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ABSTRACT

Recent studies have provided conflicting evidence on the relationship between school desegregation and white enrollment stability. Among the most frequently cited correlates of white withdrawal is the level of black concentration. The present study re-examines the relationship between the percent of black enrollment and white enrollment change at both the district and the school levels. The analysis focuses on 77 districts and approximately 2,300 schools located in southern Standard Metropolitan Statistical Areas. Higher black enrollments are found to be associated with white withdrawal at both the district and the school levels. In both cases this relationship appears to be curvilinear with a threshold roughly at 30 percent black. Above that point, white enrollments decline exponentially with increases in the percent of black enrollment. The most important implication of this study is that, on the average, districts with enrollments less than approximately 30 percent black can be desegregated without drastic declines in white enrollment. (Author/GC)

WHITE FLIGHT AND BLACK CONCENTRATION IN AMERICAN SCHOOLS

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WHITE FLIGHT AND BLACK CONCENTRATION IN AMERICAN SCHOOLS

The relationship between school desegregation and white enrollment stability has recently been the subject of considerable scholarly debate. Coleman, et.al. (1975) in a well publicized study of large school districts concluded that school desegregation accelerated the exodus of white students from urban schools. The obvious policy implications of this research have stimulated several replications and critiques. In a most detailed analysis of Coleman's research, Pettigrew and Green (1976) criticized the sample selection and offered alternative explanations of the results. Furthermore, by augmenting Coleman's sample with several large southern districts Pettigrew and Green found that desegregation was unrelated to white enrollment declines. Several additional studies (Farley, 1975; Fitzgerald and Morgan, 1977; and Rossell, 1976) using slightly different techniques and samples than Pettigrew and Green arrived at the same conclusion--desegregation was unrelated to white enrollment decline.

While the weight of evidence indicates that declines in white student enrollments are not an inevitable consequence of school desegregation, there is substantial evidence that school desegregation has resulted in white withdrawals in some districts. Munford (1976) and Clotfelter (1976) in separate analyses of Mississippi school districts, report large declines occurring in some districts subsequent to school desegregation. Giles (1977b) reports that in a random sample of 100 southern school districts many districts experienced no change or even gains in white enrollment with desegregation but many others experienced large white enrollment declines. Lord (1975) found that the number of private schools in the Charlotte-Mechlenberg, N.C., area had almost doubled in the first four years of desegregation, and in some areas of the district as many as 25

percent of the white students were withdrawn from the public schools. Outside the South, Bosco and Robin (1974) report dramatic declines in white enrollments in the Pontiac, Michigan public schools after desegregation. Thus, declining white enrollments are a potential but not inevitable outcome of school desegregation. The problem confronting social scientists is the specification of the conditions which influence white enrollment stability and instability in desegregated schools.

This problem is of more than simple academic interest. The courts have consistently held that fear of white withdrawal is not sufficient grounds to justify a denial of constitutional right. For example, when the school district asserted in Monroe v. Board of Commissioners (391 U.S. 450 at 459) that white students would "flee the system altogether" if desegregation occurred, the Supreme Court reasserted the principle of Brown that "... the vitality of these constitutional principles cannot be allowed to yield simply because of disagreement with them." The courts, however, have not been oblivious to the problems of white withdrawals. Thus, the Supreme Court declared state legislation unconstitutional which authorized the City of Scotland Neck, N.C., to separate itself from the desegregating Halifax County School district (U.S. v. Scotland Neck City Board of Education, 407 U.S. 483). This decision was based in part upon the Court's belief that the legislation would create a "refuge for white students of the Halifax County School system" (at 489). The courts also have shown a willingness to consider the problem of white withdrawals in designing remedies for segregation. For example, a California state court mandated that busing distances in San Diego be kept short for fear that long distances would increase white withdrawals (Los Angeles Times, March 10, 1977:3).

Sensitivity to the factors influencing white withdrawal and hence the long term stability of desegregation is of even greater importance in light of the U.S. Supreme Court's recent decision in Pasadena v. Spangler (427 U.S. 424 (1976)). In Spangler the Court held that a federal District court could not order a local school board to readjust its school enrollments on a yearly basis after racially neutral assignment plans had been adopted. In support of its decision the Court cited its previous statement in Swann v. Charlotte Mecklenburg that "neither school authorities nor district courts are constitutionally required to make year by year adjustments of racial compositions of student bodies once the affirmative duty to desegregate has been accomplished and racial discrimination through official action is eliminated from the system." The district courts thus appear to be bound by their initial desegregation decisions and unable to adjust desegregation plans to react to either demographic trends or the reactions of affected parents. In light of the Spangler decision it is of paramount importance that initial desegregation plans be designed to provide long-term stability in racial enrollments. This goal requires that judges know the conditions influencing white enrollment stability in desegregated schools.

Among the most frequently discussed correlates of white withdrawal is the level of black concentration. Higher black concentrations are commonly assumed to result in greater white withdrawal. For example, in the Wilmington, Delaware desegregation case (Evans v. Buchanan, 416 F. Supp. 328) the district court justified the inclusion of the predominately white Newark School district in the desegregation plan by asserting that "... the stability of any desegregation plan is enhanced by the inclusion of ... higher white concentrations (355)." Often this relationship

is perceived as non-linear with a tipping or threshold point. Below the threshold whites are thought to be relatively insensitive to the black concentration. Above the threshold, white withdrawal accelerates with black ratio until the school becomes all black. This interpretation is clearly accepted in the Federal district court's conclusion in U.S. v. Board of School Commissioners (322 F. Supp. 655) that "when the percent of black pupils... approaches 40 more or less the white exodus becomes accelerated and irreversible (676)."

There is relatively consistent empirical evidence of a linkage between racial concentration and white withdrawal. There is little agreement, however, about the structure of this relationship. Clotfelter (1976) in a study of private school enrollment increases after desegregation in 78 Mississippi counties found no relationship to the level of black concentration in counties 25 percent or less black. In counties more than 25 percent black, private school enrollment increased with the level of black concentration and the increases accelerated in counties more than 55 percent black. Giles, et.al. (1975) found that the rate of white withdrawal from desegregated public schools in seven Florida school districts was significantly higher if the school was 30 percent or more black. The rate of withdrawal, however, did not appear to increase with higher black concentrations above the 30 percent threshold. However, in a study of 100 southern districts (Giles, 1977b) changes in white enrollment were unrelated to the percent black enrollment in the district until the black ratio exceeded 30 percent. Above that point, white withdrawals increased with the black concentration. Unlike Clotfelter, Giles found this relationship to be linear above 30 percent. Munford (1973), in his study of 30

Mississippi districts, reports similar findings to those of Giles. Several studies have reported simple linear relationships without a threshold (Farley, 1975; Coleman, 1975; Fitzgerald and Morgan, 1977; Lord and Catau, 1977; Stinchcombe, 1969). Indeed, in their study of Baltimore, Stinchcombe, et.al. (1969) conclude that "there is no 'tipping point.' Or rather, the 'tipping point' is zero... Once a school is desegregated... the proportion Negro is likely to go up each year in a steady fashion... (134)."

In addition to the lack of consistency concerning the structure of the relationship between percent black and white withdrawal, previous studies have suffered several shortcomings. First, such studies have sometimes ignored the source of school desegregation (Coleman, 1975; Stinchcombe, et.al., 1969). School desegregation occurs as a result of governmental intervention and/or as a product of residential desegregation. When desegregation occurs through government intervention, desegregated schools may be created without disturbing existing patterns of segregated housing. Children are simply transported out of their segregated neighborhoods and placed in desegregated schools. The white parent in this situation is confronted with a single racial stimuli, the percent black in the school. In contrast, when school desegregation results from neighborhood racial succession, the white parent is confronted with two racial stimuli, the percent black in the school and the percent black in the neighborhood. These are clearly two different decisional situations for the parents and should be different experimental settings for the researcher.

Coleman's (1975) recent work illustrates the problem that arises from not making the distinction between these two sources of desegregation. He

finds declining white enrollments to be related to increases in the average percentage black children in the white child's school. On this basis he argues that court ordered busing is counter-productive and ought to be abandoned. Many of Coleman's school districts, however, were not undergoing government induced desegregation. In these districts, the increase in the black percentage in the school reflected an increase in the percentage black in the attendance area, i.e., residential desegregation. In this case declining white school enrollments might reflect a rejection of the percent black enrollment in the school, the percent black in the neighborhood, or both. Accordingly, the results of Coleman's analysis are not generalizable to the case of government intervention where the residential desegregation stimuli is absent.

A second limitation of the research purporting to deal with white flight is that it focuses on the school district as the unit of analysis. Rossell (1975), Farley (1975), Fitzgerald and Morgan (1977), Pettigrew and Green (1976), Coleman (1975) and Munford (1973) all take as their dependent variable decreases in the total white enrollment in school districts. The logical linkage between percent black and white withdrawals, however, is at the level of the individual school. Parents do not reject school districts, they reject schools (Pettigrew and Green, 1976). Furthermore, for designing desegregation plans, knowledge at the individual school level is of practical importance.

Focusing at the district level would not cause a problem if each school in the district reflected the system racial balance. But this condition is frequently not met. Even in school districts desegregated by government intervention, the racial balances of the schools in the district will often

vary (Lord and Catau, 1977; Giles, et.al. 1975). For example, in the Oklahoma City school district which Rossell (1975) cites as experiencing desegregation in 1968, the racial balances in the schools still ranged from 0 to 100 percent black in 1970 (H.E.W., 1970). Given this within district variation in school racial balances, analysis at the district level may seriously misrepresent the actual relationship between white withdrawals and black school enrollments.

Such errors may occur in at least two ways. First, the assumed linkage between percent black enrollment and white withdrawals may be operative but white students who withdraw from high percent black schools may simply shift to schools within the district which have lower black ratios. This intrasystem white flight results in instability in the racial balances in the schools, but since it does not effect the district aggregate white enrollments it is ignored by studies focusing at the district level. Thus, in the case of Oklahoma City, Rossell's figure of a 1.2 percent decline in white enrollment between 1969 and 1970 clearly does not take into account the amount of possible shifting between high and low percentage black schools within the system. Second, even where whites withdraw from higher percentages black schools to schools in another district or to private schools, the resulting district-wide decrease in the percent white enrollment may appear trivial. For example, if a school system had an enrollment of 50,000 white pupils and one of its high schools was projected to have an enrollment of 2,000 with a racial balance 60 percent black, then complete white flight from this school to another district would decrease district white enrollment by less than 2 percent (i.e. 800/50,000=1.6%). A few studies have avoided this problem by focusing on the school, but these studies have invariably concentrated on only one district or a very few

districts (Wegman, 1975; Giles; et.al., 1975; Stinchcombe, et.al., 1969; Giles, 1977a; Lord and Catau, 1977).

The use of the district as the district as the unit of analysis also has precluded the analysis of some important linkages--most notably, the relationship between the percent black in the school, the previous racial status of the school, and white withdrawals. A common assumption is that whites will not attend previously black schools. White opposition is thought to arise from the stigma of poor educational quality attached to these schools and their location in predominantly black areas. Indeed, desegregation has often meant the closing of black schools although conditions other than fear of white withdrawals are cited in justification.

It is conceivable that the previous racial status of the school may not only directly effect white withdrawal, but also effect the relationship between the racial concentration in the school and white withdrawal. For example, white withdrawal might be unrelated to percent black enrollment in previous white schools but strongly related to it in previously black schools.

Adopting the individual school as the unit of analysis also allows the effect of variations in school district racial balance on the relationship between school racial balance and white withdrawal to be examined. The concentration of blacks in an area consistently has been shown to influence racial climates (Blalock, 1967). We would expect, therefore, that parents with children enrolled in a school 40 percent black might react quite differently depending upon whether the over-all racial balance in the district was 10 percent black or 50 percent black. Thus, the findings by Giles, Cataldo and Gatlin (1975) that the rate of rejection of desegregated schools increased dramatically when white children were moved from schools less than 30 percent black to schools more than 30 percent black

may reflect the racial balances in the districts they studied (19% to 33%). It is conceivable that if the racial balances had been in the 40 to 50 percent black range, the threshold for rejection might have moved upward.

The present study re-examines the linkage between percent black enrollment and white withdrawal. The primary unit of analysis for the study is the desegregated school and only schools located in districts desegregating under government enforcement are examined. Five specific questions are addressed: (1) Does the rate of white withdrawal from desegregated schools vary with the percent black enrollment in the school? (2) If present, is that relationship linear? (3) Does the racial status of a school prior to desegregation effect the rate of white withdrawal? (4) Does the percent black in the district influence the rate of white withdrawal from the schools? (5) Does the relationship between the schools racial enrollment and white withdrawal vary by the racial status of the school prior to desegregation or by the percent black in the district?

Data

The unit of analysis in this study is the desegregated school but for simplicity and efficiency, sampling was done at the district level. Eligibility for inclusion in the district sample pool was contingent on four factors. First, only those districts included in the Department of Health, Education, and Welfare's racial and ethnic surveys of the public schools in 1967, 1968, 1970, 1972 and 1974, were eligible to be sampled. These surveys provide the student enrollment by race in every school in over 8,000 school districts each surveyed year. Second, the school district must have experienced either court ordered or HEW enforced school desegregation within the 1968 through 1970 time period. Limiting the

analysis to districts experiencing government induced desegregation minimizes the confounding effects of residential desegregation.[1] Furthermore, focus on those districts desegregating in 1968, 1969 or 1970 allows for information on the racial balances in the schools for at least one point in time prior to desegregation, 1967, and for at least two points in the post-desegregation period, 1972-74. Third, since virtually all government induced desegregation between 1968 and 1970 occurred in the South, the study was confined to that region. Fourth, only school districts located in metropolitan areas were eligible for inclusion in the sample. Residential choice and mobility is greater in urb n than in rural settings. We would expect, therefore, that white enrollment stability would be more of a problem in the former than in the latter.

The sample was drawn by first constructing a list of all school districts located in southern SMSA's as defined in the 1970 census. Second, all districts for which data could not be found in the 1967 through 1974 H.E.W. surveys were excluded from the list. Third, the Office of Civil Rights (OCR) of the Department of Health, Education and Welfare assembled a list of the timing and mode of desegregation for over 1400 southern school districts. Using this information, districts not reported as desegregating under court order or HEW plans in either 1968, 1969 or 1970, were deleted from the sample pool. One hundred school districts were then sampled from the pool. The fifty largest school districts were included automatically in the sample. An additional fifty were drawn by stratified random sampling to obtain variation in the district racial balance.

Accurate determination of the timing of desegregation in each district is essential to the study design. The study is concerned with enrollment

stability after desegregation. If the OCR date for desegregation in a district is incorrect, changes in racial balances arising from implementation of the desegregation plan will be confused with other sources of enrollment instability. To assure the accuracy of the date of desegregation, each of the 100 selected school districts was contacted by telephone and questioned concerning the timing of desegregation. This information was then compared with the OCR date for desegregation and with the pattern of enrollment stability by race in the district. Desegregation should be accompanied by alteration in the racial balances in the schools of a district. In particular, we would expect to see evidence of blacks attending previously all white schools and whites attending previously all black schools. For sixty of the sampled school districts, information from all three sources indicated the same date for desegregation. For the remaining forty-one, there was disagreement among the information sources. For seventeen of these forty-one, two of the three sources agreed on the desegregation date. In most cases this involved the enrollment data supporting either the local school authorities' or the Office of Civil Rights' estimate of the date of desegregation. When agreement between two sources could be obtained, that date was accepted as the correct one for desegregation. In most cases, this involved a change of one year (e.g. the OCR said a district desegregated in 1970, but the district and the school enrollment data indicated that the change occurred in 1971). Conversations with the school officials suggest that these differences may have arisen from the OCR reporting the first year of a two-year desegregation plan as the year of desegregation or the year of its adaption, rather than the year of its implementation. As a result of these changes, a few districts are included in the analysis which were outside of the original

68-70 time frame for the study. Among the remaining twenty-three school districts, there was either disagreement among all three sources over the timing of desegregation or official school sources indicated that they had desegregated prior to 1967 or after 1972 and the enrollment data supported this claim. These districts were deleted from the study.

The seventy-seven districts included in the analysis averaged slightly more than 27,000 students in total enrollment. The smallest was under 100 and the largest almost 250,000 in enrollment.[2] The districts averaged approximately 30 percent in black enrollment. This relatively high average reflects the sampling stratification which assigned a higher probability of inclusion to school districts with large black concentrations. Twenty of the sample districts desegregated under HEW enforcement and the remainder under court order. Most of the districts desegregated in either 1969 (24) or 1970 (36). Of the remainder, six desegregated in 1968, nine in 1971 and two in 1972. The deleted twenty-three districts differed slightly in size and black concentration. The latter averaged approximately 34,000 students and a 24 percent black enrollment.

Data on enrollments by race in each school in the 77 sampled districts were drawn from the HEW surveys for 1967, 1968, 1970, 1972 and 1974. Approximately 2,800 schools were included in these districts. Those schools for which enrollment data could not be identified for every survey year were omitted from the analysis. This resulted in a sample of approximately 2300 schools. The loss of 500 schools is consistent with HEW's estimate of 10 to 15 percent error in the assignment of school identification codes on a year to year basis. As expected, the largest number of schools were located in districts that desegregated in either 1969 (529 schools) or 1970 (1084). Lesser numbers were in districts desegregating in 1968 (97), 1971 (578) or 1972 (51).

The dependent variable in the study is the rate of white enrollment change. This is operationalized as the percent change in white enrollments between two surveyed years:

$$\frac{W_t - W_{t-2}}{W_{t-2}}$$

where, W_t = the white enrollment is a surveyed year

W_{t-2} = the white enrollment two years before W_t

if white enrollments decrease, this index will assume a negative value and if white enrollments increase the index will become positive. If no change in white enrollments occur, the index will be zero.

In schools with low white enrollment, even small changes in the number of white students result in high percentage changes. For example, if a school has ten white students enrolled at t_1 and five white students enrolled at t_2, the percent white enrollment change is -.50 ((5-10)/10). In contrast a school with 100 white enrolled at t_1 must lose 50 whites by t_2 to have a comparable percent white enrollment change. To compensate for this problem, all schools enrolling fewer than fifty white students are excluded from the school level analysis.[3] This does not eliminate the problem, but does substantially reduce its magnitude.

The black concentration in the schools and districts is measured straightforwardly as the percent black enrollment in each. The previous status of the schools is measured by the percent black enrollment in 1967. Some of the schools in the sample districts were desegregated prior to 1968, probably as a result of modest redistricting or "freedom of choice" desegregation plans. As shown in Table 1, however, the overwhelming majority of the schools were either predominantly white (less than 20

Table 1: Number of Schools by Racial Enrollments in 1967

Percent Black in 1967	Number of Schools	Percent
0-.19	1782	86.1%
.20-.90	86	4.2%
.90-1.00	201	9.7%

percent black in 1967), integrated (more than 20 percent black but less than 90 percent black in 1967) or previously black (90 percent or more black in 1967).[4]

District Level Analysis

In this section, enrollment stability and instability at the district level is examined to provide a necessary context for the school level analysis to follow. Three questions are addressed: (1) Did whites withdraw from the sampled districts with the onset of desegregation?; (2) Was withdrawal associated with the black concentration in the district?; and (3) If so, was that relationship linear?

The mean percent white enrollment change in the sampled districts by year of desegregation is shown in Table 2. Previous studies have reached varying results with regard to the linkage between desegregation and white withdrawal. The present data provided little immediate clarification. The six school districts desegregating in 1968 show an increase of more than 10 percent in white enrollment for each time period. In contrast, the two districts desegregating in 1972 experienced white enrollmentslosses both before and after desegregation. School districts desegregating in 1969 had relatively stable white enrollment between 1967 and 1974. Only among districts desegregating in 1970 and 1971 is a linkage between white withdrawal and desegregation supported. For these districts white enrollments, on average, were stable prior to desegregation but decreased subsequent to the onset of desegregation. This inconsistent pattern of results reaffirms the conclusion that the linkage between desegregation and white withdrawal is by no means inevitable.

Table 2: Percent White Enrollment Change by Year of Desegregation

Year of Desegregation	Comparison Years 67-68	68-70	70-72	72-74	(N)
1968	.132	.134	.173	.191	6
1969	-.017	.025	.011	.026	24
1970	.014	-.063	-.047	-.054	36
1971	.015	.012	-.060	-.023	9
1972	-.037	-.043	-.070	-.056	2

To examine the influence of the black concentration in the sampled districts on white enrollment stability, the percent white enrollment change in the districts between surveyed years was regressed on the percent black enrollment in the initial year of each comparison (e.g. white change between 1968 and 1970 was regressed on the percent black enrollment in the districts in 1968). This analysis is confined to those districts desegregating in either 1969 or 1970.[5] The small sample sizes for districts desegregating in other years preclude analysis. The results of the regression analysis are presented in Table 3.

The 1967-68 time period precedes desegregation for these districts. In Table 2 we saw that on average little change in white enrollment occurred during this time period. In Table 3 it appears that those changes that did occur were unrelated to the black concentration in these districts. The percentage change in white enrollment between 1968 and 1970 provides a before and after comparison for districts desegregating in 1969 and 1970. For those districts desegregating in 1969, this comparison measures the changes in white enrollment in the first and second years of desegregation. For districts desegregating in 1970, the changes occurring in the first year of desegregation are measured by this comparison. The black concentration in the districts is strongly related to percent white enrollment change in this time period. Approximately half the variation in percent white enrollment change is explained by the percent black enrollment. As expected, the effect of percent black is negative with higher black concentrations resulting in declines in white enrollment. With the effects of percent black enrollment controlled, differences between districts desegregating in 1969 and those desegregating in 1970 are not statistically significant.[7] Thus, the greater stability in white enrollment for the districts desegregating in 1969 appears to result from lower black concentrations in

Table 3: Regression Coefficient for Percent Black and Year of Desegregation on Percent White Enrollment Change (Districts Desegregating in 1969 or 1970)

	Constant (α)	% Black	Year	R^2
67-68	.0410	-.0661	-.0445	.04
68-70	.0660	-.3891**	+.0195	.49
70-72	.0557	-.3305**	+.0342	.39
72-74	-.0507	-.0460	+.0844	.07

* .05
** .01

those districts.

The pattern set in the 1968-70 time period continues in the 1970-72 period. The relationship between percent black enrollment and white withdrawal appears somewhat diminished in the 1970-72 period but remains statistically significant. With the effects of percent black controlled, the year in which desegregation occurred does not influence withdrawal in this time period.

Giles (1977b) previously found percent black to be unrelated to white enrollment declines after the first year of desegregation. While the timing appears slightly different, these data support a similar conclusion. In the 1972-74 time period white enrollment declines are no longer related to the black enrollment in these districts. Apparently, parents who were sensitive to the black enrollment concentrations in their districts and who could afford to, withdrew their children either with the onset of desegregation or in the first two or three years after its implementation leaving a smaller but relatively stable white enrollment.[6] Thus, the expectation of the "tipping" model that white withdrawals would continue in response to an ever increasing percent black enrollment until the districts became all black is not met in these districts.

Clotfelter (1976), Munford (1976) and Giles (1977b) found non-linear relationships between percent black enrollment and white withdrawal. Specifically, they found that whites were insensitive to racial concentrations of less than 25 (Clotfelter, 1976) to 35 percent (Giles, 1977b) black. A common procedure for testing the linearity of a relationship between a dependent and an independent variable in a regression equation is to square the independent variable, add it to the equation and test its significance.

The results of this analysis for the relationship between percent black district enrollment and percent white enrollment change is presented in Table 4. In both the 1968-70 and 1970-72 time periods percent black enrollment squared is significant, indicating the presence of a nonlinear relationship. The regression lines fitted by these equations is presented in Figure 1 for the 1968-70 period and Figure 2 for 1970-72. The relationships revealed in Figures 1 and 2 closely resemble the findings of Clotfelter (1976), Munford (1976) and Giles (1977b). Among districts less than approximately 30 percent black, differences in the percent black enrollment are not consistently related to differences in the percent white enrollment change in either time period. In fact, if these districts are considered separately the relationship between percent black enrollment and white enrollment change is nonsignificant. In contrast, among districts above thirty percent black, white enrollment decreases exponentially with higher black enrollments.

While the equations for the two time periods differ somewhat, the estimated percent white enrollment changes in the two time periods are virtually identical. For example, a school district with a 75 percent black enrollment in 1968 is predicted to lose approximately 28 percent of its white students between 1968 and 1970. Similarly, a district that is 75 percent black in 1970 is predicted to lose approximately 28 percent of its white enrollments between 1970 and 1972 (See Appendix A for the exact projections graphed in Figures 1 and 2.) Of course, a district that is 75 percent black in 1968 would be approximately 80 percent black in 1970, having lost 28 percent of its white enrollment and assuming no increase in its black enrollment. Given an 80 percent black enrollment, a 33 percent decline in white enrollments between 1970 and 1972 is projected. In total such a district is predicted to lose more than half of its white enrollment between

1968 and 1972. This pattern of accelerating losses conforms to the expectations of the "tipping" model with one major exception, the pattern ends in 1972.

In summary, among the sample districts desegregating in 1969 or 1970, white enrollment declines are associated with percent black enrollment in two of the four time periods--1968 to 1970 and 1970 to 1972. Within these two periods white withdrawals were generally unassociated with the black concentration among districts with less than 30 percent black enrollments. However, among districts above that threshold, white enrollments decreased exponentially with increases in the percent black enrollment.

School Level Analysis

In the present section the five central questions of the study are addressed: (1) Does the rate of white withdrawal from desegregated schools vary with the percent black enrollment in the school? (2) If so, is that relationship linear? (3) Does the racial status of a school prior to desegregation effect the rate of white withdrawal? (4) Does the percent black in the district influence the rate of white withdrawal from the individual schools? (5) Does the relationship between school racial enrollment and white withdrawal vary by the previous status of the school or by the percent black in the district? The pattern of analysis is the same as that employed at the district level. The percent change in the white enrollment in a school between two surveyed years is regressed on the values of the independent variables in the first year of the comparison.

White withdrawal from desegregated school may occur either with the onset of desegregation and result in higher black enrollments than expected

by the desegregation plan, or in the years following the implementation of the plan and result in increasingly higher black enrollments over time. An examination of white refusals to attend desegregated schools in the first instance necessitates a comparison between the expected black/white enrollments and the actual black/white enrollments in each desegregated school (Giles, 1977). For example, if a district desegregated in the fall of 1968, the white enrollment projected for each school under the desegregation plan would be compared to the number of whites actually enrolled in that school in 1968. Reliance on HEW school census data limits the present study to consideration of white enrollment changes after the implementation of desegregation has occurred in a district. Thus, the phenomena of white withdrawal with the onset of desegregation is not considered at the school level in this study. However, it would seem reasonable to hypothesize that the same factors which influence white enrollment stability in desegregated schools would also influence in similar ways white decisions to attend or not to attend newly desegregated schools.

As can be seen in Table 5, the time periods available for analysis vary with the timing of desegregation. For schools in districts desegregating in 1968, percent white enrollment change can be examined over three time periods, for schools in districts desegregating in 1969 or 1970, two time periods are available for analysis, and for schools in districts desegregating in 1971 and 1972 only one time period after desegregation can be examined. For simplicity, schools are grouped according to the time periods available for comparisons and separate analyses are conducted for the schools in each group.

Table 4: Regression Coefficients for Percent Black and (Percent Black)^2 on White Enrollment Change (Districts Desegregating in 1969 or 1970)

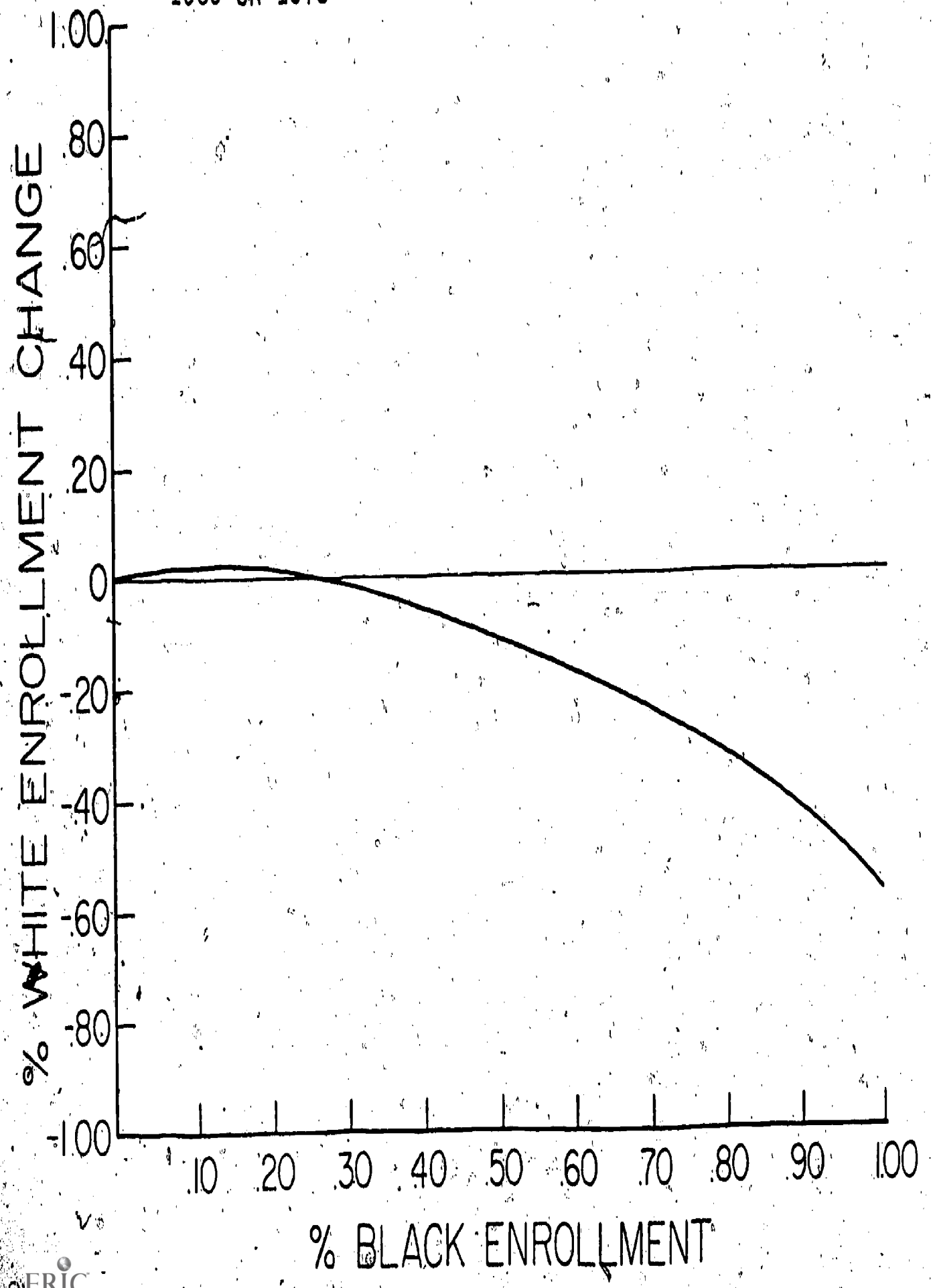
	α	% Black	% Black^2	R^2
67-68	-.0020	.0974	-.2005	.01
68-70	.0348	.0535	-.6241*	.52
70-72	-.0236	.3565	-.9258**	.49
72-74	-.0055	-.0774	.0325	.01

* sign. at .05
** sign. at .01

Table 5: Time Periods Available for Analysis by Year of Desegregation

Year of Desegregation	Time Periods		
	1968-70	1970-72	1972-74
1968	X	X	X
1969		X	X
1970		X	X
1971			X
1972			X

1968 AND 1970 FOR DISTRICTS DESEGREGATING IN 1969 OR 1970



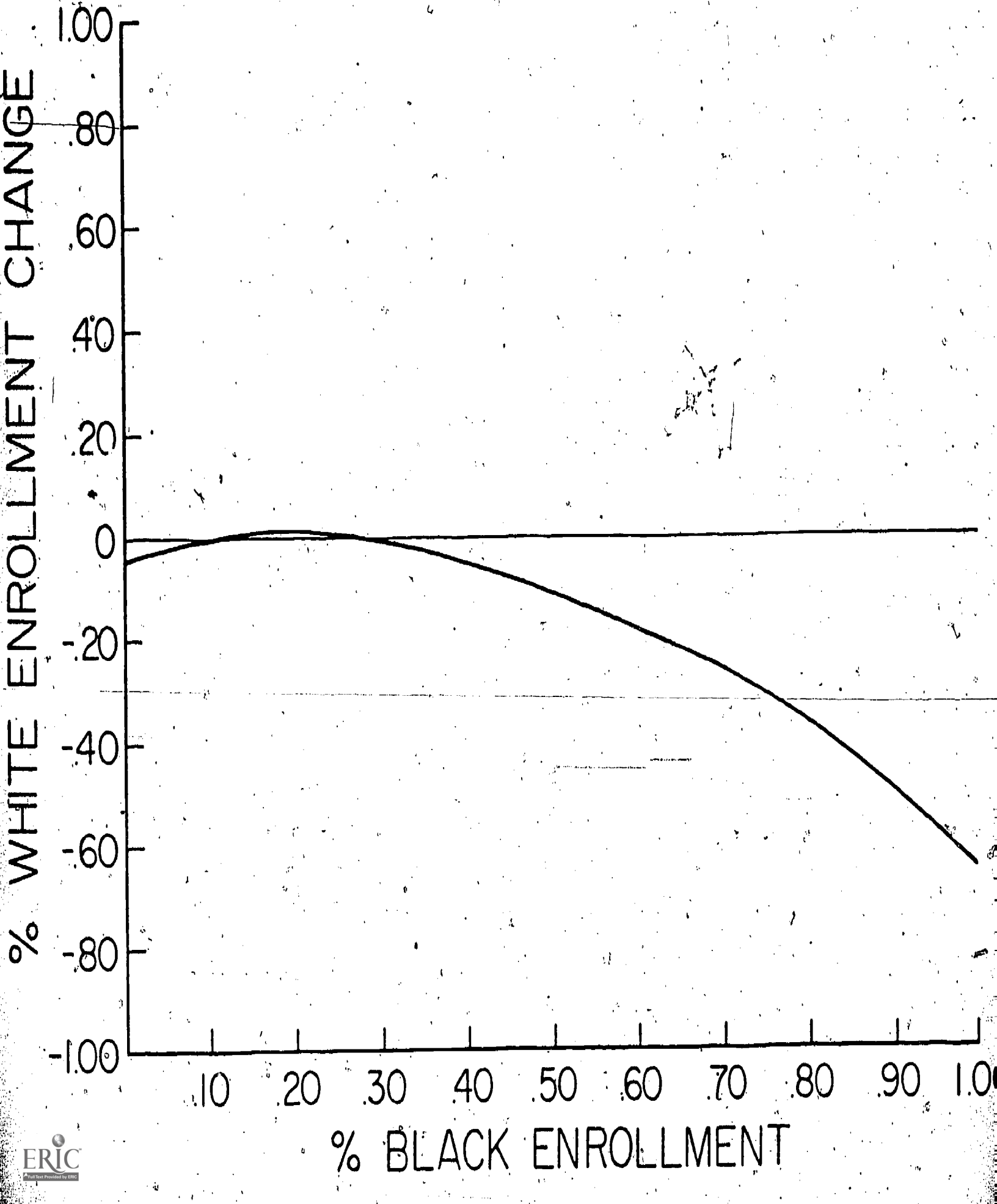
Schools in Districts Desegregating in 1968

The relationships between the independent variables and white enrollment change among schools desegregating in 1968 are shown in Table 6. The first three equations in each time period (6.1-6.3, 6.5-6.7, 6.9-6.11) in Table 6 give the uncontrolled (zero-order) relationships between each of the independent variables and percent white enrollment change. The fourth equation (6.4, 6.8, 6.12) gives the effects of each independent variable with the other variables held constant. For two of the time periods, 1970-72 (eq. 6.5) and 1972-74 (eq. 6.9), the direction of the relationship between percent black school enrollment and white enrollment change is negative as predicted, but in none of the three time periods is the relationship statistically significant. Thus, the widely-accepted relationship between higher percent black enrollments and greater white withdrawal does not appear operative among the schools in these districts.

The previous status of the school also appears to be unrelated to enrollment stability (eq. 6.3, 6.7, and 6.11). While the signs are generally negative as expected, schools that were integrated and those that were predominantly black prior to desegregation do not experience significantly greater losses than previously white schools over the time periods examined.

The only independent variable with any significant relationship to white enrollment change among these schools is percent black district enrollment. In the 1970 to 1972 time period, higher black district enrollment is linked significantly to white enrollment declines. However, in the following time period this relationship is reversed with higher percent black enrollments at the district level yielding increases in white enrollment at the school level. Given this contradictory pattern and the fact that only six districts are involved, no conclusion appears possible from these results.

1970 AND 1972 FOR DISTRICTS DESEGREGATING IN 1969 OR 1970



To test for the possibility that the relationship (or lack thereof) between percent black and white withdrawal may vary by the black concentration in the district and the previous status of the school interaction terms were constructed by multiplying percent black school enrollment by each of the remaining independent variables. These terms were then added to the regression equations including the main effects of the independent variables (eq. 6.4, 6.8, and 6.12). Only one of these interaction terms proved to be statistically significant and that for only one time period. In the 1970-72 time period the interaction term for previously black schools and percent black school enrollment was negative and significant. This indicates that while percent black enrollment generally was not effecting white enrollment stability, high black enrollment in previously black schools did result in greater white withdrawals during this time period. Caution is again in order. Relatively few previously black schools are sampled from these districts and the result occurs in only one of the three time periods examined.

On balance, none of the anticipated relationships appear to be present among the schools in districts desegregating in 1968. White enrollment stability is unrelated to the black concentration in the school, the black concentration in the district or the previous racial status of the school. These findings may arise from the characteristics of these schools and school districts. First, these districts have relatively low black concentrations. All are 20 percent or less black. Second, no sample school in these districts is more than 60 percent black and only seven are more than 20 percent black. Third, apparently many of the previously black schools were closed with desegregation since few are included in the sample. Thus, the schools located in districts desegregating in 1968 are concentrated at the low end on all of the independent variables.

Table 6: Unstandardized Regression Coefficients for Percent White Enrollment on School Percent Black Enrollment, District Percent Black Enrollment and Previous Status of the School for Schools Desegregating in 1968 (N=97)

	Intercept	School %Black	District %Black	Status Black	Previous Integrated	R^2
1968-70						
Equation 6.1	.025	.056				.00
Equation 6.2	.035		-.064			.00
Equation 6.3	.031			-.042	.004	.00
Equation 6.4	.033	.222	-.212	-.078	-.066	.00
1970-72						
Equation 6.5	-.019	-.353				.02
Equation 6.6	.093		-1.844**			.13
Equation 6.7	-.046			-.026	-.115	.01
Equation 6.8	.095	.171	-2.059**	.092	-.061	.14
1972-74						
Equation 6.9	.083	-.249				.01
Equation 6.10	.000		.866			.02
Equation 6.11	.071			-.145	-.220	.03
Equation 6.12	-.016	-.354	-1.657*	-.179	-.163	.09

* significant at .05
** significant at .01

Schools in Districts Desegregating in 1969 or 1970

The relationships between percent white enrollment change and the independent variables among schools in districts desegregating in 1969 or 1970 are shown in Table 7. In both the 1970-72 and 1972-74 time periods, percent black enrollment is significantly and negatively linked to white enrollment stability (eq. 7.1 and 7.6). Schools with high black enrollment at the beginning of each comparison period experience larger declines in white enrollments over the two year periods than do schools with low black enrollments. This relationship appears slightly stronger in the 1972-74 time period than in the 1970-72 period. In the former an increase of 10 percent in black enrollment results in about a 2 percent decline in white enrollment, compared to less than 1 percent in the latter.

To test the linearity of the relationship between percent black school enrollment and percent white enrollment change, the percent black enrollment in each school was squared and added to the regression equation. The results of this procedure are presented in equations 7.2 and 7.7. For both time periods percent black school enrollment squared is statistically significant, indicating that the relationship between percent black school enrollment and white enrollment change is non-linear. The precise shape of these relationships is presented in Figures 3 and 4.

For the 1970-72 time period, equation 7.2 predicts that up to about 30 percent black, higher black concentrations are actually associated with smaller losses in white enrollment. Above that threshold, white enrollment decreases exponentially with higher black enrollments. A similar pattern appears for the 1972-74 time period although the downward slope appears to commence between twenty and thirty percent black. (For exact estimates of percent white enrollment change see Appendix B.)

The relationship between percent black and percent white enrollment change also appears to be slightly stronger in the 1972-74 period. A school that is 75 percent black in 1970 is projected to lose approximately 18.5 percent of its white enrollments between 1970 and 1972, whereas a school that is 75 percent black in 1972 is estimated to lose 24 percent of its white enrollments between 1972 and 1974. Over the four year period a school that is 75 percent black in 1970 is projected to lose approximately 40 percent of its white students.

While the relationship between percent black and white enrollment change is statistically significant, only a small percentage of the variance (R^2) is explained. Thus, variance in white student enrollment is largely a result of factors other than percent black enrollment. For policy purposes, however, an important factor is not how much of the total variance is explained but rather how exact or inexact are the predictions portrayed in figures 3 and 4. Stated differently, how much confidence can a policymaker have in these projections when applied to schools from the same sampling universe but not included in this sample? Constructing confidence intervals for individual estimates, indicates that 99 percent of future values of white enrollment change will fall within roughly a ± .05 percent interval of the estimates.[8] For example, we can be fairly confident that a school which is 75 percent black in 1970 will lose between 13 percent and 23 percent of its whites between 1970 and 1972. Thus, the projections in figures 3 and 4 appear to provide at least some rough guidance with regard to withdrawals.

The relationship between the percent black enrollment in the district and percent white enrollment change is shown in equation 7.3 for the 1970-72 period and equation 7.8 for the 1972-74 period. In both time periods

FIGURE 3: ESTIMATED PERCENT WHITE ENROLLMENT CHANGE BETWEEN 1970 AND 1972 FOR SCHOOLS IN DISTRICTS DESEGREGATING IN 1969 OR 1970

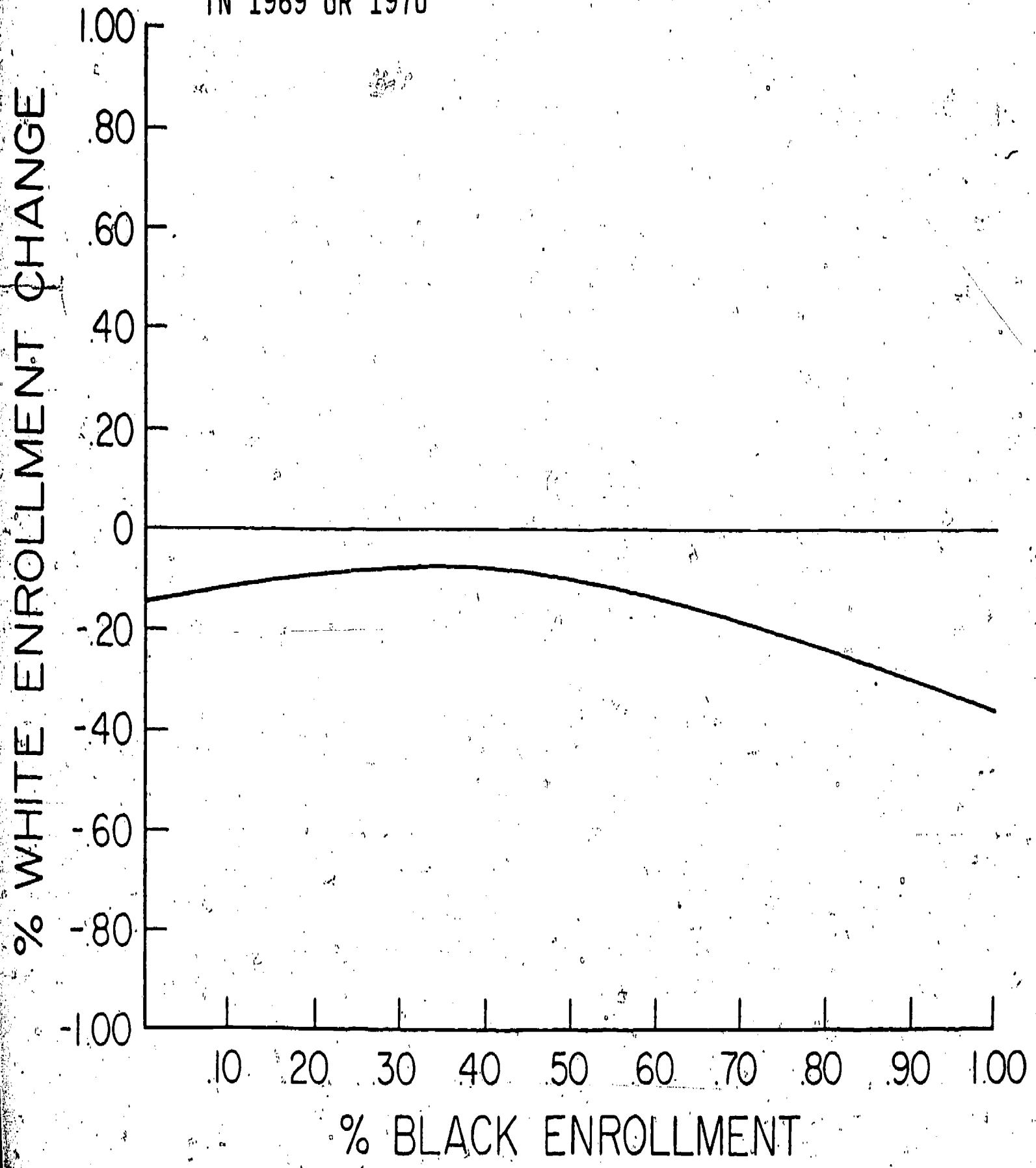
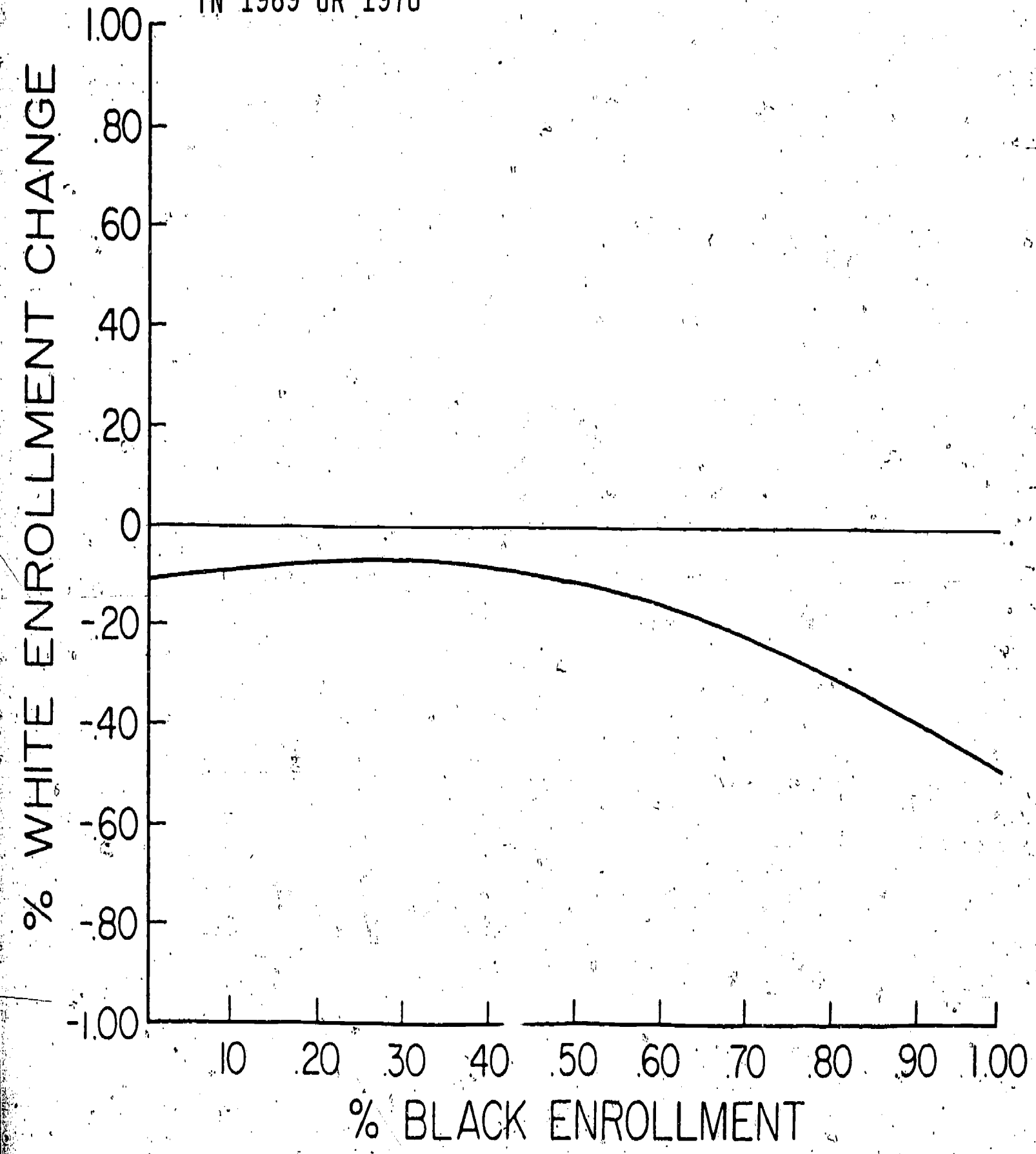


FIGURE 4: ESTIMATED PERCENT WHITE ENROLLMENT CHANGE BETWEEN 1972 AND 1974 FOR SCHOOLS IN DISTRICTS DESEGREGATING IN 1969 OR 1970



percent black in the district is significantly and negatively related to white enrollment change. The magnitude of the effect however is not great. In both time periods a 10 percent higher black enrollment in the district yields, on average, about a 2.5 percent greater decline in white enrollment once the effects of the other independent variables are taken into account (eq. 7.5 and 7.10). As might be expected, percent black school enrollment and percent black district enrollment are positively correlated (r=.38 for 1970-72 and r=.40 for 1972-74). The apparent effect of higher percent black school enrollments on white enrollment stability might simply reflect the greater liklihood of schools being located in higher percent black districts (or vice-versa). However, this is not the case. In equations 7.5 and 7.10 the effect of each independent variable is shown net of the effect of all other independent variables. Both the percent black enrollment in the school and in the district remain significant despite these controls. Thus, regardless of their percent black enrollments, schools in high percent black districts lose more white students than do schools in low black districts and, regardless of the percent black enrollment in the district, high percent black schools lose more white students than do low percent black schools.

The effect of the previous racial status of the school on white enrollment stability is shown in equations 7.4 and 7.9. The pattern is erratic. In the 1970-72 period, schools that were integrated prior to 1968 experienced significantly greater white withdrawals than did schools that were previously white. On average, the losses were 14 percent greater before (eq. 7.4) and 11 percent greater after (eq. 7.5) controlling for the effects of the school and district percent black enrollments. In contrast, previously black schools actually gained white students between 1970 and 1972. It

must be assumed that efforts to desegregate black schools lingered on in the 1970-72 time period and that the increases in white enrollments in these schools result from the reassignment of white students. In the 1972-74 time period the effects of previous status disappear. Neither previously integrated or previously black schools differ significantly from the previously white schools in percent white enrollment changes in this period, once the effects of percent black in the school and district are controlled (eq. 7.5).

Does the relationship between the percent black enrollment in the school and white enrollment change vary by the black concentration in the district and/or the previous racial status of the school? To address this question interaction terms were constructed by multiplying the squared percent black school enrollment by each of the remaining independent variables. The resulting three terms were added to equations 7.5 and 7.10. For the 1970-72 time period none of these terms were statistically significant. This result suggests that the effect of the percent black enrollment in a school on white withdrawal was the same during this period regardless of the previous status of the school or whether the district was high or low in black concentration. In the 1972-74 period, one interaction term proved to be significant, (percent black in the school X percent black in the district). The sign of the coefficient was positive indicating that white withdrawal from high percent black schools located in high percent black districts would be less than predicted by the simple additive model (eq. 7.10). Close analysis suggests that this effect arises from a non-linear relationship between percent white enrollment change and district percent black enrollment.[9] