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ABSTRACT

This monograph, a revision of a report prepared pursuant to a contract with the Commission on Civil Rights, discusses neighborhoods and schools, primary school variation in cognitive development, father absence and school achievement, neighborhood and school segregation, later effects of school segregation, self-ccncept, aspirations, and behavioral deviance. Questionnaire data were collected from stratified random samples of 17,000 students attending 11 public junior and senior high schools in Western Contra Costa County in the spring of 1965. The final sample comprised 4,077 students. Major substantive findings of the study were as follows: variations in elementary school context make a substantial and significant difference in subsequent academic success at higher grade levels; socio-economic and racial characteristics of students' age-mates have no effect independently on academic achievement of students attending similar schools; social class composition of a school affects the academic development of both Negro and white students in racially segregated or integrated situations; and, given similar social class compositions, racial balance of a school has slight bearing on the academic performance of students. (JM)

THE CONSEQUENCES OF SEGREGATION: Academic Achievement In A Northern Community

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Professor Travis Hirschi and Miss Adrienne Ross supervised the data retrieval operation.

PREFACE

Public debate over school segregation has shifted grounds since 1966 when the research reported in this monograph was completed. More and more black Americans have wearied of the posture of supplicating reluctant whites to desegregate public schools. Confronted with manifestly inferior and stigmatized schools in the ghettoes, many Negroes are persuaded that local black control of black schools could lead to vast improvement over their present predicament. Discriminatory practices and personnel within these schools could be abolished, the curriculum would include a positive emphasis upon the achievements of Negroes, and local community trust and participation in the schools might be developed.

For the past two decades school segregation has been viewed primarily as a race issue. Indeed, Negroes have provided the political thrust for desegregation with the support of liberal advocates of equal opportunities. And the staunchest opposition to desegregation stems from white bigotry.

But school segregation is a wider issue than current debate recognizes. Negroes constitute a caste adjoining the lower strata of our class society. Schools tend to be segregated

along both class and caste lines: most Negroes go to black schools; most poor whites attend schools where their classmates are likewise poor whites. In urbanized areas those schools which are integrated, and those most amenable to integration, are a mixture of poor blacks and poor whites. More privileged children of well-to-do and well-educated parents typically remain segregated.

This study will show that the social-class composition of a school significantly affects the achievement of students attending the school – whether they be black or white. The proportion of Negroes in a predominantly lower-class school does not have any substantial effect upon academic outcomes. Thus the focus of public attention upon the racial composition of schools has diverted attention away from that aspect of schools which does in fact influence the equality of educational opportunities: the social class composition.

While black control of black schools may well enhance racial morale and pride – and this would be no small achievement – whether such a grass-roots effort can develop academic and intellectual excellence remains to be demonstrated. The schools of the privileged will continue, meanwhile, to transmit the skills our society requires to their heirs.

ABW
March, 1969

INTRODUCTION

Lively interest focuses upon the topic of *de facto* school segregation throughout the nation. While political consensus deploring racial imbalance in schools has been largely attained on a national level, few local districts have substantially altered the demographic composition of their schools during the past decade. The continued immigration of Negroes into core sectors of metropolitan areas in the north and west, accompanied by the relocation of white families to peripheral suburban areas, has sharpened patterns of segregation in urban schools.

The disjunction between manifest national policy urging desegregation and developing demographic patterns of segregation is paralleled by diversity of opinion and uncertainty concerning the facts as to what educational and social consequences are actually attributable to school segregation. Gross disparities in educational attainments between Negroes and whites, between social classes, and between schools with contrasting ethnic or social class compositions have been repeatedly documented and publicized over the past years. Yet the extent to which inequities between schools might be

attributable to prior differences in the native endowments of the students, diverging familial socialization during infancy, and contrasting extra-school neighborhood experiences, has not been clearly analyzed.

The study reported here is intended to isolate effects of segregation *per se* upon the development of academic competence, and the ramifications which segregation may have for students' self-concept, aspirations, and social behavior.

The Sample

The seventeen thousand students attending eleven public junior and senior high schools in Western Contra Costa County – across the Bay from San Francisco – in the spring of 1965 constitute the population from which the sample was drawn. This population was stratified by sex, race, school, and grade-level. Random samples were drawn from each stratum. Unequal sampling fractions were applied to various strata so that the sample would contain sufficient numbers of minority-group children to provide an adequate sample base for analysis.[1]

Three-fourths of the sample of 5 545 students drawn from the school rosters ultimately completed an extensive set of questionnaires.[2] The sources of attrition to the original sample included failure to obtain parental permission, twelve percent, absenteeism, seven percent, students on the roster who had in fact transferred or dropped out, six percent, and unuseable answer sheets, one percent. An analysis of the bias resulting from these sources of attrition (Wilson, 1965) showed small but consistent differences between the students who completed the questionnaire and those who did not. Those who completed the questionnaire were somewhat better students than those who were chronically absent, dropped out, made numerous response errors or whose parents refused. Corrective weights have been applied to the estimate based upon the 4,077 students who remained in the final sample to

to allow for differential attrition between strata as well as the initial disproportionate sampling.

The Community

Western Contra Costa County is primarily an industrial urban area -- a part of the San Francisco-Oakland metropolitan region. Almost two-thirds of the employed males are manual workers.

Prior to World War II, Richmond was a gradually expanding, politically stable, community enjoying the prosperity stemming from one of the finest deep-water harbors on the West Coast. Less than one percent of the population in 1940 were Negroes. During World War II, as a direct consequence of war-time industry, the population in the western county quadrupled – growing from 39,100 to 155,200 between 1940 and 1950. Active recruitment and the attractions of shipyard employment brought large numbers of Negroes into the community from the South and Southwest. After the war, despite declining employment opportunities, most of these immigrants remained. The proportion of Negroes in the western county was twelve percent in 1960. The great majority of the Negro population is concentrated in a strip in western Richmond running from the completely segregated Negro communities in North Richmond and Parchester Village through the rapidly deteriorating central shopping district, into South Richmond. The racial distribution of the population is illustrated in Figure I.

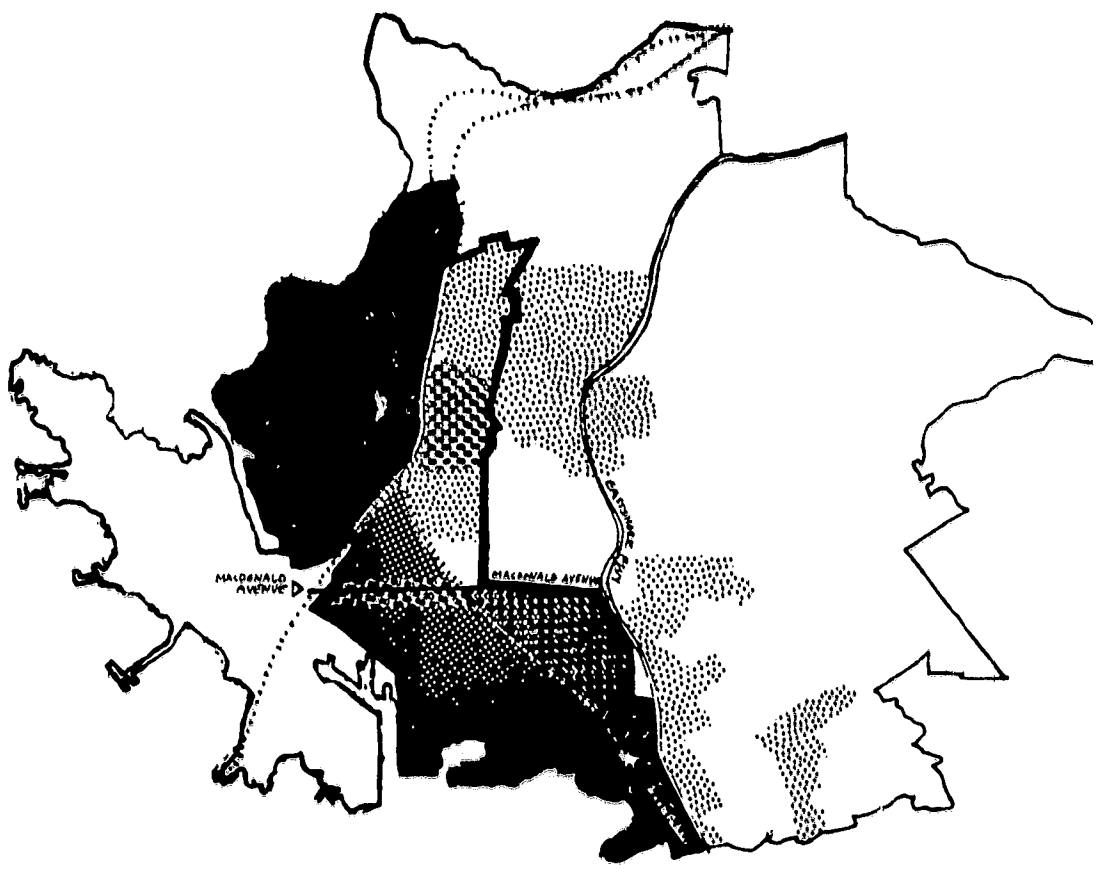

Figure 1. *Degree of Residential Segregation in Western Contra Costa County*

I

NEIGHBORHOODS AND SCHOOLS

Richmond, like most urban areas, is divided into fairly well-defined social areas. The well-to-do live in the wooded hillsides commanding a panoramic view of the San Francisco Bay; the poor live in tracts, projects, or older dwellings on the flatlands near railroad tracks and industrial plants. Median family incomes in the Kensington Highlands are more than twice as high as the incomes of families living in North Richmond. Selected statistics from the 1960 census illustrate this contrast in Table 1.1.

Table 1.1. *Selected contrasts between North Richmond and the Kensington Highlands in Western Contra Costa County.*

Variable	North Richmond	Kensington Highlands
Median family income	$4,515	$10,757
Median value of housing	$8,500	$23,000
Percent of male labor force, professional	2.1	45.3
Percent of male labor force, blue-collar	87.7	12.3
Male unemployment	27.7	1.4
Percent of houses with 1.01 occupants per room	27.9	1.2
Percent of sound housing	78.5	99.6

Adapted from U.S. Bureau of the Census, *U.S. Census of the Population and Housing: 1960, Census Tracts, San-Francisco-Oakland, Calif.*, PHC(1) 137, Washington, U.S. Government Printing Office, 1962.

The home residence of each student in the sample was recorded for each grade that he had attended at a local school. Each of these 35,000 recorded addresses was located in one of 250 enumeration districts – small geographic areas containing about 200 households each. The percentage of the school-age residents of each of these 250 districts who were Negroes, and the percentage who came from families headed by unskilled laborers, domestics, unemployed persons or welfare recipients, were calculated for each year by aggregating characteristics of the students living in the district that year.[3]

Two additional operations were performed to broaden the base of estimation. The "neighborhood" of each student was defined as the district in which he lived together with those geographically contiguous districts which were not set apart by natural obstacles or major highways. The aggregation from each district was then extended over the adjacent districts so that the "neighborhoods" overlapped one another. Finally, the composition of the neighborhood of each student was averaged within each of four grade levels: (1) the "primary grades," one through three; (2) the "intermediate grades," four through six; (3) the "junior high-school grades," seven through nine; and, (4) the "senior high-school grades," ten through twelve. Analogous calculations were made of the percent "Negro" and percent "lower-class" in the schools attended by each student at each grade level. These percentages, too, were averaged over the same four educational levels for each student.

These data processing operations yielded sixteen variables central to the analysis which follows – the percentages of Negro and of lower-class schoolmates in the neighborhood and in the school environments of each student at each of four educational levels.

Reflecting the overlap of caste and class – the disproportional representation of Negroes in the lower-class – many more Negroes than whites live in predominantly lower-class neighborhoods. The average percentage of lower-class school-

mates in the neighborhoods of Negro students is forty-eight percent as contrasted with nineteen percent for white students.

Table 1.2 shows that Caucasions tend to live in neighborhoods which are socio-economically homogeneous. Thus, most professional and managerial whites live in areas where there are few lower-class persons. Negroes, by contrast, regardless of their own occupational status, live in neighborhoods with disproportionate lower-class representation. Two-thirds of the Caucasian students whose fathers are white-collar workers, for example, live in neighborhoods where fewer than twenty percent of the students are in lower-class homes; only six percent of their Negro, white-collar compeers live in such neighborhoods.

The irrelevance of personal occupational status for the contextual neighborhood status of Negroes is due to residential segregation by race. Most Negroes, whether engaged in

Table 1.2. *Percentages of junior high school students living in neighborhoods characterized by varying percentages of lower-class schoolmates according to family status and race.*

Family status Race	Sample number	Percentage of lower-class schoolmates in neighborhood				Average percentage of lower-class schoolmates
		00-09	10-19	20-49	50-100	
Professional and managerial:						
Negro	78	12	9	39	40	40
White	389	48	35	17	0	11
White collar:						
Negro	296	5	1	56	38	44
White	530	32	35	31	2	17
Semiskilled and skilled manual:						
Negro	314	2	2	52	44	46
White	570	22	35	41	2	19
Lower-class:						
Negro	833	0	1	43	56	50
White	362	6	22	58	14	30
Total:						
Negro	1,689	2	2	47	49	48
White	1,983	27	32	37	4	19

white-collar work, blue-collar work, or no work, live in predominantly Negro neighborhoods, while the vast majority of whites live in white neighborhoods.

Table 1.3 shows that eighty-four percent of the Negro students whose fathers are white-collar workers live in neighborhoods where over half of their school-aged cohort are Negroes. By contrast, ninety-one percent of white children with white-collar fathers live in neighborhoods where fewer than ten percent of the children are Negroes.

While Tables 1.2 and 1.3 have used the junior-high school years to illustrate the contrasts in neighborhood environments of Negroes and whites, there is little variation in the pattern of neighborhoods for children as they pass from elementary grades through junior high into high school. The only systematic difference between the patterns of segregation at different age levels, shown in Table 1.4, is a slight increase over the school years in the proportion of Negro students living in neighborhoods where more than half their schoolmates are lower-class.

