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ABSTRACT

The thesis of this paper is that all children, excepting those of certifiable handicap, are educable, and the behavior of the school is critical in determining the quality of that education. Concentrating on several inner city schools in Detroit, this paper discusses the distinguishing characteristics of schools that are instructionally effective for poor children. The emphasis is on alternative approaches to desegregation that could be successful in improving the quality of instruction available to desegregated pupils. Other studies done on institutional effectiveness are referred to and analyzed in terms of their strengths or weaknesses. The performance levels of students in different schools on verbal achievement tests are used as the criteria for analyzing the effectiveness of different schools. Taken into consideration are race and home background of the student sample. Findings concerning the influence of teacher attitudes and characteristics, school characteristics, curriculum, and school influence are presented. (Author/EB)

SEARCH FOR EFFECTIVE SCHOOLS:

THE IDENTIFICATION AND ANALYSIS OF CITY SCHOOLS THAT ARE INSTRUCTIONALLY EFFECTIVE FOR POOR CHILDREN[1]

By Ronald R. Edmonds and John R. Frederiksen

Attaining educational equity in our society requires that all children have access to instructionally effective schools. Our society has not yet attained educational equity and our failure takes two principal forms. Many schools segregate children by race and then deny black pupils equitable distribution of educational resources. Most schools implicitly classify children on the basis of family background, and then express preference for middle-class children and disdain for the poor. Thus, for those of us who seek equity, the most critical policy matters in public education are court-ordered desegregation and effective instruction for poor children. The authors' unstinting opposition to segregation compels them to continue to support court-ordered busing as a means of achieving desegregation. Despite that, we recognize the tactical limitations of busing when educational equity is the objective. Educational equity requires the absence of discriminatory pupil placement and effective classroom instruction for all.

There is no need here to elaborate the divisive and sometimes debilitating impact of court-ordered busing on the social fabric of many important American cities. Boston and Louisville are but the most visible of a half-dozen major metropolitan settings recently torn by the intense emotions and severe dislocation that accompany court-ordered desegregation. Opinion polls, impressionistic educational literature, and academic analyses make clear that the growing loss of public confidence in the equity of court-ordered busing is partly a function of our schools' seeming inability to effectively educate desegregated children who are poor. Moreover, there is a body of recent social science literature (Coleman, Jencks, et al) which can be said to virtually repudiate urban school reform as an instrument of social equity. Thus those of us who seek dramatic improvement in the quality of schooling available to the poor do so in a climate of public frustration and educator dispirit. The experiences of the most recently desegregated cities are not likely to relieve public frustration or raise educator spirits.

These remarks are not meant to offer a scintilla of support to the racism that is principal cause of most city council, school committee, and board of education opposition to desegregation. These remarks are meant to acknowledge the appropriateness of seeking alternative approaches to desegregation that will be more successful in improving the quality of instruction available to desegregated pupils. Desegregation in particular and urban school reform in general would be greatly advanced were we to articulate reliable

means for improving the quality of teaching in schools that serve the urban poor.

Public perspective on these matters must flounder till at least one of two conditions come to pass. An altered political climate may precipitate a renewed quest for greater social justice, in which case we will not have to wait for social science initiative before renewing efforts to make effective schooling independent of pupil family income and social class. What is more likely is that social science research will produce findings that show that instructional effectiveness is a function of certain explicit institutional circumstances that are accessible to any group of educational decisionmakers determined to create and maintain such circumstances.

The annual average per pupil expenditure is rising with no concomitant rise in public acceptance of reported levels of pupil performance. Most public policymakers and educational decisionmakers would therefore eagerly pursue evidence of practical means by which pupil performance might be improved, particularly for those least well-served by existing educational arrangements.

We are surrounded and daily besieged by irresistable evidence of the social pathology that characterizes much of the life of our major institutions. Schools are no exception. Our national need to know of "things that work" has never been greater.

It is at precisely this point in the public policy fray that this discussion seeks to enter. This discussion will describe the authors' efforts to identify and analyze city schools that are instructionally effective for poor and/or minority children. We are pleased to note that we have already developed unusually promising evidence of the thesis we seek to demonstrate in the research under discussion. Our thesis is that all children, excepting only those with certificable handicap, are eminently educable, and the behavior of the school is critical in determining the quality of that education.

The "Search for Effective Schools" project began by answering the question: "Are there schools that are instructionally effective for poor children?" In September of 1974 Lezotte, Edmonds, and Ratner described their analysis of pupil performance in the twenty elementary schools that make up Detroit's Model Cities Neighborhood. (See Lezotte, Edmonds, and Ratner's "Remedy for School Failure to Equitably Deliver Basic School Skills"). All of the schools are located within inner-city Detroit and serve a predominantly poor and minority student population. Reading and math scores were analyzed from Detroit's Spring 1973 use of the Stanford Achievement Test and the Iowa Test of Basic Skills. Of the 10,000 pupils in the twenty schools in the Model Cities' Neighborhood, 2500 were randomly

sampled. With minor variation, the sample included eight pupils per classroom in each of the twenty schools. The mean math and reading scores for the twenty schools were compared with citywide norms. We were primarily interested in whether the data would reveal strong differences in the quality of teaching among the twenty schools. We could thus rely on city-wide performance norms despite the limitations of local standards as a measure of school effectiveness. An effective school among the twenty was defined as being at or above the city average grade equivalent in math and reading. An ineffective school was defined as below the city average. Using these criteria, eight of the twenty schools were judged effective in teaching math. Nine were judged effective in teaching reading and five were judged effective in teaching both math and reading.

Having tentatively established that instructionally effective city schools can be located, we turned to the problem of establishing the relationship between pupil family background and building effectiveness. Two schools among the twenty, Duffield and Bunche, were found that were matched on the basis of eleven social indicators. Duffield pupils averaged nearly four months above the city average in reading and math. Bunche pupils averaged nearly three months below the city reading average and 1.5 months below the city math average. The shared social class characteristics of the pupil populations in both schools are shown in Table 1.

TABLE 1

A COMPARISON OF THE DUFFIELD AND BUNCHE ELEMENTARY SCHOOLS
PUPIL POPULATIONS
ON THE BASIS OF 1970 CENSUS DATA
AND 1973 SCHOOL CHARACTERISTICS

	Duffield	Bunche
Pupils from low economic status	19%	20%
Minority group pupils	97%	99.9%
Minority group staff members	72%	76%
Average class size	22	21
Average pupil attendance	91%	90%
Pupil mobility	30%	42%
Pupils over-age in grades 3-6	22%	51%
Average teacher experience	14 yrs.	9 years
Number of paraprofessionals	3	3
Federal Compensatory Education Title I school eligibility	Eligible	Eligible
State Compensatory Education Chapter 3 pupil eligibility	50%	57%

The similarity in the characteristics of the two pupil populations permits us to infer the importance of school behavior in making pupil performance independent of family background. The overriding point here is that, in and of itself, pupil family background neither causes nor precludes elementary school instructional effectiveness.

Despite our satisfaction with our findings, we recognized the limitations of the Detroit Model Cities' Neighborhood analysis. Our evaluation of school success with poor children had depended on evaluating schools with relatively homogeneous pupil populations. The numbers of schools were too few to justify firm conclusions. Finally, the achievement tests were normative, as was the basis for determining building effectiveness among the twenty schools. Nonetheless, the Model Cities' Neighborhood analysis had served our purposes well by ranking twenty inner city schools on the basis of pupil performance and describing certain of the characteristics of two of those schools.

The second phase of the project was a reanalysis of the 1966 Equal Educational Opportunity Survey (EEOS) data (see John Frederiksen's "School Effectiveness and Equality of Educational Opportunity"). Our purpose was to answer a number of research questions that required a data base both larger and richer than had been available to us in the Model Cities' Neighborhood analysis. We retained our interest in identifying instructionally effective schools for the poor, but in addition we wanted to study the effects of schools on children having different social backgrounds. Such an inquiry would permit us to evaluate school contributions to educational outcomes

independent of our ability to match schools on the basis of the socioeconomic characteristics of their pupils. The final and most important purpose of our reanalysis was a critical examination of earlier studies of school effectiveness that have concluded that pupil performance is principally a function of pupil background characteristics.

Studies of School Effectiveness

It was a belief in the importance of education as a means of social mobility, as well as concerns regarding freedom of access to quality education, that led Congress in 1965 to order the Commissioner of Education to undertake an assessment of the equality of educational opportunity then prevailing among the public schools of the United States (Coleman et al., 1966). That assessment is popularly known as "The Coleman Report."

The report concluded that when pupil social-class and home background were taken into account, little variation in school achievement was left to be accounted for by differences in school programs and facilities. About seven years later, following extensive reanalyses of the EEOS, Mosteller and Moynihan (1972) concluded:

> Given that schools have reached their present levels of quality, the observed variation in schools was reported by EEOR (Equality of Educational Opportunity Report) to have little effect upon school achievement. This actually means a large joint effect owing to both schools and home background (including region, degree of urbanization, socioeconomic status, and ethnic group), little that is unique to schools or homes. (p. 21)

Thus, despite the methodological and statistical concerns which motivated numerous reanalyses of the EEOS (e.g., Armour, 1972;

Cain & Watts, 1970; Hanushek & Kain, 1972; Jencks, 1972; Smith, 1972), Coleman's summary conclusion stood: school characteristics are unrelated to student achievement, once factors of social background have been controlled.

We were prompted to do a reanalysis of the EEOS partly by our belief that too little is understood about what it means to statistically "control" the social background of pupils. Most analysts of the EEOS data divide the total variation in pupils' school achievement into two orthogonal parts: variation between schools, measured by the deviations of school means from the overall grand mean, and variation within schools, based upon the deviations of individual pupils from the mean achievement level for the school taken as a whole. Typical statements are that as much as 90% of the total variation in verbal achievement lies within schools, leaving a maximum variation of only 10% attributable to differences between schools (cf. Mosteller & Moynihan, 1972). If school effects are calculated on the basis of mean pupil achievement levels within a school, it is clear that these school means will in part be determined by the population of pupils enrolled in a particular school and, more specifically, by their home background and social class. Thus, in order to assess the contribution of school programs and characteristics to achievement, data analysts had to adjust the mean achievement scores for each school by an amount (a "school handicap", cf. Coleman, 1975) which is determined by the social class and family background of pupils within the school (cf. Coleman et al., 1966; Jencks, 1972). This was accomplished by regressing mean achievement scores for schools on social background

variables, and taking the residual scores as a measure of school effectiveness adjusted for pupil social background. Thus, social class variables were the first variables entered into the regression analysis. Smith (1972) and others (Hanushek & Kain, 1972; Mayeska et al., 1972, 1973) have criticized this approach on the grounds that, due to covariation between school characteristics and social class variables, removal of the latter set of variables will at the same time remove variance in mean school achievement which is also associated with school characteristics and programs. Mayeske et al. (1972, 1973) developed an alternative, and symmetric, analysis of school achievement which provides separate estimates of the proportion of school-to-school variation associated (1) uniquely with social class variables, (2) uniquely with school variables, and (3) jointly with social class and school characteristics. Their conclusion is that little variation in mean school achievement is uniquely associated with either student social background or school characteristics. For example, in their sixth-grade analysis, 11% of the variation in achievement is uniquely related to background, 5% is uniquely associated with school characteristics, and 71% is associated with the common or indistinguishable influence of school characteristics and student social background. Interestingly, when the school population was stratified according to average socio-economic status (SES) of pupils in each school "the independent role played by the Student Body variables was greater than that of school variables for high SES schools. In contrast, for low SES schools the school variables played a greater independent role than the student body variables (Mayeske et al., 1972, p.67)."

When variables related to social class are not controlled, variation in school achievement that is common to school and social class variables is included in the assessment of school effectiveness, leading to conclusions which are at variance with those of Coleman et al. (1966). Shaycoft (1967), for example, has analysed growth in achievement for high school seniors previously tested in the ninth grade. Growth rates differed for different schools, and discriminant functions revealed a variety of school and community characteristics which differentiate high from low-achieving schools. However, no attempt was made to distinguish"between effects of what the school does and effects of other environmental influences, such as family and community" (Shaycoft, 1967, p. 7)

One of the methods for controlling for the influence of family background is to ensure that the schools being compared have comparable or matched pupil populations. In addition to the analysis of Detroit Model Cities' Neighborhood Schools described earlier, there are two other studies that have used this technique. In the first study (Weber, 1971), four inner-city schools were located that had median third-grade reading scores at or above the national grade norm, and that also had few pupils classified as "nonreaders" in comparison with typical inner-city schools. The schools studied were all nonselective in admissions, located in the central areas of large cities, and attended predominantly by poor children. The four effective schools shared some characteristics which are not ordinarily present in inner-city schools. These included: strong administrative leadership, high expectations for pupils, an orderly atmosphere, strong emphasis on reading, use of

phonics, individualized instruction, and the periodic evaluation of each pupil's progress. Thus, there is evidence that when investigators restrict their attention to a target group of poor children living in the inner city, effective schools can be located which do not differ in terms of pupil family background from other schools which are less effective. However, in this study a set of control schools was not located; thus comparisons were to a set of normative school characteristics thought typical of inner city schools.

In the second study (State of New York, Office of Education Performance Review, March, 1974), two inner city schools serving disadvantaged children were selected on the basis of levels of reading achievement, one having high mean achievement and the other low mean achievement. The two schools were chosen so as to be matched on a variety of student background factors, including race and social class. Differences in pupil achievement in these two schools were attributed to factors judged to be under the school's control, among them administrative policies and practices, plans for reading instruction, characteristics and attitudes of teachers and other professional personnel.

In what is probably the most comprehensive review of evidence for school effectiveness, Averch et al. (1972) have at several points emphasized the possibility that the effects of schools on their students may not be the same for all subgroups of students enrolled in the schools, and have hinted that the failure to take into account differential effects of schools on pupils having different characteristics may account for the inability of

educational researchers to identify effective school programs. They point out, for example, that students attending the same school may receive substantially different amounts of the school's resources. In discussing teacher characteristics, they conclude that teacher expectations are based in part on pupil social class membership (Rist, 1970), that teachers have been found to demand less from children from whom they expect less (Brophy & Good, 1970), and that in the future, "studies of long-term trends in teacher effectiveness must designate which kinds of students the teacher is effective with, as well as how effective he is (p. 60)." Finally, they suggest that "a general failure to match student characteristics with specific educational programs is a major reason for the lack of positive findings in educational research and for the consequent lack of success in defining factors that substantially affect educational outcomes (p. 77)." We suspect that what is needed in the assessment of school effectiveness is an approach which takes into account the interactions between characteristics of pupils and characteristics of the schools they attend.

The design of our reanalysis proceeded from the following premises, which differ from those of our predecessors and represent an attempt to relax past assumptions that may have obscured relationships between school characteristics and pupil performance.

1. Schools are not uniformly effective for all pupils who attend them. A school that is effective in teaching middle-class children may not be effective in teaching poor children. This means that the institutional characteristics associated with effective teaching may vary as a function of the family background and social class of pupils

whose performance is evaluated. Therefore, the assumption of homogeneity of regression equations for subgroups of pupils varying in race and social background will be relaxed, in order to allow for possible interaction between a pupil's family background and the school characteristics that are related to successful pupil performance.

2. Pupil social class and family background have two aspects: they represent characteristics of the individual student, which influence his level of achievement, and (in their distribution) they represent characteristics of the set of pupils attending a given school. These two aspects of social background must be separated in any statistical study of school effectiveness (cf. Mayeske et al., 1973).

3. Conclusions about the existence of effective schools should be non-normative. Our interest, from the standpoint of judging equality of educational opportunity, is not in the proportion of variance in the sample attributable to differences among school means, but rather in demonstrating the existence of some schools that are educationally more effective than others for particular groups of children. Since consistency is one of our criteria for judging effectiveness, an effective school must be shown to be consistently effective for two or more independent groups of pupils having comparable or nearly comparable social backgrounds. This criterion is logically equivalent to that used by Klitgaard and Hall (1973).

4. Conclusions about school effectiveness are tempered by the performance measure employed. Schools that have effective reading

programs may be ineffective in teaching other basic skills. Since our reanalysis was based on a data file containing measures of verbal performance (Jencks, 1972), our results cannot be generalized at this stage to other measures of performance. It should be noted that we are relying on a measure that is usually considered a test of verbal aptitude, rather than a test of achievement. Aptitude tests do not measure skills that are closely related to instructional programs employed in schools, and are considered relatively insensitive to differences among educational programs. This choice of a performance criterion is therefore conservative with regard to the effort to demonstrate the existence of instructionally effective schools.

In addition to the premises above, the following assumptions of Coleman, et. al., (1966) were adopted:

5. School effectiveness (we add, for a given performance measure and for a designated target group of students) can be measured by the average performance of students in the school.

6. The family/social background of an individual student and school response to that background must be taken into account in assessing school effectiveness.

METHODS OF ANALYSIS

Our procedure was to stratify the pupil population into a set of criterion subgroups, as did Guthrie et al. (1971). Our classification of pupils was based on their race and home background.

Separate analyses of school effectiveness were then carried out for each subgroup, using the mean achievement scores for pupil subgroups within each school as measures of school effectiveness. By correlating these measures of effectiveness for all pupil subgroups, we could determine empirically if school effectiveness extends to all pupils, regardless of their social class, or if it is limited to pupils of a single social group. We then examined the effects of peer social class on achievement when individual family background was held constant--by restricting consideration to one subgroup of pupils at a time. Finally, a description of certain characteristics of more effective and less effective schools was attempted, on the basis of the questionnaire responses of teachers and school principals. In this analysis, examination included (1) the social class characteristics of the pupils within a school taken as a whole, (2) teacher attitudes and characteristics, and (3) school programs and characteristics, as revealed in the teacher's and principal's questionnaires.

Subject Population

The source of our data was an intermediate summary file used in earlier analyses of the EEOS (Jencks, 1972). The subject population included sixth grade pupils in northern elementary schools and tested in the EEOS (Coleman, et al., 1966).

Measure of Pupil Performance

The pupil performance measure was a standardized sixth grade verbal achievement test prepared by Educational Testing Service and administered as part of the EEOS.

Identification of Pupil Subgroups

Pupils within each school were stratified into subgroups based on their race (black or white) and their responses to a set of questions about home items, which were included in the EEOS student questionaire. These nine home item questions are reproduced in Table 2. The home index scale is the number of items for which a given child checks "yes". The scale tends to make fine distinctions among the very poor, lumping middle-class children together at the high end of the scale. This is the same home index scale that has been used to define "poor" children in other studies derived from the EEOS data (cf. Armour, 1972; Jencks, 1972; Smith, 1972). Four levels on the home index scale were distinguished: 0-4, 5-6, 7-8, and 9 home items.

