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The Effects of Interaction Analysis Feedback on the Verbal Behavior of Student Teachers.

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To investigate the effects of interaction analysis feedback on the verbal behavior of student teachers, 40 college seniors enrolled in an elementary teaching program were randomly selected and divided into experimental and control groups. Following training in interaction analysis during an academic quarter, subjects were assigned to eight elementary schools for student teaching and were systematically observed (for 15 minutes weekly for eight weeks) by raters trained in a 13-category modification of Flanders' system of interaction analysis. Following each observation matrices and information sheets were constructed for all student teachers, but were presented only to those students in the experimental group during a weekly discussion session (in which performances from previous weeks were compared, the value of feedback was discussed, and verbal performances were related to lesson types). Twenty-four selected student-generated verbal behaviors (analyzed by the Flanders' system) were subjected to analysis of variance for significant differences of means between the experimental and control groups for all weeks combined. Results showed that for student teachers who received analyses, feedback differed significantly from those who did not in 15 of the 24 analyses, exhibited more indirect verbal behaviors and in addition, used significantly less teacher-initiated talk with more student-initiated talk. (A 10-item reference list is included.) (SM)

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THE EFFECTS OF INTERACTION ANALYSIS  
FEEDBACK ON THE VERBAL BEHAVIOR  
OF STUDENT TEACHERS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE  
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## INTRODUCTION

Down through the years the student teaching experience has almost universally been included as a major part of every teacher training program. In fact, when asked what they considered to be the single most beneficial aspect of their preservice training, the stock answer offered by most teachers is the student teaching experience. However, simply to consider a consensus of teacher opinion in support of student teaching only at face value can be misleading. Despite the high esteem in which student teaching experiences are held, the cold fact still remains that in terms of sound theoretical rationale and carefully planned learning experiences, far too many student teaching programs have evolved only slightly beyond the "guess and by golly" stage. In short, the majority of student teaching programs are extremely unpredictable in terms of the kinds of teachers they turn out: some student teachers turn out to be quite effective while an embarrassingly large number of their equally promising colleagues who were a part of the same program turn out to be only mediocre at best. Such a discouraging state of affairs presents a most perplexing dilemma that certainly demands considerable study and further investigation.

The research reported here is directly concerned with one specific aspect of this confounding dilemma--providing student teachers with student teaching experiences that will be more likely to equip them with the skills and competencies that are normally considered to be necessary to effective teaching. To be a bit more specific, the present research investigated how interaction analysis (an observational system) can be used as a means for helping teachers to become aware of and better able to control their verbal behavior during student teaching. It is predicated on the basic, (perhaps overly optimistic) assumption that in order to

accomplish these ends, a student teacher must have ample opportunity to become acquainted with and able to try out at his discretion a wide variety of verbal teaching behaviors and, in turn, to determine from empirical evidence which are best suited to facilitate student learning in a given situation.

During the past several years, a number of innovations have been developed and implemented in teacher education programs in attempts to improve the ultimate effectiveness of the teachers who come out of these programs. The concept of systematic observation\* is certainly one of the more widely publicized of these recent innovations. By its very nature and basic construct, an observational system represents an effective means for providing objective empirical data describing specific teacher and student variables that are found to interact in a given teaching-learning situation. Data of this kind have been found to be quite helpful in assisting teachers to analyze and improve their individual teaching effectiveness.

Currently, several manageable observational systems are available for teacher use. Each is specially designed to assess a different and particular dimension of the classroom situation. Perhaps one of the most widely known and most extensively used of the systems presently available is interaction analysis. Originally developed by Flanders (2), interaction analysis is designed to assess the verbal dimension of the teacher-pupil interaction in the classroom.

Recently, numerous pieces of research have been conducted in which interaction analysis was incorporated as a teaching and/or a research tool.

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\*As it is used here, an observational system is defined as any technique designed for the purposes of identifying, examining, classifying, and/or quantifying specific variables of a teaching-learning situation.

Findings coming out of studies of this sort are, for the most part, clear cut and reflect a high degree of commonality (1, 2, 3, 4, 5, 7, 8). As they relate to the present study, findings from studies that have used interaction analysis as a teaching tool tend to agree in that subjects who were trained to use the system were found to be better able to control their verbal behavior to be in closer agreement with the basic philosophy of their training experiences as well as their personally stated beliefs concerning effective teaching than their untrained counterparts. Furthermore, trained subjects were found to use a significantly greater frequency of verbal behaviors that are normally associated with greater student achievement and more positive student attitudes toward their teachers and school in general than untrained subjects. In summary of these findings, training in interaction analysis represents a powerful tool for shaping and controlling the verbal behavior of teachers.

