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SEX AND RACE DIFFERENCES IN THE PERCEPTION OF SCHOOL SOCIAL CLIMATE BY FOURTH AND FIFTH GRADE STUDENTS IN MICHIGAN PUBLIC ELEMENTARY SCHOOLS

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By

Douglas Vaughan Hathaway

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ABSTRACT

SEX AND RACE DIFFERENCES IN THE PERCEPTION OF SCHOOL SOCIAL CLIMATE BY FOURTH AND FIFTH GRADE STUDENTS IN MICHIGAN PUBLIC ELEMENTARY SCHOOLS

By

Douglas Vaughan Hathaway

This research attempts to determine if the sex and race of elementary school students, and classroom teachers, are related to the ways in which students perceive the social factors in the learning environment. Two samples of fourth and fifth grade public elementary school students from Michigan are analyzed using one-factor and two-factor analysis of variance techniques. Post hoc comparisons are used to locate the sources of significant differences in perception of the school social climate. Five hypotheses relating to the student and teacher sex and race are evaluated. It is found that female students have a more positive perception of the school social climate than do male students; white students have a more positive perception of school social climate than do black students in majority-black schools; and that sex and race of the teacher are related to perception of school social climate by the students in a random sample of achools

DEDICATION

DR RUSSELL HEDDENDORF

for his assistance, inspiration, encouragement
and for providing a sound background
in the principles of sociology
with great appreciation

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INTRODUCTION

The recent work of Brookover, et al. (1977) has reported differences in the achievement of elementary school children due, in part, to the effect of the social factors present in the learning environment of the elementary classroom. This report found that social factors, taken on the aggregated, building level, can help explain the differential achievement levels attained by black and white students, as well as by lower- and middle-class students.

The present research is an attempt to examine these social factors, but at the level of the individual student. This research will attempt to determine if there are any differences between black students and white students in the perception of the social factors, which could be related to the differential achievement levels attained by these two categories of students. Also, this research will attempt to determine if male and female students perceive the social factors in different ways. Finally, this research will examine the relations of the sex and race of the teachers to the ways the students perceive the social factors present in the learning environment.

THE CONCEPT OF SOCIAL CLIMATE

Brookover and Erickson (1975) have provided a working definition of the concept of school social climate. They state that:

> "School climate or the school subculture refers to the attitudes, beliefs, values, and norms that characterize the social system of the school. The climate or culture is determined by the aggregate attitudes, beliefs, norms, and expectations of the persons who make up the school social system" (p. 360).

The school social climate is thus determined within the school social system by the participants themselves. The school social climate is an aggregate of the attitudes, beliefs, norms, and expectations of the persons who are involved in the educational experience. The student perceives the expectations and evaluations of principal, teachers, and fellow students, which contributes to his beliefs about the school and his role within it. Teachers hold varying expectations for students, and have beliefs as to what students can do. Teachers also perceive the evaluations of their colleagues.

These perceptions are indicative of the social system. The school social climate variables measure the attitudes of the participants towards the school, and their place in the social system of the school.

This research is designed to measure the perceptions the students themselves have of the school social climate. It will attempt to find out if the sex and race of both

students and teachers are related to differences in this perception of the school social climate.

RELATED RESEARCH

Although the study of the school social climate would seem to be one of primary importance, very little has been reported. Even less research on the effects of sex differences within the classroom has been reported.

The comprehensive report by James S Coleman, et al., Equality of Educational Opportunity (1966) served to shift the focus of educational research away from analyzing the inputs into the school and onto the outputs and the process of the educational system.

This study, commonly referred to as the Coleman Report, reported that the traditional attributes of a good school, such as size of class, per-pupil expenditures, and the like, had little power in explaining the variance in school achievement. Rather, the background at home of the students, related to the social system of the school, had greater variance-explanation power. Specifically, the report said that the the racial background of the student, in combination with the socioeconomic status (SES) of the family explained the greatest portion of the variance in school academic achievement.

Coleman and associates did begin to notice the social factors, although they did little in the way of analysis

of these factors. They reported that the perceptions of the teachers toward the students they taught did a great deal to explain achievement variance. Additionally, the factor identified as "Sense of Control", which measured the degree to which students felt that what they did have an effect on their success in school, explains more variance than the traditional input variables. Finally, the student's self-concept of academic ability is also important. Building upon the early self-concept of ability studies by Brookover and various associates (1962, 1965, 1967), Coleman and his team of researchers found that the self-concept of ability was a contributor to the explanation of achievement variance. They found that self-concept of ability and sense of control were inversely related: black students, in majority-black schools, have a higher self-concept of ability but a lower sense of control. Also, black students in majority-white schools have a higher sense of control than do black students in majority-black schools.

These findings regarding the sense of control, self-concept of academic ability, and teacher perceptions provided the impetus for the recent research by Brookover and his associates (1976, 1977). Brookover et al. went beyond the self-concept of ability to examine the evaluations and expectations, both present and future, which teachers have for their students. This grew from the Coleman Report relative to teacher perceptions. They

also examined the student's perceptions of how teachers, fellow students, parents, and administrators evaluate them and how they are expected to perform academically, both in the present as well as in the future.

Brookover and his team also developed a more complete measure of Coleman's sense of control variable. They developed a variable, named the "Sense of Academic Futility", which expands upon the theme of the Coleman variable. The sense of futility variable measures the degree to which a student feels he can do nothing to improve his success in school. This variable, when combined with other measures of the social climate and the SES and racial composition of the school, serve to explain the greatest portion of school academic futility (1977).

There exists a second current of research focusing on social climate which is relevant to the current research. In an attempt to document the advantages of the experimental Harvard Project Physics curriculum, Gary Anderson and Herbert Walberg constructed the Learning Environment Index (LEI), which focuses on eleven dimensions of school social climate. Anderson (1970) has shown that the characteristics of class groups have significant effects on learning, and that there are wide differences in these effects for students differing in ability and sex. Walberg et al. (1977) obtained similar results in a cross-cultural validation study conducted in India. When combined with successful validations conducted in the United States, Canada, Australia, and Great Britain,

the LEI appears to be a very good tool with which to measure classroom social climate.

In a series of studies, Lawrenz applied the LEI to a variety of situations. In one case, the LEI, as developed by Anderson, detected differences in the climate of high school biology, chemistry, and physics classes (Lawrenz, 1976a). A second study, this time of biology and chemistry classes, determined that positive attitudes toward science are likely to be found in classes perceived as having little internal conflict (Lawrenz, 1976b). The most recent research in this vein deals with the stability of the LEI measures. Lawrenz notes that student perception of the LEI, is constant over time (1977, p. 80). She concludes that the mere existence of this stability in the usually amorphous student perceptions is an indication that classroom social climate is a variable worthy of further research.

Ediger (1974) suggests that the quality of learning environments either hinders or encourages pupils to achieve at their optimum. He sees the teacher as the stimulus within the classroom setting to achieve this positive climate to foster optimal achievement. Among his conclusions, O'Reilly (1975) notes that classroom climate is a significant factor in pupil achievement, and also that "climate" variables have an independent effect on achievement (p. 247). This conclusion has been confirmed by Brookover et al. (1976).

In her now classic collection of essays The Development of Sex Differences (1966), Eleanor Maccoby summarizes the

"accepted truths" established prior to 1966. She notes, among others, three key items related to the present research. First, Maccoby notes that the achievement drop-off among girls as they reach maturity is linked to the adult sex role of the female (p. 31). Second, she concludes from analyzing the previous research that boys are more likely to rise to an intellectual challenge, while girls usually retreat from a challenge (p. 33). Finally, she notes that the same environmental factors affect the sexes differently, with the result being that different factors are associated with optimal performance for boys than those associated with girls. She notes also that the environmental effects are in a complex interaction with characteristics of the individual students (p. 51).

Building upon Maccoby's work, there has been a great body of research developed which focuses on sex differences. However, only a very few are relevant to the present research.

Condry and Condry (1976) report that when all else is controlled, people still see differences due to the sexual label of "boy" or "girl". These differences tend to follow in the steps of socially accepted stereotypes.

The literature on the question of whether or not a teacher's sex affects a child's performance is divided. Lee and Wolinsky (1973) report that male teachers tend to be more evaluative of male than of female students. Further, female teachers give twice as many sanctions as do male

teachers. Thus, Lee and Wolinsky report a difference in teacher behaviors directed to the different sexes. Similarly, Goebbes and Shore (1975) report results that indicate that the sex of the teacher is of importance regarding their expectations of boys' and girls' behavior. They claim that their results suggest that male teachers in the elementary schools are more favorably disposed to children of their own sex (p. 224).

Taking the opposite viewpoint, Wheeler and Wheeler (1974) report evidence suggesting that while male and female teachers do instruct differently, and while male and female students receive differential treatments, individual teachers, regardless of sex, respond similarly to boys and girls (p. 24). Forslund and Hull (1974) report that the sex of the teacher does not significantly affect the achievement scores of either boys or girls.