Table 1.3. *Percentages of junior high-school students living in neighborhoods characterized by varying percentages of Negro schoolmates, according to family status and race.*

Family status Race	Sample number	Percentage of Negro schoolmates in neighborhood				Average percentage of Negro schoolmates
		00–09	10–19	20–49	50–100	
Professional and managerial:						
Negro	78	21	2	4	74	65
White	389	96	2	1	1	2
White collar:						
Negro	296	8	3	5	84	72
White	530	91	4	3	2	4
Semiskilled and skilled manual:						
Negro	314	3	4	5	88	76
White	570	91	3	4	2	4
Lower class:						
Negro	833	3	2	5	90	78
White	362	84	2	6	8	9
Total:						
Negro	1,689	5	3	5	87	76
White	1,983	91	3	3	3	5

Table 1.4. *Percentage of students living in neighborhoods characterized by varying proportions of lower-class schoolmates, according to grade level and race.*

Race	Sample No.	Percentage of lower-class schoolmates in neighborhood				Average percentage of lower-class schoolmates
		0–9	10–19	20–49	50–100	
A. Primary grades (1–3):						
Negro	1, 326	1	1	61	36	47
White	1, 521	27	26	43	4	21
B. Intermediate school grades (4–6):						
Negro	1, 478	1	1	53	44	48
White	1, 737	28	30	39	4	19
C. Junior high school grades (7–9):						
Negro	1, 689	2	2	47	49	48
White	1, 983	27	32	37	4	19
D. Senior high school grades (10–12):						
Negro	1, 033	2	2	46	49	48
White	1, 369	26	33	37	4	19

Table 1.5. *Percentage of students living in neighborhoods characterized by varying proportions of Negro schoolmates, according to grade level and race.*

Race	Sample No.	Percentage of Negro schoolmates in neighborhood				Average percentage of Negro schoolmates
		0–9	10–19	20–49	50–100	
A. Primary grades (1–3):						
Negro	1, 326	2	3	9	86	74
White	1, 521	87	6	4	3	6
B. Intermediate grades (4–6):						
Negro	1, 478	4	2	7	87	75
White	1, 737	90	3	4	3	5
C. Junior high school grades (7–9):						
Negro	1, 689	5	3	5	87	76
White	1, 983	91	3	3	3	5
D. Senior high school grades (10–12):						
Negro	1, 033	3	4	4	89	77
White	1, 369	91	4	2	3	4

This increase reflects the gradual trend in the community over the past decade toward increasing racial segregation through the immigration of lower-class Negroes into Western Richmond, by the Bay, and the exodus of white families to San Pablo and the surrounding suburban areas.

While the neighborhood contexts of Negro and white children of various occupational levels remain fairly constant over the school years, the school contexts vary drastically. On the average, two-thirds of the Negro child's elementary schoolmates, half of his junior-high schoolmates, and a quarter of his senior-high schoolmates are also Negroes.

Table 1.6. *Average percentages of Negro schoolmates, and of lower-class schoolmates, in the schools of students, according to race, family status and grade level.*

Family status	Average percentage of Negro schoolmates		Average percentage of lower-class schoolmates	
	Negroes	Whites	Negroes	Whites
A. Primary grades (1–3):				
Professional and managerial	55	2	39	13
White collar	66	6	44	19
Semiskilled and skilled manual	68	6	45	20
Lower class	71	11	48	28
B. Intermediate grades (4–6):				
Professional and managerial	62	2	40	12
White collar	67	5	44	18
Semiskilled and skilled manual	70	5	45	20
Lower class	73	11	49	29
C. Junior high grades (7–9):				
Professional and managerial	39	6	33	16
White collar	47	11	37	21
Semiskilled and skilled manual	50	12	38	23
Lower class	48	17	39	26
D. Senior high grades (10–12):				
Professional and managerial	22	13	26	18
White collar	26	15	28	22
Semiskilled and skilled manual	27	15	29	24
Lower class	27	18	30	27

There is a similar, but less marked, decline in the average proportion of lower-class schoolmates in the schools attended by Negroes – from forty-six percent to thirty percent.

White children, on the average, experienced a change in school composition in the opposite direction – toward slightly increasing proportions of Negro and of lower-class schoolmates as they progressed from elementary to junior-high to senior-high school.

The process of averaging, particularly for white children, obscures much more drastic shifts in context for some than for others. The large number of white children who attended schools which fed into virtually all-white high schools experienced little change in social composition. Those who attended segregated elementary schools which fed into integrated junior and senior high schools experienced a sharp change. Table 1.7 illustrates the wide variation in contextual patterns typical of students who start in virtually all-white elementary schools, and continue to live in all-white neighborhoods.

Table 1.7. *Percentages of Negro students and of lower-class students in sets of feeder schools which represent slight and sharp contextual changes.*

Slight change				Sharp change			
School		Context		School		Context	
Level	Name	Percent Negro	Percent low SES	Level	Name	Percent Negro	Percent low SES
Elementary	Del Mar	2	7	Elementary	Mira Vista	0	13
Junior high	Portola	4	11	Junior high	Adams	3	20
Senior high	El Cerrito	9	10	Senior high	Ells	33	30

II

PRIMARY SCHOOL VARIATION IN COGNITIVE DEVELOPMENT

Our primary interest in this study is to assess the effects of the social composition of the school upon the educational attainments of the students who pass through it. In cross-sectional studies, in which all variables measure characteristics at one point of time, it is difficult to separate differences due to school experience from those present at the time of entrance into the school. A common analytical tactic in such studies has been to hold intelligence test scores "constant" on the assumption that by doing so initial differences in native ability or prior education will be removed. The ambiguous theoretical status of measures of intelligence has, however, made such a solution less than convincing.

Most behavioral scientists would agree that measured intelligence is a function of both biological endowments and environmental influences, but that we have no definitive way of allocating the proportion of variation due to each factor (Ferguson, 1954, pp. 99-112; Hunt, 1961, pp. 361-362). Concommitant measures of intelligence and verbal achievement are to a great degree redundant. To the extent that both measure

developed verbal abilities, it makes little sense to statistically control for variations in measured intelligence while examining effects of prior social variables upon achievement.[4] This is like asking about the effect of social environment on the development of a particular intellectual competence when the effects of the social environment on academic development have already been removed. On the other hand, to the extent that variations in achievement are determined by differences in genetic endowment, the socio-cultural impact is over-emphasized by ignoring differences in intelligence.[5] The middle-class student may in fact do better in school simply because he was better equipped from the beginning.

Even though we cannot resolve variations in measured intelligence into quantitative factors reflecting environmental and hereditary influences, the data obtained in this study enable us to control for initial differences in ability, whatever their source, at the primary grade level, when the children have just started school. We can then isolate the differentiating effects of intervening experiences upon subsequent academic achievement in the higher grades. Thus, the question as to the extent to which an I.Q. test taps innate or cultural influences is irrelevant. Control of an intelligence test score administered soon after entrance to school matches children in the effects of both pre-school environment and genetic differences. Changes which occur subsequent to school entrance may thus be attributed to new or continuing experiences, and not to uncontrolled initial differences. The plague of the cross-sectional study is effectively removed. The simplified schematization in Figure II illustrates the causal ordering of the variables we are considering.

According to this model, when we control for primary grade I.Q. test scores in the analysis of academic achievement in higher grade levels (see the following sections of this report), we will be controlling for the differences between children in intellectual development in their first years in school.

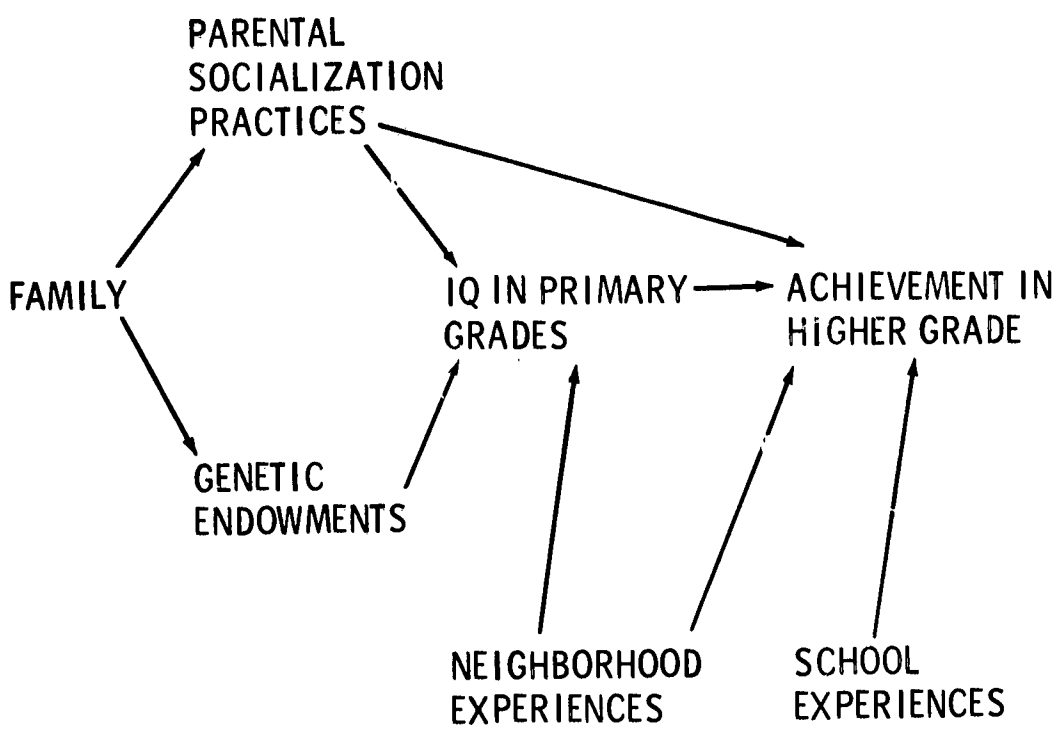

Figure II. *Causal ordering among determinants of academic achievement.*

Differences between social groups in measured intelligence are, of course, well established. Tables 2.1 through 2.4 report the average I.Q. test scores of Negro and white stu-

Table 2.1. *Mean primary grade I.Q. test scores by race, sex, and family status (California Mental Maturity Test).*

Sex / Family status	Negroes		Whites	
	Number	Mean	Number	Mean
Males:				
Professional and managerial	31	100	210	114
White collar	141	101	278	113
Semiskilled and skilled manual	128	102	301	109
Lower class	355	103	189	107
Females:				
Professional and managerial	28	101	84	116
White collar	95	105	119	110
Semiskilled and skilled manual	125	102	125	111
Lower class	310	102	86	107
Total	1, 350	102	1, 495	111

dents, classified by family status, at four age levels. This set of four tables illustrates two patterns, both of which are consistent with other survey studies.

First, the disparity in attainment between Negroes and whites increases through the school years. There is a difference of nine I.Q. points between the average Negro and white

Table 2.2. *Mean sixth-grade Henmon-Nelson I.Q. Test scores by race, sex, and family status.*

Sex / Family Status	Negroes		Whites	
	Number	Mean	Number	Mean
Males:				
Professional and managerial	37	95	244	111
White collar	150	90	333	106
Semiskilled and skilled manual	143	94	368	102
Lower class	407	92	220	98
Females:				
Professional and managerial	36	98	100	112
White collar	114	96	135	108
Semiskilled and skilled manual	137	95	147	105
Lower class	339	93	100	100
Total	1, 507	93	1, 765	105

Table 2.3. *Mean eighth-grade Henmon-Nelson I.Q. Test scores by race, sex, and family status.*

Sex / Family Status	Negroes		Whites	
	Number	Mean	Number	Mean
Males:				
Professional and managerial	44	93	287	111
White collar	173	89	383	105
Semiskilled and skilled manual	170	92	405	102
Lower class	450	88	248	97
Females:				
Professional and managerial	40	94	115	111
White collar	133	94	156	106
Semiskilled and skilled manual	157	91	174	104
Lower class	386	91	123	100
Total	1, 722	90	2, 029	104

Table 2.4. *Mean eleventh-grade Henmon-Nelson I.Q. Test scores by race, sex, and family status.*

Sex / Family Status	Negroes		Whites	
	Number	Mean	Number	Mean
Males:				
Professional and managerial	14	103	134	111
White collar	68	90	181	105
Semiskilled and skilled manual	56	89	195	103
Lower class	170	88	108	100
Females:				
Professional and managerial	13	93	57	113
White collar	53	94	70	104
Semiskilled and skilled manual	56	93	91	102
Lower class	145	89	51	99
Total	623	90	934	105

test scores in the primary grades. The difference between these two groups in senior-high school is fifteen points.[6]

Second, family status makes a substantial difference in the performance of white students but makes a negligible difference in the performance of Negroes. The lack of effect among Negroes is partly attributable to the fact that the status differences between Negro occupational groups are not as great as among white groups. Ministers, for example, are routinely coded as "professional". Among Negroes, however, many ministers are ill-educated; some combine ministry with casual labor.

It was assumed, as shown in the model illustrated in Figure II, that school segregation could have no impact on primary grade development. Actually, the tests used to estimate primary grade attainment were administered after the students had been in school for some time (see Appendix C). Social characteristics of the neighborhood, however, are a part of the socializing environment of pre-school children, and could have some impact by reinforcing or counteracting the influence of the family.

An analysis of the data shows, however, that the neighborhood context does not have a significant independent effect

on primary school attainments as reflected by these test scores. In Table 2.5 we can see that neither the proportion of lower-class children nor the proportion of Negroes in the neighborhood makes any systematic difference to the I.Q. test scores of either Negro or white children within any social stratum. A covariance analysis, treating the proportion of lower-class children as a continuous variable, and controlling for additional familial characteristics, confirms that the effect of neighborhood context is not statistically significant. This analysis is summarized in Table 2.6.[7]

In spite of the substantial and conspicuous differences in school performance of children living in different parts of town, the lack of an independent neighborhood effect at this age level is not surprising. During pre-school years the family is clearly the most important socializing agency for the child. The salience of peers, and of socializing institutions outside of the family, does not appear until later.

At the time the student enters school there is a great deal of variation in educational attainment. Correlates of this variation, such as race, family socioeconomic status, and the cultural level of the home, have already appeared. Analysis of subsequent variation in the cross-sectional study thus risks mistaking original differences for differences produced by subsequent experiences in the school and community.

