DOCUMENT RESUME

ED 038 693 CG 005 244

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TITLE	Learning Climate Correlates in Black and White Rural Schools.
INSTITUTION	American Educational Research Association, Washington, D.C.; Georgia Univ., Athens. Inst. of Social Science Research.
SPONS AGENCY	Georgia Univ., Athens. Research and Development Center in Educational Stimulation.
PUB DATE	2 Mar 70
NOTE	8p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.50
DESCRIPTORS	*Academic Achievement, Achievement Rating, Caucasians, Elementary School Students, *Interaction Process Analysis, Measurement, Negroes, *Racial Differences, Student Attitudes, *Student Behavior, Student Teacher Relationship, *Teacher Influence, Teacher Role

ABSTRACT

The paper discusses differences in classroom process and environment in two rural schools and relates these differences to attendant differences in student achievement and peer ratings. Relationships between pupil creativity, achievement, personality, peer ratings and ability in classes are described using Flanders' Interaction Analysis; comparing black students in all-black schools to white students in all-white schools. Subjects were students and teachers in third through sixth grade in two schools, one white and one black, in the same rural county in Georgia. Median family incomes were compared. The findings, although incomplete due to poor student attendance, show that black students are lower achievers than white students and are two and a half years behind grade placement while white students are one half year ahead on grade placement. White teachers and pupils function at higher cognitive levels than black pupils and teachers. Teacher and student verbal behavior in questioning and answering was tabulated by thought level and classroom interaction patterns. In general, classroom climate, peer concepts, reading achievement and thought level used are related when comparisons are made between black and white students. (Author/MC)

LEARNING CLIMATE CORRELATES IN BLACK AND WHITE RURAL SCHOOLS[1]

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Paper presented at the meetings of
The American Educational REsearch Association, 1970
Minneapolis-St. Paul

Introduction

The purpose of this paper is to discuss differences in classroom process and climate in two rural schools, Black and White, and to relate these differences to attendant differences in pupil achievement and peer ratings. The point of the overall study was to examine relationships between pupil creativity, achievement, personality, peer rating, and ability in classes described as to climate and process using Flanders' Interaction Analysis (1960), comparing black students in all-black schools to white students in all-white schools. Elsewhere, data have been reported on the peer rating differences between Black and White pupils (Powell & White, 1969) and will be reported on personality test scores versus peer ratings for the Black sample (White & Powell, 1970).

The sample in this report consists of all pupils and teachers in two schools, one White and one Black, in third through sixth grade in a rural county in Georgia. This county expends $257 per pupil compared to a state average of $384 and a national average of $532 (1965 data from Nix, et al. 1967). The schools are separate-but-equal in facilities, both being 1-12th grade institutions built the same year on the same plans. In the 1960 census, this county had a median per-family cash income of $2,500, compared to a state median of $4,208 and a national median of $5,660. The Black median income, however, was $1,561 per family.

Data used in this study, for the various summations, do not cover the complete sample, due to poor pupil attendance and other causes of loss. Each table specifies the number of students or classrooms included; due to these losses, and due to the ex post facto character of the design, statistical analyses are rarely appropriate.

[1]Some of the initial data processing for this study was done with the support of the Research and Development Center in Educational Stimulation, The University of Georgia. Dr. William F. White was instrumental in designing and carrying out a major part of the overall study.

INSTRUMENTATION

Metropolitan Achievement Tests, Intermediate, were used to yield reading level scores for the pupils in grades four through six. For the third grades, the Primary form was used; these data, not being comparable, are excluded. Additionally, data from the previous year were excluded because their fragmentary nature did not permit gain calculations. Other reading scores were yielded for all pupils by the Cloze technique in which two passages of third grade reading difficulty, in primary type, were given to the pupils. After reading and handing back the passages, students took the Cloze test itself composed of the same passages in the same format but with every fifth noun, adjective, or adverb replaced by a line of standard length on which the pupil was to write the missing word. Correct or synonymous words were scored as correct. The test did not bottom; [illegible] scores were correlated with the Metropolitan reading scores (r = .44 to .66). Cloze tests were administered on one day by the experimenters; the Metropolitan tests were administered in the same month by the County Testing Specialist.

The classroom interaction data were collected following standard procedures (Amidon & Flanders, 1966) for each class for an hour per class per visit, with two visits made per class. Matrices were derived for each class for each visit. When the combined White first visit matrices were compared with the combined White second visit matrices for the same teachers and no differences were found significant, a composite 'White' matrix was formed. Similarly, a composite 'Black' matrix was also formed. The category system used included many subscripted categories, following the procedure reported by Amidon & Powell (1967). The matrices presented, however, collapse the subscripted categories to major category labels.

The subscriptions, however, while not presented in the matrices, yield data concerning the cognitive level of teacher and pupil discourse in a non-standardized but interpretable form. Teacher questions were classified as cognitive, memory, convergent, divergent, or evaluative; pupil responses were similarly classified, using definitions usually cited in the literature (Amidon & Powell, 1967).