Good, Sikes, and Brophy (1973) add further to this confusion. They report that sex differences in classroom interaction patterns are due mainly to the students, rather than the teachers (p. 85). They hold a view in which teachers are reactive to the differential processes that boys and girls create within the classroom. They claim that the teacher's role, rather than sex, is the important factor in the classroom.

Finally, King, Mayer, and Borders-Patterson (1973) report that white males in the fourth grade seem to have

more educational interactions with their teachers than do white female students or black students of either sex. The black male student is the least likely to initiate contact with the teacher, while the white male student is the most likely and aggressive in the realm of initiating contacts. They further report that the modicum of interaction that the black male does have is primarily of a disciplinary nature. They finally conclude that the black male student, of all the sex-race groups, is least likely to have a positive exchange with his educational environment.

QUESTIONS FOR THIS RESEARCH

Albert Bandura's theory of imitation and identification in social learning is particularly relevant to this research. In a study of nursery-school children, Bandura and Huston (1961) found that when children had experienced a nurturant model, they imitated the model's behavior substantially more frequently than did those children who received distant and non-rewarding attention from the model. These children in the nurturant condition also exhibited more behaviors which were only partially imitative of the model's behaviors.

In a second experiment, Bandura, Ross, and Ross (1963) found that, in a three-person group, children identified with the source of rewarding power rather than with the

competitor for the rewards. These children also exhibited a relatively weak pattern of behavior representing a synthesis of behaviors presented by models of both sexes (Lee and Stewart, 1976).

Other studies, such as the studies of the influence of film-mediated violence on aggressive behaviors carried out by Bandura and his associates, have shown that males tend to be more aggressive, regardless of the sex of the model, and tend to take control of the social environment.

It is the author's belief that these findings of Bandura and his associates, coupled with the sex-role stereotypes present in contemporary United States society, presents a situation in which male students will assert their more aggressive nature within the classroom setting. Maccoby (1966) has concluded that male students tend to approach a challenge. Thus, the male is the aggressor when the teacher presents a problem to the class. If the teacher presents an attitude such as the "nurturant" behavior of Bandura, Ross, and Ross (1963)--by expecting that all students can master the subject matter, by expressing these beliefs to the students, and by using positive and negative reinforcement techniques properly--it is believed that male students will pick up on this and thus exhibit more positive perceptions of the school social climate.

It is also believed and expected that the same phenomenon will be in force for the racial dimension of this

research. In this situation, the black student is the key. If the teacher, the possessor of power and rewards, is the same race as the majority of the students in that school, then these students will identify with the teacher, and will imitate the proper behavior more readily than will students of the opposite race. Thus, black students in a majority-black school will imitate the black teacher, and consequently will perceive the social climate more positively than will the white students.

Building upon the small amount of previous research, and the above theoretical aspects, several questions concerning the perception of school social climate by students may be raised.

First, it is expected that the sex of a student will have an effect on the perception of school social climate. At the point of physical development at which most fourth and fifth grade students are, they are beginning to differentiate between the sexes, and are beginning to inculcate the sexual stereotypes of the adult society. Thus, it is expected that male students will have a more positive perception of the school social climate than will female students. It is expected that this will hold true for both the fourth and the fifth grade students.

Second, it is expected that the race of a student will be of importance. Even though the Civil Rights movement has increased the educational level and opportunities for

black students, the educational establishment appears to still be stacked heavily in favor of the white students. These two facts come into a conflict which can serve to alienate black students and those of other minorities. Thus, it is expected that white male students will have the most positive perception of the school social climate, and that black male students, on the basis of the report by King, Mayer, and Borders-Patterson (1973), will display the least positive perception of the school social climate. White female students and black female students, respectively, are expected to rank between these two extremes in their perception of the school social climate.

Also, it is expected that the sex and race of the student's teacher will be of importance. It is expected that a student will exhibit a more positive perception of the school climate if the teacher has the same sex and race characteristics. Thus, it is expected that white male students with white male teachers, white female students with white female teachers, black male students with black male teachers, and black female students with black female teachers will exhibit more positive perceptions of the school social climate. It is expected that the other students will be ranked according to the previous statements.

Finally, it is expected that where black students are in the majority they will display more positive perceptions of the social climate in the school than will white students,

in these majority-black schools, who are unaccustomed to being in the minority within a classroom setting.

Specification of Hypotheses

Specifically, the following hypotheses, stated in the null, concerning the sex and race differences in the perception of school social climate by fourth and fifth grade Michigan elementary schools will be examined.

HYPOTHESIS 1: There is no difference in the perception of school social climate due to the sex of the student. Female students will not exhibit a more positive perception of school social climate than will male students.

HYPOTHESIS 2: There is no difference in the perception of school social climate due to the race of the student. Black students will not exhibit a more positive perception of school social climate than white students.

HYPOTHESIS 3: There is no difference in the perception of school social climate related to an interaction of the sex and race of the student. White male students will not exhibit the most positive perception of school social climate, followed by white female

students and black female students. Black male students will not exhibit the least positive perception of the school social climate.

HYPOTHESIS 4: There is no difference in the perception of school social climate related to the race and sex of the teacher. Students will not exhibit more positive perceptions of the school social climate when the sex and race characteristics of the teacher match those of the student.

HYPOTHESIS 5: There is no difference in the perception of school social climate due to the racial proportion within the school. Where black students are in the majority, they will not exhibit more positive perceptions of school social climate than will white students, in the same majority-black schools.

DETERMINATION OF SCHOOL SOCIAL CLIMATE SCORES

A measure of the school social climate has been developed by Brookover et al. (1976). Actually, in that report there were three components to the dimension of school

climate. Data were obtained from principals and teachers as well as from students. However, the present research is concerned solely with the perceptions of the students themselves, since they are, in effect, the "raw material" which the school attempts to alter by means of education.

After much pretesting and many revisions, a number of items were obtained to measure the student's perception of the school climate. In the final developmental stage, three separate factor analyses were carried out using all the school climate items contained in the student, teacher, and principal questionnaires, respectively. The results of the factor analyses and the content of the items were taken into consideration when constructing the scales. No item was included that did not have a loading of at least 0.30 on that factor. A very small number of items with reasonably high loadings were not included in any climate variable in the final analysis because they did not, in the independent judgement of the research team, have appropriate content validity. Scale values were obtained by calculating the total item score based on the particular response chosen on a five-point scale response (Brookover et al., 1977, p. 33). The means and standard deviations of these scales for the student climate variables, for both the state sample and the black sample, are shown in Table 1-a in Appendix A. Five variables were identified for the measurement of student social climate: Student Climate 1--Student Sense of Academic Futility; Student

Climate 2--Student Future Evaluations and Expectations; Student Climate 3--Student Perceived Present Evaluations and Expectations; Student Climate 4--Student Perception of Teacher Push and Teacher Norms; and Student Climate 5--Student Academic Norms (Brookover, et al. 1976). The questionnaire items which composed each variable are shown in Appendix A.

These variables are highly interrelated, and are also highly related to the SES and racial composition of the school. This is noted by Brookover et al. (1977, p. 45). They note that the most important intercorrelation is the relationship between the student sense of academic futility and the composition of the school. The intercorrelations of these five variables may be located in Brookover et al. (1977, p. 308).

The concern in this research is not with these individual items. Rather, the overall perception by the student of the social climate of the school is important. Thus, a composite score, the average of the five variables, was obtained.

Once the scores were obtained for each of the five variables, they were averaged, yielding the score for the student's overall perception of the social climate of the school. The resulting scores, ranging in magnitude from one to five, were then used in the data analysis, which will be discussed in a following section.

SELECTION OF SUBJECTS

In the original research by Brookover et al. (1976, 1977) three samples were taken from the universe of Michigan public elementary schools containing fourth and fifth grade students. Two of the samples reported in that research (1976, p. 16) are used in the present research.

The state sample is a sample of sixty-eight schools selected at random from the population of interest. Of these sixty-eight schools, seven had a majority of black students. Since this was not a sufficient sample size for analysis, a second sample, the black sample was taken from the universe of public elementary schools in Michigan containing fourth and fifth grades, and having a majority of black students. This sample consisted of an additional twenty-three schools. The seven majority-black schools taken as part of the state sample were combined with the second sample to provide thirty schools in the black sample. The remaining sixty-one schools from the state sample comprised the white sample. This research is only concerned with the original sample, the state sample, and the black sample, population breakdowns of which are contained in Table 1.