Statistical Analysis

For each school, the mean verbal achievement score was calculated for each of eight subgroups of pupils that represent two races and four home-index levels. The schools were then ranked on the basis of the mean performance of the pupils in each subgroup, yielding eight separate rankings of the schools. From these rankings, two points were indentified: the 25th and 75th percentiles. Schools for which the mean achievement of pupils in a given subgroup was above the 75th percentile were considered effective for that subgroup, and schools for which the mean performance was below the 25th percentile were considered ineffective. Consistency in school effectiveness was then investigated by gauging the extent to which the schools were classified as effective for a second independent subgroup of pupils. A statistical test of the independence of these two classifications was then carried out. As an alternative procedure,

TABLE 3

Home Items Scale Used in the EEOS

Does your family have a television set?

(A) Yes
(B) No

Does your family have a telephone?

(A) Yes
(B) No

Does your family have a record player, hi-fi, or stereo?

(A) Yes
(B) No

Does your family have a refrigerator?

(A) Yes
(B) No

Does your family have a dictionary?

(A) Yes
(B) No

Does your family have an encyclopedia?

(A) Yes
(B) No

Does your family have an automobile?

(A) Yes
(B) No

Does your family have a vacuum cleaner?

(A) Yes
(B) No

Does your family get a newspaper every day?

(A) Yes
(B) No

correlations between the mean verbal achievement measures obtained for different subgroups of pupils within schools were calculated. These analyses were designed to reveal the degree of consistency in school effectiveness and the generality of these effects for different classes of pupils.

The relationship between mean verbal performance of subgroups of pupils within a school and school social class variables, teacher variables, and other school characteristics was investigated by (1) comparing the means for each of these additional variables for effective and ineffective schools, and (2) by looking at correlations for each of these variable with mean verbal achievement. These analyses were supplemented in the first case, by discriminant function analyses, and in the second case, by multiple regression analyses. These investigations of the relation of school effectiveness to school and teacher characteristics were conducted separately for each of the eight subclasses of pupils previously identified. A list of the school variables is given in Table 3, along with descriptive statistics for the Northeast sample of schools.

RESULTS

Preliminary analysis sought answers to the following questions.

Question One: Are there Schools That are Instructionally Effective?

The mean levels of verbal performance for each of the eight subgroups of pupils are given in Table 4, along with the standard deviations of distributions of school means, the ranges of school means, and the numbers of schools in our sample having pupils in each category. Also given are the mean, standard deviation, and range for the number of pupils within a school. Note that the identification of a particular criterion group of pupils (e.g., black children

TABLE 3

Descriptive Statistics for Northeast Sample

	Mean	S.D.	Lowest	Highest	N
Poor Social Background					
1. S Percent Black	21.142	29.980	0.0	99.900	812.000
2. *+S Percent White	67.684	34.764	0.0	99.900	812.000
3. S Family Size	6.151	0.700	4.000	8.400	811.000
4. S Percent Family Intact	71.303	16.924	0.0	99.900	812.000
5. S Percent White Collar Black	14.412	24.573	0.0	99.900	812.000
6. S Percent White Collar White	30.216	22.572	0.0	99.900	812.000
7. S Mean Mother's Education	5.598	0.599	2.000	7.789	810.000
8. S Mean Father's Education	4.694	0.727	2.800	9.000	811.000
9. S Expected Length of Schooling	7.398	0.325	5.000	8.000	811.000
10. S Percent Attended Kindergarten	75.494	20.196	0.0	99.900	812.000
11. S Percent Attended Nursery School	14.446	10.971	0.0	73.600	811.000
12. S Percent "No Chance"	11.740	6.441	0.0	36.000	812.000
Teacher Characteristics					
13. T Years to Graduate 4 Year College	52.848	23.269	0.0	99.900	802.000
14. *T Years Experience in Present School	6.154	3.422	0.0	26.000	802.000
15. T Credit Hours Beyond Degree	12.099	5.902	0.0	35.000	802.000
16. T Years Teaching Experience	11.894	4.954	0.0	30.000	802.000
17. T Percent White in College Attended	82.646	17.299	0.0	99.400	802.000
18. T Mean Verbal Score of Teachers	24.179	2.056	6.800	30.000	802.000
19. T Percent Male Teachers	15.422	11.062	0.0	66.700	801.000
20. T Mean Age of Teachers	39.493	5.525	24.000	60.000	802.000
21. T Percent Black Teachers	12.397	22.747	0.0	99.900	802.000
22. *+T Percent White Teachers	87.549	22.721	0.0	99.900	802.000
Teacher Attitudes					
23. T Percent Asked to work in School	36.644	23.507	0.0	99.900	802.000
24. T Percent Prefer Teach Upper Class	13.020	12.648	0.0	83.300	802.000
25. *T Professional Satisfaction	1.618	0.289	0.700	3.000	802.000
26. T Percent Prefer another School	10.146	10.335	0.0	76.900	799.000
27. T Mean Prefer teach Middle Class	2.210	0.288	0.0	3.000	802.000
28. T Mean Prefer teach White	2.950	0.374	0.700	4.000	802.000
29. T Mean Prefer teach High Ability	1.209	0.177	0.0	2.000	802.000
30. T Mean Attitude Towards Busing	0.206	0.245	0.0	2.000	802.000
31. T Mean Attitude Towards Compens. Ed.	1.545	0.232	0.500	2.000	802.000
32. T Mean Journals Read	1.267	0.514	0.0	4.000	802.000
33. T Mean Teachers Committment	2.337	0.496	0.500	4.000	802.000
34. T Mean Preparation time	2.294	0.537	1.000	5.000	802.000

TABLE 3 (Cont.)

Descriptive Statistics for Northeast Sample

	Mean	S.D.	Lowest	Highest	N
Teacher Load					
29. * Percent Teaching Full Load	99.314	1.972	83.300	99.900	802.000
30. * Mean Class Size	29.056	3.523	15.000	40.100	795.000
31. +* Pupils per Teacher	272.252	61.511	0.0	758.000	752.000
School General Characteristics					
32. * Percent Attendance	94.084	3.041	80.000	99.000	782.000
33. * Percent Teaching 1 Ability Group	15.134	16.719	0.0	77.800	802.000
40. +* Tracking	0.392	0.489	0.0	1.000	699.000
41. * Percent Attend Part-Time	2.864	14.781	0.0	100.000	782.000
42. * Racial or Ethnic Tensions	3.656	0.598	1.000	4.000	776.000
43. * Serious Stealing	3.579	0.623	1.000	4.000	776.000
44. +* Years as Principal	10.679	7.896	0.0	34.500	773.000
45. * Length of School Day	4.062	1.063	1.000	9.000	780.000
46. +* Number of Teachers	20.974	10.153	1.000	57.000	743.000
47. * Suspensions	0.427	0.495	0.0	1.000	782.000
48. +* Amount of Homework	1.222	1.026	0.0	7.000	661.000
49. +* School Size	569.348	309.871	5.000	1896.000	746.000
Location					
50. * Rural	0.081	0.273	0.0	1.000	777.000
51. * Small Town	0.042	0.202	0.0	1.000	777.000
52. * Large Town	0.106	0.308	0.0	1.000	782.000
53. * Industrial Suburb	0.022	0.146	0.0	1.000	777.000
54. * City Residential	0.260	0.439	0.0	1.000	777.000
55. * Inner City	0.276	0.447	0.0	1.000	782.000
56. * Residential Suburb	0.208	0.406	0.0	1.000	782.000
Affluence					
57. * Mean Teachers Salary	69.292	8.461	35.000	96.400	802.000
58. +* Land Acres	4.475	3.310	0.0	9.000	743.000
59. * Age of Building	5.076	1.814	1.000	7.000	772.000
Teacher Essentials					
60. +* Consistent Date of Reading Test	3.037	0.975	2.000	7.000	702.000
61. * Ungraded	1.063	0.243	1.000	2.000	778.000
Parents Attitude					
62. * Number Parents at Parents Groups	2.908	0.958	1.000	6.000	775.000

TABLE 3 (cont.)

