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ABSTRACT

This study was conducted in an attempt to analyze selected aspects of the social milieu surrounding elementary school children. The relationship between the two techniques (one semi-projective, one verbal) used in measuring this social environment was also of interest. Fourth and fifth grade students' affective reactions to the following stimuli on both techniques formed the data base: home, friends, mother, self, father, school, teacher, principal. Of primary interest in this study was the attempt to predict or explain the students' reactions to the above stimuli on the basis of the following effects: grade-level, teacher-sex, student-sex, teacher-effect, student-behavior (as perceived by his teacher), and student-reading-achievement. Results indicate that the combined techniques were most valid when estimating students' affective reactions to these stimuli: mother, father, school, teacher, and principal. The semantic differential method, which provided the greatest variability among individuals, seemed to be the more sensitive instrument. Further research is recommended to improve the validity and reliability of the techniques. Several measures of the social climate of the classroom may provide a more comprehensive picture than was previously realized. (Author/LR)

A MULTIVARIATE STUDY OF TWO TECHNIQUES FOR ANALYZING SOCIAL VARIABLES IN THE CLASSROOM

by

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This study was conducted in an attempt to analyze selected aspects of the social milieu surrounding elementary school children. The relationship between the two techniques (one semi-projective, one verbal) used in measuring this social environment was also of interest. Fourth and fifth grade students' affective reactions to the following stimuli on both techniques formed the data base: home, friends, mother, self, father, school, teacher, principal. Of primary interest in this study was the attempt to predict or explain the students' reactions to the above stimuli on the basis of the following effects: grade-level, teacher-sex, student-sex, teacher-effect, student-behavior (as perceived by his teacher), and student-reading-achievement.

In the past, few studies (i.e., Cheong, 1967; Glick, 1969; Jackson, 1967) have incorporated more than one or two measures of the social climate within the elementary classroom. These studies have usually relied on standard sociometric techniques. In general, these studies have not included direct measures of the students' affective reactions to important social figures, both in and out of the classroom. It would also seem apparent that other social influences might be interacting with the peer group structure within classrooms; i.e., the teacher, principal, and possibly the student's parents. In an attempt to incorporate other dimensions of the social environment in elementary schools, the present study included the students' affective reactions to both home and school related variables.

Within the above context, an attempt was made to answer the following questions:

(1) Would the same student's affective reactions to the social influences noted above differ from their fourth to their fifth grade experiences?

(2) Would students in different fifth grade classes react differently to these social influences, especially those directly related to the school?

(3) Would students classified as non-disruptive or disruptive in their class by their teacher react differently to these social influences?

(4) Would students of high reading achievement versus students of low reading achievement react differently to those social influences?

A problem of secondary importance in this study concerned the basic, psychometric relationship between the two techniques used in obtaining the child's affective reactions to these social forces. One technique was developed by Kuethe (1967). This was a semi-projective technique that requires the student to make an overt physical reaction in response to the eight social concepts under consideration. The second technique was verbal; utilizing the format of the semantic differential technique (Osgood, Suci, and Tannenbaum, 1957). The two techniques were utilized in this study based on the suggestion by Campbell and Fiske (1959) that one might increase the validity of measuring psychological traits or attitudes by employing more than one independent technique for assessing the same traits. It was assumed that the combined techniques would provide a more valid estimate of the students' affective reactions to the home and school related variables noted above.

The technique developed by Kuethe (1967) required each child to place a gumbacked stamp imprinted with a figure representing himself on a piece of paper having a stimulus figure on its right-hand edge. The stimulus figures used represented the student's home, best friends, mother, self, father, school, teacher, and principal.

The semantic differential employed in this study required each student to rate the concepts noted above on a five-point scale between twelve evaluative bi-polar adjective scales. It was predicted that students rating their teachers negatively would also place their "self-stamps" further away from the teacher stimulus than those students rating their teacher positively, and vice versa. This relationship was expected to hold for all concepts used and was evaluated against the criteria suggested by Campbell and Fiske (1959).

RESULTS

Four basic designs were developed to answer the four questions noted above. The two instruments had been administered to 134 students during both their fourth and fifth grade experiences. Both instruments were also administered to 255 fifth grade students. This provided data on 16 dependent variables (8 from each technique).

In essence, the multitrait-multimethod analysis based on the criteria suggested by Campbell and Fiske (1959) provided evidence that the combined techniques were most valid when estimating the students' (both sexes) affective reactions to the following stimuli: mother, father, school, teacher, and principal.

Insert Table 1

Design I dealt with the grade-level effect across the 16 dependent variables.

Insert Table 2

The overall multivariate hypothesis proved significant. Those dependent variables accounting for this effect were the semantic differential ratings on the concepts of principal, father, home, plus the placement task reactions to school and father. With reference to the latter variables, the students placed their "self-stamp" significantly further from the school stimulus at the fifth grade and significantly closer to the father stimulus. Unfortunately, only the semantic rating of the school paralleled this effect.

Design II was developed to see if the students' reactions depended upon the sex of their teachers.

Insert Table 3

The overall teacher-sex effect was significant, and interestingly enough, the school related variables accounted for the greatest variance. It should be noted that the placement variables on self and father were also significant. This suggests a more complex system of variability. In fact, meaningful differences were obtained from the students' reactions to the same stimuli under teachers of opposite sex. For example, in classes with male teachers, the mean distance for the self-to-teacher variable was 1.57 centimeters as compared with 1.70 for the students' reactions to the female

teacher stimulus. However, the reverse was true for the principal; here the students' mean distance was 2.33 for classes with male teachers and 2.10 for female teachers. Thus, with male teachers the students place themselves closer to the teacher stimulus and further from the principal, while the reverse is true in classes with female teachers.

Design III analyzed the student-behavior-rating effect.

Insert Table 4

The overall multivariate effect was not significant. However, the semantic rating on the teacher was significant in the step-down analysis and the semantic ratings for the principal, their best friends, and father were significant for the univariate analysis of variance. The teachers had rated the students from least disruptive to most disruptive on seven-point scales. Interestingly, there was an increase in negative affect in reaction to the significant variables noted above as one goes from least disruptive to the "next to most disruptive." Then the most disruptive students rated their teachers less negatively than the "next to most disruptive" students.

Design IV was developed to analyze the effect of classroom reading achievement on the students' reaction to the social variables. No overall multivariate reading effect was determined. However, two interesting univariate effects were significant. Students doing poorly in reading react quite negatively to the overall concept of "my school" and also place themselves further from the stimulus for mother than top readers. It should

be noted that these results are difficult to interpret because of a significant two-way interaction between the teacher-sex effect and the bottom-readers effect.

In conclusion, it is suggested that several measures of the social climate of elementary school classrooms may provide a more comprehensive picture of the actual situation than was previously realized. However, as far as techniques are concerned, the semantic differential method provided the greatest variability among individuals and thus seemed to be a more sensitive instrument than Kuethe's placement task. Further research should be conducted in order to improve the validity and reliability of both techniques. It would be interesting to compare either technique with an instrument being developed by Strickland (1970) for tapping first graders' attitudes toward school.

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Table 1

Correlation Matrix - 16 Dependent Variables - Raw Data

Fifth Grade Total Sample - N = 275

	1 SelfHo	2 SelfFr	3 SelfMo	4 SelfSe	5 SelfFa	6 SelfSc	7 SelfTe	8 SelfPr
1 SelfHo	1.00							
2 SelfFr	.27	1.00						
3 SelfMo	.20	.26	1.00					
4 SelfSe	.25	.18	.01	1.00				
5 SelfFa	.31	.27	.27	.20	1.00			
6 SelfSc	.11	.18	.17	.05	.05	1.00		
7 SelfTe	.12	.09	.18	.09	.23	.38	1.00	
8 SelfPr	.07	.14	.08	.13	.07	.44	.24	1.00
9 SemRHo	.22	.26	.30	.08	.15	.16	.24	.11
10 SemRFr	.10	.18	.03	.04	.04	.18	.18	.04
11 SemRMo	.14	.20	.35	.12	.11	.19	.13	.11
12 SemRSe	.14	.15	.08	.11	.09	.12	.06	.09
13 SemRFa	.14	.14	.19	.06	.26	.10	.30	.07
14 SemRSc	.07	.09	.21	.01	.00	.49	.30	.27
15 SemRTe	.11	.09	.13	.02	.10	.34	.53	.18
16 SemRPr	.05	.12	.11	.02	.06	.39	.18	.33

Table 1 (continued)

	9 SemRHo	10 SemRFr	11 SemRMo	12 SemRSe	13 SemRFa	14 SemRSc	15 SemRTe	16 SemRPr
9 SemRHo	1.00							
10 SemRFr	.46	1.00						
11 SemRMo	.57	.36	1.00					
12 SemRSe	.31	.29	.21	1.00				
13 SemRFa	.50	.43	.44	.34	1.00			
14 SemRSc	.30	.45	.38	.22	.34	1.00		
15 SemRTe	.35	.34	.38	.23	.43	.47	1.00	
16 SemRPr	.27	.43	.33	.23	.31	.67	.43	1.00

Table 2

Test of Grade-Level Effect - Design I - Sixteen Dependent Variables

F-Ratio for Multivariate Test of Equality of Mean Vectors = 3.52
Degrees of Freedom = 16.00 and 273.00 p Less Than .0001

Variable	Hypothesis Mean Sq.	Univariate F	p Less Than	Step-Down F	p Less Than
1 SelfTe	0.71	1.13	.290	1.13	.290
2 SemRTe	101.25	1.05	.306	0.45	.503
3 SelfPr	0.12	0.15	.698	0.61	.437
4 SemRPr	1278.06	12.12	.001*	19.66	.001*
5 SelfSc	4.69	5.37	.021*	4.47	.036*
6 SemRSc	725.63	8.03	.005*	2.16	.143
7 SelfSe	0.52	0.61	.435	0.88	.349
8 SemRSe	126.56	2.35	.127	1.82	.178
9 SelfFr	0.04	0.10	.752	0.10	.747
10 SemRFr	114.22	1.91	.168	0.43	.515
11 SelfMo	0.07	0.16	.692	0.04	.842
12 SemRMo	135.14	2.33	.129	.026	.610
13 SelfFa	3.42	7.35	.007*	6.66	.011*
14 SemRFa	147.02	3.40	.066	4.48	.029*
15 SelfHo	0.74	1.75	.187	0.98	.324
16 SemRHo	526.13	13.68	.001*	8.72	.004*

Degrees of Freedom for Univariate Test of Hypothesis = 1
Degrees of Freedom for Error = 252
* Significant at Level Specified

Table 3

Test of the Teacher-Sex Effect - Design II - Sixteen Dependent Variables

F-Ratio for Multivariate Test of Equality of Mean Vectors = 5.42
Degrees of Freedom = 16.00 and 240.00 p Less Than .0001

Variable	Hypothesis Mean Sq.	Univariate F	p Less Than	Step-Down F	p Less Than
1 SelfTe	3.29	6.32	.013*	6.32	.013*
2 SemRTe	1607.11	19.89	.001*	14.32	.001*
3 SelfPr	3.51	4.70	.031*	9.09	.003*
4 SemRPr	464.06	4.44	.036*	12.40	.001*
5 SelfSc	3.29	3.93	.049*	10.60	.001*
6 SemRSc	12.73	0.14	.710	0.50	.479
7 SelfSe	12.89	15.44	.001*	12.62	.001*
8 SemRSe	14.53	0.29	.593	0.75	.388
9 SelfFr	0.42	1.12	.292	0.09	.764
10 SemRFr	108.12	1.83	.178	2.99	.085
11 SelfMo	3.75	1.46	.228	1.90	.170
12 SemRMo	2.32	0.04	.835	0.14	.705
13 SelfFa	3.39	7.80	.006*	4.93	.037*
14 SemRFa	3.03	0.18	.674	0.01	.941
15 SelfHo	0.14	0.29	.591	0.84	.362
16 SemRHo	76.64	2.04	.155	1.94	.165

Degrees of Freedom for Univariate Test of Hypothesis = 1
Degrees of Freedom for Error = 255
* Significant at Level Specified

Table 4

Test of Student-Beh.-Rating Effect - Design III - Sixteen Dependent Variables

F-Ratio for Multivariate Test of Equality of Mean Vectors = 1.04
Degrees of Freedom = 96.00 and 1321.21 p Less Than .3863

Variable	Hypothesis Mean Sq.	Univariate F	p Less Than	Step-Down F	p Less Than
1 SelfTe	0.51	0.92	.480	0.92	.480
2 SemRTe	175.62	1.86	.088	3.46	.003*
3 SelfPr	0.22	0.27	.949	0.24	.960
4 SemRFr	376.12	3.01	.008*	1.69	.125
5 SelfSc	0.32	0.33	.919	0.30	.937
6 SemRSc	197.97	2.01	.065	0.75	.606
7 SelfSe	0.88	0.93	.475	0.73	.628
8 SemRSe	55.18	1.08	.373	0.59	.735
9 SelfFr	0.57	1.51	.175	1.42	.208
10 SemRFr	212.80	3.78	.001*	1.40	.217
11 SelfMo	0.28	0.55	.773	0.57	.757
12 SemRMo	59.62	1.04	.400	1.12	.351
13 SelfFa	0.42	9.92	.481	0.57	.757
14 SemRFa	99.41	2.23	.041*	1.76	.108
15 SelfHo	0.63	1.28	.268	0.54	.775
16 SemRHo	28.34	0.72	.633	0.73	.628

Degrees of Freedom for Univariate Test of Hypothesis = 6
Degrees of Freedom for Error = 247
* Significant at Level Specified