Table 1

Population Information Concerning Two Samples of Michigan Public Elementary Schools Containing Fourth and Fifth Grades

	State Sample	Black Sample
Schools in Universe	2,226	225
Schools Sampled	68	30
Teachers Participating	327	177
Students Participating	8,078	4,737

A number of items used in the original research were not included in the present analysis. First, many records, when processed, were found to be incomplete with respect to the variables of race, sex, and grade level which were used to characterize the students. Also, some records were found to have keypunching errors. In this light, Table 2 contains the population characteristics of the subjects which were actually available for analysis. In this table, as well as in some of the following tables, the following abbreviations, or derivations of them, will be used:

WMWMT -- White Male Student with a White Male Teacher

WMWFT -- White Male Student with a White Female Teacher

WMBMT -- White Male Student with a Black Male Teacher

WMBFT -- White Male Student with a Black Female Teacher

WFWMT -- White Female Student with a White Male Teacher

WFWFT -- White Female Student with a White Female Teacher

WFBMT -- White Female Student with a Black Male Teacher

WFBFT -- White Female Student with a Black Female Teacher

BMWMT -- Black Male Student with a White Male Teacher

BMwFT -- Black Male Student with a White Female Teacher

BMBMT -- Black Male Student with a Black Male Teacher

BMBFT -- Black Male Student with a Black Female Teacher

BFWMT -- Black Female Student with a White Male Teacher

BFWFT -- Black Female Student with a White Female Teacher

BFBMT -- Black Female Student with a Black Male Teacher

BFBFT -- Black Female Student with a Black Female Teacher.

Table 2
Characteristics of the Student Population
Available for Analysis

	State Sample		Black Sample	
	Grade Four	Grade Five	Grade Four	Grade Five
WMWMT	261	408	0	6
WMWFT	1145	1124	15	11
WMBMT	0	0	7	7
WMBFT	0	43	12	8
WFWMT	267	342	1	2
WFWFT	1079	1060	9	14
WFBMT	0	0	6	63
WFBFT	99	32	17	14
BMWMT	22	17	27	67
BMWFT	102	95	139	141
BMBMT	15	56	4	65
BMBFT	195	184	513	350
BFWMT	30	26	17	50
BFWFT	106	101	178	157
BFBMT	10	51	3	84
BFBFT	189	151	463	363
TOTAL	3520	3690	1411	2753

It should be noted that where there were more than 200 subjects, as in the case for black male students with black female teachers, a randomly selected sub-sample of 200 subjects was taken. This was due to the capacity restrictions imposed by the data processing system upon which the analysis of the data was conducted.

Table 3 presents the characteristics of the teachers who met the requirements for inclusion in this research.[1]

Table 3

Characteristics of the Teacher Population Available for Analysis

	State Sample		Black Sample	
	N	%	N	%
White Males	65	20.3	8	6.7
White Females	212	66.3	28	23.3
Black Males	5	1.6	10	8.3
Black Females	38	11.8	74	61.7
TOTAL	320	100.0	120	100.0

[1]It is interesting to note that female teachers dominate, regardless of the racial composition of the school. This supports the common assumption that most elementary school teachers are women. Also, it is interesting that approximately sixty percent of the teachers are women whose race matched that of the majority of the students in the school. From this information it appears that black teachers are being trained, but are rarely employed in schools which are other than majority-black. It seems that the "separate but equal" attitude still prevails among the Boards of Education in Michigan.

Another interesting fact is that there are fewer black male teachers in state sample schools than there are white male teachers in majority-black schools. The causal factors behind this phenomenon are beyond the investigative scope of this research.

As was noted previously, seven of the schools comprising the state sample were schools with a majority of black students. These schools contained approximately 90% black students. The remaining sixty-one schools contained approximately 95 percent white students. In considering the results of the analyses which are to follow, this fact must be kept in mind. Any comparisons between black and white students must be done cautiously, since the black students in the state sample are almost entirely located within these seven schools. Had the factor of the school been controlled for, these comparisons would be possible; however, this is not the case, and any such comparisons must be only tentatively advanced.

ADMINISTRATION OF THE STUDENT QUESTIONNAIRE

A trained staff of research personnel administered the questionnaires in each school. Each teacher of a fourth or fifth grade classroom was asked to respond to the teacher questionnaire at the same time that her or his class was administered the questionnaire. Teachers were asked to leave the classroom while the questionnaire was being administered to their students to preclude any possible interaction with the students. The students completed the questionnaires on their own, with the research personnel assisting as needed. All data was collected during the 1974-1975 academic year.

Obtaining the Student Climate Score

After the student data was sorted, the school climate score was obtained for each student. These scores were then keypunched on cards to be used in the statistical programs.

When there were more than 200 students in a group, a random sub-sample of that size was made. Two-hundred was selected as a sample size for two reasons. First, a sample or sub-sample greater than a size of 200 adds little to the precision and accuracy of the data analysis techniques. Second, the capacity of the analysis system, as previously noted, was such that a maximum of 200 subjects per group was possible.

Analysis

Once the student's perception of the school social climate was determined, two statistical tests were performed on the scores. First, a two-factor analysis of variance (ANOVA) with equal replications was performed for the state sample. The design of this test was a 4 X 4 design -- four student sex and race categories by four teacher sex and race categories. The hypotheses previously stated were tested by means of post hoc comparisons.

Second, a series of one-factor ANOVA tests were performed. Through analyzing the perceptions of each of the student sex and race groups separately with regard to the teacher sex and race categories (the treatment levels) a combination, or combinations, of groups could be identified as exhibiting extremely positive or extremely negative perceptions of the school climate. Each of these analysis procedures was repeated for the black sample.

RESULTS

School Social Climate

State Sample

The first analyses conducted were the two-factor ANOVA tests for the fourth and fifth grades. The results for the fourth grade are shown in Table 4; those for the fifth grade in Table 5. In the ANOVA test results reported throughout this thesis, the following abbreviations and notations are used:

SS -- Sum of Squares for a source of variation listed

df -- degrees of freedom

MS -- Mean Square for a source of variation

F -- The value of the F-Statistic calculated for a source of variation listed.

Table 4
Two-Factor ANOVA Test of Student Perception of School Social Climate by Teacher Sex and Race, Grade Four, State Sample*

Source	SS	df	MS	F
Students	10.505	3	3.500	205.88**
Teachers	7.400	3	2.470	145.29**
Interaction	9.165	9	3.055	179.71**
Error	23.100	114#	0.017	
Total	50.170	129		

*unweighted-means analysis
**significant at the 0.001 level
#there were ten replications per cell

Since there were empty cells in the design, those for white male students with black female teachers and for white female students with black female teachers, the unweighted means analysis, as described by Glass and Stanley (1970, pp. 439-443) was used

Table 5
Two-Factor ANOVA Test of Student Perception of School Social Climate by Teacher Sex and Race, Grade Five, State Sample*

Source	SS	df	MS	F
Students	3.545	3	1.1820	157.60**
Teachers	6.768	3	2.2560	300.80**
Interaction	7.229	9	0.8030	107.07**
Error	31.880	222#	0.0075	
Total	49.422	237		

*unweighted-means analysis
**significant at the 0.001 level
#there were seventeen replications per cell

The unweighted-means analysis was again used to generate the results presented in Table 5, since the white male student with black male teacher and white female student with black male teacher cells were empty.

The results reported in both Table 4 and Table 5 present significance for both main effects -- those due to student sex and race and those due to teacher sex and race -- and also for the interaction of these two effects. Generally, significance at the 0 05 level is required for further analysis of results. The present results indicate that further analysis is appropriate.

In an attempt to determine which levels of these factors contribute most to the statistical significance, Tukey post hoc comparisons were performed for each main effect.

Table 6 indicates the values of the comparisons for the student effect for grade five. The value tabulated is the difference between the means of the two groups in the comparison. A confidence interval around this difference is established using the formula

$$\pm\ q_{I,\ N-IJ}(1-\alpha)\sqrt{MSerr/Jn}$$

where q is the value for the "studentized range statistic" at the appropriate level of significance with I (number of rows) and N (total number of subjects in the test) less IJ (number of rows times the number of columns) degrees of

freedom. MSerr is the mean square error taken from the appropriate ANOVA table, and Jn is the number of columns in the design multiplied by the number of replications per cell. The value from this formula for the comparisons

Table 6
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of School Social Climate Grade Five, State Sample

	WM	WF	BM	BF
White Male	--	-0.02	-0.18*	-0.2*
White Female	--	--	-0.16*	-0.18*
Black Male	--	--	--	-0.02
Black Female	--	--	--	--

*significant at an overall level of 0.05

presented in Table 6 is 0.049. Those values indicated (*) as being significant are those for which the confidence interval did not contain zero. If zero is contained in the confidence interval the results may not be considered statistically significant (Glass and Stanley, 1970, p. 385).

It appears in examining Table 6 that black male students do not differ from black female students, nor do white male students differ from white female students in their perceptions of the school social climate. The remaining values indicate differences which appear to be predominantly related to the race of the student.

Table 7 presents the results of the comparisons for the teacher effect in grade five. The confidence interval around these values is set again by the value 0.049.

Table 7
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of School Social Climate Grade Five, State Sample

	WM	WF	BM	BF
White Male	--	-0.01	-0.16*	-0.07*
White Female	--	--	-0.15*	-0.06*
Black Male	--	--	--	-0.09*
Black Female	--	--	--	--

*significant at an overall level of 0.05

It may be seen that there are differences for students with all types of teachers except for those with white male or white female teachers in the perception of school social climate. Evidently, teacher sex and race have an influence on perceiving school climate in the fifth grade.

Turning now to the fourth grade students, Table 8 indicates the comparisons for the student effects. In this case, the confidence interval is set by the value 0.102.