Descriptive Statistics for Northeast Sample

	Mean	S.D.	Lowest	Highest	N
Testing Programs					
?[illegible] ? Intelligence Tests	3.598	1.110	1.000	5.000	777.000
?[illegible] ? Achievement Tests	4.348	1.829	0.0	9.000	778.000
?[illegible] ? IEP Tests for Teachers	2.579	0.792	1.000	3.000	780.000
School Facilities and Programs					
?[illegible] ? Library	1.265	0.442	1.000	2.000	776.000
?[illegible] ? Music Teacher	2.864	1.480	1.000	5.000	781.000
?[illegible] ? Speech Therapist	2.303	0.782	1.000	5.000	781.000
?[illegible] ? Psychologist	2.862	0.960	1.000	5.000	778.000
?[illegible] ? Guidance Counselor	0.521	1.069	0.0	8.000	778.000
?[illegible] ? Kindergarten	0.858	0.350	0.0	1.000	772.000
?[illegible] ? Nursery School	0.053	0.225	0.0	1.000	769.000
?[illegible] ? Persons Receiving Free Lunch	4.827	12.266	0.0	95.000	782.000
?[illegible] ? Remedial Reading	0.883	1.198	0.0	8.000	778.000
?[illegible] +? Persons in Special Math Courses	2.433	4.587	0.0	27.000	725.000
?[illegible] +? Persons in Special English Course	4.893	6.192	0.0	27.000	726.000
?[illegible] +? Special Low IQ Classes	1.436	0.496	1.000	2.000	768.000
?[illegible] +? Special Behavior Problem Classes	1.809	0.393	1.000	2.000	759.000
?[illegible] +? Held Back Slow Learners	0.463	0.499	0.0	1.000	626.000

* --- Not included in regression analyses
+ --- Not included in discriminant analyses

S--Student Questionnaire
T--Teacher Questionnaire
P--Principal Questionnaire

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Table 4

Verbal scores for Subgroups of Students classified by Race and Number of Home Items

Race	Number of Home Items	Number of Students Mean	SD	Range	Verbal Scores Mean	SD	Range	Number of Schools
Black	0-4	4-7	6.00	1-27	21.2	8.04	3-47	288
	5-6	8.1	10.09	1-43	25.0	6.42	3-45	356
	7-8	12.0	15.78	1-65	27.9	6.49	9-49	450
	9	8.0	12.13	1-90	30.6	6.70	10-49	441
White	0-4	2.5	3.05	1-17	25.6	9.87	3-49	415
	5-6	4.0	4.52	1-33	30.0	7.71	4-49	611
	7-8	14.5	12.03	1-88	34.3	5.40	7-49	744
	9	30.9	29.04	1-153	37.0	4.52	9-49	718

with 0-4 home items) involves not only the selection of a particular subset of pupils within a given school, but also the selection of a particular subset of schools—namely, those which enroll the given class of children. For example, only 288 out of 812 schools in the sample (or 35%) enrolled students in the poorest black category, and 718 or 88% of the schools enrolled white students having the entire set of 9 home items. The reader must keep in mind that, when we are discussing different target groups of pupils, we are implicitly basing our remarks on different (but overlapping) subsets of the school sample. Descriptive statistics for each of these eight overlapping samples of schools are given in an earlier report (Frederiksen, 1975).

There are substantial differences in mean verbal performance for black and white children, and for children from poor and middle-class home backgrounds. The differences in scores, for example, between black pupils having 9 home items and those having only 0-4 home items is 9.36 points, representing a 2.3 year difference in normative grade equivalents:[2] the corresponding figure for white pupils is 11.39 or 2.8 years. These differences are much larger than those associated with race, which range from 4.36 (or 1.1 years) for the poorest category of children to 6.38 (or 1.5 years) for the most advantaged group of children. The variability in school means also appears to be larger in the case of poor children than it is for children from more advantaged homes. The number of black and white pupils within a school who are in the poorest category (having 0 to 4 home items) is smaller than for the other categories, and this

may explain why the sample means for these groups have greater variability than do those for the other groups of pupils. However, what is perhaps the most striking feature about these data is the close similarity in the ranges of school means from one pupil subgroup to another. This suggests that a substantial number of schools are effectively teaching verbal skills to the poorest group of children, and conversely, that a substantial number of schools are failing to impart necessary verbal skills to their pupils, whatever their race or social background.

A demonstration that the mean performance level of a school is high or low relative to the overall distribution of school means obtained for a given group of pupils is not sufficient by itself to establish the existence of an effective shcool. Additionally, information must be obtained about the reliability or consistency of these school differences. The question is, will an independent sample of pupils within the same school score as high (or low) in verbal achievement as the original group of pupils? In other words, given two opportunities to exhibit excellence, will a school turn out to be effective for both samples of students?

This question was dealt with in two ways. First, correlation coefficients were calculated between the mean verbal scores obtained for subgroups of pupils classified by race and home background; these intercorrelations are shown on the left side of Table 5. Second, for each subgroup of pupils, the schools were ranked according to the performance level of the relevant group of pupils, and the 75th percentile of the distribution was determined. Schools

Table 5

Intercorrelations among Mean Verbal Scores for Subgroups Classified by Race and Home Background

Number of Home Items	Pearson r +				Phi Coefficient			
	Black with Black				Black with Black			
	0-4	5-6	7-8	9				
5-6	31 (254)***	-	-	-	30***	-	-	-
7-8	14 (269)*	38 (325)***	-	-	7	36***	-	-
9	20 (254)**	22 (304)***	35 (352)***	-	6	22**	26***	-
	White with White				White with White			
	0-4	5-6	7-8	9	0-4	5-6	7-8	9
5-6	23 (363)***	-	-	-	15**	-	-	-
7-8	27 (390)***	28 (583)***	-	-	19***	19***	-	-
9	27 (383)***	26 (566)***	53 (700)***	-	25***	21***	45***	-
	White (Rows) with Black (Cols.)				White with Black			
	0-4	5-6	7-8	9	0-4	5-6	7-8	9
0-4	28 (173)***	12 (207)	9 (258)	19 (228)**	21**	16*	6	11*
5-6	9 (214)	20 (270)***	18 (336)***	20 (329)***	6	12*	16*	16*
7-8	17 (227)**	17 (293)**	30 (386)***	25 (381)***	9	9	26***	24***
9	13 (205)	20 (267)***	24 (360)***	23 (361)***	2	9	19***	16**

* $p < .05$ ** $p < .01$ *** $p < .001$

+ Sample sizes are given in parentheses.

having mean performance measures above the 75th percentile were then classified as effective for that group, and the others classified as moderately effective or ineffective.[3] Note that the cutting point (75th percentile) was determined separately for each criterion subgroup of pupils, so that the mean performance levels used in classifying schools for one group of pupils are not the same as those used in classifying schools for another group of pupils. Moreover, since the subgroups of pupils are not overlapping, these separate classifications of the schools in the sample are independent. A school classified as effective for one pupil group will not necessarily be classified as effective for another group. To investigate the degree of consistency in the effectiveness of schools for different subgroups of pupils, crosstabulations were obtained for schools classified as effective or ineffective for each subgroup of pupils, and Phi coefficients were calculated as a measure of consistency in effectiveness for the two subgroups in each crosstabulation. Phi coefficients, together with an indication of the significance of the associated Chi-square statistics, are given in the right-hand panel of Table 5.

Inspecting the overall pattern of correlations and Phi-coefficients, a number of trends are apparent and worthy of mention. The degree of consistency in school effectiveness appears to depend upon the similarity in family background of the pupils for whom school effectiveness has been determined. The Phi coefficients for black children are highest near the diagonal of the matrix, and decrease as one moves away from the diagonal. High correlations near the diagonal show consistency in school effectiveness for pupils with

similar family backgrounds (adjacent categories), and low correlations located away from the diagonal indicate a lack of consistency in performance for pupils with dissimilar family backgrounds. This pattern of correlations and Phi coefficients is also obtained when children of each race are compared for similar and dissimilar home backgrounds; these values are found at the bottom of Table 4. For example, schools that are effective for the poorest black children also tend to be effective for the poorest white children ($\phi = .21$, $p < .01$) but do not tend to be unusually effective or ineffective in teaching middle class children ($\phi = .02$). There is a departure from this pattern in one case: when the performance of white children furnishes the basis for a school's classification, the schools appreared consistently effective (to varying degreas), regardless of family background, and the degree of consistency appears to be greatest for middle-class children (i.e., those having 7-8 or 9 home items).

In summary, there is evidence that schools are consistently effective or ineffective beyond a level which would be expected on a chance basis, and that a school may not be effective for both poor and middle-class children.

Question Two: How Large are the Differences between Effective and Ineffective Schools?

In order to judge the importance of differences in pupil achievement associated with attending effective or ineffective schools, one would ideally like to know the effect of the given difference in achievement on future educational or occupational opportunities. For example, if certain levels of skill were necessary for educational or

Table 6

Descriptive Statistics and Estimated Proportions ($\hat{p}$) of Pupils Scoring 25 or Higher within Effective and Ineffective Schools

Pupil Subgroup	Effective Schools Mean	S.D.	n	$\hat{p}$	Ineffective Schools Mean	S.D.	n	$\hat{p}$
Black, 0-4 home items	32.0	5.2	71	.65	11.9	3.5	75	.23
Black, 5-6 home items	33.1	4.3	91	.67	17.6	3.8	91	.34
Black, 7-8 home items	36.3	4.1	113	.69	20.2	3.7	110	.42
Black, 9 home items	38.7	4.1	119	.76	22.4	3.9	111	.44
White, 0-4 home items	38.1	4.4	114	.80	13.3	4.4	107	.23
White, 5-6 home items	39.2	3.3	154	.82	19.9	5.0	152	.37
White, 7-8 home items	40.1	1.9	189	.77	27.3	4.9	184	.54
White 9 home items	41.4	1.2	182	.74	31.1	4.4	185	.59

occupational advancement, one could calculate the difference in proportions of students from effective or ineffective schools who are attaining the level of skill necessary for entry into an occupation, and use this as an index of the importance of differences in school effectiveness. While we have no information about the validity of using the EEOS verbal achievement test in this way, we have attempted to estimate the number of pupils in effective and ineffective schools who could successfully meet an arbitrary competency criterion: correctly completing half of the test items (i.e., 25 out of 50 items). These estimates provide another description of the range of performance differences between effective and ineffective schools.