Control of initial variation in educational attainment, as is possible in the present study, provides a method of estimating experiential effects without running this risk. Subsequent differences outside the school and to some extent independent of neighborhood remain, however, as possible counter-explanations of observed results. One of these differences which has a great deal of appeal as an explanation of Negro-white differences in school performance is discussed in the section which follows.

Table 2.5. *Mean first-grade I.Q. scores by race, percent Negro in neighborhood, family status, and percent lower class in neighborhood during primary grades (California Mental Maturity Test).*

Family Status / Percent lower class	Negro—percent Negro in neighborhood			White—percent Negro in neighborhood		
	50–100	10–49	00–09	50–100	10–49	00–09
Profession and managerial:						
50–100 percent	99 (13)	(3)	(0)	(0)	(1)	(1)
10–49 percent	102 (26)	(4)	(1)	(0)	106 (14)	112 (122)
00–09 percent	(0)	(0)	(2)	(0)	(1)	120 (120)
White collar:						
50–100 percent	101 (60)	(4)	(0)	(3)	(3)	(4)
10–49 percent	102 (127)	108 (21)	(4)	(9)	106 (28)	113 (201)
00–09 percent	(0)	(0)	(4)	(0)	(2)	111 (124)
Semi-skilled and skilled manual:						
50–100 percent	103 (63)	(4)	(0)	(1)	(2)	(4)
10–49 percent	100 (147)	104 (14)	(7)	(9)	110 (34)	109 (261)
00–09 percent	(0)	(0)	(1)	(0)	(3)	112 (95)
Lower class:						
50–100 percent	101 (260)	(7)	(0)	(8)	105 (12)	109 (24)
10–49 percent	103 (302)	100 (62)	(6)	(9)	108 (31)	107 (166)
00–09 percent	(0)	(0)	(0)	(0)	(0)	(8)

Table 2.6. *Sources of variation of primary-grade California Mental Maturity I.Q. Test scores.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
Lower-class primary neighborhood				[2] −.02
Lack of supervision by mother				−.05
Number of objects in home				+.12
Number of siblings				−.07
Family status				[3] .16
Professional and managerial	285	116	+4.1	+.12
White collar	503	110	+.0	+.00
Semiskilled and skilled manual	557	109	−.7	−.03
Lower class	721	105	−2.0	−.07
Race				[3] .17
Negro	886	102	−4.3	−.14
White	1,180	111	+1.0	+.03
Total (R=0.38)	2,066	109		

[1] See App. D for a discussion of covariance analyses.

[2] Not statistically significant. Throughout this report all partial regression coefficients have been evaluated by comparing the reduction in the sum of squares due to fitting constants when a variable is included, and when it is excluded, from the analysis. Variables have been flagged wherever the ratio of the variance due to regression over the uncontrolled variance is less than what might be expected by chance 2.5 percent of the time under simple random sampling conditions. The stratified disproportionate sampling in this study, and the interdependence of many of the tables appearing in this report, make affirmative application of tests of significance inappropriate.

[3] This underlined *beta*—normalized regression coefficient—summarizes the effects of the classes of the nominal variable. See James N. Morgan, *et al.*, *Income and Welfare in the United States* (New York: McGraw-Hill, 1962), pp. 508–511, for a discussion of the calculation and rationale.

III

FATHER ABSENCE AND SCHOOL ACHIEVEMENT

One of the circumstances which has long been held responsible for a variety of social ills is the broken home. William Goode, remarking the lack of research on the effects of divorce on children commented that it would be surprising if the absence of the father had no effect on the child. (Goode, 1956; see also, Yarrow, 1964, pp. 117-121.)[8] Several recent studies have suggested that father absence does generate sex-role identification problems (see Burton, 1961, pp. 85-95; and McCord, 1962, pp. 361-369).[9]

Negro families are much more likely than white families to be broken. In 1960 twenty-three percent of urban Negro families, as contrasted with nine percent of white families, were headed by a woman (Office of Policy Planning, 1965, pp. 61, 64). The rates of broken homes among Negroes and whites in this California community correspond – twenty-two percent as contrasted with nine and a half percent (Wilson, 1966). This difference is so universal and so pronounced that it offers a tempting explanation of developmental differences between Negro and white children in school.

Reviewing the historical devastation of the Negro family during the era of slavery, and the effects of continuing economic marginality, Martin Deutsch concludes:

> . . . All these circumstances have contributed to the instability of the Negro family, and particularly to the fact that it was most often broken by the absence of the father. As a result, the lower-class Negro child entering school often has no experience with a "successful" male model or thereby with a psychological framework in which effort can result in at least the possibility of achievement. (Deutsch, 1963, p. 167.)[10]

In his recent policy report on the Negro family, David Moynihan argues that the great number of father-absent homes is a prime cause of Negroes' poor school achievement, and, partly through the resulting failure to develop competence, of their later occupational difficulties. "The effect of broken families on the performance of Negro youth," he states, "has not been extensively measured, but studies that have been made show an unmistakable influence." (Office of Policy Planning, 1965, p. 36.)[11]

As Moynihan observed, however, the empirical evidence upon which the connection is based is sparse, and has become conspicuous more for its absence than for its presence in the research literature. Robins, Jones and Murphy, for example, in their study of the backgrounds of achievement of Negro elementary school children in St. Louis in 1937-38, comment, "Surprisingly, whether or not a child's father was in the home appeared unrelated to the child's academic and behavior problem." (Robins, 1966, p. 431.) The recent national survey directed by James Coleman (1966, p. 302) similarly found that the structural integrity of the home showed little relationship to achievement among Negroes.

A study of several indicators of academic success in the Richmond secondary schools does not show any consistent difference in the achievement of father-present and father-absent youths of the same sex and race, and of similar social-class background.

For example, when we look at the percentages of lower-class students who have high cumulative grade-point averages in English, in Table 3.1, we see that while far more girls

Table 3.1. *Percentages of lower-class students having high cumulative grade-point averages in English by race, sex, and presence or absence of father.*

Family structure	White		Negro	
	Boys	Girls	Boys	Girls
Father present	52 (184)	75 (82)	46 (251)	64 (201)
Father absent	63 (28)	73 (12)	49 (74)	60 (59)

recieved high grades than boys, and more Caucasian children recieved high grades than Negroes, there is very little difference within these groups between those who have fathers in the home and those who do not. Among the boys, in fact, those with no father received somewhat better grades.

Covariance analyses among lower-class children of several of the measures of academic development at various age levels, reported in Table 3.2, show that in no case does father-absence have a significant effect.

Table 3.2. *Sources of variation of verbal test scores among lower-class children at different grade levels.*

Source of Variation	Marginal Relations		Partial Regression Coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
A. 1st-grade California Mental Maturity IQ Test scores:				
Lack of supervision by mother	--------	--------	--------	[1] −.01
Objects in home	--------	--------	--------	+.11
Number of siblings	--------	--------	--------	−.09
Family structure	--------	--------	--------	[1] .04
Father present	552	105	−0.2	−.01
Father absent	194	105	+.8	+.03
Sex	--------	--------	--------	[1] .01
Male	419	105	−.1	−.00
Female	327	105	+.1	+.00
Race	--------	--------	--------	.21
Negro	506	101	−2.6	−.13
White	240	107	+1.7	+.08

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated Mean	Raw	Normalized
B. 3d-grade Stanford Reading Achievement Test grade-level scores:				
Lack of supervision by mother				[1] +.02
Objects in home				+.12
Number of siblings				[1] −.03
Family structure				[1] .03
Father present	552	3.4	−.01	−.01
Father absent	194	3.4	+.05	+.03
Sex				.12
Male	419	3.3	−.10	−.06
Female	327	3.5	+.08	+.05
Race				.24
Negro	506	3.2	−.23	−.14
White	240	3.6	+.15	+.10
C. 6th-grade Stanford Reading Achievement Test grade-level scores:				
Lack of supervision by mother				[1] −.03
Objects in home				+.14
Number of siblings				−.08
Family structure				[1] .04
Father present	552	5.4	+.03	+.01
Father absent	194	5.1	−.12	−.03
Sex				[1] .01
Male	419	5.4	−.01	−.00
Female	327	5.4	+.01	+.00
Race				.17
Negro	506	4.9	−.30	−.10
White	240	5.7	+.20	+.07
D. 8th-grade Differential Aptitude Verbal Ability Test percentile scores:				
Lack of supervision by mother				[1] −.04
Objects in home				+.18
Number of siblings				−.06
Family structure				[1] .01
Father present	552	37	−0.1	−.00
Father absent	194	33	+0.3	+.00
Sex				.09
Male	419	39	+2.7	+.05
Female	327	34	−2.2	−.04
Race				.24
Negro	506	25	−8.1	−.14
White	240	43	+5.4	+.10

[1] Not statistically significant.

Neither our own data nor the preponderance of evidence from other research studies indicates that father presence or absence, *per se*, is related to school achievement. While broken homes reflect the existence of social and personal problems, and have some consequences for the development of personality,[12] broken homes do not appear to have any systematic effect on the overall level of school success.

In the analysis of achievement in subsequent sections of this report, this aspect of family structure will be ignored. The category of family status dubbed "lower" in ensuing tables includes both father-present homes where the father is unskilled or unemployed, and father-absent homes where the mother is a domestic, welfare recipient, or is unemployed and has less than a high-school education.

IV

NEIGHBORHOOD AND SCHOOL SEGREGATION IN ELEMENTARY GRADES

At grade six Negro students are an average of 1.7 years behind white students in reading development in this California community. This disparity is almost identical to the average difference between Negroes and whites throughout the metropolitan West.[13] At grade three the disparity was slightly less than one year. The mean grade level Stanford Reading Achievement Test score in grade three for whites was 4.0; the mean in grade three for Negroes was 3.2. The increasing disparity through the school years between the privileged and the disadvantaged has been repeatedly documented.

Many plausible reasons for this increasing gap have been suggested: the cumulative deficit of skills and knowledge, increasing inattentivity and demoralization in school, continuing inadequacy of parental stimulation and support, and the earlier independence from the family and growing influence of peers for lower-class youths.

In this section we are particularly interested in examining and comparing the effects upon this racial disparity of school and neighborhood segregation during the elementary school years. When the achievement of students in these different social contexts is contrasted we find differences which are larger than those between Negroes and whites. The average sixth-grade reading level of children who had attended primary schools with fewer than ten percent lower-class children, for example, was 7.4; children who went to schools where a majority of their classmates were lower-class, however, averaged only 4.9 in the sixth grade.

This contrast, and all of the others listed in Table 4.1 are, of course, confounded with one another. Most Negroes live in predominantly Negro areas and attend predominantly Negro schools, as described in Section One.

Table 4.1. *Mean sixth-grade Stanford Reading Achievement Test grade-level scores according to several variables.*

Variable category	Sample Number	Mean
Lower-class primary school:		
00–09 percent	218	7. 4
10–49 percent	1, 452	6. 3
50–100 percent	407	4. 9
Negro primary school:		
00–09 percent	1, 052	6. 8
10–49 percent	244	5. 6
50–100 percent	781	5. 0
Lower-class primary neighborhood:		
00–09 percent	337	7. 2
10–49 percent	1, 358	6. 2
50–100 percent	382	5. 2
Negro primary neighborhood:		
00–09 percent	1, 046	6. 8
10–49 percent	208	5. 9
50–100 percent	823	5. 0
Family status:		
Professional and managerial	282	7. 4
White collar	504	6. 8
Semiskilled and skilled manual	557	6. 1
Lower class	734	5. 4
Race:		
Negro	905	5. 0
White	1, 172	6. 7
Total	2, 077	6. 3

There are several important questions to be answered by analysis of the interrelationships among these variables. When we allow for the pre-existing differences in primary-grade mental maturity, do the intervening contextual variables have any independent effect on achievement? If so, is the neighborhood or the school context more important? Also, do family characteristics have any direct effect on achievement in addition to their effects through pre-school socialization and determination of social context?

Before examing the data, the distinction between neighborhood and school contexts should be re-emphasized. The neighborhood consists of the several blocks surrounding the home of each student, ignoring school boundaries. Students living at the periphery of an elementary school boundary may have as neighbors children who attend a different school. Also, if an elementary school covers areas with varying demographic characteristics, a student's school and immediate neighborhood may be quite different in composition.

The multivariate analysis implied by these questions is summarized in Table 4.2. This analysis shows that, allowing for variation in primary-grade mental maturity, the social-class composition of the primary school has the largest independent effect upon sixth-grade reading level. Among students who attended schools with similar social-class composition, neither the racial composition of the school nor the characteristics of the neighborhood made any difference.

The lack of any direct effect of neighborhood composition, either racial or socioeconomic, upon measured school achievement is of considerable consequence for policy and theory. One continuing reservation about the relevance of proposals to alter the demographic composition of schools is the question as to whether continuing residential segregation might structure the effective environment of students so that their integration in schools makes no difference. These data are inconsistent with this reservation. On the contrary, these data suggest that the effect of neighborhood segregation

Table 4.2. *Sources of variation of sixth-grade Stanford Reading Achievement Test scores.*

Source of variation	Marginal Relations		Partial Regression Coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
Lower-class primary school	.....	.....	.....	−.12
Negro primary school	.....	.....	.....	[1]+.01
Lower-class primary neighborhood	.....	.....	.....	[1]−.01
Negro primary neighborhood	.....	.....	.....	[1]−.00
Primary-grade mental maturity	.....	.....	.....	+.15
Lack of supervision by mother	.....	.....	.....	−.04
Number of objects in home	.....	.....	.....	+.07
Family status	.....	.....	.....	.08
Professional and managerial	282	7.4	+0.3	+.03
White collar	504	6.8	+.3	+.04
Semiskilled and skilled manual	558	6.1	−.2	−.02
Lower class	734	5.4	−.3	−.04
Race	.....	.....	.....	[1].01
Negro	905	5.0	−.1	−.01
White	1,173	6.7	+.0	+.00
Total variance joint effect (R=0.31)	2,078	6.3	.....	.....

[1] Not statistically significant.

upon achievement derives entirely from the resulting segregation of neighborhood schools on social class lines. Restructuring the composition of schools, even in the absence of residential rearrangements, can be expected to have an effect upon the academic achievement of students.