Table 8
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of School Social Climate Grade Four, State Sample

	WM	WF	BM	BF
White Male	--	-0.017	-0.375*	-0.400*
White Female	--	--	-0.358*	-0.383*
Black Male	--	--	--	-0.025
Black Female	--	--	--	--

* significant at an overall level of 0.05

Again, as was the case for student effects presented for grade four in Table 6, the difference appears to be along the lines of race. White male students and white female students, as well as black male students and black female students, appear not to differ in the way in which they perceive the school social climate.

Table 9 presents the comparisons for the teacher effect for grade four. Again, the confidence interval is determined by the value 0.102.

Table 9
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of School Social Climate Grade Four, State Sample

	WM	WF	BM	BF
White Male	--	0.100	-0.045	0.075
White Female	--	--	-1.450*	-0.025
Black Male	--	--	--	0.120*
Black Female	--	--	--	--

*significant at an overall level of 0.05

There appears to be an interaction present in these comparisons. Students with white female teachers differ only from those with black male teachers, and those students with black male teachers differ from those with black female teachers as regards the student perception of the school social climate.

When these tests of two-factor ANOVA had been conducted, a series of one-factor ANOVA tests were conducted. A test was made for each race and sex group among the students for both fourth and fifth grades. The "treatment levels" were the four teacher race and sex categories.

A total of four tests were performed for each grade level. The level of significance was initially set at the 0.10 level. None of these tests yielded statistically significant results. The tables showing these results may be found in Appendix B. This seems to indicate that it is not possible to determine the effects of teacher sex and race for specific categories of students.

Black Sample

As with the state sample, the first analyses performed on the black sample were the two-factor ANOVA tests for both the fourth and fifth grade. The results for the fourth grade are presented in Table 10, while those for the fifth grade are presented in Table 11.

Table 10
Two-Factor ANOVA Test of Student Perception of School Social Climate by Teacher Sex and Race, Grade Four, Black Sample*

Source	SS	df	MS	F
Students	2.389	3	0.796	5.81**
Teachers	2.921	3	3.097	22.61***
Interaction	7.421	9	0.825	6.02***
Error	12.330	26#	0.137	
Total	31.431	41		

*unweighted-means analysis

#there were three replications per cell

**significant at 0.005 level

***significant at 0.001 level

Table 11
Two-Factor ANOVA Test of Student Perception of School Social Climate by Teacher Sex and Race, Grade Five, Black Sample

Source	SS	df	MS	F
Students	0.625	3	0.208	1.11
Teachers	0.125	3	0.042	0.22
Interaction	3.125	9	0.347	1.85*
Error	3.000	16#	0.188	
Total	6.875	31		

* significant at the 0.25 level
# there were two replications per cell

As in the state sample, some cells were empty, and the unweighted-means analysis was used. This was the case for the fourth grade, where the white male students with white

male teachers and white female students with white male teachers cells had no observations. For grade five, though, it was possible to have a completely crossed design. Thus, the standard two-factor ANOVA was performed on this data.

For the fourth grade, as shown in Table 10, there is significance for the two main effects, as well as for the interaction of these two factors. Since this is significant at the 0.001 level, further analysis is appropriate.

For the fifth grade, as presented in Table 11, however, there is significance, which is, at best, only marginal, for the interaction between the two factors. This should be viewed as possibly indicating a trend, which would require further data to be strengthened.

In an effect to determine the location of the differences for the fourth grade, Tukey post hoc comparisons were performed according to the procedure previously outlined.

Table 12 contains the results of these comparisons for the student effect. In this case, the confidence interval in determined by the value 0.569.

Table 12
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of School Social Climate Grade Four, Black Sample

	WM	WF	BM	BF
White Male	--	-0.330	-0.055	-0.140
White Female	--	--	0.275	0.190
Black Male	--	--	--	-0.085
Black Female	--	--	--	--

*tested at an overall level of 0.05

In examining this table, it can be seen that none of these comparisons yields a statistically significant result. However, there does appear to be a trend toward a difference between white female students and black male students. If a larger sample were available, this set of comparisons would, most likely, have yielded significant results.

Table 13 presents the results of the comparisons of the teacher effect in the perception of the school climate for the fourth grade. The confidence interval was again set by the value 0.569. As was the case for the comparisons of student effects, there are no significant differences at the 0.05 level. A trend towards a difference between students with white male teachers and those with white female teachers, as well as for white male teachers and those with black male teachers, may be noted, though. Again, if a larger sample were available this quite possibly could have yielded a significant result.

Table 13
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of School Social Climate Grade Four, Black Sample

	WM	WF	BM	BF
White Male	--	-0.240	-0.250	-0.333
White Female	--	--	-0.010	-0.093
Black Male	--	--	--	-0.083
Black Female	--	--	--	--

*tested at an overall level of 0.05

No comparisons were possible for the fifth grade of the black sample, since post hoc comparisons may only be conducted when the omnibus F-test yields a statistically significant result (Glass and Stanley, 1970, p. 381).

As was the case when analyzing the state sample, a series of one-factor ANOVA tests were performed on the students in the black sample. Again, there were no significant results. The results of these tests are presented in the tables in Appendix C.

Two trends were noted, however. First, white male students yielded a "significant" result at the 0.25 level. Further, black male students in grade four yielded a "Significant" result, again at the 0.25 level. While these relationships are by no means sufficiently strong, they do indicate a direction in which differences may be detected in future research.

Student Sense of Academic Futility

The research by Brookover et al. (1976, 1977) reported that the first student climate variable, named the Student Sense of Academic Futility, contributed most to the explanation of variance in academic achievement. Thus, after analyzing the perception of the overall school climate by students, it was decided to conduct a second series of analyses using the sense of academic futility variable alone. Total scores were used in this analysis. Thus, a low score on the sense of futility variable signifies a high sense of academic futility. A high sense of futility is translated into a less positive perception of the school climate. The hypotheses previously stated in connection with the overall perception of the school social climate are also applicable to the sense of futility variable. Since the sense of futility is such a major factor in the overall social climate of the school, it is expected that the relationships present in the perception of school climate will also be present in the perception of academic futility.

State Sample

The pattern of analysis was identical to that performed on the overall perception of the social climate. Thus, a two-factor ANOVA test was conducted for each grade level. The unweighted-means analysis was again used for these tests.

The results for the fourth grade are shown in Table 14, while those for the fifth grade are presented in Table 15.

Table 14
Two-Factor ANOVA Test of Student Sense of Academic Futility by Teacher Sex and Race, Grade Four, State Sample*

Source	SS	df	MS	F
Students	764.555	3	254.852	48.22**
Teachers	911.395	3	303.798	57.48**
Interaction	2055.275	9	228.364	43.21**
Error	7410.400	114#	5.285	
Total	11441.625	129		

*unweighted-means analysis
**significant at the 0.001 level
#there were ten replications per cell

Table 15
Two-Factor ANOVA Test of Student Sense of Academic Futility by Teacher Sex and Race, Grade Five, State Sample*

Source	SS	df	MS	F
Students	89.94	3	29.98	8.397**
Teachers	1393.95	3	447.98	125.485**
Interaction	1371.03	9	152.34	42.672**
Error	15314.36	222#	3.57	
Total	18119.28	237		

*unweighted-means analysis
**significant at the 0.001 level
#there were seventeen replications per cell

The results presented in both Table 14 and Table 15 indicate significance for both main effects as well as for the interaction of these factors. Again, the relationships are significant at the 0.001 level.

Tukey post hoc comparisons were again conducted for the significant main effects. In Table 16, the results for the comparisons of the student effect for the fourth grade are presented. The confidence interval for these values is set by the value 1.789.

Table 16
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of the Sense of Academic Futility, Grade Four, State Sample

	WM	WF	BM	BF
White Male	--	-3.2*	2.25*	4.1*
White Female	--	--	5.45*	7.3*
Black Male	--	--	--	1.85*
Black Female	--	--	--	--

*significant at an overall level of 0.05

An examination of Table 16 reveals that there are differences in the sense of academic futility felt by students according to student race and sex. White male students, it seems, sense more futility than do white female students. The remaining results seem to coincide with the general results reported by Brookover et at. (1977).

Table 17 presents the results of the comparisons of teacher effects in the fourth grade. Again, the confidence interval is determined by the value 1.789.

Table 17
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of the Sense of Academic Futility, Grade Four, State Sample

	WM	WF	BM	BF
White Male	--	-0.72	-0.10	-2.22*
White Female	--	--	0.62	-1.50
Black Male	--	--	--	-2.12*
Black Female	--	--	--	--

*significant at an overall level of 0.05

These results seem to indicate that the teacher effect is related in a differential pattern. Those students with white male teachers sense more futility than do those students with black female teachers. Also those students with black male teachers seem to sense more futility than do students with black female teachers. The trend for students with white female teachers to have more futility than those with black female teachers, when combined with the two significant results, seem to indicate that black female teachers, somehow, evoke less futility in their students than do the other categories of teachers, at least in this instance.

Table 18 presents the results obtained when comparing the student effect for the fifth grade. In this case, the confidence interval is established by the value 1.075.