Since the data were obtained from an intermediate summary data file containing mean verbal scores and base n's for subgroups of pupils, we could not directly count the number of pupils belonging to a given subgroup who scored above 25. In order to estimate this number, an estimate of the within-school variation in verbal achievement was obtained by multiplying the standard deviation of school means by the square root of the average number of pupils on the basis of which the school means were calculated ($\hat{s}_y = s_{\bar{y}} \times \sqrt{\bar{n}}$). Then, assuming a normal distribution of scores within a school, the proportion of scores meeting the competency criterion was estimated. The means and standard deviations[4] for effective and ineffective schools identified for each criterion subgroup of pupils are given in Table 6, along with the estimated proportions of pupils completing at least 25 of the 50 test items. (Also see Figure 1). On average, 75% of well-to-do students in effective schools show mastery of more than half the test items, while 72% of poor students in effective schools

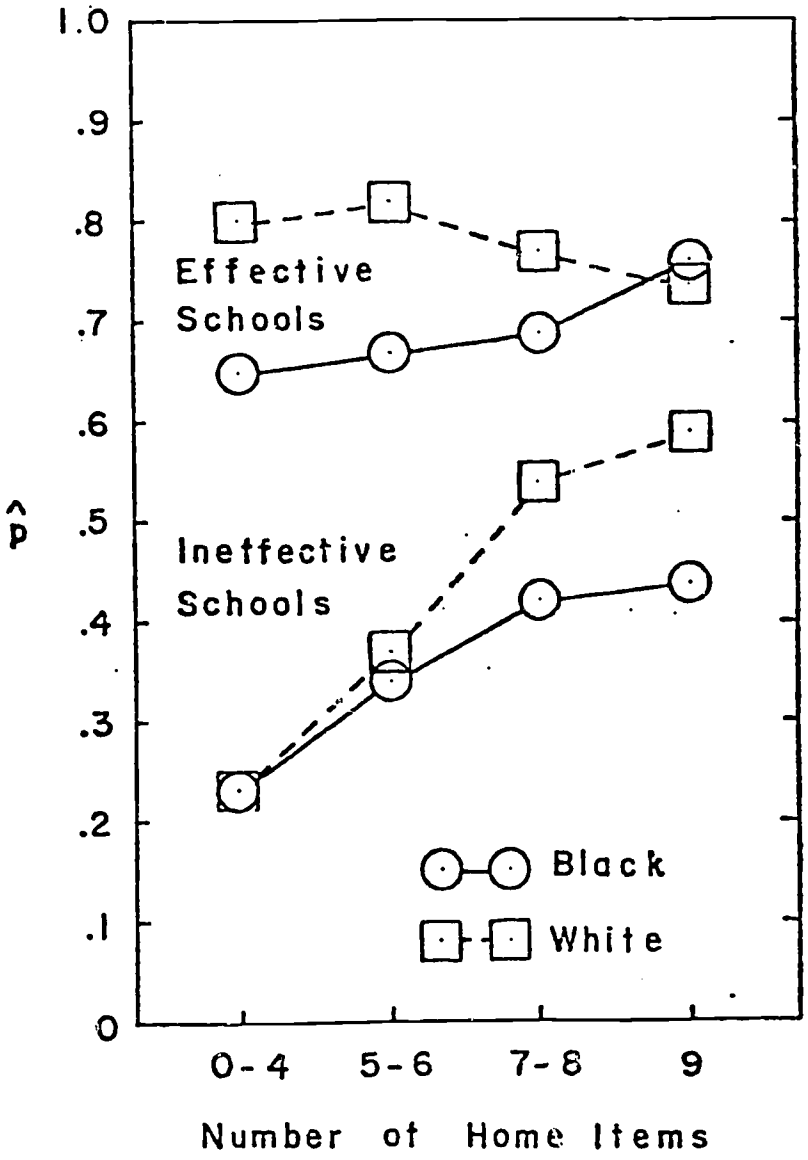

Figure 1. Estimated proportion ($\hat{p}$) of pupils scoring above 25 on the verbal test for subgroups of sixth grade students.

show similar mastery. This finding permits the general observation that, when a competency criterion is used in judging performance, effective schools can be shown to all but eliminate the relationship between family background and pupil performance, at least in the acquisition of the tested school skills to the critical level of competency. Note further that, on average, 51% of well-to-do students in ineffective schools still show mastery of more than half the items, while only 23% of poor students in ineffective schools show such mastery. That is, of course, a sizeable difference and has the effect of making pupil performance a dramatic function of family background.

A second way to gauge the magnitude of the difference between effective and ineffective schools is to convert the mean score for each set of schools into a grade equivalent, and then calculate the difference in grade equivalents between the two sets of schools. This difference, expressed in <u>years</u>, tells how far apart two samples of children drawn from the norming sample would have to be in order to find a similar difference in mean scores. In this conversion, the normative standard deviation of 6.2 was used, which represents 18 months in terms of grade equivalents (cf. Jencks, 1972, p.12, footnote 25). The differences in grade equivalents for effective and ineffective schools are, for black pupils in each of the four home-item categories, 4.9 years, 3.7 years, 3.9 years, and 3.9 years. The corresponding values for white pupils are 6 years, 4.7 years, 3.1 years, and 2.5 years. The achievement advantage of effective over ineffective schools is greatest for poor children and smallest for middle-class children. However, the differences are large, even

for middle-class children, representing at minimum two and a half years.

Question Three: Is School Effectiveness Attributable to Peer Social Class?

The next question we wish to ask of the data is the one first posed by Coleman et al. (1966) and asked repeatedly by others (cf. Mayeske et al., 1972, 1973). Is the effectiveness of a school primarily attributable to the social class of the pupils who attend the school? We approached the question in a way which is different from that of previous investigators. By stratifying the pupil population according to race and home background and conducting our analyses separately for each of the resulting eight subgroups of pupils, we could explore the relations of peer social class and school variables to achievement in school without having to first "remove" pupil family background by a prior regression analysis. We could thus separate the effect of a pupil's family background from the effect of the social background of a pupil's peers in school. When using this approach, "social class characteristics" refer to the predominant family background of pupils in the school and not to the background of the individual pupil whose achievement forms the basis for evaluating school effectiveness. Note that it is entirely possible that the effects of peer social class may differ for the various subclasses of

pupils we have been considering.

Eight separate regression analyses were carried out, one for each of the subclasses of pupils who differ in race and number of home items. The regression analyses were carried out using a stepwise regression procedure, entering the school social class variables ahead of other school descriptors. The stepping procedure provides a measure of the variance in achievement accounted for at each stage in the stepping sequence, so that a measure of the variance accounted for by the first seven variables--the social class variables--could be obtained. This measure, or its square root, the multiple correlation coefficient, provided an initial answer to our question about the contribution of social class variables in accounting for school achievement.[5] If the multiple correlation obtained using the seven social background variables as regressors is large in comparison to the multiple correlation obtained after all the other school variables have been added to the regression analysis, then it is possible to conclude that the unique contribution of school characteristics in fostering pupil achievement is minimal. On the other hand, if social background accounts for little of the variance in achievement, then our attention can shift to identifying the characteristics of schools that are accociated with high pupil achievement. The results are shown in Table 7 and plotted in Figure 2. The seven social class variables entered are (1) percent of black pupils, (2) average family size, (3) percent intact families, (4) & (5) percent of fathers who are white collar workers for black (4) and white (5) pupils, (6) mean mother's education, and (7) mean father's education. For poor black pupils, the variance in school achievement associated with these

Table 7

Multiple Correlations Obtained in the Regression Analyses

Criterion Group	Mult. R. (All Variables)	Mult R. (Social Class Var.)	Ratio of R^2s
Black pupils with 0-4 home items	.56	.14	.06
Black pupils with 5-6 home items	.58	.32	.30
Black pupils with 7-8 home items	.56	.34	.37
Black pupils with 9 home items	.57	.39	.47
White pupils with 0-4 home items	.58	.38	.43
White pupils with 5-6 home items	.54	.33	.37
White pupils with 7-8 home items	.72	.62	.74
White pupils with 9 home items	.70	.63	.81