The theoretical significance of this relationship is its emphasis on the probable mechanisms through which segregation influences achievement. The view that this influence is primarily an osmotic process of transmission of values and behavior patterns among peers would lead us to expect that neighborhood segregation would have at least as large an effect as school segregation upon educational outcomes. Such an expectation might be enforced by the finding that even within schools residential proximity is a factor in the selection of friends and social contacts among students. Our data do not support such an expectation, however.

This contradiction of popular thought suggests that we should look to modes of influence more specific to the school situation. While peers may have an influence on achievement, it is their behavior in the school setting and not their generalized attitudes as expressed out of school which we should focus on to illuminate the process of influence. Variations in the modal socioeconomic composition of a school, and accompanying variation in cognitive development in the primary grades, generate norms of interpersonal behavior and role-expectations which acquire a force of their own and have a redounding impact upon the students in the situation. The proportion of time teachers devote to behavioral control as opposed to academic instruction, the level and pace of group instruction, the standards of excellence and adequacy, the expectations for role-performance, the "definitions of the situation," the morale, competence, and commitment of teachers, all systematically vary by the class composition of schools (Herriott, 1966; Passow, 1963, *passim*). These factors, along with the model of schoolmates, intervene and interpret the effect of modal socioeconomic composition.

The second substantive point brought out in Table 4.2 was the fact that the racial composition of the elementary school does not have any independent effect, over and above the social-class composition of the school, upon achievement. This finding is of sufficient importance to be reconfirmed and elaborated in detail (see Section Five) for it suggests that the central importance placed upon racial balance in schools may be somewhat off the mark. But let us return to this suggestion after examining further relevant data, in the following section.

Finally, after allowing for the effects of family status and caste upon pre-school cognitive development, as indicated by primary grade I.Q., we see that their direct additional effect upon later elementary school verbal achievement is very small. We see (in Table 4.2) virtually no difference in sixth-grade reading test scores between Negroes and whites which is not

attributable to differences in pre-school development, variation in school environments, and social-class characteristics. While race, along with social-class, has a differentiating effect upon pre-school development, it has no continuing additive effect during the elementary school years. We shall find in this study, however, that it has a large renewed effect when students enter junior high school.

V

SOCIAL-CLASS OR RACIAL SEGREGATION

The lower average achievement levels of students attending predominantly Negro schools has been repeatedly documented during the past decade. Advocates of school integration call attention to the inferior resources of Negro schools even within a single school administrative district. The migration of proven teachers to middle-class (hence white) schools, the run-down plants and smaller grounds in the core of the city where Negroes live, inadequate libraries and laboratories, and, above all, sagging morale and custodial perceptions of the educational function, have all been emphasized.

But integrationists and segregationists alike implicitly agree that the proportion of Negroes in a school defines the quality of a school. Whether negative characteristics are seen as a consequence of discrimination or bigotry, or whether the ethos of the school is believed to be affected by the predominance of presumably ill-motivated and academically retarded youths, color stigmatizes the institution as well as the individual.

In Richmond, as elsewhere, the contrasts are sharp. The average percentile score in verbal reasoning attained by

eighth-grade students who have attended predominantly Negro elementary schools is twenty-seven as contrasted with the percentile score of fifty-nine attained by students from almost all-white schools. But this disparity in achievement holds for Negro students who attend schools of contrasting racial composition as well as for white students. Table 5.1 shows that the achievement level of Negroes attending predominantly white elementary schools is closer to their white compeers at these schools than to that of Negroes who attend predominantly Negro schools.

Table 5.1. *Mean eighth-grade DAT verbal reasoning test percentile scores by race and intermediate school racial composition.*

Race of student	Intermediate school racial composition		
	White [1]	Integrated [2]	Negro [3]
White	59 (1,070)	50 (98)	39 (36)
Negro	45 (36)	36 (92)	26 (777)
Total	59 (1,106)	47 (190)	27 (813)

[1] 0–9-percent Negro students in school.
[2] 10–49-percent Negro students in school.
[3] 50–100-percent Negro students in school.

The racial composition of a school, however, is confounded with its social-class composition and the various characteristics which link social class to educational attainment. A predominantly Negro school is generally a predominantly lower-class school. If we classify the elementary schools on the basis of the proportion of lower-class students in the school, instead of the proportion of Negroes, we find that the contrasts in achievement are even stronger. Table 5.2 shows that the achievement level of both whites and Negroes coming from elementary schools which house few lower-class students average at the sixty-fifth percentile, considerably higher than the average for all the white schools shown in Table 5.1.

Table 5.2. *Mean eighth-grade DAT verbal reasoning test percentile scores by race and intermediate school social-class composition.*

Race of student	Intermediate school social-class composition		
	High [1]	Medium [2]	Low [3]
White	65 (640)	50 (525)	44 (39)
Negro	66 (17)	29 (502)	24 (386)
Total	65 (657)	45 (1, 027)	29 (425)

[1] 0–19 percent lower-class students in school.
[2] 20–49 percent lower-class students in school.
[3] 50–100 percent lower-class students in school.

Since the racial and social-class compositions of schools are so closely correlated (r=.77), these two tables reflect, in large part, the contrasts between the same elementary schools. The independent effects of these two variables, and the social-class background of the student, are examined in detail in Table 5.3 for white students. There are, of course, very few

Table 5.3. *Mean eighth-grade DAT verbal reasoning test percentile scores by family status, intermediate school racial composition, and intermediate school social-class composition among white students.*

Family status of student social-class composition	Intermediate school racial composition		
	White	Integrated	Negro
Professional and managerial:			
High	75 (197)	---- (2)	---- (0)
Middle	64 (49)	---- (2)	---- (1)
Low	---- (2)	---- (0)	---- (0)
White collar:			
High	63 (183)	---- (4)	---- (0)
Middle	56 (110)	57 (27)	---- (3)
Low	---- (3)	---- (2)	---- (4)
Semiskilled and skilled manual:			
High	61 (184)	---- (6)	---- (0)
Middle	50 (156)	49 (22)	---- (3)
Low	---- (3)	---- (2)	---- (5)
Lower class:			
High	50 (62)	---- (2)	---- (0)
Middle	41 (117)	43 (27)	---- (8)
Low	---- (4)	---- (2)	43 (12)

white students in our sample who attended elementary schools with student bodies over fifty percent Negro, and very few who attended predominantly lower-class schools. Many of the possible combinations, therefore, are not represented by enough cases to warrant calculation of an average test score.

The contrasts which are available are unmistakably clear and consistent, however. The achievement of white students who attended predominantly white elementary schools has been strongly affected by the social-class composition of the school. But the degree of racial integration of a school has no effect upon the achievement of white students who attended modally middle-class schools. This finding is consistent with Coleman's report that ". . .the apparent beneficial effect of a student body with a high proportion of white students comes not from racial composition *per se,* but from the better educational background and higher educational aspirations that are, on the average, found among white students." (Coleman, 1966, p. 307.)

When we further allow for the effects of individual variations in initial primary school mental maturity, and for the effects of variation in home environment, on the student's academic performance, in the covariance analysis presented in Table 5.4, we see that while the social-class context of the elementary school has had a pronounced effect, the effect of school racial composition is non-significant for white students.

If the percentage of Negroes and percentage of lower-class students in the school environment are treated as continuous variables rather than as definitions of discrete categories, the analysis remains substantially the same. School racial composition shows an insignificant relationship to achievement for white students while school social class composition has a substantial effect.[14]

We confront a different problem in trying to assess the independent effects of school racial and social-class composition on achievement among Negroes. There are hardly any

Table 5.4. *Sources of variation of eighth-grade DAT verbal reasoning test percentile scores among white students.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated mean	Raw	Normalized
Lower class intermediate school				. 10
0–19 percent	640	65	+2. 8	+. 05
20–49 percent	525	50	−3. 1	−. 05
50–100 percent	39	44	−2. 4	−. 02
Negro intermediate school				[1] . 02
0–9 percent	1, 070	59	+. 1	+. 00
10–49 percent	98	50	−. 2	−. 00
50· 100 percent	36	39	−3. 8	−. 02
1st-grade mental maturity				+. 32
Lack of supervision by mother				−. 04
Number of objects in home				+. 16
Number of siblings				−. 05
Family status				. 15
Professional and managerial	253	72	+5. 6	+. 08
White collar	336	60	+1. 7	+. 03
Semiskilled and skilled manual	381	55	−. 6	−. 01
Lower class	234	44	−7. 6	−. 10
Total (R=0.51)	1, 204	58		

[1] Not statistically significant.

Negroes in our sample in predominantly white schools or predominantly upper-status schools. Examining the contrasts which are available in Table 5.6, we find, again, that the social-class composition of the school has a systematic effect on the achievement of Negro students. Negro students from predominantly Negro elementary schools which have fewer than fifty percent lower-class students do somewhat better than those from schools with more lower-class students.

Here, by contrast with the case of the white students whose achievement was not related to the racial composition of their school, we find that Negro students from integrated schools are doing better than their compeers from segregated Negro schools. When we take account of individual variation

Table 5.5. *Sources of variation of eighth-grade DAT verbal reasoning test percentile scores among white students.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated mean	Raw	Normalized
Lower-class intermediate school				−.07
Negro intermediate school				[1] −.03
First-grade mental maturity				+.32
Lack of supervision by mother				−.04
Number of objects in home				+.16
Number of siblings				−.05
Family status				.15
Professional and managerial	253	72	+5.8	+.08
White collar	336	60	+1.7	+.03
Semiskilled and skilled manual	381	55	−.6	−.01
Lower class	234	44	−7.7	−.10
Total (R=0.51)	1, 204	58		

[1] Not statistically significant.

Table 5.6. *Mean eighth-grade DAT verbal reasoning test percentile scores by family status, intermediate school racial composition, and intermediate school social-class composition among Negro students.*

Family status of student social-class composition	Intermediate school racial composition		
	White	Integrated	Negro
Professional and managerial:			
High	(2)	(0)	(0)
Middle	(0)	(7)	30 (17)
Low	(0)	(0)	28 (13)
White collar:			
High	(4)	(5)	(0)
Middle	(7)	37 (15)	27 (89)
Low	(0)	(1)	22 (58)
Semiskilled and skilled manual:			
High	(4)	(0)	(0)
Middle	(9)	38 (16)	29 (85)
Low	(0)	(3)	28 (71)
Lower:			
High	(2)	(0)	(0)
Middle	(8)	34 (41)	27 (208)
Low	(0)	(4)	23 (236)

in primary school cognitive development and home influences, however, we find that this relationship is largely spurious. The analysis of covariance presented in Table 5.7 shows the racial composition of the school as not having a significant direct relationship to the achievement of Negro students. The Negro students who attended integrated schools had higher mental maturity test scores in their primary grades, and came from homes better provided with educative materials.

Table 5.7. *Sources of variation of eighth-grade DAT verbal reasoning test percentile scores among Negro students.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated mean	Raw	Normalized
Lower class intermediate school				[1] .20
0–19 percent	17	66	+27.1	+.18
20–49 percent	502	29	+1.0	+.02
50–100 percent	368	24	−3.0	−.06
Negro intermediate school				[1] .04
0–9 percent	36	45	+3.3	+.03
10–49 percent	92	36	+2.1	+.02
50–100 percent	777	26	−.4	−.01
1st-grade mental maturity				+.31
Lack of supervision by mother				[1] −.04
Number of objects in home				+.07
Number of siblings				−.09
Family status				[1] .06
Professional and managerial	39	33	+.3	+.00
White collar	179	29	−1.9	−.03
Semiskilled and skilled manual	188	31	+2.5	+.04
Lower class	499	26	−.3	−.01
Total (R=0.45)	905	28		

[1] Not statistically significant.

Treating the two contextual variables as continuous variables in Table 5.8 again confirms the conclusion that racial

composition of the school, while tending to favor Negro students in racially integrated schools, does not have a substantial effect – not nearly so strong an impact as the social-class composition of the school.

Table 5.8. *Sources of variation of eighth-grade DAT verbal reasoning test percentile scores among Negro students.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated mean	Raw	Normalized
Lower-class intermediate school	--------	--------	--------	−. 15
Negro intermediate school	--------	--------	--------	[1] −. 05
1st-grade mental maturity	--------	--------	--------	+. 31
Lack of supervision by mother	--------	--------	--------	[1] −. 04
Number of objects in home	--------	--------	--------	+. 07
Number of siblings	--------	--------	--------	−. 09
Family status	--------	--------	--------	[1]. 05
Professional and managerial	39	33	+1. 6	+. 01
White collar	179	29	−1. 5	−. 02
Semiskilled and skilled manual	188	31	+2. 1	+. 04
Lower class	499	26	−. 4	−. 01
Total (R=0.44)	905	28	--------	--------

[1] Not statistically significant.

While the racial composition of a school *per se* apparently has a negligible effect on the achievement of both Negro and white students, the social-class composition has a much more pronounced effect on the achievement of Negroes than on whites. (Compare the regression of achievement on school social-class composition which is .20 for Negroes in Table 5.7 and .10 for whites in Table 5.4.) The occupational status of the family and the cultural richness of the home, on the other hand, are much stronger predictors of achievement among white students.

Although we have found that family structure, the presence or absence of a father, was not *per se* a factor in the achievement of lower-class Negro or white students, the family has

much more influence on the achievement of white students than Negro students; the latter being more sensitive to variation in the school milieu (Coleman, 1966, pp. 302, 304).

An analysis of the effects of class and caste school segregation on earlier achievement yields confirmation of the conclusion drawn above. The Stanford Reading Achievement Test scores, discussed in the preceding section, were shown to be partly dependent upon the composition of the student's primary school. Contrasting the effects of social-class and racial school composition in Table 5.9 we find that at this level also reading development is independent of the school's racial composition.

Table 5.9. *Scores of variation of sixth-grade Stanford Reading Achievement Test scores.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
Lower-class primary school	.....	.....	.....	−. 12
Negro primary school	.....	.....	.....	[1] +. 00
1st-grade mental maturity	.....	.....	.....	+. 15
Lack of supervision by mother	.....	.....	.....	−. 04
Number of objects in home	.....	.....	.....	+. 07
Family status	.....	.....	.....	. 08
Professional and managerial	283	7. 4	+0. 3	+. 03
White collar	505	6. 8	+. 3	+. 04
Semiskilled and skilled manual	550	6. 2	−. 2	−. 02
Lower class	736	5. 4	−. 3	−. 04
Race	.....	.....	.....	[1] . 01
Negro	905	5. 0	−. 1	−. 01
White	1, 178	6. 7	+. 0	+. 00
Total (R = 0.31)	2, 083	6. 3	.....	.....