Table 18
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of the Sense of Academic Futility, Grade Five, State Sample

	WM	WF	BM	BF
White Male	--	-0.41	5.27*	6.07*
White Female	--	--	5.68*	6.48*
Black Male	--	--	--	0.80
Black Female	--	--	--	--

*Significant at an overall level of 0.05

Once again, the differences appear to be along the dimension of race. White female students and white male students appear not to be different, while the same appears to be true for black male students and black female students.

Table 19 presents the comparisons for teacher effects in the fourth grade. Again, the confidence interval is established by the value 1.075.

Table 19
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of the Sense of Academic Futility, Grade Five, State Sample

	WM	WF	BM	BF
White Male	--	-1.75*	1.92*	-1.05
White Female	--	--	3.67*	0.70
Black Male	--	--	--	-2.97*
Black Female	--	--	--	--

*Significant at an overall level of 0.05

This table presents some interesting results. Those students with white male teachers differ in the perceived sense of futility from all other students except for those with black female teachers. Those students with white female teachers differ only from those with black male teachers, while those students with black male teachers appear to differ only from those students with black female teachers. It appears, in light of a lack of pattern in the differences, that there is an interaction of race and sex influencing the teacher effects for the fifth grade of the state sample on the perception of academic futility.

Black Sample

As with the state sample, two-factor ANOVA tests were performed on the sense of academic futility variable in the black sample. The results of the analysis for grade four is presented in Table 20; those for the analysis of the fifth grade are in Table 21.

Table 20
Two-Factor ANOVA Test of Student Sense of Academic Futility by Teacher Sex and Race, Grade Four, Black Sample*

Source	SS	df	MS	F
Students	544.459	3	181.486	19.066**
Teachers	1083.310	3	361.103	37.935**
Interaction	1155.885	9	128.430	13.492**
Error	889.334	27#	9.519	
Total	3672.988	41		

*unweighted-means analysis
**significant at the 0.001 level
#there were three replications per cell

As in previous cases, empty cells were present for the fourth grade test, so the unweighted-means analysis was performed. Table 20 reveals a significant relationship for both main effects and also for the interaction of these factors at the 0.001 level.

Table 21
Two-Factor ANOVA Test of Student Sense of Academic Futility by Teacher Sex and Race, Grade Five, Black Sample

Source	SS	df	MS	F
Students	95.60	3	31.87	0.529
Teachers	174.60	3	58.03	0.965
Interaction	70.27	9	7.81	0.129
Error	962.50	16#	60.16	
Total	1302.47	31		

*tested at the 0.05 level
#there were two replications per cell

There is no significance in any of the results for the fifth grade as presented in Table 21. It may be concluded that, for the fifth grade of the black sample, there is no difference in the sense of academic futility related to the sex and race of the student, the sex and race of the teacher, or an interaction of the two factors. Hence, no further analysis of this data is possible.

For the fourth grade of the black sample, however, post hoc comparisons are possible. Table 22 contains the results of comparisons of the student effect. The confidence intervalls around the tabulated values are set by the value 4.73.

Table 22
Values for Tukey Post Hoc Comparisons of Student Effects in the Perception of the Sense of Academic Futility, Grade Four, Black Sample

	WM	WF	BM	BF
White Male	--	6.44*	-0.725	4.272
White Female	--	--	-7.165*	-2.168
Black Male	--	--	--	4.997*
Black Female	--	--	--	--

*significant at an overall level of 0.05

These results seem to signify an interaction between sex and race. White male students differ from white female students in such a way that white female students would appear to sense more futility than white male students. However, white female students differ from black male students in such a way that it would appear that the black male

students sense more futility than the white female students. Finally, black male students appear to have less futility than black female students. It would seem that the classroom factors would be of tantamount importance here.

Presented in Table 23 are the results of the comparisons for the teacher effects. The confidence interval is again determined by the value 4.73. It may be seen in the lack of significance for any of these comparisons that the teacher race and sex has no significant relationship upon the sense of futility of fourth grade students in majority-black schools. If the results in Table 23 are combined with

Table 23
Values for Tukey Post Hoc Comparisons of Teacher Effects in the Perception of the Sense of Academic Futility, Grade Four, State Sample

	WM	WF	BM	BF
White Male	--	-0.75	1.502	1.498
White Female	--	--	2.552	-0.748
Black Male	--	--	--	-3.000
Black Female	--	--	--	--

*tested at an overall level of 0.05

those in Table 13, it appears that the sex and race of the teacher have little relationship to perception of the social factors within the classroom for the fourth grade of majority-black elementary schools.

DISCUSSION

This research has attempted to expand upon the research previously carried out by Brookover et al. (1976, 1977) and contribute to the understanding of differences in the perception of school social climate by students with different sex and race characteristics.

The hypotheses previously stated may be evaluated by using the Scheffe technique of post hoc comparisons. This technique is more powerful than the Tukey technique when performing multiple comparisons, and has the additional advantage of yielding a shorter confidence interval than the Tukey method, which makes detection of differences easier (Glass and Stanley, 1970, p. 397).

Hypothesis 1 may be evaluated for both the overall perception of the school social climate and for the sense of academic futility. To do this, the first and third groups (white male students and black male students) may be averaged, and the average of the second and fourth groups (white female students and black female students) subtracted from it. The confidence interval for this contract is determined by the formula

$$\pm \sqrt{MSerr \left(\frac{c_1^2}{n_1}+\frac{c_2^2}{n_2}\right)} \sqrt{(I-1),(I-\alpha)F_{I-1,(N-IJ)}} .$$

C_1 and c_2 are the weights applied to each component of the contrast. Unless otherwise noted, all comparisons are made at the 0.05 level of significance.

Using the multiple comparison method detailed by Glass and Stanley (1970, p. 455) a value of -0.021 was obtained for the fourth grade of the state sample on the measure of overall perception of the school social climate. The confidence interval (-0.054, 0.012) around this value is determined by the value 0.033. Since zero is contained in this interval, the test is not significant. Thus, for the fourth grade there is no difference in the perception of school social climate between male and female students. The trend, as indicated by the negative direction of the comparison value, is for female students to have a more positive perception of the school climate than male students.

For the fifth grade of the state sample, this comparison yields a value of -0.02. The confidence interval around this value, set by the value 0.016, is (-0.036, -0.04). This indicates that for the fifth grade of the state sample female students have a more positive perception of the school climate than do male students. Thus, the hypothesis that there are no differences must be rejected. There does appear to be a difference in the perception of school climate between the sexes.

In the fourth grade of the black sample, the value -0.207 results from the comparison. The value 0.17 determines a confidence interval of (-0.377, -0.037) around this value. Thus, the hypothesis must be rejected. There is a difference in perception of school climate, and female

students appear to have a more positive perception of the school climate than do male students.

In the fifth grade of the black sample, the comparison yielded a value of zero. Thus, there is no difference in the perception of school social climate between male and female students, and the hypothesis must be retained.

Examining these results together, there is a definite difference present in the fourth grade of the black sample and the fifth grade of the state sample. Taken together with the trend noted for the fourth grade of the state sample, it may be concluded that there is a difference in the perception of the school social climate related to the sex of the student. Female students, both black and white, have a more positive perception of the school social climate than do male students.

When comparing differences in the sense of academic futility, the comparison between male and female students for the fourth grade of the random state sample yields a value of -0.675. The confidence interval set by the value 0.58 is (-1.255, -0.095). The hypothesis must be rejected. There is a difference in the sense of futility between male and female students. Remembering that a <u>low</u> score on the sense of futility variable indicates a <u>high</u> sense of futility, it may be seen that male students sense more futility than female students in this situation.

For the fifth grade of the state sample, the result of the contrast is -0.20. The confidence interval (-0.143, 0.543) is determined by the value 0.343. Since zero is contained in this interval, the hypothesis must be retained. There appear to be no differences, in this situation, in the sense of futility between male and female students.

The comparison for the fourth grade of the black sample yields a value of 5.73. The value 1.42 sets a confidence interval of (4.31, 7.15) around the comparison. Thus, the hypothesis may be rejected. It appears that, in this situation, male students have less futility than do female students.

In the fifth grade of the black sample no test is possible due to the lack of statistical significance previously noted.

Taken together, it appears that there is a difference in the sense of futility related to the sex of the student, but only for the fourth grade. In each sample, the sex exhibiting more futility differs. For the random state sample, male students have more futility, while in the black sample male students have less futility than female students. It would appear that there is an interaction between sex and race or grade level at work in this situation.

Hypothesis 2 may also be evaluated by a Scheffe comparison. To do this, the average of the third and fourth groups (black male students and black female students) is subtracted from the average of the first two groups (white male students and white female students).

For the fourth grade of the state sample, this contrast yields a value of -0.3785. The value 0.0337 sets a confidence interval of (-0.4122, -0.3448) around this value. It may be seen that, from this result, the hypothesis may be rejected. There is a difference in the perception of the school social climate, and black students have a more positive perception of school climate than do white students in this grade level of the random sample.

The comparison for the fifth grade of the state sample yields a value of -0.18 The value 0.011 sets the confidence interval (-0.191,-0.169). Again, there is a difference related to the race of the student, and the hypothesis may be rejected. Black students in the fifth grade of the state sample also have a more positive perception than do white students.