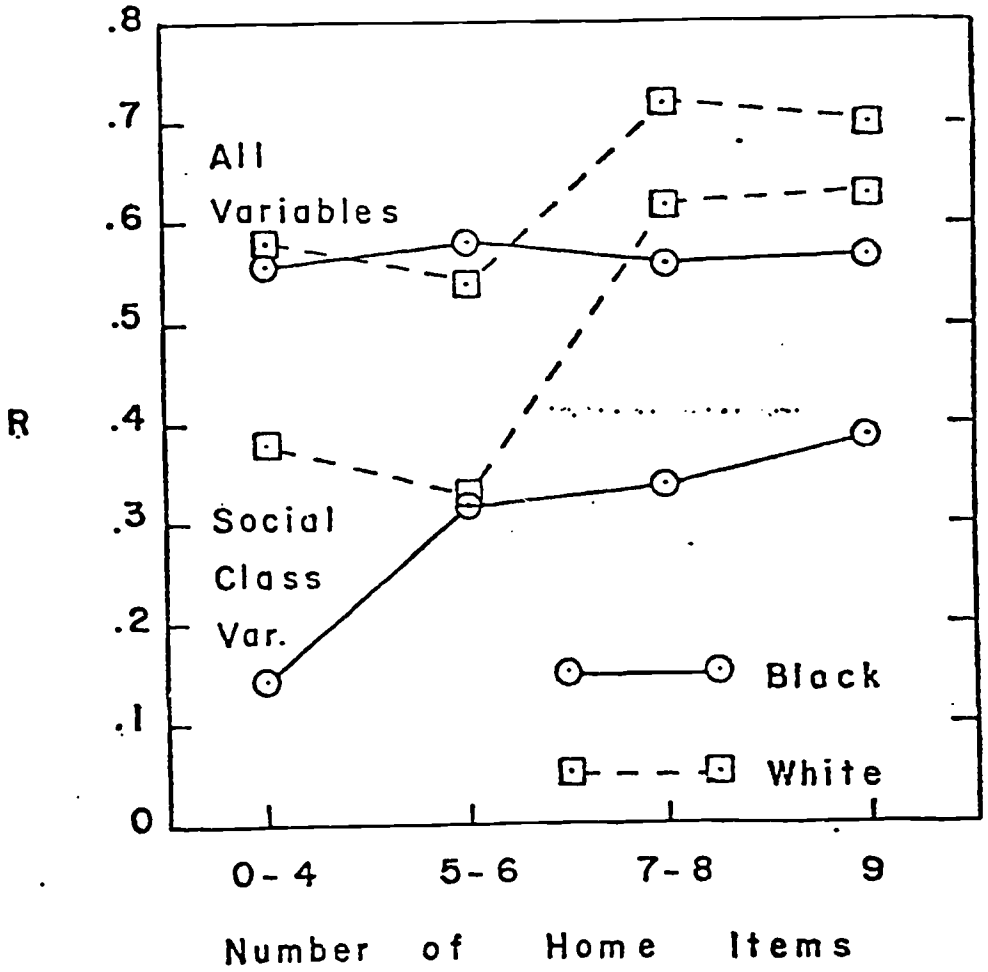

Figure 2. Multiple correlations (R) obtained in predicting mean verbal achieverent from social class variables alone, and from social class variables together with school variables.

variables is only 6% of the total "explained" variance.[6] For middle-class white pupils, a much larger proportion (81%) of the total explained variance is related to social class, and the degree of involvement of social class variables is in general greater for white pupils than for black pupils, and greater for middle class pupils than for poor pupils.

Another way of examining the relationship between peer social class and school achievement is to look individually at the correlations between each of the social class variables and achievement for each of the eight criterion subgroups of pupils; these data are shown in Table 8 (to increase readability, correlations have been multiplied by 100 to eliminate the decimal point). In all cases, the correlations for poor black pupils are approximately zero. The correlations are greater for white pupils than for black pupils, and higher for middle-class pupils than for lower-class pupils.

A third set of data also support these conclusions, and they are the differences between means for each of the social class variables, for schools that have been classified as effective or ineffective.[7] The differences between the means for the effective and ineffective schools are given in Table [9] for each of the eight criterion subgroups of pupils; the variables are, once again, the seven social-class variables. The degree to which peer social class is related to school effectiveness depends upon the family background of the pupil upon whose performance the school is evaluated. Schools in our sample that are effective for middle-class and white pupils tend to enroll a greater proportion of such children than do the less

Table 8

Correlations between Social Class Variables and Achievement for the Eight Criterion Groups of Pupils*

Variable	Black Pupils				White Pupils			
	0-4	5-6	7-8	9	0-4	5-6	7-8	9
% Black	-6	-8	-19	-27	-30	-29	-51	-41
Mean Family Size	-2	-9	-15	-21	-26	-21	-37	-35
% Families Intact	8	24	24	37	33	25	45	45
% Wh. Collar Path. (Black)	-7	-9	19	17	-2	3	5	7
% Wh. Collar Path. (White)	7	11	20	19	18	18	47	52
Mean Mother's Education	4	21	23	22	16	20	41	46
Mean Father's Education	2	17	30	33	27	22	50	57

* Correlations have been multiplied by 100

Table 9

Differences between Means of Social Class Variables

for Effective and Ineffective Schools

Variable	Black Pupils				White Pupils			
	0-4	5-6	7-8	9	0-4	5-6	7-8	9
% Black	-2.4	-5.5	-18.3	-26.4	-13.1	-16.7	-26.9	-17.8
Mean Family Size	.00	-.13	-.39	-.52	-.40	-.42	-.65	-.60
% Families Intact	1.6	10.2	11.9	15.4	13.6	9.3	17.4	16.9
% Wh. Collar Fath. (Black)	-5.0	-3.0	9.4	10.9	-.5	4.0	3.9	5.7
% Wh. Collar Fath. (White)	1.9	5.3	12.4	11.8	7.7	10.0	28.5	32.3
Mean Mother's Education	-.03	.22	.36	.35	.18	.35	.75	.83
Mean Father's Education	-.03	.17	.49	.60	.36	.39	1.03	1.19

effective schools. However, the schools that are effective in teaching poor black children turn out to be equivalent to the ineffective schools in terms of the social class variables. This finding demonstrates that school characteristics can be important in fostering high pupil achievement. On the basis of these results, we feel we must take issue with Coleman's conclusion that

> "the resources most important for a child's achievement in school are the cognitive skills in his social environment in school, including his fellow-students as well as his teachers, and that these effects are strongest for the children with least educational resources outside school...Other resources on which school systems spend much money, appear unimportant; and lower-class students do better in absolute terms rather than worse...in schools where their relative achievement is low due to the presence of higher-performing middle-class students." (Coleman, 1970, p.245)

The conclusion that poor children perform better in schools which contain high proportions of middle-class children is not supported by our analysis of the EEOS data. When one looks separately at the data which are relevant to this question--namely, at the social class characteristics of schools that are effective or ineffective in teaching poor black pupils, it becomes clear that these two groups of schools are indistinguishable on the basis of the social-class variables we have examined.

Question Four: What are the Characteristics of Effective Schools?

Our purpose is to describe those variables for which there are EEOS data that distinguish effective from ineffective schools. The

stratification of the pupil population into eight subgroups varying in race and home background enables us to judge the separate contribution of a given variable to school effectiveness for each of the eight subgroups. Four types of relationships are possible: (1) Variables may be consistently related to school effectiveness in every pupil subgroup; (2) some variables may show clear trends, so that the nature of the relationship depends upon the family background and/or race of the pupils upon whose performance the schools are being evaluated; (3) some variables may be unrelated to pupil subgroup; and (4) some variables may be inconsistently related to school effectiveness, with no clear trend. Variables in the first class will be called consistent predictors, and variables in the second class will be called social-class-dependent predictors. Variables which are inconsistently related or unrelated to school effectiveness will not be discussed here. As we examine each school characteristic, we shall indicate the degree and nature of its relationship to school effectiveness. We shall present the correlations with mean verbal achievement of black and white pupils in parenthesis, listed in each case for the subgroups of pupils having 0-4, 5-6, 7-8, or 9 home items, and in that order.[8]

We have elected to report results whenever consistent patterns of correlations have been found. We will not report here results bearing on school location, although there were significant differences in the location of effective and ineffective schools. These data are discussed in an earlier report (Frederiksen, 1975). While the number of schools involved in the calculation of these correlations varies, correlations of .09 are generally significant at the .05 level, and correlations of .11 are generally significant at the .01 level.

1. Teacher Attitudes and Characteristics

Teacher characteristics like age and sex were not consistently related to pupil performance. Those teacher variables that did turn out to be related to pupil performance are predictive of verbal achievement for middle class pupils, but not for poor black pupils and to only a moderate degree for poor white pupils. These variables include the teacher's race (black keyed positive) (black: -.01, -.13, -.15, -.24; white: -.28, -.34, -.52, -.42), the teacher's verbal ability (black: 1,5,11, 11; white: 18, 15, 25, 23), the teacher's attitudes on race and social class, preferring to teach upper class children (black: 6, 12, 10, 16; white: 14, 8, 21, 24), middle class children (black: 6, 12, 9, 9; white: 14, 8, 22, 23), and white children (black: 6, 13, 23, 20; white: 31, 28, 45, 40), and holding a negative attitude towards bussing (black: -6, -14, -8, -9; white: -20, -23, -21, -13). The findings suggest that there is higher achievement among white and/or middle class children when they attend schools whose teachers are white and have middle-class backgrounds, and who prefer teaching children who have backgrounds similar to their own. However, the reverse statement does not appear to be true; achievement of poor children--particularly poor black children--is not related to the race or social class of the teachers working in a school, or to the stated social class preferences of their teachers. The verbal ability of a teacher is not related to the verbal achievement of poor black children, although it is associated with high achievement for white children and to a lesser extent for middle-class black children.

The schools in our sample that are effective in teaching poor children tend to have teachers who have been assigned to their school, while the less effective schools have teachers who have chosen to work in their school. The correlations of verbal achievement with the variable--teacher asked for school--are, for black pupils: -11, 4, 8, 14 and for white pupils: -10, 6, 4, 4. One other variable related to school effectiveness, but only for poor children, is a teacher's attitude toward compensatory education (black: -12, -6, -6, -8; white: -16, -12, -6, -2). Teachers in the more effective schools do not agree that "culturally disadvantaged" children benefit from programs of compensatory education, but hold conversely that a common standard of instruction can be applied to all. When we turn to another set of variables related to school programs, we shall find additional evidence to support the conclusion that schools that are effectively teaching poor pupils do not separate them according to "ability".