[1] Not statistically significant.

VI

LATER EFFECTS OF SCHOOL SEGREGATION

The reader may have noted that in discussing effects of school segregation upon intermediate grade achievement, the proportion of lower-class schoolmates during the *primary* school years was used as the "predictor" variable; and, in Section Five, when contrasting effects of racial and social-class segregation on eight-grade achievement, the composition of the school during the preceding *intermediate* grade levels was used as the independent variable.

The reasons for looking at the prior rather than concurrent school context are two-fold. In the first place, this eliminates any ambiguity about chronological order and, hence, the possible direction of causation. A skeptic might argue, for example, that parents of children who do well in school are more likely to move into neighborhoods within the boundaries of elite schools. One cannot argue the converse that future academic achievement is the cause of earlier choice of residence.

The more important reason for emphasizing the effect of segregation on subsequent rather than concurrent achieve-

ment, however, is that segregation has more substantial long-run than short-run effects. The discrepancy in achievement between students attending similar junior high schools who had attended elementary schools of contrasting social-class composition is much larger than the discrepancy in achievement between students from similar elementary schools who go to contrasting junior high schools.

Table 6.1. *Sources of variation of eighth-grade Differential Aptitude Test scores in verbal reasoning.*

Source of Variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated Mean	Raw	Normalized
Lower-class junior high school				−.04
Lower-class intermediate school				−.08
Lower-class primary school				[1] −.04
1st-grade mental maturity				+.30
Lack of supervision by mother				−.04
Number of objects in home				+.13
Number of siblings				−.05
Family status				.13
Professional and managerial	280	71	+6.6	+.08
White collar	499	55	+1.2	+.02
Semiskilled and skilled manual	555	52	−0.3	−.00
Lower class	716	37	−5.2	−.08
Race				.10
Negro	880	28	−6.3	−.08
White	1,170	58	+1.5	+.02
Total (R=.60)	2,050	52		

[1] Not statistically significant.

Table 6.1 shows that elementary school segregation has twice the effect of junior-high segregation upon eighth-grade achievement when allowing for effects of familial background and primary school development. The same result is found in the analysis of covariance shown in Table 6.2 where school composition at the three levels is treated categorically

rather than continuously. The average difference in achievement between students attending the intermediate grades in schools having more than fifty percent of the student body who are lower-class is more than eight percentile points lower than students in predominantly middle-class schools, after allowing for differences in starting point in the primary grades, family influences, and effects of the junior-high context. The average effect of junior-high context, on the other

Table 6.2. *Sources of variation of eighth-grade Differential Aptitude Test scores in verbal reasoning.*

Source of Variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated Mean	Raw	Normalized
Lower-class junior high school				.06
20–49 percent	1, 430	44	−1. 6	−. 03
00–19 percent	619	64	+2. 3	+. 04
Lower-class intermediate school				.11
50–100 percent	413	29	−4. 4	−. 04
20–49 percent	1, 004	45	−2. 6	−. 04
00–19 percent	632	65	+3. 9	+. 06
Lower-class primary school				[1].03
50–100 percent	392	25	−1. 4	−. 01
20–49 percent	1, 043	47	+0. 8	+. 01
00–19 percent	614	64	−0. 6	−. 01
1st-grade mental maturity				+. 30
Lack of supervision by mother				−. 04
Number of objects in home				+. 13
Number of siblings				−. 05
Family status				. 13
Professional and managerial	280	71	+6. 5	+. 08
White collar	499	55	+1. 1	+. 02
Semiskilled and skilled manual	555	52	−0. 2	−. 00
Lower class	715	37	−5. 4	−. 08
Race				. 12
Negro	879	28	−7. 6	−. 10
White	1, 170	58	+1. 8	+. 02
Total (R=.60)	2, 049	52		

[1] Not statistically significant.

hand, upon students from similar elementary schools, is less than four percentile points.

Turning, finally, to attainments in senior high school, in Table 6.3, we see that for white students the social-class characteristics of the junior and senior high school attended have no independent effect upon Henmon-Nelson I.Q. test scores, while, again, the social-class composition of the elementary school makes a substantial difference. Among Negroes (Table 6.4) the social-class characteristics of the schools attended have no appreciable effect upon I.Q. test scores at the senior high level.

Table 6.3. *Sources of variation of eleventh-grade Henmon-Nelson I.Q. Test scores among white students.*

Source of Variation	Marginal Relations		Partial Regression Coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
Lower-class senior high school	-------	-------	-------	[1].00
20–69 percent	309	102.7	+0.0	+.00
00–19 percent	224	107.2	−0.0	−.00
Lower-class junior high school	-------	-------	-------	[1].01
20–69 percent	235	101.6	−0.1	−.00
00–19 percent	298	107.0	+0.1	+.00
Lower-class intermediate school	-------	-------	-------	.11
50–100 percent	18	97.4	−2.7	−.03
20–49 percent	250	101.6	−1.4	−.05
00–19 percent	265	108.1	+1.5	+.05
Primary grade mental maturity	-------	-------	-------	+.24
Lack of supervision by mother	-------	-------	-------	−.05
Number of objects in home	-------	-------	-------	+.10
Number of siblings	-------	-------	-------	−.06
Family status	-------	-------	-------	.22
Professional and managerial	104	113.3	+5.7	+.16
White collar	153	104.0	−0.5	−.02
Semiskilled and skilled manual	174	103.0	−0.8	−.02
Lower class	102	98.8	−4.0	−.11
Total (R=0.46)	533	104.6	-------	-------

[1] Not statistically significant.

Table 6.4. *Sources of variation of eleventh-grade Henmon-Nelson I.Q. Test scores among Negro students.*

Source of Variation	Marginal Relations		Partial Regression Coefficients	
	Sample Number	Estimated Mean	Raw	Normalized
Lower-class senior high school	.....	.....	.....	[1].02
20–69 percent	285	92.1	+0.1	+.00
00–19 percent	30	90.9	−0.8	−.02
Lower-class junior high school	.....	.....	.....	[1]−.01
20–69 percent	310	92.0	−0.2	−.00
00–19 percent	5	.....	.....	.....
Lower-class intermediate school	.....	.....	.....	[1].08
50–100 percent	134	92.4	+1.2	+.04
20–49 percent	179	91.6	−0.9	−.03
00–19 percent	2	.....	.....	.....
Primary-grade mental maturity	.....	.....	.....	+.22
Lack of supervision by mother	.....	.....	.....	[1]+.07
Number of objects in home	.....	.....	.....	+.13
Number of siblings	.....	.....	.....	[1]+.00
Family status	.....	.....	.....	[1].12
Professional and managerial	10	100.0	+5.9	+.07
White collar	73	92.4	−0.3	−.01
Semiskilled and skilled manual	55	94.4	+2.2	+.06
Lower class	177	90.5	−1.0	−.04
Total (R=0.31)	315	92.0	.....	.....

[1] Not statistically significant.

A possible explanation for this anomalous finding among Negro high-school students lies in the fact that we are here dealing with the senior-high population, excluding those who have dropped out between the eighth and eleventh grades. If, during this period, Negro students whose achievement is poor, and who have attended lower-class schools, drop out or transfer out in greater numbers than their compeers who have attended middle-class schools, the survivors in the lower-class schools would disproportionately represent the high achievers. This trend would tend to diminish (or reverse) the differences in achievement between the Negro students in lower-class and middle-class schools.

Table 6.5. *Distributions of several variables among junior and senior high school students.*

Variables	Junior High	Senior High
	Percent	*Percent*
Report ability to get A or B grades	56	65
Negro	23	17
Low family status	35	30
Number of sample cases	2, 234	1, 843

While differential drop-out rates have not been analyzed in detail, other data in this survey are consistent with this interpretation. Senior high students have higher status, and higher self-appraisal of their abilities, and more of them are white.

This digression should not obscure the general thesis that segregation in the elementary school has a major effect upon subsequent school achievement; segregation at later grade levels augments this effect only slightly, if at all. This result was clear, in Tables 6.1 and 6.2, when the effects of elementary and junior high school segregation in eighth-grade verbal reasoning test scores were contrasted. Among white students elementary school segregation showed long-run effects upon academic performance in senior high school. This long-run effect is not evident among Negro students – perhaps because of the differential "holding power" of "middle-class" and "lower-class" high schools for Negro poor achievers.

In any event, these data suggest that efforts to balance school composition should have the most perceptible impact upon subsequent student performance if it is done at the elementary school level. This is due not only to the cumulative deficit in acquisition of skills but also to the transitional effect of moving from segregated lower-class elementary schools into relatively more integrated junior high schools. Contrasting the second and third rows of Table 6.6, we see that children of manual workers, for example, moving from relatively high status elementary schools into low status

junior high schools perform considerably better than their compeers moving from low status elementary schools into high status junior high schools.[15]

Table 6.6. *Mean eighth-grade DAT verbal reasoning test percentile scores among white children of manual workers attending elementary and junior high schools of contrasting social-class composition.*

Social class composition of school				Mean	
Elementary		Junior High			
High	(00–19)	High	(00–19)	63	(88)
High	(00–19)	Low	(20–49)	60	(47)
Low	(20–49)	High	(00–19)	55	(33)
Low	(20–49)	Low	(20–49)	48	(103)

VII

SELF-CONCEPT

Up to this point we have been concerned with the analysis of measured academic achievement, examining variations between persons occupying different positions in the social structure. We now wish to turn briefly to some of the attitudinal concommitants of the achievement of students.

A frequently postulated cause of the low achievement levels of Negro youths is their pessimistic view of their own ability to do better (see e.g., Grambs, 1965). This discouraging view is presumably an internalization of a social definition of their own worth. Within the school context the evaluation and expectations of teachers would seem to be the most salient source of information for a child to gauge his ability. John Niemeyer has argued that "the chief cause of the low achievement of the children from alienated groups is the fact that too many teachers and principals honestly believe that these children are educable only to an extremely limited extent." (Niemeyer, 1963, p. 81.)

In our secondary school sample of students we found that while seventy percent of the white students thought they were capable of getting A or B grades in school, only forty-four percent of the Negro students had similar high evaluations of their ability.

It is an open question whether this large difference in self-assessment of ability to achieve is cause or consequence of school performance. It is certainly plausible to argue, with the support of considerable experimental research, that feed-back evaluation of prior performance, even when erroneous, affects expectations for future success. A more appropriate model than uni-directional causation in either direction between performance and self-concept is a recursive model of repeated feed-back.

Since, in this study, our measure of self-assessment was gathered on a questionnaire administered after the performance tests we will view this expression of ability as a consequence of prior achievement, rather than as a cause of subsequent performance.

An analysis of the variation in percentage of students reporting that they are capable of getting A's or B's shows that measured eighth-grade verbal ability accounts for almost all of the variation between groups. This covariance analysis is shown in Table 7.1.

In fact, although the difference is not large, allowing for differences in measured achievement and other related variables, Negroes report slightly higher perception of their academic ability than whites. This slight discrepancy could result from the tendency of some Negro students to discount the evaluations of their performance as discriminatory. Two-fifths of the Negroes and one-fifth of the remaining students thought that teachers preferred white students.

The sense of incompetence (which is reflected in the belief that they are incapable of getting better grades) has other significant attitudinal manifestations. A natural corollary is the belief that one cannot do anything about destiny; one cannot control the environment. The proportion of Negroes who subscribe to the view that "Planning is useless since one's plans hardly ever work out," for example, is twice as high as the proportion of whites expressing that view.

Table 7.1. *Sources of variation of the percentages of students who say they are capable of obtaining A or B grades.*

Source of Variation	Marginal Relations		Partial Regression Coefficients	
	Sample Number	Estimated Percentage	Raw	Normalized
8th-grade verbal ability				+. 49
Lower-class junior high school				[1] —. 01
Lower-class intermediate school				[1] —. 01
1st-grade mental maturity				[1] +. 01
Lack of supervision by mother				—. 08
Number of objects in home				+. 08
Number of siblings				—. 03
Family status				[1]. 03
Professional and managerial	287	82	+0. 6	+. 00
White collar	506	70	+1. 9	+. 02
Semiskilled and skilled manual	550	63	—1. 3	—. 01
Lower class	714	50	—0. 8	—. 01
				. 03
Sex				
Male	1, 274	63	—1. 5	—. 02
Female	783	66	+1. 3	+. 01
				. 04
Race				
Negro	874	44	+4. 0	+. 03
White	1, 183	70	—0. 9	—. 01
Total (R=.55)	2, 057	65		

[1] Not statistically significant.

Table 7.2. *Sources of variation of the percentages of students who agree that "Planning is useless since one's plans hardly ever work out."*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
8th-grade verbal achievement				−. 11
Lower-class junior high school				. 05
0–19 percent lower class	727	10	−1. 6	−. 02
20–69 percent lower class	1, 154	22	+1. 8	+. 02
1st-grade mental maturity				−. 08
Lack of supervision by mother				[1]+. 01
Number of objects in home				−. 07
Number of siblings				−. 03
Family status				[1]. 02
Professional and managerial	292	8	−1. 1	−. 01
White collar	462	14	+. 0	+. 00
Semiskilled and skilled manual	499	16	+. 7	+. 01
Lower class	628	22	+. 0	+. 00
Sex				. 07
Male	1, 153	18	+2. 6	+. 04
Female	728	14	−2. 3	−. 03
Race				. 07
Negro	778	28	+5. 4	+. 06
White	1, 103	13	−2. 3	−. 01
Total (R=0.27)	1, 881	16		

[1] Not statistically significant.

Even allowing for differences in school achievement, a significantly larger proportion of Negroes feel they cannot control their fate. The opposite was the case, recall, with subjective competence. That is, allowing for differences in achievement, more Negroes feel they are competent but fewer feel they can control their future. The perception of a hostile prejudicial environment accounts for both disparities, on the one hand discounting the feed-back of negative evaluations of competence; on the other hand, raising external obstacles to realizing goals.

VIII

ASPIRATIONS

More than half of the secondary school students in Richmond say they want to go to a four-year college. While wishes may outstrip ultimate realization, at this point there is virtually no difference between expressed aspirations and expectations. In every sub-group of the population – among boys and girls, Negroes and whites, students from varying social strata – almost all those who say they want to go to college also say they expect to.

