniques used in special classes, were not designed to quantify these variables.

A number of investigators have attempted to classify and quantify teacher and student verbal behavior within the regular classroom. Anderson and Brewer (1945) classified teacher and student behavior into dominative and integrative activities. They found a high correlation between verbal behavior of teachers and their pupils. Withall (1949); Medley, Mitzel, and Rabinowitz (1959), and others elaborated on the observer systems and described methods for determining observer reliability.

Flanders (1960) built upon earlier work and developed a set of ten categories and a method for noting consecutive communication events through entries in a ten-by-ten matrix. His system of verbal Interaction Analysis was used by Davies (1961) to delineate two groups of secondary school teachers along a continuum of indirectness of teaching style. Davies compared the scores of the groups on the Minnesota Teacher Attitude Inventory (MTAI) and found no significant differences. However, she felt selective factors were operating, and suggested further research on the problem.

The present study used Flanders' Interaction Analysis technique to investigate the verbal behavior of teachers and TMR children in the public schools, and teacher attitudes as measured by the MTAI. It was expected that a group of teachers with high scores on the MTAI would be more indirect in their influence, thereby increasing students' participation and freedom of action. High MTAI teachers were expected to use more statements indicating the acceptance of students' feelings, praise, acceptance of students' ideas, and asking questions of students than a group of teachers with lower scores on the MTAI. We also predicted that the low MTAI group of teachers would be more direct in their influence, thereby limiting student participation and freedom of action, with more teacher statements consisting of lecture, giving directions, and criticism than the high MTAI teacher group. Finally, we predicted that the verbal behavior within the high MTAI teachers' classrooms would reveal a high percentage of student talk, including both teacher-initiated student talk and pupil-initiated talk, than the low MTAI teachers' classrooms.

Method

Sample. MTAI tests were administered to a population of 87 public school teachers of the trainable mentally-retarded. Seven teachers were chosen from each extreme of the distribution of teacher scores to make up the high and low MTAI groups. Table 1 presents the characteristics of the teachers and pupils used in this study.

Insert Table 1 about here

The teachers in both groups reported that all children in their classes understood language. Two children in the high MTAI teachers' classes could not speak, whereas three children in the low MTAI teachers' classes could not speak.

Instruments. Flanders' system of Interaction Analysis was used to record the verbal interaction which took place between the teacher and students within respective classrooms. The system classifies verbal interaction into ten categories (a list and description of the categories can be found in Table 2). The first seven categories comprise the total teacher verbalization in the classroom. The first four categories refer to indirect teacher influence since they expand student participation and freedom of action, whereas categories five, six, and seven represent direct teacher influence since they limit student participation and freedom of action. Categories eight and nine represent student talk in the classroom interaction process. Category ten is used to record pauses, short periods of silence, or periods of confusion when communication cannot be understood by the observer.

An observer trained in the technique of Interaction Analysis sits in the classroom and in three-second intervals records the category number for the communication event he observes. After a standard observation period is completed, the numbers recorded are plotted on a ten-by-ten matrix which lists the Interaction Analysis categories horizontally and vertically. When a matrix is completed, it shows the loadings in the categories and reveals the pattern of verbal interaction taking place for that particular classroom during the time observed.

Table 2 about here

The MTAI was also used in this investigation. It is a standardized paper and pencil test designed to "measure those attitudes of a teacher which .... predict how well the teacher gets along with pupils in interpersonal relationships" (Cook, et al, 1952). The MTAI is designed to show high scores for those teachers with attitudes which are expected to lead to flexibility and harmony in the classroom, and to show low scores for those teachers whose attitudes are expected to lead to a more rigid and autocratic classroom.

The test results in a total score which may range from -150 to +150.

Procedure. Three graduate students at the University of Michigan were trained in the Interaction Analysis technique for the study. After an initial period using training tapes and manuscripts of selected classroom situations, the observers began a series of practice sessions in TMR classrooms. After each practice session, the observers discussed their differences in categorization. At several points during the training, a reliability coefficient was computed. The final ratings computed prior to the study were .87 for observers A and B, .70 for observers B and C, and .75 for observers A and C.

After the training was completed, two one-hour observations were made in each of the 14 classrooms. Each one-hour observation was made independently by a different observer.