#### THE PROBLEM

The present research was conducted in order to determine what effect feedback in the form of printed interaction analysis matrices describing the verbal behavior of student teachers had on the overall verbal teaching behavior of these same student teachers. The primary factor studied was the feedback quality of interaction analysis as a means for shaping the verbal behavior of student teachers.

#### DESIGN

A total of 40 subjects--an experimental and a control group of 20 each (re: Fig. 1)--were randomly selected from a parent population of seniors who were regularly enrolled in the elementary teacher education program at the University of South Florida during the 1967-68 academic year. All 40 subjects were appropriately orientated and familiarized

<b>CONTROL</b>	<b>TEMPLE TERRACE - 5 Student Teachers</b>	<b>ROBLES - 5 Student Teachers</b>
<b>EXPERIMENTAL</b>	<b>RIVERHILLS - 5 Student Teachers</b>	<b>FOSTER - 5 Student Teachers</b>
	<b>OBSERVER A</b>	<b>OBSERVER B</b>
<b>CONTROL</b>	<b>SULPHUR SPRINGS - 5 Student Teachers</b>	<b>BELLE WITTER - 5 Student Teachers</b>
<b>EXPERIMENTAL</b>	<b>FOREST HILLS - 5 Student Teachers</b>	<b>MILES - 5 Student Teachers</b>
	<b>OBSERVER C</b>	<b>OBSERVER D</b>

(Note: Each observer visited one control group and one experimental group weekly. By rotating weekly, the observers visited each of the schools twice during the eight week observation period.)

**Fig. 1 - Assignment Distribution of Subjects to the Eight Participating Host Schools and Observer Schedules.**

concerning the nature and purposes of the study and were assured that their participation in the study would have absolutely no effect on their individual grades in student teaching. In addition, college supervisors, cooperating teachers, and the principals of the host schools were properly briefed regarding their respective parts in the study.

Each of the 40 subjects received 14 hours of formal training in interaction analysis while they were regularly enrolled in EDC 401 (the University of South Florida Catalogue number assigned to an undergraduate curriculum and instruction course that precedes student teaching). Each subject was taught how to build and interpret matrices and, in turn, how to analyze his own verbal behavior from data plotted in such a matrix. Other than these special training experiences in interaction analysis, the remainder of the EDC 401 course for both groups was comprised primarily of experiences that are of a more traditional nature (i.e., general curriculum, instructional principles, lesson planning, class control, basic individual differences, and the like).

During the Spring Quarter (1968) following the curriculum and instruction course--EDC 401-- each of the 40 subjects was assigned to one of the eight participating host schools in Hillsborough County, Florida for student teaching according to the usual procedures followed by the Director of Student Teaching, University of South Florida (re: Fig. 1 showing subject distribution by host schools). Four of the eight host schools were arbitrarily designated as experimental and the other four as control.

The observational system employed in this study was a 13-category modification of the original Flanders system of interaction analysis as adapted by Hough et al. (6). Fig. 2 shows the category descriptions for this 13-category modification. This modification expands the teacher

Category Number	Description of Verbal Behavior	
T E A C H E R	I N D I R E C T	1. <u>ACCEPTS FEELING</u> : Accepts and clarifies the feeling tone of students in a friendly manner. Student feelings may be a positive or negative nature. Predicting and recalling students feelings are also included.
		2. <u>PRAISES OR ENCOURAGES</u> : Praises or encourages student action, behavior, recitation, comments, ideas, etc. Jokes that release tension not at the expense of another individual. Teacher nodding head or saying "uh-huh" or "go on" are included.
		3. <u>ACCEPTS OR USES IDEAS OF STUDENTS</u> : Clarifying building on, developing, and accepting the action, behavior and ideas of the student.
		4. <u>ASKS QUESTIONS</u> : Asking a question about the content (subject matter) or procedure with the intent that the student should answer.
		5. <u>ANSWERS STUDENT QUESTIONS (STUDENT-INITIATED TEACHER TALK)</u> : Giving direct answers to student questions regarding content or procedures.
T A L K	D I R E C T	6. <u>LECTURES (TEACHER-INITIATED TEACHER TALK)</u> : Giving facts, information or opinions about content or procedure. Teacher expressing his own ideas. Asking rhetorical questions (not intended to be answered).
		7. <u>GIVES DIRECTIONS</u> : Directions, commands, or orders to which the student is expected to comply.
		8. <u>CORRECTIVE FEEDBACK</u> : Telling a student that his answer is wrong when the correctness of his answer can be established by other than opinions (i.e., empirical validation, definition or custom).
		9. <u>CRITICIZES STUDENT(S) OR JUSTIFIES AUTHORITY</u> : Statements intended to change student behavior from a non-acceptable to an acceptable pattern; bawling out someone; stating why the teacher is doing what he is doing so as to gain or maintain control; rejecting or criticizing a student's opinion or judgment.