Within each of these groups, we would expect to find both aspirations and expectations for college attendance modified by the students' knowledge of their prior performance. Students whose academic performance has been poor in the secondary schools will tend to redefine their expectations and modify their aspirations to be congruent with past performance.

As we would expect, we find large differences in academic achievement between students who aspire to go to college and those who do not. More boys want to go to college than girls,[16] and more whites than Negroes. Yet, when we allow for differences in measured achievement, we find that far more Negro students than whites, of similar achievement

Table 8.1. *Sources of variation of educational aspirations for college.*

Source of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
8th-grade verbal ability	-------	-------	-------	+.39
Lower-class junior high school	-------	-------	-------	−.09
Lower-class intermediate school	-------	-------	-------	[1] −.03
1st-grade mental maturity	-------	-------	-------	[1] −.01
Lack of supervision by mother	-------	-------	-------	−.06
Number of objects in home	-------	-------	-------	+.11
Number of siblings	-------	-------	-------	−.05
Family status	-------	-------	-------	.07
Professional and managerial	285	76	+1.7	+.01
White collar	489	66	+4.0	+.04
Semiskilled and skilled manual	546	53	−4.4	−.04
Lower class	693	47	−0.3	−.00
Sex	-------	-------	-------	.10
Male	1,232	65	+5.4	+.06
Female	781	54	−4.9	−.05
Race	-------	-------	-------	.20
Negro	847	51	+20.6	+.16
White	1,166	61	−4.7	−.04
Total (R=.48)	2,013	59	-------	-------

[1] Not statistically significant.

levels, want to go to college. In Table 8.1 we see that while fifty-one percent of the Negro students and sixty-one percent of the white students aspire to college, allowing for differences in achievement and school and home environments, twenty-five percent more Negroes than whites have college desires.

The fact that the largest disparity between aspiration and achievement is to be found among depressed groups has been noted before,[17] yet we continue to find action programs formulated on the assumption that the stimulation of aspiration will ameliorate the problem of poor achievement. If Negro students, however, can maintain or develop high aspirations for advanced educational attainment without developing present academic competence, such programs may serve only

to widen the gap between hopes and performance and intensify the ultimate personal damage.

The relatively high proportion of Negro students who are low achievers yet aspire to go to college is more clearly brought out in Tables 8.2 and 8.3. Thirty percent of the white students whose measured verbal ability is below the thirtieth percentile say they would like to go to college; forty-three percent of the Negro students in this lowest achievement bracket have college aspirations.

Table 8.2. *Sources of variations of college aspirations among white students.*

Sources of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
Self-concept of ability				.23
A or B	1,088	73	+7.2	+.07
C, D, or F	479	31	−17.4	−.16
8th-grade verbal achievement				.22
0–29 percent	302	30	−17.3	−.14
30–69 percent	586	53	−3.7	−.04
70–99 percent	679	81	+11.1	+.11
Lower-class junior high school				.08
0–19 percent	830	70	+3.7	+.04
20–69 percent	737	50	−4.2	−.04
Lack of supervision of mother				−.09
Objects in home				+.13
Number of siblings				−.04
Family status				.07
Professional and managerial	339	77	+3.9	+.03
White collar	449	66	+3.0	+.03
Semiskilled and skilled manual	480	52	−4.8	−.04
Lower class	299	46	−1.3	−.01
Sex				.14
Male	1,080	68	+7.3	+.07
Female	487	54	−6.8	−.07
Total (R=0.53)	1,567	60		

Table 8.3. *Sources of variation of college aspirations among Negro students.*

Sources of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
Self-concept of ability				.15
A or B	445	65	+8.9	+.09
C, D, or F	613	41	−6.7	−.07
8th-grade verbal achievement				.13
0–29 percent	647	43	−5.1	−.05
30–69 percent	327	61	+5.3	+.05
70–99 percent	84	78	+15.9	+.09
Lower-class junior high school				[1].03
0–19 percent	45	77	+7.8	+.03
20–69 percent	1,013	50	−.3	−.00
Lack of supervision by mother				[1] −.05
Objects in home				+.11
Number of siblings				[1] −.05
Family-status				[1].07
Professional and managerial	54	76	+13.7	+.06
White collar	206	54	+.6	+.00
Semiskilled and skilled manual	227	51	−1.6	−.01
Lower-class	571	48	−.9	−.01
Sex				[1].01
Male	526	49	−.7	−.01
Female	532	53	+.6	+.00
Total (R=0.33)	1,058	51		

[1] Not statistically significant.

Differences in self-conception of ability do not account for the disproportionate number of poor-achieving Negroes who report college aspirations. Forty-one percent of the Negroes who do not think they are able to get better than C, D, or F grades nevertheless say they want to go to college. In general, as we can see from the regression coefficients in Tables 8.2 and 8.3, academic performance and confidence in ability to achieve good grades are more relevant to the aspirations of white students than Negroes.

It is particularly among the poor-achieving, lower-class students in predominantly lower-class schools that the reversal in educational aspirations is pronounced. Among this group of students whose likelihood of academic success is minimal, the proportion of Negroes wanting a college education is more than double that of white students.

Table 8.4. *Percentages of lower-class students achieving below the thirtieth percentile, in lower-class junior-high schools, aspiring to go to college by sex, race, and self-concept of ability.*

Self-concept of ability	Male		Female	
	Negro	White	Negro	White
A or B	49 (56)	18 (12)	59 (54)	26 (10)
C, D, or F	35 (123)	17 (25)	40 (31)	19 (20)

Table 8.5. *Sources of variation of the percentages of lower-class students, attending predominantly lower-class junior-high schools, who aspire to go to college.*

Sources of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
8th-grade verbal achievement				+.32
1st-grade mental maturity				−.13
Lack of supervision by mother				−.07
Number of objects in home				+.19
Number of siblings				−.06
Sex				.10
Male	332	52	+5.9	+.06
Female	299	40	−4.0	−.04
Race				.21
Negro	468	48	+10.9	+.11
White	153	41	−9.9	−.10
Total (R=0.39)	621	45		

This apparent paradox could be accounted for by differences between lower-class Negroes and whites in their perceptions of the structure of opportunities. Working- and lower-class white male students both desire and feel they can obtain manual occupations. Negro students tend to reject manual occupations and have experienced either personal or vicarious rejection in the job market. Opportunities for continued education, while not instrumentally valuable, are more available to Negroes and have intrinsic prestige value (Glenn, 1963, pp. 645-657).

In Table 8.6 we see analogous reversal. While a slightly higher proportion of Negroes than whites say they would like manual occupations, when allowing for differences in achievement, the relationship is reversed. Negro students whose achievement is poor eschew manual labor.

Table 8.6. *Sources of variation in aspirations to manual occupations.*

Sources of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
8th-grade verbal ability				−. 21
Lower-class junior high school				[1] +. 00
Lower-class intermediate school				+. 05
1st-grade mental maturity				[1] +. 03
Lack of supervision by mother				[1] +. 02
Objects in home				[1] +. 01
Number of siblings				[1] −. 00
Family status				. 10
Professional and managerial	258	3	−5. 3	−. 06
White collar	444	9	−2. 2	−. 03
Semiskilled and skilled manual	489	14	+2. 2	+. 03
Lower class	608	18	+3. 6	+. 05
Sex				. 26
Male	1, 132	20	+8. 5	+. 13
Female	667	4	−8. 1	−. 12
Race				. 06
Negro	775	16	−3. 9	−. 05
White	1, 024	11	+. 9	+. 01
Total (R=0.37)	1, 799	12		

[1] Not statistically significant.

The consequences of poor academic achievement are quite different for Negro and white students. White students perceive manual jobs as a viable alternative in the event of school failure. If the Negro student drops out he has good reason to expect to be unemployed.

This contrast in perceptions was repeatedly reflected in interview materials with students. One Negro student in continuation school who had been expelled from several prior schools for malbehavior and poor grades reflects this perception.

Q. Why are most of the students on the basketball team colored?

A. Because, as you can look around and see, most of the kids here in the afternoon are colored. I guess you've seen when you walked up that most of them are colored. I mean, you find a few white ones but they, most of the white boys, go in the morning. Most of them have jobs. . .

* * *

Q. How certain are you that you'll go to college?

A. I'm pretty certain – 'cause like Junior College, you don't have to finish high school. You can be eighteen years old to go there.

Q. You don't have to finish high school?

A. No.

Q. So, you don't think you'll finish it?

A. I mean, if something comes up and I can't finish school, I'm gonna go to college. I don't care what comes up. (Blake, 1964.)

IX

BEHAVIORAL DEVIANCE

The fact that Negroes are more likely than whites to be involved in delinquency and crime is well established. In our data fifty-three percent of the Negro adolescent boys and twenty-six percent of the white adolescent boys have official police records of offenses during the two years prior to the administration of the questionnaire.[19] At the same time, there is no reason to think that the causes of crime among Negroes are different from the causes of crime among whites. If the broken home is conducive to delinquency among white boys, it should be conducive to delinquency among Negro boys; if low socioeconomic status fosters crime among whites, it should do the same among Negroes. In other words, an explanation of Negro-white differences in criminal activity should be a by-product of an explanation of criminal activity in general.

At the same time, Negro-white differences in such things as family structure, school performance, socioeconomic status, and cultural values should offer important clues toward a general explanation of criminal activity, since these differences are often easily visible. In fact, this route from Negro-white difference in criminal activity through other Negro-white differences which purportedly explain the initial

difference is the one most frequently followed by students of this question. The difficulty is that the Negro-white difference in criminality becomes evidence for the assertion that other Negro-white differences are the cause of the criminality, and the circle is closed with that which was to be explained explaining itself. For example, the Negro home is much more likely than the white home to be broken. Therefore, the broken home may be taken as an explanation of Negro-white differences in delinquency. In the present data, however, the broken home is unrelated to delinquency, and Negro-white differences in delinquency therefore cannot be attributed to the differences in the rate of broken homes.[20]

The same cannot be said for educational attainment. As the material presented earlier amply illustrates, Negroes are much less likely than whites to do well in school, and those who do poorly in school are much more likely to have police records, whether white or Negro, as Table 9.1 shows.

How does school attainment affect delinquency? Explanations of this relation or at least the relations following from it have taken two major forms. In the dominant sociological view, the student turns to delinquency as a way of relieving frustrations attendant upon school failure (Cohen, 1955). In a second view, lack of success in school reduces the student's stake in the entire "conventional game", therefore, giving him greater opportunity to engage in delinquent acts and increasing the likelihood that he will do so should the opportunity arise (Toby, 1962).

In this second view, which we follow here, ties to conventional institutions and groups, such as the family, the school, and peers, are seen as the major source of social control. This "social bond" or stake may be characterized by several conceptually distinct, if empirically overlapping, dimensions: the bond of affection or attachment, the bond of involvement, and the bond of commitment, which comes from accepting the groups' goals and investing time and energy in activities which lead toward them. Applied to the school,

this kind of analysis helps locate the place of educational attainment in the causation of delinquent behavior, for it is clear that poor school performance weakens all of these bonds to the school.

Table 9.1. *Sources of variation of the percentages of male students having no official police records of delinquency.*

Sources of variation	Marginal relations		Partial regression coefficients	
	Sample number	Estimated percentage	Raw	Normalized
Perceived importance of grades				. 08
Very important	732	71	+2. 4	+. 03
Somewhat important	363	71	+0. 3	+. 00
Fairly important	177	61	−7. 6	−. 06
Completely unimportant	40	58	−8. 5	−. 03
8th-grade verbal achievement				+. 17
Lower-class junior high school				. 11
00–19 percent	538	79	+5. 0	+. 05
20–69 percent	774	58	−5. 3	−. 06
1st-grade mental maturity				+. 04
Lack of supervision by mother				−. 07
Number of objects in home				[1] −. 01
Number of siblings				−. 08
Family status				[1]. 03
Professional and managerial	206	81	+1. 1	+. 01
White collar	338	70	−0. 9	−. 01
Semiskilled and skilled manual	360	68	−1. 4	−. 01
Lower class	408	61	+1. 8	+. 02
Race				. 06
Negro	468	47	−5. 9	−. 05
White	844	74	+1. 3	+. 01
Total (R=0.35)	1, 312	69		

[1] Not statistically significant.

Attachment

As a matter of fact, both of the sociological views mentioned earlier accept, if they do not start from, what must be considered one of the best established findings of delinquency research: "Delinquents don't like school." (Glueck, 1950.) The first step in understanding the implications of this finding requires converting it from a descriptive to a causal statement: "Children who don't like school are much more likely to be delinquent." This statement is clearly supported by the data in this study.

Commitment to the Future

Still another aspect of the bond to the school, and one frequently highly emphasized by sociological theories of delinquency, is the stake in a future which depends upon education, and which success in school, therefore, strengthens and lack of success in school effectively weakens. While it is probably true that for many students adult occupational success is not as salient a consideration in day-to-day activities as these theories sometimes suggest, yet it is also true that for some students the future is real for the very reason that they have a future, a fact repeatedly brought home to them by their success in the school system. This link to the future strengthens the bond to the present, because those with a future have something to lose by deviant activity. This orientation to the future is reflected in concern for present academic performance. Students who think good grades are important, for example, are likely to be future oriented. They are also less likely to commit delinquent acts.

Involvement in School Activities

Attitudes and beliefs favorable to the commission of delinquent acts are one thing, opportunities to commit these acts are another. As would be expected, those children not constrained by beliefs in the value of school and the legitimacy

of its authority are also more likely to have opportunities to commit delinquent acts, because their out-of-school time is less likely to be occupied by school-related activities. The student who does not finish his homework, who spends little time at it, is also more likely to have committed delinquent acts, and this is true regardless of his attitudes toward the school. (Attitudes toward the school are of course importantly related to whether the student completes his homework, however.)

The student who does poorly in school is less likely to like school, less likely to be involved in school activities, less likely to accept the school's authority, and less likely to see school as relevant to his future. For all these reasons, he is more likely to be delinquent.