Results and Discussion

The observation tallies were analyzed using a Fortran program on the IBM 7090 computer (Wrightman, 1961). A matrix for each teacher and summed matrices for the two experimental groups were compiled.

Table 3 presents the percentage of tallies in each category of verbal interaction for the high and low MTAI teachers. Categories one through nine represent the total verbal interaction in the classroom. Teacher talk includes categories one through seven which represent 74.22 per cent of the total verbal interaction for the high MTAI group and 72.48 per cent for the low MTAI group. This difference is not significant.

Table 3 about here

Table 4 presents the mean percentage in each category of teacher statements in the high and low MTAI groups. There are two ways to compare the percentages across categories in terms of direct and indirect teacher statements (Flanders, 1966). First is the total I.D. ratio which is found by taking the sum of the percentages in categories one, two, three and four and dividing by the sum of the percentages in categories five, six, and seven.

The total I.D. ratio found in the high MTAI group was .74 and in the low MTAI group .56. The difference, .18, was significant ($p < .01$). That is the high MTAI group was significantly more indirect than the low MTAI group, using the total I.D. ratio. However, Flanders (1965) suggests that the total I.D. ratio, including categories four and five, may not be as sensitive as the revised I.D. ratio which excludes the content categories four and five. The revised I.D. ratio for the high MTAI group was .53 and for the low MTAI group .57. The difference, .04, was not significant. These results imply that teacher attitudes, as measured by the MTAI, are not reflected in definite direct and indirect verbal patterns.

Inspection of the categories for the high and low MTAI groups reveals categories four, five and seven to have the largest differences. Category four, asking questions, is used significantly more by the high MTAI teachers ($p < .01$), while category five, lecture, and category seven, criticism, are used significantly more by the low MTAI group ($p < .05$). The higher percentage of category four, asking questions, found in the high MTAI teachers, did lend some support to the greater indirectness of this group. The higher percentages in categories five, lecture, and seven, criticism, found in the low MTAI teachers, indicates the more direct approach of this group. None of the other category differences were significant between the two groups. However, categories one (accepting feeling), two (praise), and three (using ideas), which refer to indirect influence, showed greater percentages for the low MTAI teachers, and category six, giving directions, which refers to direct teacher influence, showed a slightly higher percentage for the high MTAI teachers. The direction of the differences in percentages between these categories, while not significant, was in opposition to the expectation that high MTAI teachers would use less direct teacher-statements than the low MTAI teachers.

Table 4 about here

Student talk includes categories eight and nine which represent 25.88 per cent of the total verbal interaction in the high MTAI group and 27.66 per cent in the low MTAI group. Again this difference is not significant. Table 5 presents the type of student statements as a percentage of the total verbal interaction in high and low MTAI groups. The students in the high MTAI teachers' classrooms use category eight significantly more frequently ($p < .05$) than the students in the low MTAI teachers' classrooms. However, category nine is used significantly more often by the students in the low MTAI teachers' classroom ($p < .01$). These results did not support the expectation that there would be more student talk in the high MTAI teachers' classrooms.

Table 5 about here

Although they had more teacher-initiated talk (category eight), the low MTAI teachers' classrooms had more pupil-initiated talk (category nine). The explanation of this result is not apparent. It may be that the two groups were not adequately matched on verbal ability.

Figure 1 presents a histogram comparing data from the total sample of the present study with that obtained from an earlier pilot study (Semmel, Jorgensen, & Herzog, 1965), using educable mentally-retarded (EMR) and normal subjects in regular and special classes. With the understanding that the comparability of the data in Fig. 1 is questionable, it is, nevertheless, of interest to note trends which might furnish meaningful hypotheses for future research. When regular classes, EMR classes, and TMR classes are compared, the greatest differences can be found in categories five, lecture; eight, student response; nine, student-initiated talk; and ten, silence or confusion. Examination of category five in Fig. 1 reveals

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Fig. 1 about here

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that EMR teachers made the greatest use of lectures and TMR teachers the least, with teachers of normal children falling in between. Category eight indicates that student response may be a function of intelligence, with normals responding most and TMR's least. Category nine shows that more student statements are initiated in EMR classrooms than either normal or TMR classes. Perhaps, an explanation may be sought in the degree of structure in these classes. Category ten shows TMR classes to have much more silence and confusion than regular or EMR classes. Further studies might find it useful to break down category ten into meaningful silence, such as seat work, and confusion. The general nature of the category obscures its implications.