Category Number	Description of Verbal Behavior
S T U D E N T	<p>10. <u>TEACHER-INITIATED STUDENT TALK</u>: Talk by students in response to requests or narrow teacher questions. The teacher initiates the contact or solicits students' statements.</p> <p>11. <u>STUDENT QUESTIONS</u>: Student questions concerning content or procedure that are directed to the teacher.</p> <p>12. <u>STUDENT-INITIATED STUDENT TALK</u>: Talk by students in response to broad teacher questions which require judgment or opinion. Voluntary declarative statements offered by the student but not called for by the teacher.</p>
	<p>13. <u>SILENCE OR CONFUSION</u>: Pauses, short periods of silence, and periods of confusion in which communication cannot be understood by an observer.</p>

$$\text{Indirect-Direct Ratio} = \frac{\text{categories 1, 2, 3, 4, 5}}{\text{categories 6, 7, 8, 9}}$$

$$\text{Student-Teacher Ratio} = \frac{\text{categories 10, 11, 12}}{\text{categories 1, 2, 3, 4, 5, 6, 7, 8, 9}}$$

Flexibility Factor = Total Number of Occupied Cells

Fig. 2 - Description of Categories for the 13 Category Modification of the Flanders System of Interaction Analysis.

talk categories originally included in the Flanders' instrument from seven to nine and the student talk categories from two to three. The addition of these three categories permits a finer distinction to be made between 1) teacher lecture and teacher answers to student questions (Categories 5 and 6), 2) teacher corrective feedback and teacher aversive stimulation (Categories 8 and 9) and 3) student questions and student-initiated student talk (Categories 11 and 12).

The first five teacher talk categories of the 13-category modification are pooled to constitute "indirect" teacher influence and the last four are pooled to constitute "direct" teacher influence. As in the Flanders system, a single category is assigned to periods of silence or confusion (Category 13).

Mechanics for collecting data using the 13-category modification are quite similar to those of the original Flanders system. The observer situates himself at a convenient location in the room in order that he can hear clearly the verbal interaction that transpires between the teacher and student(s). Observations are recorded on a tally sheet at the rate of at least one each three seconds. The number of the category which best describes the previous three-second interval is recorded simultaneously with the assessment of the present three second interval, etc. In the event that more than one verbal behavior transpires within a given three second interval, all observations are recorded in proper sequential order.

Following are several ground rules associated with the 13-category modification that depart slightly from the original Flanders system:

1. Each observation period begins and ends with Category 13.
2. All unison responses by students are recorded as Category 10.
3. During nonverbal activities, observations are not recorded.
4. Such activities as group work, tests, movies, are not recorded,

as they yield little information pertaining to a teacher's verbal behavior in the classroom.

The 13-category modification of interaction analysis described above was incorporated in this study both as a training instrument (in the EDC 401 course) and as a research tool to collect data describing the dependent variables.

All interaction analysis data describing the dependent variables were collected by four trained observers who had previously received special training in the use of the 13-category modification. Intra- and interobserver reliabilities were held to a minimum of 0.70 (as calculated by Scott, 1958 [10]). Each student teaching subject was observed once weekly for a total of eight weeks for 20 minutes per observation.

Raw interaction analysis data were punched on IBM data cards. Matrices were produced by means of a special computer program in conjunction with an IBM 1410 computer. Data describing the independent and dependent variables were analyzed by means of a Lindquist Type 1 Analysis of Variance (9), specially written by the Computer Research Center, University of South Florida.

#### INDEPENDENT AND DEPENDENT VARIABLES

The independent variables in the present study were (1) the feedback provided in the form of printed matrices for the experimental group and (2) the lack of such feedback in the control group.

The dependent variables (the criteria by which differences were determined) were selected verbal behaviors of student teachers that they generated during their student teaching experience.

Specifically, the dependent variables measured by the 13-category modification

that were used in this study were:

1. Total use of category 2\*
2. " " " " 3\*
3. " " " " 4\*
4. " " " " 5\*
5. " " " " 6\*
6. " " " " 7\*
7. " " " " 8\*
8. " " " " 9\*
9. " " " " 10\*
10. " " " " 11\*
11. " " " " 12\*
12. I/D Ratio\*\*
13. S/T Ratio\*\*
14. Flexibility Factor\*\*

Specific verbal patterns (sequences of verbal behaviors identified by certain matrix cells) including the following:

15. Extended positive reinforcement as measured by the 2-2 cell loading (Area "A" of Fig. 3).
16. Extended acceptance and/or use of student ideas as measured by the 3-3 cell loading (Area "B" of Fig. 3).
17. Positive affective teacher talk as measured by the 1, 2, 3 block (Area "C" of Fig. 3)
18. Negative affective teacher talk as measured by the 7, 8, 9 block (Area "D" of Fig. 3).
19. Teacher's acceptance of student responses as measured by the 10-3 cell loading (Area "E" of Fig. 3).

\*See Fig. 2 for description of categories

\*\*See Fig. 2 for definitions

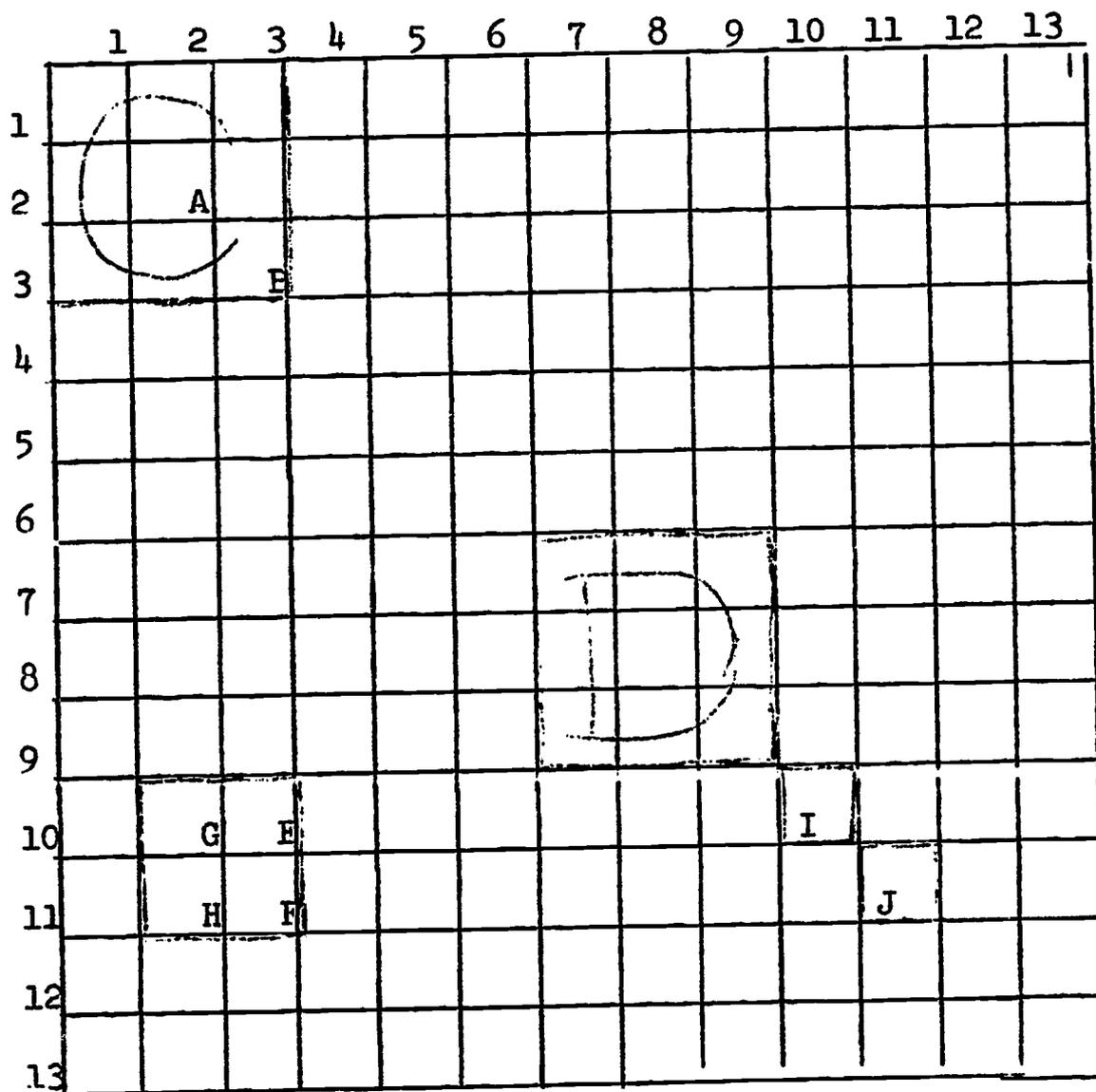


Fig. 3 - Matrix for the 13-Category Modification of the Flanders' System of Interaction Analysis Shwing Areas Used to Measure Several Dependent Variables Considered in this Study.

20. Teacher's reinforcement of student responses as measured by the 10-2 cell loading (Area "G" of Fig. 3)
21. Teacher's acceptance of students' ideas as measured by the 11-3 cell loading (Area "F" of Fig. 3).
22. Teacher's reinforcement of students' ideas as measured by the 11-2 cell loading (Area "H" of Fig. 3).
23. Extended student response as measured by the 10-10 cell loading (Area "I" of Fig. 3).
24. Extended student ideas as measured by the 11-11 cell loading (Area "J" of Fig. 3).

### PROCEDURES

Beginning the second week of student teaching, data were collected for all 40 subjects (one fifteen-minute observation per week per subject for eight consecutive weeks) using the 13-category modification of interaction analysis. There was no attempt to control observation schedules except for the days of the week (Monday and Tuesday). Student teachers knew they could expect an observer on one of those two days, but did not know what hour to expect him. Classes observed were classified as slow, average, and accelerated (in terms of overall ability) with equal representation of each in the experimental and control groups. All eight elementary schools that participated in the study had been frequently used for placement of observers, aides and student teachers; consequently, a visitor in the classroom was not an uncommon occurrence. Any "Hawthorne effect" can be assumed to have operated equally in both groups of student teachers.

Following each observation, a matrix and related data (Re; Fig. 4 for sample matrix) were prepared by the observer and presented to the subject for each of the twenty student teachers in the experimental group. A matrix and information sheet was also constructed for each member of the control group, but these student teachers did not receive copies of them. Thus, feedback in the tangible form of matrices and

	1	2	3	4	5	6	7	8	9	10	11	12	13
1													
2			11								1		1
3				1		1							
4										111			
5												1	
6						11	1						
7				1			1						
8													
9													
10		11								1		1	
11					1								
12		11										1	
13				1									

Total Number  
Occupied Cells 18

Fig. 4 - Sample Interaction Analysis Data Plotted in a 13x13 Matrix.

information sheets were given only to teachers in the experimental group. In order to disrupt the regular student teaching routine as little as possible, feedback in the form of matrices and information sheets were given to the twenty student teachers in the experimental group on Thursday afternoons immediately following their weekly seminar meetings on campus.

Weekly feedback sessions included the presentation of printed matrices and information sheets showing verbal performance to the twenty student teachers who were in the experimental group. Comparisons of a given week's performance were made with performances from previous weeks. Each of the thirteen categories was examined for total use by the student teachers. Indirect-direct ratios and student-teacher ratios were also studied. No special attempt was made to evaluate performances as "good" or "bad." Group discussions in the experimental groups centered around the feedback that was available to the students. In addition, the four trained observers worked with the students they had observed during a particular week, assisting them to relate verbal performances to the type of lesson taught. A college supervisor was on hand to answer questions posed by the twenty students in the experimental group in cases where they could not be answered by the observer. In addition, a college supervisor was available in his office after the hour long sessions for further help to students.

Students in the control group met regularly with a college supervisor to discuss observation schedules and student teaching experiences. The control group knew that similar meetings were being held with the other group of student teachers (experimental group), but did not know that the other group was receiving weekly feedback in the form of printed matrices and information sheets.

A great deal of rapport had been built up previously between the college supervisor, the four observers, and the forty subjects in the study. Student teachers in both the control group and experimental group had worked with the four observers and the writer in training sessions the previous term. Observations and group discussions were made with a minimum amount of difficulty in all cases.

### RESULTS AND DISCUSSION

Significant F-Ratios for group mean differences were found in fifteen of the twenty-four dependent variables studied.