The peer concept ratings were accomplished by having each child in each class studied rate one third of his class members on a form of Semantic Differential (SD) consisting of fifteen adjective pairs separated by five boxes. The goal of this was to yield sociometric plots of peer ratings; these would come from factor score means for each child rated. While a fuller report is available elsewhere (Powell & White, 1968), only the factor scores and means are of interest here.

FINDINGS

The Black students, as expected, were lower achievers than the White pupils (Table I). The Black students were two and one half years behind grade placement, the White pupils one half year ahead of grade placement. Concurrent with these differences are some data regarding the level of questioning taking place in the classrooms, and the types of answers provided

by the pupils. (Direction of relationships between these data are not available, but the relationship seems to exist.) Table II summarizes the thought levels from the White and Black classes, as evidenced from verbal behavior classified as to a) cognitive, memory, b) convergent, c) divergent, or d) evaluative through the subscripted Flanders system.

Except for one comparison, between convergent answering, the White teachers and pupils were functioning at higher cognitive levels than were the black pupils and teachers. The exception occurred due to the fact that data were collected in mathematics classes more often in the Black school than in the White, and convergent problem-solving is characteristic of mathematics.

There were differences between the means for White and for Black classes in the Flanders data matrices: these are presented in Tables III and IV. The Darwin X^2 between these mean matrices, when expressed in per thousand rather than in per hundred as in the tables, was 216,889, yielding a z of 7.448. That these differences are significant cannot be adduced from these data alone, since the Darwin X^2 procedure is open to criticism. The inter-school differences represented by the above X^2 and z, however, can be seen to be of interest since the largest X^2 obtained between repeated observations of any one teacher in a school was less than twenty (19.44).

TABLE I

MEAN TESTED LEVEL MINUS GRADE LEVEL ON METROPOLITAN READING (INTERMEDIATE) FOR SELECTED CLASSES[1]

BLACK		WHITE	
Class #	Diff.[2]	Diff.	Class
0	-2.025	+ .19	10
4	-2.404	+ .77	11
5	-2.340	+1.81	13
6	-2.482	+ .26	7
8	-2.106	- .13	15
9	-1.877	+ .49	Mean
Mean	-2.184		

[1]Classes for which data other than Flanders' were complete. There are data missing for two black and for two white classes. N = 109(B), 112(W).

[2]In years, months. Means are pupil rather than class means. Grades are 4-6.

TABLE II

TABULATION OF TEACHER AND PUPIL VERBAL BEHAVIORS IN QUESTIONING AND ANSWERING BY THOUGHT LEVEL BY PERCENTS OF EACH[1]

Level	QUESTIONS a	b	c	d	ANSWERS a	b	c	d
White	86.67	8.76		1.36	60.45	22.60	15.82	1.13
Black	93.63	5.43	0	.94	62.01	31.28	6.70	0

[1]N = 15 for teachers, N = 156(B), 145(W) pupils.

TABLE III

WHITE TEACHERS' FLANDERS MATRIX, MEANS OF 14 OBSERVATIONS OF 7 TEACHERS, IN PERCENTS

		TEACHER 1	2	3	4	5	6	7	PUPIL 8	9	10
Accept Feeling	1	.12	.02	.03	.03	.03	.04	---	.03	.02	.02
Praise, Encourage	2	.06	.36	.40	2.71	1.59	.87	.03	.70	.84	.43
Accept Ideas	3	.02	.20	.73	.55	.58	.17	.05	.08	.17	.03
Questions	4	.02	.08	.02	1.82	.38	.21	.09	7.20	1.33	1.11
Give Information	5	.02	.29	.05	2.42	7.16	1.41	.10	.45	.64	.38
Give Directions	6	---	.04	.03	.48	.46	1.57	.30	2.87	.29	1.13
Criticize	7	---	.11	---	.52	.34	.57	.34	.94	.26	.26
Narrow Answer	8	.05	5.29	.57	2.41	1.04	1.34	1.50	11.23	.10	.82
Broad Answer, Initiation	9	.07	1.51	.69	.29	.97	.30	.43	.01	1.56	.24
Silence, Confusion	10	---	.11	.06	.94	.39	.74	.44	.86	.84	18.62
TOTAL		.36	8.01	2.58	12.17	12.94	7.22	3.28	24.37	6.05	23.04

TABLE IV

BLACK TEACHERS' FLANDERS MATRIX,
MEANS OF 16 OBSERVATIONS OF 8 TEACHERS,
IN PERCENTS

		TEACHER						PUPIL		
		1	2	3	4	5	6	7	8	9	10
Accept Feeling	1	.12	.18	--	.03	--	--	--	.03	.03	--
Praise, Encourage	2	.06	.93	.34	2.56	1.82	.76	.14	1.98	.88	1.08
Accept Ideas	3	--	.09	.26	.22	.52	.06	--	.15	.12	.06
Questions	4	.03	.34	--	2.61	.29	.24	.18	11.45	.97	1.64
Give Information	5	.03	.47	.09	3.58	11.75	.93	.14	.50	.27	1.02
Give Directions	6	--	.03	--	.93	.21	.95	.31	2.57	.24	1.94
Criticize	7	--	.15	--	.57	.27	.49	.62	.97	.30	.61
Narrow Answer	8	.03	5.79	.51	4.70	1.80	1.29	1.93	3.74	.18	.87
Broad Answer, Initiation	9	.11	1.30	.21	.75	.76	.16	.19	.03	.96	.41
Silence, Confusion	10	--	.82	.06	1.87	1.18	1.28	.63	.78	.98	6.60
	TOTAL	.38	10.10	1.47	17.82	18.60	6.16	4.14	22.20	4.93	14.23

TABLE V

SELECTED NON-PHYSICAL PEER CONCEPT RATINGS ON A 15-ITEM SEMANTIC DIFFERENTIAL SHOWING MEANS AND EVALUATIVE FACTORS[1]

	Means[2]		Factor Loadings[3]		
			I		II
	Black	White	Black	White	Black
Dull	3.0	3.1		.33	-.51
Sad	3.1	3.0		.42	-.36
Weak	3.3	3.4		.71	-.64
Bad	2.6	2.8	.69	.73	
Unfair	3.6	3.8	.48	.61	-.48
Useless	2.3	2.6	.41	.58	
Lazy	3.3	3.5	.45	.58	-.41
Noisy	2.1	2.3	.70	.67	

1. N = 221, 109 (B), 112 (W) rating 247 peers, 116 (B), 131 (W): 2521 ratings on each of 15 items, 1406 (B), 1115 (W).

2. Means are on a five-step semantic differential; scales were randomly reversed for administration but are not for analysis.

3. Evaluative factors on principal components solution; I (B, W) is positive evaluation, II (B) is negative evaluation.

Comparison of the different matrices suggests that there are somewhat different patterns of interaction, and attendant differences in classroom climate between the Black and the White classrooms. There is no way of knowing if this is due to the pupil differences, or whether the pupil differences, other than race, are the results of the climate and process differences.

(While these differences are not of primary interest to those interested in ethnic differences per se, they are included here because they may be of some hypothesis-building use. The matrix totals show that White teachers of White pupils praised less, but accepted ideas more than did their Black counterparts. The White teachers gave more directions, but criticized the pupils less. All told, the i/d ratio for Black is higher than that for White (1.17 vs. 1.03) mostly due to the lower percentage of praise given by the White teachers. Examining pupil talk totals, in categories 8 and 9, white classes had 30% pupil talk, Black classes 27%, and of the pupil talk, a higher percentage, both absolutely and relatively, was initiations in the White classes. Comparison of the 4-8 cells shows that the White teachers were less likely to ask questions that could be answered simply than were the Black teachers; this has been shown already in the breakdown of category 4 and 9 in Table II.)

The White teachers reinforced pupil ideas through acceptance (3) more than did the Black teachers, who tended to use praise more. The White teachers' classes operated at higher levels of thinking, with slightly less criticism of pupils.

The SD data are excerpted in Table V. The consistently high ratings of White students by White students shown by the mean person concept ratings are reflected in the factor scores. The results of a principal components analysis, these scores demonstrate that while the White pupils held consistently positive views of their classmates, the Black students had a bipolar, or ambivalent view of their peers. Further analysis of this peer rating phenomenon showed that those Black students with higher Reading and Cloze scores were negatively perceived by their peers, or vice-versa. ~~Reading and Cloze scores were negatively perceived by their peers, or vice-versa.~~ These results came from a second-order analysis of CPQ, Cloze, Reading, and SD pupil mean scores, which showed that on the first factor extracted, for the Black students, the Reading, Cloze, and CPQ-B scores were positively loaded while the evaluative and potency factors loaded negatively. (These were, respectively, .70, .88, .43, -.50, -.47.) Data from the White pupils show that those students who are regarded by their peers on the SD as high in evaluation and potency were also those who were high scorers in Reading and Cloze tests (or the reverse relationship.)

CONCLUSIONS

Data presented here again point up the well-known fact that Black children achieve poorly on achievement tests; what is interesting but inconclusive is that there are some interesting correlates of this fact. The notion that all children value good students and see them as high-potency peers is open to question; when the relationships of achievement to the SD data from the Black children are compared with the ratings and achievement of the White children, it can be seen that Black children <u>did not</u> value high-achieving peers (or <u>did</u> value low-achieving peers). Even this pair of suppositions may not be true, for it may be that low-status Black children were high achievers, or high status Black children were low achievers because of their status. The point is that this exploration raises some questions.

Further questions are raised when it is seen that the peer ratings of Black children, when compared to White children, were ambivalent on the Evaluative dimensions. There may be some real significance to this finding if it is replicated in a way that shows that Black/White differences are interbalized by Black children in a way that is confusing to them.

The process data on thought level, while non-standard, show that whether as a cause or as an effect, classes in the Black school were operating at lower levels than were classes in the White school. Further, the matrices show differences in process and atmosphere. It has been supposed that process modifies achievement; research is under way to see if achievement level modifies process. That they are related seems hard to challenge.

All told, classroom climate, peer concepts, reading achievement, and thought level used have been shown to be related in interesting ways when comparisons are made between Black and White pupils. The direction of causation of these relationships seems to be a vital question.

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