2. School Characteristics and Curriculum

Consistent Predictors

In the EEOS questionnaire, the principals of the more effective schools responded that their students are not separated into ability groups (black: -12, -2, -8, -6; white: -8, -7, -9, -5), and the teachers' responses confirmed this statement by saying that they teach pupils of varied abilities (black: -13, -12, -12, -12: white: -21, -13, -25, -18). The more effective schools have few teachers of remedial reading (black: -8, -15, -4, -7; white: -14, -10, -23, -15), and few students are enrolled in special mathematics (black: -2, -9, -18, -6: white: -10, -14, -17, -12) or English courses (black: -7, -15, -19, -13; white: -16, -20, -28, -[illegible]). They also have fewer guidance

counsellors (black: -14, -11, -4, -6; white: -16, -11, -19, -11) than do the less effective schools. However, they do have special education programs (black: 11, 17, 8, 3; white: 8, 18, 13, 11). Thus, with regard to one of the most fundamental characteristics of an elementary school curriculum, there is a clear relationship between school effectiveness and mixing students of varying abilities and backgrounds. These measures, which are indicators of policy toward tracking, all show a negative correlation with verbal achievement, and the degree of correlation with school effectiveness appears to be independent of the social class of pupils for whom a school has been found to be effective. Such schools, however, do have special education programs for pupils with certifiable disabilities, and, again, this relationship is independent of pupil social class.

There is some evidence that schools that are instructionally most effective tend to have small classes (black: -5, -6, -4, -10; white: -3, -14, -15, -14), and use the National Teachers Examinations in selecting teachers (black: 9, 6, 7, 9; white: 14, 14, 26, 18). They also have a larger proportion of families who attend PTA meetings than the ineffective schools (black: 8, 13,20, 17; white: 16, 15, 24, 25), and the principals of more effective schools generally believe their schools to have a good reputation among educators in their community (black: 7, 8, 7, 15; white: 3, 11, 15, 17).

Pupils in schools classified as effective are more likely to have attended kindergarten (black: 12, 14, 13, 6; white: 23, 8, 17, 11) and nursery school (black: 8, 16, 17, 10; white: 7, 6, 24, 32) than are pupils in less effective schools. Note that these effects of early education are apparent even though pupil family background has

been controlled through stratification of the pupil population, and they show up even in the case (i.e., black children having only 0-4 home items) where the effective schools have turned out to be matched with the ineffective schools on social-class variables.

3. Affluence of the School

Two measures which can be regarded as indicating the degree of affluence of a school district are related to school effectiveness, but only for middle-class children. High achievement for this group is found in schools with a large number of land acres (black: -6, 4, 9, 18; white: 1, 4, 15, 19), and relatively new school buildings (black: 7, 1, -9, -17; white: 6, -7, -17, -17).

4. Some Additional Measures of the Outcome of School Experiences

There are a number of additional variables that represent alternative measures of the effects of school experiences on the attitudes and behavior of pupils, although in the case of middle-class schools, these measures may also reflect a student's home environment. For each of these variables there are consistent correlations with pupil achievement regardless of the social class background of the pupils, although in some cases the correlations tend to be higher for middle-class pupils than for poor pupils. Children who attend schools that are instructionally effective attend school more regularly (black: 3, 4, 16, 16; white: 17, 13, 28, 19), expect to continue their schooling for a longer period of time (black: 22, 25, 27, 24; white: 24, 21, 39, 41) than pupils who attend schools that are less effective, and their attitude toward chances in life is generally more positive (black: -8, -25,

-21, -32; white: -19, -21, -44, -39). Moreover, there is low racial tension in the more effective schools (black: 16, 7, 11, 13; white: 14, 13, 18, 25) and a lower incidence of serious stealing within these schools (black: 6, 6, 16, 19; white: 13, 13, 24, 20). Note that, since effective and ineffective schools which enroll poor black children do not differ in the race or social background of their pupils, the correlation of .16 between incidence of racial tension and school effectiveness cannot be due to differences in racial composition of the two groups of schools. This suggests that effective school programs might contribute to improving race relations within schools, as well as to developing more positive attitudes towards learning and education.

Regression Analyses

In our discussion of the association between school characteristics and instructional effectiveness, we have focused on the correlations between predictors and the performance criterion. Regression analyses have been used only to estimate the overall degree to which variance in the criterion is generally related to the social class characteristics of schools, or uniquely related to institutional variables other than social class. Interpretation of regression weights is regarded as extremely hazardous, due to their inherent instability from sample to sample. The problem can be illustrated using the results we obtained for the social class variable Mean Mother's Education, shown in Table 10. The trends that are evident for the first two statistics are absent when one looks at regression weights, or partial correlations. For example, if we regard the results for closely similar pupil

Table 10

Regression Statistics for the Variable Mean Mother's Education Which were Obtained for Each Criterion Group of Pupils.

Statistic	Black Pupils				White Pupils			
	0-4	5-6	7-8	9	0-4	5-6	7-8	9
Correlation with criterion	.04	.21	.23	.22	.16	.20	.41	.46
Differences between means (Effective - Ineffective)	-.03	.22	.36	.35	.18	.35	.75	.83
Standard Regression Coefficient (beta)	.01	.13	-.04	-.04	-.02	.09	.04	-.05
Partial Correlation	.00	.10	-.03	-.03	-.02	-.06	.04	-.03

subgroups (e.g., black pupils with 5-6 home items and black pupils with 7-8 home items) as providing a crossvalidation of the regression weights, we find that the first two descriptive statistics have similar values in the two cases (compare .21 with .23, and .22 with .36), while the corresponding regression weights are markedly dissimilar (.13 and -.04). The instability in regression weights in crossvalidation as illustrated using this variable is characteristic of nearly every variable included in our analyses of the EEOS. This being so, there will be no further discussion of regression coefficients. Those who seek detailed description of our regression analysis may do so by referring to Frederiksen's 1975 report.

Discriminant Analysis

We have already referred to the comparisons among means for effective and ineffective schools in our discussion of characteristics of effective schools. As we stated previously, schools were classified as effective for purposes of the discriminant analysis if above the 75th percentile in mean verbal achievement for the designated subgroup of pupils, and ineffective if below the 25th percentile for that subgroup of pupils. The school means for social class and school variables were calculated for the effective and ineffective schools, for each subclass of pupils.

A discriminant function analysis was then conducted for each of the eight pupil subgroups. In these analyses, equations (functions) were developed for classifying schools as effective or ineffective on the basis of the social class and school variables. Simple F-tests ($F=t^2$) of the differences between means and multivariate

F tests based on the discriminant function analyses were then obtained for each variable. Results are presented in tabular form in a previous report (Frederiksen, 1965).

In general, differences between means of social class and school variables for effective and ineffective schools follow the patterns we have already observed in looking at the correlation between social class, school variables, and verbal achievement. For all pupil subgroups, there are highly significant ($p < .001$) differences between vectors of means for effective and ineffective schools (the statistic employed in the generalized Mahalanobis D-Square). An index of the degree to which the two populations of schools are adequately characterized by the school variables employed is the percent of correct school classifications in using the discriminant function. The classification procedure involves calculating the discriminant scores for a given school and choosing the category (effective or ineffective) whose function has the larger value. The percent of schools correctly classified for the eight pupil subgroups were, respectively, 89%, 85%, 83%, and 82% for the four subgroups of black pupils differing in number of home items, and 85%, 82%, 91%, and 92% for the corresponding groups of white pupils. Our conclusion is that clear differences exist in the characteristics of effective and ineffective schools, and that it is possible to predict with a fairly high degree of precision the effectiveness of a school on the basis of observed characteristics of the school. A separate discussion of the nature of these characteristics will be omitted, however, since such a discussion parallels to a high degree the previous discussion of correlations of social class and school variables with pupil performance.

Overview and Conclusions

A very great proportion of the American people believe that family background and home environment are principal causes of the quality of pupil performance. In fact, no notion about schooling is more widely held than the belief that the family is somehow principal determinant of whether or not a child will do well in school. The popularity of that belief continues partly because many social scientists and opinion makers continue to espouse the belief that family background is chief cause of the quality of pupil performance. Such a belief has the effect of absolving educators of their professional responsibility to be instructionally effective for all pupils.

While the authors recognize the importance of family background in developing a child's character, personality, and intelligence, we cannot overemphasize our rejection of the notion that a school is relieved of its instructional obligations when teaching the children of the poor. We reject such a notion partly because we recognize the existence of schools that successfully teach basic school skills to all children. Such success occurs partly because these schools are determined to serve all their pupils without regard to family background. At the same time, these schools recognize the necessity of modifying curricular design, text selection, teaching strategy, etc., in response to differences in family background among pupils in the school. Our findings strongly recommend that all schools be held responsible for effectively teaching basic school skills to all children. Turning to the lessons to be learned from the

major studies of school effectiveness, our summary conclusions are as follows.

1. Studies in which the income and social class of pupils is not included in the assessment shows growth in pupil achievement to be significantly related to a variety of school and community characteristics (Shaycoft, 1967).
2. In conventional regression analyses of school mean performance scores, the largest proportion of variance in performance is attributable to school variables that co-vary with mean pupil social class variables and thus cannot be regarded as independent effects of schools on pupil achievement (Mosteller and Moynihan, 1972, p. 19).
3. The proportion of variation in performance which is uniquely associated with school variables grows as one restricts the population of schools considered to those which predominantly enroll the children of the poor (Mayeske et al., 1972, p. 67).
4. Inner-city schools can be located that differ in pupil reading performance, even though the schools are matched on pupil background (State of New York, Office of Education Performance Review, 1974). Thus, when attention is restricted to inner-city schools that enroll substantial numbers of poor children, effective schools can be identified that serve a pupil population quite similar in family background to the pupil population of less effective schools.