Comparisons, such as those based on verbal interaction, may indicate the nature of the differences in pedagogic methods used in special and regular classes.

The results of this pilot study must be interpreted with caution. The stratification of teachers by MTAI scores resulted in a particular bias in the amount of teaching experience for Ss. The high MTAI subgroup was composed of teachers with significantly fewer years of experience than the low MTAI sample. This suggests that both attitudes and verbal behavior in the classroom may be related to amount of teaching experience (and the age of the teacher).

Summary

Flanders' Interaction Analysis technique was used to compare two groups of seven TMR classrooms. The sample was selected from a population of 87 TMR classrooms on the basis of high or low teacher score on the MTAI. High MTAI teachers used more questions and had more student response. Low MTAI teachers used more lecture and criticism and had more student-initiated talk. The results did not yield unqualified support for the hypothesis that teachers' verbal behavior in the classroom can be predicted from MTAI scores. However, the Interaction Analysis technique holds promise for a productive approach in the study of the verbal dynamics in special and regular education classrooms.

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Footnote

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Table 1

Characteristics of Pupils and Teachers*

Variable		High MTAI Group	Low MTAI Group
MTAI Raw Score	Mean	87.29	-13.71
	S.D.	12.81	14.33
Years Teaching Experience	Mean	6.85	14.26
	S.D.	5.87	8.90
Class Size	Mean	13.29	11.86
	S.D.	1.87	2.55
Age of Pupils	Mean (mos.)	140.63	147.35
	S.D.	38.25	34.12
I.Q. of Pupils	Mean	43.59	44.36
	S.D.	11.43	8.87
Academic Degrees			
Bachelors	N	5	6
Masters		2	1

*Note--There were 7 female teachers in each group.

Table 2

Categories for Interaction Analysis**

TEACHER TALK*

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 not 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 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.

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*

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.

**From Interaction analysis in the classroom - A manual for observers by Dr. Ned A. Flanders, 1964.

Table 3

Mean Percentage in Each Category of Interaction Analysis for High and Low MTAI Groups

		1 Accepts Feeling	2 Praise	3 Accepts Ideas	4 Questions	5 Lecture	6 Directions	7 Criticism	8 Student Response	9 Student Initiated	10 Silence or Confusion
High	Mean	.06	2.69	6.65	12.95	11.93	14.69	2.61	13.25	5.03	30.13
	S.D.	.06	.80	2.50	4.77	3.28	2.98	1.22	3.11	2.46	10.58
Low	Mean	.06	3.54	6.57	7.90	15.07	14.06	3.91	9.91	8.51	30.47
	S.D.	.06	1.70	2.98	2.57	7.33	4.52	2.17	6.46	4.21	10.71
Mean Difference		.00	.85	.08	5.05	3.14	.63	1.30	3.34	3.48	.34

Table 4

Mean Percentage in Each Category of Teacher Statements in High and Low MTAI Groups

		1 Accepts Feeling	2 Praise	3 Accepts Ideas	4 Asks Questions	5 Lecture	6 Gives Directions	7 Criticism
High	Mean	.11	5.31	12.64	24.59	23.57	28.68	3.21
	S.D.	.11	1.68	3.64	7.09	7.42	5.79	2.72
Low	Mean	.13	7.40	12.72	15.38	28.75	28.11	7.51
	S.D.	.14	4.22	4.13	3.90	8.60	8.46	3.78
Mean Differences		.02	2.09	.08	9.21**	5.30*	.57	2.30*

* Significant at .05 level

** Significant at .01 level

Table 5

Mean Percentage of Each Category of Student Statements Based on Total Verbal Interaction (Cat. 1-9) in High and Low MTAI Groups

	8 Student Response	9 Student Initiated
High Mean	18.80	7.08
S.D.	3.30	2.73
Low Mean	14.88	12.78
S.D.	6.80	7.03
Difference	4.30*	5.20**

* Significant at .05 level

** Significant at .01 level