The results of this study clearly show that those student teachers who received interaction analysis feedback in the form of printed matrices differed significantly from those student teachers who did not receive such feedback as follows: (1) they used more praise (Category 2), (2) they accepted and clarified student ideas more frequently (Category 3), (3) they used more indirect teacher talk as opposed to direct teacher talk (I/D ratio), (4) they used more extended praise (the 2-2 cell), (5) they produced more extended use of student ideas (the 3-3 cell), (6) they used more positive affective talk, (the 1, 2, 3 block), (7) they accepted student ideas more frequently after teacher-initiated student talk (the 11-3 cell), (8) they used more positive reinforcement following teacher-initiated student talk (the 10-2 cell), (9) they used less corrective feedback (Category 8), (10) they criticized students less, (Category 9), (11) they asked more questions (Category 4), (12) they used less lecture (Category 6), (13) they gave less directions (Category 7). In addition, there was significantly less teacher-initiated student talk (Category 10) and significantly more student-initiated student talk (Category 11) in the student teacher group that received feedback. Refer to Fig. 5 for a summary of findings.

The above results should have direct implications for practitioners; especially those engaged in supervision. Interaction analysis shows promise as an effective feedback mechanism. Student teachers should have an opportunity to utilize feedback from systematic observations describing their own verbal behavior. Those of us who are involved in teacher education must teach students to "read behavior itself" instead of just "reading about behavior" on the printed page. Student teachers trained in the skills of interaction analysis can become actively involved in evaluating their teaching performances and, as a result, move toward more effective teaching in the future.

Dependent Variables	Feedback Group (N=20)		Non Feedback Group (N=20)		$\bar{X}_1 - \bar{X}_2$	F Ratio
	$\bar{X}_1$	S.D.	$\bar{X}_2$	S.D.		
Category						
2	7.19	2.29	4.12	1.48	3.07	24.16*
3	9.53	2.49	4.78	1.91	4.75	43.40*
4	16.96	2.50	12.54	2.75	4.42	26.81*
5	2.13	1.28	2.90	1.34	-0.77	3.21
6	8.92	2.89	13.25	4.87	-4.32	11.11*
7	6.25	2.04	8.86	2.72	-2.61	11.21*
8	1.12	0.57	2.12	1.10	-1.00	12.39*
9	0.23	0.22	1.18	0.84	-0.95	22.41*
10	1.93	1.04	4.32	1.74	-2.39	26.39*
11	2.41	1.63	3.37	1.67	-0.96	3.21
12	21.73	4.75	14.88	4.35	6.85	21.46*
I/D Ratio	3.16	1.86	1.18	0.33	1.98	20.84*
S/T Ratio	0.83	0.21	0.73	0.20	0.10	2.20

\*Significant at the .05 level of confidence  
 $F_{.95} = 4.10$  for 1 and 38 degrees of freedom

$\bar{X}_2$	$\bar{X}_1 - \bar{X}_2$	F Ratio
2	1 2	

Dependent Variables	Feedback Group (N=20)				Non Feedback Group (N=20)	
	$\bar{X}_1$	S.D.	$\bar{X}_2$	S.D.	$\bar{X}_1 - \bar{X}_2$	F Ratio
Flexibility Factor (Number of Occupied Cells)	16.73	1.66	17.19	1.21	-0.46	0.94
2-2 Cell	0.63	0.33	0.23	0.21	0.40	20.15*
3-3 Cell	1.86	0.77	0.76	0.57	1.10	25.04*
1,2,3 Cell Block	5.98	2.02	2.50	1.29	3.48	40.29*
7,8,9 Cell Block	14.64	3.04	15.20	4.58	-0.56	0.20
10-3 Cell	2.73	0.96	1.68	0.81	1.05	13.23*
11-3 Cell	0.22	0.04	0.22	0.04	0.00	0.00
10-2 Cell	2.27	0.98	1.52	0.65	0.76	7.75*
11-2 Cell	0.02	0.03	0.02	0.03	0.00	0.25
10-10 Cell	5.38	2.19	7.02	3.43	-1.64	3.08
11-11 Cell	0.63	0.67	0.69	0.68	-0.06	0.08

\*Significant at the .05 level of confidence  
 F .95 = 4.10 for 1 and 38 degrees of freedom

Fig. 5 - Summary of F-Values for Group Mean Differences of the Feedback and Non-Feedback Groups.

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