It is interesting to note in Table 9.1 that there is a substantial and significant difference in rates of official delinquency between the boys who attended predominantly middle-class junior-high schools and those who went to lower-class schools, even when allowing for the effects of this variable upon school achievement. Segregated schools affect deviant behavior not only through their impact upon achievement, and thereby upon students' commitments to the institution and society, but cause an additional differential. This residual inter-school differential seems to be due to geographic variation in police surveillance which is concentrated in the city core and in lower-class areas heavily populated by Negroes. Inter-school and Negro-white differences in self-reported delinquent acts are much smaller than police-recorded offense differentials.

Segregation, then, not only has its effect upon individual intellectual and moral development, but also affects the behavior of institutions outside the school, to create a "self-fulfilling prophecy." Negroes and lower-class persons have less "stake" in established social institutions, are more apt to engage in deviant activity, hence they are watched more closely, and a higher proportion of committed delinquent acts come to official attention.

X

CONCLUSION AND IMPLICATIONS

Segregation in public schools, consequent on community demographic patterns, has been a topic of local and national concern for many years. Many public and private agencies have operated under the assumption that racial imbalances in schools are undesirable, and have sought to develop procedures for the amelioration of imbalance. Yet, they have not been able to radically affect practice or compellingly substantiate deleterious consequences of segregation in the face of political or ideological opposition.

One of the large gaps in the documentation of the effect of segregation is the lurking suspicion that the well-established differences in performance of children at different schools are due to initial differences in relevant intellectual abilities which children bring with them on entry. If schools do not in any way contribute to or aggravate these differences, and if essentially equivalent educational opportunities are provided by schools serving the poor and the well-to-do, then the minimal requisites of "equality of educational opportunity" are met. Even the more generous extension of public responsibility to compensate for remediable environmental deficiencies might as well, or better, be accomplished by

programmatic investment in schools where the disadvantaged are concentrated.

A series of empirical studies have been conducted during the past few years to determine whether there are substantial inter-school differences in the intellectual development of students which are not attributable to prior personal characteristics of the individual, his home background and pre-school experiences, or extra-school influences stemming from the neighborhood milieu. A common analytical stratagem in these studies is to compare the achievement of students in different school contexts who have been exposed to similar non-school experiences. The largest and most comprehensive of these studies is the national survey conducted in 1966 by the U. S. Office of Education under the legislative mandate of the Civil Rights Act of 1964 (Coleman, 1966).

While the control of relevant individual differences in social background helps isolate effects of differences between schools, there always remains the possibility that other significant social factors engendering initial variation in intellectual development remain uncontrolled. Moreover, systematic differences between school student bodies in the distribution of genetic endowments must be assumed away.

The central purpose of the present study was to fill this gap by "partialling out" measured differences in initial mental maturity of the students during their primary grades – rather than environmental correlates of intellectual development alone – while examining the effects of differing school contexts upon subsequent achievement. The major substantive conclusions, based upon the foregoing analysis, are:

1. Allowing for individual differences in personal background, neighborhood context, and mental maturity at the time of school entry, variations in elementary school context make a substantial and significant difference in subsequent academic success at higher grade levels.

2. Socioeconomic and racial characteristics of students' age-mates in the local neighborhood have no independent effect upon the academic achievement of students attending similar schools.

3. The social-class composition of a school – indicated by the proportion of students whose parents are unskilled laborers, unemployed, or welfare recipients – affects the academic development of both Negro and white students in either racially integrated or racially segregated situations.

4. *Given similar social-class compositions,* the racial balance of a school has slight bearing on the academic performance of students. (Social-class and racial compositions are, of course, closely correlated.)

5. Social-class segregation of students, through its effect upon the development of academic skills, has ramifying consequences for students' subjective sense of competence and belief that they can plan and control their future.

6. Failure to succeed in school weakens students' bonds to established institutions and social norms, freeing them to engage in delinquent activity. Segregation, moreover, affects official delinquency rates not only through its effect upon the competence, morale, and subsequent behavior of students but also through its effect upon the intensity of police surveillance.

In broad outline we see that the unequal inheritance with which students enter school, which should become less salient as students progress through school if schools in fact "maximized individual potential," is in fact aggravated because of segregation.

* * *

Three guidelines to policy are implicit in the results of this study:

1. Conclusions three and four (above) together suggest that strategems to achieve racial balance in schools must simultaneously ameliorate social-class imbalance if they are to equalize the educationally relevant milieux.

2. Conclusions two and three suggest that while residential integration may be a desirable social goal in its own right, the effectiveness of school integration is not dependent upon concommitant changes in neighborhood patterns.

3. The large initial differences in social inheritance of children entering school are not perceptibly ameliorated by standard school programs of remedial reading, special classes for the "mentally retarded", which take place in segregated schools and grouped classes within schools. Investments into compensatory programs should be designed to make cumulative increments to knowledge about the development of competence.

APPENDICES

A

WEIGHTED ESTIMATION

Estimates of means, percentages, and regression coefficients which are based upon the secondary school sample are *weighted* rather than simple averages of the sample values. A hypothetical example will demonstrate the necessity and rationale for weighting and will illustrate the procedure used throughout.

Suppose we had a population consisting of one hundred boys and one hundred girls. We ask them some question yielding a "yes" or "no" response: e.g., "Do you plan to go to college?" Eighty of the boys but only forty of the girls say "yes". This results in Table A.1.

Table A.1. *Distribution of responses in a hypothetical population.*

Sex	Frequencies			Percent "yes"
	Total	Yes	No	
Boys	100	80	20	80
Girls	100	40	60	40
Total	200	120	80	60

Sixty percent of the students in this hypothetical population respond that they plan to go to college.

If we now drew a random probability sample with disproportionate numbers of boys and girls in the sample – say eighty percent of the boys but only twenty percent of the girls, the *expected* proportion of each stratum saying "yes" would remain the same. That is, we would expect eighty percent of the boys in our sample to say "yes" and forty percent of the girls to say "yes". The table we would expect to get, then, appears as Table A.2.

Table A.2. ***Expected distribution of responses in sample.***

Sex	Frequencies			Percent "yes"
	Total	Yes	No	
Boys	80	64	16	80
Girls	20	8	12	40
Total	100	72	28	72

While the percent "yes" for boys and girls separately remains the same, seventy-two percent of the sample as contrasted with sixty percent of the population say "yes." Boys, who aspire to college in greater numbers, are unduly represented in our sample. The simple unweighted average provides an estimate of the total which is heavily biased toward the over-sampled stratum.

To make an unbiased estimate of the original population figures we have to multiply the number of girls in the sample by 5 and the number of boys by 1.25. This will restore the population frequencies shown in Table A.1. These "weights" are the *reciprocals of the sampling fractions,* one-fifth for girls and four-fifths for boys.

In the originally selected sample of 5,545 students, five sampling fractions were used: eighty-five percent of Negro boys, sixty percent of Negro girls, thirty percent of "other" boys, twelve percent of "other" girls, and one hundred percent of those population sub-strata containing fewer than twenty-five cases. For the reduced final sample of 4,077 cases who completed the questionnaire two adjustments were made. *First*, in each stratum a revised estimate of the number of cases in the population was made by subtracting the same percentage of students who were found in the sample from that stratum to have transferred or dropped-out, from the number of students listed on the school rosters in the Fall. This provides an estimate of the population size for the stratum at the time of the survey in the Spring. *Second*, the fraction of this estimated population of students actually completing the questionnaire in each sub-stratum was calculated. This fraction, in which the numerator was adjusted for non-response rates and the denominator adjusted for population transfers and drop-outs, replaces the originally intended sampling fractions for the purpose of making estimates based upon the final sample. Because of the fluctuation in actual completion rates from stratum to stratum, almost one hundred thirty different weights are involved.

One way of describing the gross effect of this weighting procedure is to say that the students completing the questionnaire within a stratum – say, tenth grade Negro boys at a particular school during the Spring – are taken to be representative of all of the students in that stratum. There is a slight non-response bias involved in this "representation". If we ignore the differential fractions actually sampled in the different strata, the type of bias demonstrated in Figure A.2 would be added to the general non-response bias.

In sum, then, the weighting procedure provides optimal estimates of population parameters, correcting for the effects of disproportionate sampling, but not correcting for non-response bias.

B

COLLECTION OF DATA

A field staff composed of six clerks hired for six weeks was formed to collect data from a sample of guidance folders in the Richmond public schools. This sample was composed of 4,077 Richmond youth who had been junior- and senior-high school students in Richmond in 1964-65 and had, at that time, completed an extensive questionnaire. In July of 1966, about one-sixth of the students in that sample had graduated from high school.

A "transfer code sheet" was designed on which the crew transcribed pupil movement, ability and achievement data: school attendance, addresses. grade point average (GPA), track assignment (curriculum patterns, e.g., "college prep" or "secretarial"), test scores, and any available transfer or drop information.

There are thirteen junior and senior high schools located throughout Richmond. Licensed counselors were engaged at some schools to assist in locating guidance folders. At the outset, the consultant service was invaluable because we had to meet and deal with score- and address-location problems for the first time, set coding precedents, dicipher the special

notations that counselors, teachers and other school personnel diversely use and, in short, learn how to collect these data quickly and accurately. For many of our questions, the school counselor was our only source of information. For example, particular areas of the folder might ordinarily contain the student's address(es) as he moved through the system, but we learned that a careful search of his entire guidance folder was practical. His health card, suspension notice, or transfer form might list addresses or moves which were not in evidence elsewhere. Since the Richmond School District has been unified for only a very few years, there was found to be only scattered homogeneity in methods of recording students' test scores and addresses. The ARC (Academic Record Card) is a consistent and easily located, separate record of students' GPAs and also nearly always contains many of the most important test scores.

Of the 4,077 students in the 1964-65 Richmond school sample, the records of one hundred thirty-six students could not be located. Best estimates, based on all available school information, of where these missing records might be, are shown in Table B.1.

Breakdowns of the one hundred thirty-six students records by (1) sex and race, (2) grade level in 1964-65, and (3) school attended at time of sample selection in 1964-65, are seen in Table B.2.

Coding problems arose mainly from two sources. One, the unexpected mobility of many students. This problem was met by developing an exhaustive directory of all Richmond streets and a complete coding into neighborhood areas. The other most troublesome problem was the immense diversity of tests and test scores found in the sample. This resolved itself by treating each complication as a separate sub-problem: it was clear that not every datum could be used!

When the grade-level score appeared in the school records, it was recorded. When the grade-level was unavailable, a percentile score was transcribed. Raw scores were not coded (except for fifth grade STEP-Science) because ordinarily the

Table B.1. *Frequency distribution of students whose school records were not located.*

Location	Number of Students
Richmond High	11
Harry Flls High	20[21]
De Anza High	6
Gompers continuation school	5
Other schools in Richmond district	18[22]
Total believed to be in Richmond	60
Oakland school district	13
Berkeley school district	5
San Francisco school district	4
Other Bay Area schools	20
Total believed to be in Bay Area outside Richmond	42
CYA, juvenile authorities, Byron, etc.	3
Out of Bay Area but in California	18
Out of state	4[23]
No records	9[24]
Total miscellaneous	34

form of the test was not identified in the school records and there was no way of knowing what the raw score meant (different forms of the same test have different numbers of items, etc.). I.Q. scores were recorded in I.Q. form and so coded.

Some test scores were discarded before coding for two reasons: (1) the test itself did not appear frequently enough in the sample, or (2) the form that the score came in (e.g., "reading age," or percentile) was one which was not consistent with the form most commonly found. These data were transcribed from the school records but not coded.

When conversion tables were available or could be constructed, scores were uniformly converted to one form and coded. When varying forms appeared regularly, and no

Table B.2. *Distribution of students whose school records were not located by race and sex, grade level, and school attended in 1964-65.*

Description of student	Number
1. Race and Sex	
Negro males	37
Negro females	33
White males	49
White females	17
2. Grade level in 1964-65.	
Grade 7	27
8	44
9	31
10	22
11	13
12	none
3. School attended in 1964-65	
a. Junior high schools	
Adams	4
Downer	22
Granada	18
Helms	13
Portola	16
Roosevelt	19
b. Senior high schools	
Gompers	6
De Anza	9
El Cerrito	5
Ells	7
Richmond	17

conversion was possible, two types of scores (e.g., percentile and grade-level) were coded. This occurred in two cases: Stanford Achievement Test, and STEP-Science. Partial conversion tables existed for Stanford tests and others were constructed, but conversion tables for the California Achievement Tests and STEP Tests were found to be not relevant to

forms of scores found in school records. Henmon-Nelson I.Q.s and Kuhlman-Anderson I.Q.s were converted when necessary from percentile to I.Q. score.

It was decided to record Reading, Arithmetic, and Language part scores, because they were so frequently given, for the California Achievement Tests, Stanford Achievement Tests, Science Research Associates Tests (SRA), and Iowa Tests. All were recorded in grade-level form except for Stanford above the eighth grade, when percentiles were almost exclusively recorded in the school records.

Tests which occasionally occurred in the school records which were not coded because (1) they were anomalous; (2) the scores came in forms which could not be converted: or (3) there was not enough information in the school records to identify [a] the test, or [b] the form of the test, are listed below.

American Scholastic Achievement
Ammons (percentile)
Ammons – Vocabulary
California Achievement Tests – Spelling
California Battery Median
California Tests ("achievement age")
California Tests ("mental age")
California Tests (percentile)
Durrell-Sullivan (ratio or fraction)
Tates ("achievement age")
Gates (percentile)
Gates – P
Gates – S
Gates (raw score)
Gates ("total" score)
Goodenough I.Q.
Ingraham-Clark
Iowa – Spelling
Iowa – Work-Study
Iowa – unidentified part score
Madden Peak Arithmetic
Metropolitan – Arithmetic

Metropolitan – Reading (part score)
Metropolitan – Reading (percentile)
Metropolitan – Reading (raw score)
"NA" – Spelling
New Basic Reading Test
N.Y. Match Concepts
N.Y. Reading Readiness
"OPS" Arithmetic
Orleans – Algebra
Orleans – Prognosis
Pint-Cunning
"PMA"
"SBL"
SRA – I.Q.
SRA – Spelling
SRA – Work Skills
Stanford Achievement ("achievement age")
Stanford Achievement ("mental age")
Stanford Achievement ("reading age")
Stanford Battery Median
Stanford Science
STEP 3-digit converted scores (except Science)
Wide Range Achievement Tests (WRA)

C

ESTIMATION OF TEST SCORES

In any study based upon data retrieved from extant documents and historical records, missing, fragmentary, or incomparable information creates a severe problem for subsequent analysis and comparison. In this particular study our sample consisted of 4,077 secondary school students who were in the seventh through twelfth grades during the school year 1964-65. The twelfth-grade students in this sample were in the first grade during the years 1953-54; the seventh grade students were in the first grade during 1958-59. Altogether, records spanning the years from 1953 through 1966 had to be gleaned.