In the black sample, the comparison for the fourth grade yields a value of 0.067 The confidence interval (-0.105, 0.239) is determined by the value 0.172. This is not significant, so the hypothesis must be retained. However, the trend indicated by the positive direction of the contrast is for white students in the majority-black schools to have a more positive perception of the school climate than the black students.

Due to the lack of statistical significance for the fifth grade of the black sample, this hypothesis may not be evaluated.

It must be remembered that the black students in the state sample are largely located in the seven majority-black

schools. Thus, a statement as to minority status in these schools may not be made. However, it may be noted that white students in majority-black schools tend to have a more positive perception of school climate than black students. It is interesting that black students, represented in the random sample, have a more positive perception of school climate, and that this relationship does not carry over to the schools of the black sample. It may be stated, then, that black students in a random sample of schools have a more positive perception of the school social climate, for both the fourth and fifth grades, while white students tend to have a more positive perception of school climate in majority-black schools. This was noted by Coleman et al (1966) regarding the sense of control variable, but it now appears that the overall perception of the school climate also fits this pattern.

When comparing the relationship between race and the sense of futility, the comparison for the fourth grade of the state sample yields a value of 4.775. The confidence (4.178, 5.372) set by the value 0.597 is significant, and the hypothesis may be rejected. Since the direction is positive, black students have a higher sense of academic futility than do white students in a random sample of schools.

In the fifth grade, the contrast yields the value 5.88 The value 0.343 sets a confidence interval of

(5.537, 6.223) around the contrast. Again, black students have a higher sense of futility than do white students.

In the black sample, however, things are different. In the fourth grade of this sample, the contrast yields a value of -1.446. The confidence interval around this contrast is set by the value 1.42, and is (-2.866, -0.026). In this case, black students have less futility, and the white students have a higher sense of futility. The fifth grade results are not available due to lack of significance in the overall test.

Taken together, these results indicate that the hypothesis of no difference must be rejected. There does appear to be a difference in the sense of futility related to the race of the student, and this difference is as would be expected. White students in the majority-black schools exhibit more futility than do black students. Also, black students in the random sample of schools have more futility than do the white students in these schools.

Hypothesis 3 may also be evaluated by the Scheffe technique. In order to test the hypothesized direction of the interaction, weights were assigned. Since the weights in a multiple comparison must sum to zero, a weight of six was assigned to white male students, a weight of three to white female students, a weight of two to black female students, and a weight of one to black male students.

The comparison for the fourth grade of the state sample yielded a value of -1.226. The confidence interval (-1.773, -0.679) around this value is set by the value 0.547. Since zero is not in the interval, the hypothesis may be rejected. There does appear to be a difference in the perception of school climate related to an interaction of the race and sex of the student. However, the negative direction of the comparison value indicates that the hypothesized order must be retained.

Comparing the groups in the fifth grade of the state sample yields the value -0.64. The value 0.239 sets the confidence interval (-0.879, -0.401) around this value. Once again, the hypothesis as to an interaction may be rejected, while that aspect dealing with the order must be retained.

In analyzing the fourth grade of the black sample, the comparison results in the value -1.325. The value 2.576 sets a confidence interval of (-3.895, 1.245) around this comparison. Since zero is contained within this interval, the results are not significant, and the hypothesis must be retained.

Again, no test was possible for the fifth grade of the black sample.

On the whole, this is a weak hypothesis regarding the perception of school climate. It appears from the significant results and from the trends where the results are not significant, that there is an interaction of student sex

and student race related to the perception of school social climate. However, the order of the relationships must be retained as hypothesized.

For the sense of academic futility variable, the comparison for the state sample at the fourth grade level results in a value of -0.85. The confidence interval around this value (-10.726, 9.026) is set by the value 9.876. Since this interval contains zero, the hypothesis must be retained.

In the fifth grade of the state sample, the contrast results in the value 16.18. The value 4.562 sets a confidence interval of (11.618, 20.742) around the contrast. This is a significant result, and the hypothesis may be rejected. Further, the direction indicates that the order of the interaction, as hypothesized, may also be rejected.

There does appear to be a difference in the sense of futility for fifth grade students in a random sample of schools related to an interaction of their sex and racial characteristics.

For the black sample, the comparison at the fourth grade level results in a value of 27.139. The value 21.46 sets a confidence interval of (5.679, 58.599) around this value. Again, the hypothesis may be rejected in its entirety. For this situation, there is a difference in the sense of futility related to an interaction of the sex and race of the students. The hypothesized direction of

this interaction is also rejected. No test was possible for the fifth grade of the black sample.

Taken as a whole, these results indicate that there is a difference in the sense of futility related to an interaction between student sex and race. The conditions in which the entire hypothesis may be rejected are those of the fifth grade of the random sample of schools and the fourth grade of the black sample of schools. Since the results are significant at different grade levels, it could be that the age of the student, or, perhaps, the grade level are also influencing the sense of academic futility. This is a weak relationship, at best, and should be regarded with caution.

Hypothesis 4 may be evaluated by once again examining the data presented in the various tables of Tukey comparison results.

Table 7 presented the results for these comparisons for the teacher effect in the fifth grade of the state sample on the perception of school social climate. This table indicated that there were differences for all students except for those with white male teachers as compared to white female teachers.

Table 9 showed that, for grade four of the state sample, those students with white female teachers differed from those with black male teachers, and that those with black male teachers also differed from those students with black female teachers in the perception of the school social climate.

The Tukey comparisons for the fourth grade of the black sample were presented in Table 13. Here, there were no comparisons that were significant. No comparisons were possible for the fifth grade of the black sample.

Taken together, there appears to be a difference in the perception of school climate related to the sex and race of the teacher, but only in the random sample of schools comprising the states sample. Teacher sex and race appear not to be related to differences in the perception of school climate in the majority-black schools of the black sample. Thus, the hypothesis may be rejected on the condition that a random sample of schools be analyzed, rather than a random sample of majority-black schools.

With regard to the sense of academic futility, Table 17 presented the Tukey results for the comparison of teacher effects for the fourth grade of the state sample. Only two differences were noted, those between students with white male as compared to black female teachers, and for those students with black male teachers as compared to black female teachers. Table 19 presented the results for the fifth grade of the state sample. Numerous differences may be noted here, with only those students with white male teachers as compared to those with black female teachers, and those with white female teachers compared to black female teachers failing to yield significant differences.

Table 23 failed to yield any significant results in the comparisons for the fourth grade of the black sample, with the conclusion being that the teacher sex and race are not related to differences in the sense of futility. No comparisons were possible for the fifth grade of the black sample.

Taken together, these results indicate that the hypothesis that teacher sex and race are related to the sense of futility may be rejected for the state sample of schools, but must be retained for the black sample. Teacher sex and race explain some of the difference in the students' sense of academic futility, but only in the random sample of schools. As was the case for the perception of the school social climate, the sex and race of the teacher do not appear to be related to the sense of futility for students in the black sample of schools.

Hypothesis 5 may also be examined by looking at previously presented data. However, this may be evaluated only for the majority-black schools. It will be remembered that the greater portion of the black students in the state sample attend the seven majority-black schools that are a part of that sample of schools. Thus, comparisons on the dimension of racial composition between these samples is not possible.

For the overall perception of the social climate in the fourth grade of the black sample, it was found, in the discussion of Hypothesis 2, that white students tended to

have a more positive perception of the school social climate than did the majority-black students.

The state sample, while not totally valid, presents an interesting situation. In both grade four and grade five black students tend to exhibit a more positive perception of the social climate than do white students. Given that most of these black students are in majority-black schools, the question of what it is about the seven schools, taken at random, that is different from the twenty-three schools, also taken at random but from a more restricted universe. While this question may not be addressed in the present research, it presents intriguing possibilities for future research efforts. All that may be noted here is that Hypothesis 5 may be rejected for the fourth grade of the black sample. There is a difference in the perception of school social climate related to the composition of the school, but only for majority-black elementary schools.

For the sense of futility, the same limitations are in force. For the fourth grade of the black sample, white students have a higher sense of futility than do black students. This is as was hypothesized, and the hypothesis must be retained as to the direction of the differences.

Differences related to grade level may also be noted On the overall perception of school climate, in the state sample, the fourth grade students displayed a more positive

perception than did the fifth grade students, with a mean perception of 3.34 to 3.15 for the fifth grade students. For the black sample, this is reversed, and fifth grade students have a more positive perception of the climate, with a mean perception of 3.31 as compared with a mean perception of 3.24 for the fourth grade students.

On the dimension of student sense of academic futility, differences are also noted. The mean futility felt by fourth grade students in the state sample is 38.22, as compared to 38.57 for the fifth grade students. Since a low score indicates high futility, fourth grade students in this sample appear to have slightly more futility than fifth grade students. For the black sample, this pattern is even stronger. Fourth grade students have a mean futility of 37.378, while that for fifth grade students is 38.72. In this sample, fourth grade students have a good deal more futility than do fifth grade students.