In our re-analysis of the EEOS, separate evaluations of the schools were made for subgroups of pupils of different races and home backgrounds. Schools were found to be consistently effective (or ineffective) in teaching subgroups of their populations that were homogeneous in race and economic condition. These schools were not found to be consistently effective in teaching children of differing economic condition and race. School effectiveness for a given level on the home items scale extended across racial lines. The prime factors which condition a school's instructional effectiveness appear to be principally economic and social, rather than principally racial.

Without seeking to match effective and ineffective schools on mean social background variables, we found that the schools that were instructionally effective for poor and black children were indistinguishable from the instructionally less effective schools on measures of pupil social background (mean father's and mother's education, category of occupation, percentage of white students, mean family size, and percentage of intact families). The large differences in performance between the effective and ineffective schools could not therefore be attributed to differences in the social class and family background of pupils enrolled in the schools. This finding is in striking contrast to that of other analysts of the EEOS, who have generally concluded that variability in performance levels from school to school is only minimally related to institutional characteristics.

Since our re-analysis used pupil performance as the basis for assessing school effectiveness, we must entertain the possibility that effective schools enroll pupils of higher ability than pupils enrolled by ineffective schools. Taken together, the following findings strongly suggest that this is not true. (1) Schools classified as effective for one subgroup of pupils are also effective for a second, independent subgroup of pupils who have similar social backgrounds and whose performance has not been used in making the original school classification. (2) In the case of poor black children, the effective and ineffective schools are comparable in demographic characteristics, including peer social class and school location. (3) The effective and ineffective schools differ, as noted earlier, in a number of characteristics related to programs, personnel, and methods of instruction.

Given the character of our results and the relatively routine nature of the statistical techniques we employed, it is tempting to ask why earlier analyses of the EEOS do not appear to have correctly answered the question: What is the impact of school characteristics on the achievement of poor/minority students? The explanation for certain of the earlier errors of analysis may be found in the conventional methodology used in earlier studies of this question. A set of routine statistical assumptions were made in these earlier studies in the belief that those assumptions would not result in any seriously misleading conclusions. The crucial assumptions were:

1. Homogeneity of Regression Equations. Regression surfaces were assumed to be homogeneous for subgroups of the pupil population.

2. Lack of Interactions between Pupil Background and School Effectiveness. Schools that are effective for pupils of one social class were assumed to be effective for all classes of pupils.

These assumptions are implicit in the breakdown of the overall variance in pupil achievement into two orthogonal components: variance within schools and variance between schools. Part of the problem is that nationally only a small number of poor students are enrolled in most schools, so that their influence on overall school means and on the resulting regression equations is small. Moreover, the relation of school factors to educational achievement is obscured by the removal of variance associated with social-class variables that had to be included in order to control for the family background of children within the school. What was needed was to concentrate the power of investigation and analysis on the target population of greatest interest to policy makers, namely, black and white children who are poor. Our way of doing this is to stratify the pupil population. When that is done, it is no longer necessary to conceive of school effectiveness as a unitary phenomenon. Schools can be found which are effective for one subgroup of pupils but not for a second. Moreover, using our methods, it is no longer necessary to enter social background variables as a control for home background. The separate effects of peer social background can be distinguished from the effects of home background of the pupils whose achievement is the basis for judging school effectiveness.

We recommend that future studies of school and teacher effectiveness consider the stratification design as a means for investigating the separate relationship of programs and policies for pupils of differing family and social background. Information about individual student family background and social class is essential in our analysis if we are to disentangle the separate effects of pupil background and school social class make-up on pupil achievement. Moreover, studies of school effectiveness should be multivariate in character and employ longitudinal records of pupil achievement in a variety of areas of school learning. The "Search for Effective Schools" project now underway at the Center for Urban Studies is designed in response to each of these design suggestions.

Finally, there may be many among you who do not think it proper to evaluate schooling on so narrow a basis as pupil acquisition of reading and math skills. We share your interest in broader purposes as proper ends for schooling, but hasten to point out the following. American city schools, as a group, do not now successfully teach reading and math to sufficient proportions of the children of the poor. To bring city schools to widespread instructional success would be a social service triumph of the first order.

We are therefore quite content, at least for now, to concentrate our energies on the means by which schools that serve the poor might be brought to greater and greater instructional success.

REFERENCES

Armour, D. J. "Equality of Educational Opportunity: The Basic Findings Reconsidered." On Equality of Educational Opportunity, ed. F. Mosteller and D. P. Moynihan. New York: Random House, 1972.

Averch, H. A., Carroll, S. J., Donaldson, T. S., Kiesling, H. J., and Pincus J. "How Effective Is Schooling? A Critical Review and Synthesis of Research Findings." Santa Monica: Rand, 1972.

Brophy, J. E., and Good, T. L. "Teacher's Communication of Differential Expectations for Children's Classroom Performance." Journal of Educational Psychology, 61 (1970), 365-74.

Cain, G. G., and Watts, H. W. "Problems in Making Policy Inferences from the Coleman Report." American Sociological Review, 35 (1970), 228-42.

Coleman, J. S. "Methods and Results in the IEA Studies of Effects of School on Learning." Review of Educational Research, 45 (1975), 335-86.

_____, Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., and York, R. L. Equality of Educational Opportunity. Washington, D. C.: U. S. Office of Education, National Center for Educational Statistics, 1966.

Frederiksen, John R. "School Effectiveness and Equality of Educational Opportunity." Report submitted to Carnegie Corporation by the Center for Urban Studies of Harvard Graduate School of Education, Cambridge, Massachusetts, December, 1975.

Guthrie, J. W., Kleindorfer, G. B., Levin, H. M., and Stout, R. L. Schools and Inequality. Cambridge, Massachusetts: MIT, 1971

Hanushek, E., and Kain, J. F. "On the Value of Equality of Educational Opportunity as a Guide to Public Policy." On Equality of Educational Opportunity by F. Mosteller and D. P. Moynihan. New York: Random House, 1972.

Jencks, C. S. "The Coleman Report and the Conventional Wisdom." On Equality of Educational Opportunity by F. Mosteller and D. P. Moynihan. New York: Random House, 1972.

Klitgaard, R. E., and Hall, G. R. "A Statistical Search for Unusually Effective Schools." Santa Monica: Rand, 1973.

Lezotte, Larry, Edmonds, Ron, and Ratner, Gershon. "Remedy for School Failure to Equitably Deliver Basic Skills." Report submitted to Carnegie Corporation by the Center for Urban Studies, Harvard Graduate School of Education, Cambridge, Massachusetts, September, 1974.

Mayeske, G. W., Cohen, W. M., Wisler, C. E., Okada, T., Beaton, A. E., Jr., Proshek, J. M., Weinfeld, F. F., and Tabler, K. A. A Study of Our Nation's Schools. Washington, D. C.: U. S. Government Printing Office, 1973.

_____. A Study of the Achievement of Our Nation's Students. Washington, D. C.: U. S. Government Printing Office, 1973.

Mosteller, F., and Moynihan, D. P. On Equality of Educational Opportunity. New York: Random House, 1972.

Rist, R. C. "Student Social Class and Teacher Expectations: The Self-Fulfilling Prophecy in Ghetto Education." Harvard Educational Review, 40 (1970), 411-511.

Shaycoft, M. F. "The High School Years: Growth in Cognitive Skills." Pittsburgh: University of Pittsburgh, American Institute for Research and School of Education, 1967.

Smith, M. S. "Equality of Educational Opportunity: The Basic Findings Reconsidered." On Equality of Educational Opportunity by F. Mosteller and D. P. Moynihan. New York: Random House, 1972.

"Performance Review School Factors Influencing Reading Achievement: A Case Study of Two Inner City Schools. Report by State of New York, Office of Education, March 1974.

Weber, "Inner-City Children CAn Be Taught to Read: Four successful Schools." Council for Basic Education, Occasional Papers No. 18, October 1971.

FOOTNOTES

[1] The "Search for Effective Schools" project began in 1974 and has variously included: Ron Edmonds, Harvard Graduate School of Education Center for Urban Studies, Project Director; Gary Ratner, Greater Boston Legal Services, Project Director of Legal Research; John Frederiksen, Bolt Beranek & Newman, Inc., Project Director of Research; Larry Lezotte, Michigan State University Department of Urban and Metropolitan Studies, Project Consultant and Researcher; Charles Cheng, University of California at Los Angeles Graduate School of Education, Project Research Associate. From its beginning, the project has been supported by the Carnegie Corporation, with Frederick Mosher serving as Project Program Officer.

[2] Normative grade equivalents are obtained by dividing the difference in mean verbal scores by the overall normative standard deviation of 6.2, and multiplying by 18 months, the amount of verbal growth reputed to correspond to a single standard deviation (cf. Jencks, 1972, n. 25).

[3] In our later analysis of characteristics of effective and ineffective schools, only schools with means below the twenty-fifth percentile will be termed ineffective.

[4] The standard deviations are spuriously low, due to restriction of range. The estimate $s_{\bar{y}}$ used in estimating s_y was based upon the entire sample of schools.

[5] Aside from our having stratified the pupil population before conducting the regression analyses, this procedure is similar to the one used by Coleman et al. (1966) in their analysis of the EEOS.

[6]The percent of "explained" variance attributable to social class is the ratio of the squared multiple correlation for social class variables alone to the squared multiple correlation for the entire set of variables.

[7]Means and standard deviations for effective and ineffective schools are given in the previous report.

[8]The correlations will be multiplied by 100 to increase their legibility.