The elementary districts feeding into the Richmond Union High School District were not unified during this period. Even the Richmond Elementary District had not centralized its testing program. The subsequent variation in testing practices, between the feeder districts and among schools within districts, together with the idiosyncratic records of students who had transferred in and out of local schools, who had been absent, or who had been given special tests for guidance purposes, have led to the tremendous diversity of available records.

While it was possible to retrieve some standardized test information for the great majority of students in the sample at each level – primary grades, intermediate grades, junior high level, and senior high for those who had reached the tenth grade by 1964-65 – only a minority of the students have a complete sequence of the same tests at each level. An analysis restricted to this group alone would severely limit the effective sample size as well as introducing a bias into the sample, overrepresenting students who were non-mobile, non-absentees, and not subject to special guidance attention.

Most of the tests which were available at each level, however, have a high communality of content with all of the other available tests – predominantly verbal ability. For example, the California Reading Achievement Test at the sixth-grade level correlates .85 with the Stanford Reading Achievement Test, .82 with the Henmon-Nelson I.Q. Test, .86 with the California Language Achievement Test, and so forth. Given this high degree of intercorrelation among the set of variables it is possible to make reasonably accurate regression estimates of what a particular student's CAT reading score would be on the basis of his scores on any other tests which may be available for him.

The steps which were taken to estimate selected test scores are as follows:

1. At each of the four grade-level groups (1-3, 4-6, 7-9, and 10-12) all of the tests which are known to have high verbal content and for which more than twenty scores had been gathered during the field work were selected.

2. Within each group the intercorrelations between each test and every other test were calculated on the basis of all cases for which test scores were present for the particular pair under consideration. At the same time the mean and standard deviation were calculated for each test based on all of the scores available for each test.

3. For each test for which a substantial number of original test scores were present (this ranged from 3,555 eighth-grade DAT Verbal Aptitude Test scores to a low of 919 first-grade California Mental Maturity Test scores), the regression of the test on every other test within the set was calculated. The variances of these regression coefficients were also computed at this time in order to estimate the accuracy of the prediction formulæ.

4. The reciprocal of the variance of each regression coefficient was calculated to serve as a weight in estimating a missing test score if more than one prediction could be made for that score. For example, if a student had no record for a test that was to be estimated, say a first-grade CMM, but had several other test scores recorded for his primary grade years, there would be several "predicted" scores, one based on each test score that was available. The smaller the variance of a regression coefficient, the more accurate a prediction is apt to be. Therefore, in these cases, a weighted average of the predicted scores is used as a best estimate of the missing score.

The very substantial gain in numbers of cases for which scores are available for analysis is shown in Table C.1.

Table C.1. *Numbers and means of "original" and "estimated" test scores.*

			Original		Estimated	
Level	Grade	Test	Number	Mean	Number	Mean
Primary	1	CMM	919	106.8	3003	106.5
Primary	3	STAN-R	1549	3.6	3020	35.4
Intermediate	6	STAN-R	2743	5.8	3468	57.2
Intermediate	6	H-N	1308	99.8	3458	99.0
JHS	8	DAT-Ve	3555	42.7	3966	42.1
JHS	8	H-N	2380	97.6	3963	97.5
SHS	11	STEP-R	1574	48.3	1635	48.0
SHS	11	H-N	1584	98.5	1635	98.5

D

COVARIANCE ANALYSIS

When the analysis of the variation of a variable entails assessing the effects of a large number of "independent" variables which have complex causal interrelationships, some parsimonious model is required to utilize the available data efficiently. Where all of the variables are measured by continuous numerical scales, least squares estimates of the parameters of multiple regression equations are commonly used to assess the independent direct effects of the predictor variables on the dependent variable. The multiple correlation, or squared multiple correlation, is used to estimate the total independent and joint effects of the set of predictor variables.

In the present analysis, as in most social surveys, some of the independent variables consist of nominal classifications – such as male or female, Negro or white. Regression analysis may be readily extended to include nominal categorization by assigning the "dummy" value of one if an individual belongs to a particular category, and zero if he does not (see e.g., Suits, 1957, pp. 548-551). A regression coefficient is estimated for each category of the nominal variable, with the constraint that their weighted sum shall be zero. The

procedure is equivalent to the classical non-orthogonal analysis of covariance (Wilks, 1938, pp. 141-154; Nair, 1941, pp. 317-328; Kempthorne, 1952, pp. 91-96) and has now been applied several times in non-experimental empirical research (Hill, 1959, pp. 355-381; Morgan, 1952; Wilensky, 1964, pp. 173-197).

Where the dependent variable is nominal -- as in the analysis of educational aspiration in Section Eight, in which students were classified according to their desire to go to college or not -- an analogous extension of the regression model may be made. Again each individual is assigned the variable value of one if he belongs to a given category, and zero if he does not. Least squares estimates of the regression coefficients of this "dummy" variable on the predictor variables estimate the proportion of persons (or conditional probability of a person) falling in a category associated with a unit change in the respective independent variables. If the independent variables in the analysis are numerical, this application of regression is equivalent to the discriminant function (Fisher, 1936, pp. 179-188; 1954, pp. 285-287).[25]

The regression model, estimated by the method of least squares, may be generally extended, then, to either numerical or nominal variables, in any combination. The general model in this case may be represented by

$$Y_a = b_0 + \sum_{i=1}^{p} \sum_{j=1}^{qi} b_{ij} X_{ija} + \sum_{K=1}^{r} b_k x_{ka} + e_a,$$

subject to the side-restrictions

$$\sum_{j=1}^{i} N_{ij} b_{ij} = 0 \qquad (i = 1, \ldots, p),$$

where Y represents either a numerical or nominal dependent variable, X represents a nominal independent variable, and x

represents a numerical independent variable scaled as a deviation from the mean of the variable.

Two characteristics of regression coefficients should be emphasized when interpreting the estimated effects of variables or classifications such as appear throughout this paper. The appropriateness of an interpretation hinges upon the model of causal interrelationships among the set of variables under consideration.

First, a regression coefficient provides a weighted *average* direct effect of each variable or classification upon the dependent variable being analyzed after adjusting for the effects of all other independent variables included in the analysis. If, in fact, a variable has very different, or opposite, effects in different sub-populations, or in different ranges of a covariate – if, that is, two variables interact – the average effect will be of little interest and may be misleading. The specification of the effect in each sub-population would be of greater interest and would more accurately reflect the data.

For example, we found in Section Eight that more boys than girls aspired to go to college, both in the marginal relationship and after allowing for differences in academic achievement, social status, and so forth. The conclusion that being a boy in our culture is more likely to lead to college aspirations would obscure the fact that among Negro students more girls than boys aspire to go to college. Since whites outnumber Negroes in the population, the statement is valid, on the average, but it is a misleading generalization.

Second, the interpretation of the partial regression coefficient depends upon the causal order among the variables included in the analysis. In this study this ordering is generally established by the temporal sequence among the variables, with race and sex being considered exogenous, and parental characteristics assumed to be prior to student behaviors. The partial coefficient represents the *total* effect of a variable upon the dependent variable only when three conditions are met:

1. Variables which are *causes* of the predictor variable under consideration, and have a direct independent effect upon the dependent variable, are held constant by inclusion in the analysis. Otherwise the apparent relationship may be partially or totally spurious.

2. Variables which *intervene* between the predictor variable and the dependent variable are excluded from the analysis. Where an intervening variable is included, the partial coefficient estimates the independent *direct* effect only, omitting its effect through the intervening variable.

3. Variables which are *consequences* of the dependent variable must be excluded. If actual subsequent college entry, for example, were to be held constant in the analysis of educational aspirations in Section Eight, we would only be analyzing that part of the variation of aspirations which was irrelevant to matriculation.

The second condition mentioned is particularly crucial to the interpretation of regression coefficients and warrants some explication. In the analysis of the college aspirations of white students in Table 8.2, for example, we assume the following causal ordering, from proximate to remote:

	Normalized Partial Regression Coefficient
Dependent Variable:	
College aspirations	
Independent Variables:	
Self-concept of ability	.23
Eighth grade verbal achievement	.22
Social-class composition of junior high school	.08

Family Characteristics:	
Lack of supervision by mother	.09
Objects in home	.13
Number of siblings	.04
Family status	.07
Exogenous Variables:	
Sex	.14
Race (white students only)	

If this is a correct ordering, the first partial coefficient, .23, estimates the total effect of self-concept of ability upon college aspirations. The second coefficient, .22, estimates the additional direct effect of earlier verbal achievement on aspirations over and above its effect through modifying students' reported appraisal of their own ability. We already know from Section Seven that prior academic performance has a very strong influence upon self-concept of ability. Similarly, the estimated direct effect of the social-class composition of the junior high school on achievement, .08, is an additional effect, over-and-above the influence this context has upon achievement and upon self-concept of ability.

In comparing the magnitude of partial regression coefficients, then, it is important to bear in mind that these are direct path coefficients. A small, even an insignificant or zero, partial regression coefficient on a predictor variable does not necessarily indicate that the variable is irrelevant to the causation of the dependent variable if intervening variables have been included in the analysis. Rather, the effect of such a variable is interpreted by the intervening variable. The small partial regression of educational aspirations on the number of siblings of a student (.04) does not indicate that the number of siblings has slight effect. Most of the effect of family size, however, is through its effect upon parental supervision and the development of academic competence. It has very little additional direct effect upon aspirations.

ENDNOTES

1. The disproportionate sampling required corrective weighting procedures to be applied in analysis. This is described in Appendix A, "Weighted Estimations."
2. These data were collected for the "Richmond Youth Project," supported by NIMH (MH-00970). The survey is described in detail in Alan B. Wilson, Travis Hirschi and Glen Elder (1956), "Technical Report No. 1: Secondary School Survey."
3. This procedure automatically allows for variation in demographic composition over time due to internal migration and immigration, but makes no allowance for selective emigration.
4. James Coleman's position that "ability tests are simply broader and more general measures of education, while achievement tests are narrower measures directed to a restricted subject area" (Coleman, 1966, p. 293), sharply points up the circularity of explaining one measure by the other.
5. The recent interchange in "Neighborhood Context and College Plans," between Ralph H. Turner, John A. Michael and Richard P. Boyle (who question the independence of measured intelligence), and William H. Sewell and J. Michael Armer (who argue for controlling variation in intelligence), illustrates this theoretical ambiguity (Turner, *et al.*, 1966).
6. The sample, of course, consists of students who had not dropped out of school in 1964-65. Test norms, however, are also developed on school populations which exclude drop-outs.
7. See Appendix D for a discussion of covariance analyses.
8. Leon J. Yarrow (1964) similarly comments upon the paucity of theory and research.
9. Roger V. Burton and John W. M. Whiting (1961) elaborate a theory of identification, present supporting cross-cultural evidence, and review some relevant research.
10. David and Pearl Ausobel similarly report "The greater frequency of broken homes, unemployment, and negative family atmosphere, as well as the high rate of pupil turnover, are also not conducive to academic achievement." (Ausobel, 1963, p. 124.)

11. Moynihan cites in evidence census data which show that fewer of the children of single-parent families are enrolled in school, and also a study (Deutsch, 1964, pp. 24-35) which reports that fatherless children have lower Large-Thorndike I.Q. test scores. James Bryant Conant (1961) also implies a connection between father absence and the poor academic showing of ghetto youths.

12. A study by Lyn Carlsmith (1964) suggests that the learning of a sex-role identity affects one's conceptual style so that students whose fathers were absent, particularly at an early age, are relatively more proficient in verbal than in mathematical tests. The criterion test used in this study have been primarily verbal – as is the curriculum of secondary education.

13. James Coleman, *et al.*, show a difference of 1.6 years between Negroes and whites at grade six (Coleman, 1966, p. 274, Table 3.121.1).

14. The reduction in the regression of achievement on school social-class context from .10 in the categorical analysis to .07 in the continuous analysis is due to the non-linearity of the relationship.

15. Among Negroes there are too few students attending high status schools at any level to warrant an inference about transitional effects. The pattern of the few cases represented, however, is consistent with that of white students.

16. Among Negro students, however, more girls than boys hope to go to college. See Table 8.3.

17. For example, A. S. Beckham (1933), G. F. Boyd (1952), A. B. Wilson (1963), and P. S. Sears (1940).

18. This section is partially based upon, and is elaborated in, Travis Hirschi's "Juvenile Delinquency and Commitment to Conventional Values," doctoral dissertation, University of California, Berkeley, 1968.

19. Records of all boys in the sample were collected from the local police departments and from the county sheriff's office.

20. The analysis parallels the study of effects of father absence on academic achievement reported in Section Three.

21. The last and mainly productive attempt at search was conducted during the first two days of the Fall, 1966 semester. Due to normal confusion at this time, plus a tense and chaotic personnel strike, we were not allowed access to the records at Ells High School. This more than likely accounts for the large number of records, believed to be at Ells, which we must list as "unlocated."

22. If a student's file records show him as having transferred, for example, from Downer to Richmond, and his records are not found at either school, and no other schools seem to have his records, he is still listed as being in the Richmond district unless the school specifically notes he has left the district. We were able to ascertain in some cases that students had in fact left the district or area, but the schools who gave us this information did not possess records.

23. Since it is the Richmond School District's official policy to on no account send records out of state, the most likely conclusion is that a drop file listing, for example, "gone to Wyoming," is the result of clerical carelessness.

24. In the case of students categorized as having "no records", the school has no record of the student having attended *even in 1964-65;* therefore, as far as we can determine, there has been no note made of his existence at all except in our original sampling. However, a probable answer may be that those students with "no records" are recently married girls whose records, if any, are filed away under their married name.

25. Examples of analyses where all variables, independent as well as dependent, are nominal appear in Gordon Fisher's (1962) "A Discriminant Analysis of Reporting Errors in Health Interviews," and Alan B. Wilson's (1963) "Social Stratification and Academic Achievement."

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