Since these scores are not standardized, comparisons between samples and within samples are not valid. However, these figures do show that there are differences on these two dimensions that may be related to the grade level within the school.

This research, taken as a whole, indicates that merely examining a student's sense of academic futility or perception of the school climate as related to achievement of self-concept of academic ability, as was the case in the

Brookover studies (1976, 1977), may not give as true a picture of the influences of race and sex upon these variables. It is believed, on the basis of this research, that the race and sex of the student are of importance in the school, and should be more carefully considered in future research projects.

It is interesting that the results of this research concerning the perception of school climate and the sense of academic futility tend to fall in the same manner as some of Coleman's data fell. In the Coleman Report, black students were found to have a higher sense of control in majority-white than in majority-black schools. This research has shown that white students have more positive perceptions of the school climate when in the minority within majority-black elementary schools. This finding would seem to have important implications for education.

CONCLUSIONS

This research has answered the questions set forth in the introduction, namely, the existence of differences in the perception of school social climate related to the race and sex of students. Two samples of Michigan public elementary school students were analyzed at the fourth and fifth grade levels. Five hypotheses were tested and evaluated. It is now possible to state several conclusions rising from this research.

First, the sex of the student is related to the perception of the school social climate. Specifically, female students consistently have a more positive perception of the school social climate than do male students. The sex of the student is also related to the sense of academic futility, but only in the fourth grade. Male students in a random sample of schools, and female students in a sample of majority-black schools have lower senses of futility.

This conclusion is not in line with the theoretical expectations. It was theorized that male students would be more aggressive in the classroom and would, in this capacity, imitate the teacher and, consequently, have a more positive perception of the school climate. This expectation was supported by the finding of King, Mayer, and Borders-Patterson (1973) within which white male students have more interactions with teachers than do all other students. The studies by Bandura and associates (1961, 1963) also led the author to expect that male students would perceive the school climate more positively. However, from this research, it appears that this is not the case. Female students, in this research, have higher perceptions of the school social climate. Perhaps the lack of male teachers in the education system is the location of this discrepancy. Goebbes and Shore (1975) found that male teachers are more favorably inclined toward male students than are female

teachers, The implication here is that the same is true for female teachers and students. Since 78 percent of the teachers in the state sample, and 85 percent of the teachers in the black sample, are females, this would seem to be a plausible factor. It appears that this research backs up the "feminization of the schools" contention, only now with regard to perception of school climate in addition to achievement differences.

On the dimension of the sense of academic futility no clear pattern is revealed. It would appear that the sex of the student interacts with other variables, such as the racial composition of the school as well as the grade level, in the students' sense of futility by elementary school students.

Second, the race of the student is related to the perception of school social climate. White students in majority-black schools have more positive perceptions of the social climate of the school than the black students do, while black students in a random sample of schools have a more positive perception of the climate than do white students. The race of the student has the expected relationship to the sense of academic futility; black students in majority-black schools and white students in a random sample of schools have lower futility.

This conclusion is also not in line with the theoretical framework. The "reference group" effect often attributed to black students does not seem to be as powerful

a factor in the perception of school climate as was expected. It was hypothesized that black students in majority-black schools would have higher perceptions of school climate than would white students in majority-black schools. From this research, the opposite appears to be true. White students in majority-black schools have higher perceptions of the school social climate than do black students. This seems to fit the general pattern of results found by Coleman et al (1966), where the black students were reported to have higher self-concepts than white students in majority-white schools It appears from this research that the racial identification factor is not as important as the racial composition of the school. It appears that being in the racial "minority" within a school serves to foster a more positive perception of the school climate.

However, the sense of futility is in line with the theory. Black students in majority-black schools and white students in a random sample of schools, 90 percent of which are majority-white schools (95 percent or more white students), have lower senses of academic futility. While this seems to be in line with the identification and imitation theory, it contradicts the results of the Coleman Report. Further research on this question is needed to provide a definite conclusion.

Finally, the sex and race of the classroom teacher are related to the perception of school social climate and the sense of academic futility, but only in the randomly

selected schools. It appears that the race and sex of the teacher are not related to these variables in the majority-black schools.

This finding serves to confuse the situation in the continuing debate over the effects of teacher sex and race upon the students. One side of the argument holds that the sex and the race of the teacher affects the child's performance (Lee and Wolinsky, 1973; Goebbes and Shore, 1975). The other side holds that these characteristics of the teacher have no impact upon the students (Wheeler and Wheeler, 1974; Forslund and Hull, 1974; Good, Sikes, and Brophy, 1973). The present research reveals that the sex and race of the teacher are of importance only in a random sample of schools. Since most of the previously-cited research has used random samples of schools and/or students, the reports of Lee and Wolinsky (1973) and Goebbes and Shore (1975) appear to be substantiated. However, when one looks at only those schools with a majority of black students, in effect controlling for race, the viewpoint held by Wheeler and Wheeler (1974, Forslund and Hull (1974), and Good, Sikes, and Brophy (1973) is substantiated. In light of this confusion, further research is needed to examine the effects of controlling for racial composition.

One fact seems certain from this research, and that is the salience of the classroom as the unit for further research into the nature of school social climate. This research has demonstrated that the school social climate

and sense of academic futility felt by the students are perceived differently by female and male students and by black and white students. The sex and race of the teacher are also of some importance. Future research must focus upon the classroom, in an effort to determine the factors underlying the findings of this research.

APPENDICES

APPENDIX A

QUESTIONS COMPRISING THE SCHOOL SOCIAL CLIMATE SCORE

MEANS AND STANDARD DEVIATIONS OF THE

FIVE STUDENT CLIMATE VARIABLES

APPENDIX A
QUESTIONS COMPRISING THE SCHOOL SOCIAL CLIMATE SCORE

Student Climate 1: Student Sense of Academic Futility

1. How many students in this school don't care if they get bad grades?

Almost all of the Students--1
Most of the Students--2
Half of the Students--3
Some of the Students--4
Almost none of the Students--5

2. How many students in this school make fun or or tease students who get real good grades?

Almost all of the Students--1
Most of the Students--2
Half of the Students--3
Some of the Students--4
None of the Students--5

3. How many students don't do as well as they could do in school because they are afraid other students won't like them as much?

Almost all of the Students--1
Most of the Students--2
About Half of the Students--3
Some of the Students--4
None of the Students--5

4. How many students don't do as well as they could do in school because they are afraid their friends won't like them as much?

Almost all of the Students--1
Most of the Students--2
About Half of the Students--3
Some of the Students--4
None of the Students--5

5. People like will not have much of a chance to do what we want to in life.

Strongly agree--1
Agree--2
Disagree--3
Strongly disagree--4

6. People like me will never do well in school even though we try hard

Strongly agree--1
Agree--2
Disagree--3
Strongly disagree--4

7. I can do well in school if I work hard?
Strongly agree--1
Agree--2
Disagree--3
Strongly disagree--4

8. In this school, students like me don't have any luck.
Strongly agree--1
Agree--2
Disagree--3
Strongly disagree--4

9. You have to be lucky to get good grades in this school
Strongly agree--1
Agree--2
Disagree--3
Strongly disagree--4

10. How many teachers in this school tell students to try and get better grades than their classmates?
Almost all of the teachers--1
Most of the teachers--2
Half of the teachers--3
Some of the teachers--4
Almost none of the teachers--5

11. Of the teachers that you know in this school, how many don't care if the students get bad grades?
Almost all of the teachers--1
Most of the teachers--2
Half of the teachers--3
Some of the teachers--4
Almost none of the teachers--5

12. Of the teachers that you know in this school, how many don't care how hard the students works, as long as he passes?
Almost all of the teachers--1
Most of the teachers--2
Half of the teachers--3
Some of the teachers--4
Almost none of the teachers--5

Student Climate 2: Student Future Evaluations and Expectations

1. If you could go as far as you wanted in school, how far would you like to go?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

2. Sometimes what you want to happen is not what you think will happen How far do you think you will go in school?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

3. If most of the students here could go as far as they wanted in school, how far would they go?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

4. How far do you think your best friend believes you will go in school?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

5. How far do you think the teacher you like the best believes you will go in school?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

6. Does your teacher think you could finish college?

Yes, for sure--1
Yes, probably--2
Maybe--3
Probably not--4
No, for sure--5

7. Remember, you need more than four years of college to be a teacher or doctor. Does your teacher think you could do that?

Yes, for sure--1
Yes, probably--2
Maybe--3
Probably not--4
No, for sure--5

8. How far in school do you think your parents believe you will go?

Finish grade school--1
Go to high school for a while--2
Finish high school--3
Go to college for a while--4
Finish college--5

9. Do your parents think you could finish college?

Yes, for sure--1
Yes, probably--2
Maybe--3
Probably not--4
No, for sure--5

10. Remember, you need more than four years of college to be a teacher or doctor. Do your parents think you could do that?

Yes, for sure--1
Yes, probably--2
Maybe--3
Probably not--4
No, for sure--5

Student Climate 3: Student Perceived Present Evaluations

1. How good a student does the teacher you like the best expect you to be in school?

One of the best--1
Better than most of the students--2
Same as most of the students--3
Not as good as most of the students--4
One of the worst--5

2. Think of your teacher. Would your teacher say you can do school work better, the same or poorer than other people your age?

Better than all of them--1
Better than most of them--2
Same as most of them--3
Poorer than most of them--4
Poorer than all of them--5

3 Would your teacher say that your grades would be with the best, same as most, or below most of the students when you graduate from high school?

One of the best--1
Better than most of the students--2
Same as most of the students--3
Below most of the students--4
One of the worst--5

4 How good a student do your parents expect you to be in school?

One of the best--1
Better than most of the students--2
Same as most of the students--3
Not as good as most of the students--4
One of the worst--5

5. Think of your parents. Do your parents say you can do school work better, the same, or poorer than your friends?

Better than all of them--1
Better than most of them--2
Same as most of them--3
Not as good as most of them--4
One of the worst---5

6 Would your parents say that your grades would be with the best, same as most or below most of the students when you finish high school?

One of the best--1
Better than most of the students--2
Same as most of the students--3
Not as good as most of the students--4
One of the worst--5

Student Climate 4: Student Perception of Teacher Push and Teacher Norms

1 Of the teachers you know in this school, how many tell students to try hard to do better on tests?

Almost all of the teachers--1
Most of the teachers--2
Half of the teachers--3
Some of the teachers--4
Almost none of the teachers--5

2 How often do teachers in this school try to help students who do badly on their school work?

They always try to help--1
They usually try to help--2
They sometimes try to help--3
They seldom try to help--4
They never try to help--5

3. How important is it to teachers in this school that their students learn their school work?

It is the most important thing to the teachers--1
It is very important to the teachers--2
It is somewhat important to the teachers--3
It is not very important to the teachers--4
It is not important to the teachers --5

4. Think about the teachers you know in this school. Do you think the teachers in this school care more, or less, than teachers in other schools about whether or not their students learn their school work?

Teachers in this school care a lot more--1
Teachers in this school care a little more--2
There is no difference --3
Teachers in this school care a little less --4
Teachers in this school care a lot less-5

Student Climate 5: Student Academic Norms

1. How many students in this school try hard to get a good grade on their weekly tests?

Almost all of the students--1
Most of the students--2
Half of the students--3
Some of the students--4
Almost none of the students--5

2. How many students in this school will work hard to get a better grade on the weekly test than their friends do?

Almost all of the students--1
Most of the students--2
Half of the students--3
Some of the students--4
Almost none of the students--5

3. How important do most of the students in this class feel it is to do well in school work?

They feel it is very important--1
They feel it is important--2
They feel it is somewhat important--3
They feel it is not very important--4
They feel it is not important at all--5

4. How important do you think most of the students in this <u>school</u> feel it is to do well in school?

They feel it is very important--1
They feel it is important--2
They feel it is somewhat important--3
They feel it is not very important--4
They feel it is not important at all--5

5. Compared to students in other schools, how much do students in this school learn?

They learn a lot more in this school--1
They learn a little more in this school--2
About the same as in other schools--3
They learn a little bit less in this school--4
They learn a lot less in this school--5

6. Compared to students from other schools, how well will most of the students from this school do in high school?

They will be among the best--1
They will do better than most--2
They will do about the same as most--3
They will do poorer than most--4
They will be among the worst--5

Table 1-a
Mean and Standard Deviation of the Five Student Climate Variables in Two Samples of Michigan Elementary Schools*

Variable	State Sample Mean	State Sample SD	Black Sample Mean	Black Sample SD
Student Climate 1: Student Sense of Academic Futility	45.97	2.11	42.21	1.94
Student Climate 2: Student Future Evaluations and Expectations	42.68	3.60	42.70	3.29
Student Climate 3: Student Perceived Present Evaluations and Expectations	23.11	0.81	24.50	0.66
Student Climate 4: Student Perception of Teacher Push and Teacher Norms	16.63	0.59	16.52	0.70
Student Climate 5: Student Academic Norms	22.81	0.62	27.72	0.83

*Adapted from Brookover et al. (1977, p. 35)

APPENDIX B
STATE SAMPLE ONE-FACTOR ANOVA TABLES

APPENDIX B
STATE SAMPLE ONE-FACTOR ANOVA TABLES

Table 1-b
One-Factor ANOVA Test of Student Perception of School Social Climate, White Male Students Grade Four, State Sample

Source	SS	df	MS	F
Between Teachers	0.0025	1*	0.0025	0.022**
Within Teachers	44.3749	398	0.1115	
Total	44 3774	399		

*there were no black male or black female teachers
**tested at the 0.10 level

Table 2-b
One-Factor ANOVA Test of Student Perception of School Social Climate, White Female Students Grade Four, State Sample

Source	SS	df	MS	F
Between Teachers	0.271	2*	0.136	1.124**
Within Teachers	59.753	496	0.121	
Total	60.024	498		

*there were no black male teachers
**Tested at the 0.10 level

Table 3-b
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Male Students Grade Four, State Sample

Source	SS	df	MS	F
Between Teachers	0.634	3	0.211	0.765**
Within Teachers	85.830	311	0.276	
Total	86.830			

**tested at the level 0.10

Table 4-b
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Female Students Grade Four, State Sample

Source	SS	df	MS	F
Between Teachers	0.468	3	0.156	0.629**
Within Teachers	81.932	331	0.248	
Total	82.400	334		

**tested at the 0.10 level

Table 5-b
One-Factor ANOVA Test of Student Perception of School Social Climate, White Male Students Grade Five, State Sample

Source	SS	df	MS	F
Between Teachers	0.0268	2*	0.0134	0.179**
Within Teachers	33.0723	441	0.0750	
Total	33.0991	443		

*there were no black male teachers
**Tested at the 0.10 level

Table 6-b
One-Factor ANOVA Test of Student Perception of School Social Climate, White Female Students Grade Five, State Sample

Source	SS	df	MS	F
Between Teachers	0.153	2*	0.0765	1.197**
Within Teachers	27.394	429	0.0639	
Total	27.547	431		

*tested were no black male teachers
**tested at the 0.10 level

Table 7-b
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Male Students Grade Five, State Sample

Source	SS	df	MS	F
Between Teachers	0.365	3	0.122	0.731**
Within Teachers	58.034	347	0.167	
Total	58.399	350		

**tested at the 0.10 level

Table 8-b
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Female Students Grade Five, State Sample

Source	SS	df	MS	F
Between Teachers	0.334	3	0.111	0.558**
Within Teachers	64.773	326	0.199	
Total	65.107	329		

**tested at the 0.10 level

APPENDIX C
BLACK SAMPLE ONE-FACTOR ANOVA TABLES

APPENDIX C
BLACK SAMPLE ONE-FACTOR ANOVA TABLES

Table 1-c
One-Factor ANOVA Test of Student Perception of School Social Climate, White Male Students Grade Four, Black Sample

Source	SS	df	MS	F
Between Teachers	0.839	2*	0.42	2.47**
Within Teachers	5.279	31	0.17	
Total	6.118	33		

*there were no white male teachers
**Significant at the 0.25 level

Table 2-c
One-Factor ANOVA Test of Student Perception of School Social Climate, White Female Students Grade Four, Black Sample

Source	SS	df	MS	F
Between Teachers	0.613	3	0.204	1.085**
Within Teachers	5.448	29	0.188	
Total	6.061	32		

**tested at the 0.10 level

Table 3-c
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Male Students Grade Four, Black Sample

Source	SS	df	MS	F
Between Teachers	0.102	3	0.034	1.504**
Within Teachers	82.682	366	0.226	
Total	82.784	369		

**significant at the 0.25 level

Table 4-c
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Female Students Grade Four, Black Sample

Source	SS	df	MS	F
Between Teachers	0.467	3	0.156	0.696**
Within Teachers	88.088	394	0.224	
Total	88.555	397		

**tested at the 0.10 level

Table 5-c
One-Factor ANOVA Test of Student Perception of School Social Climate, White Male Students Grade Five, Black Sample

Source	SS	df	MS	F
Between Teachers	0.101	3	0.034	0.362**
Within Teachers	2.617	28	0.094	
Total	2.718	31		

**tested at the 0.10 level

Table 6-c
One-Factor ANOVA Test of Student Perception of School Social Climate, White Female Students Grade Five, Black Sample

Source	SS	df	MS	F
Between Teachers	0.171	3	0.057	0.35**
Within Teachers	4.738	29	0.163	
Total	4.909	32		

**tested at the 0.10 level

Table 7-c
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Male Students Grade Five, Black Sample

Source	SS	df	MS	F
Between Teachers	0.345	3	0.115	0.55**
Within Teachers	98.019	469	0.209	
Total	98.364	472		

**tested at the 0.10 level

Table 8-c
One-Factor ANOVA Test of Student Perception of School Social Climate, Black Female Students Grade Five, Black Sample

Source	SS	df	MS	F
Between Teachers	0.773	3	0.258	1.296**
Within Teachers	97.064	487	0.199	
Total	97.064	490		

**tested at the 0.10 level

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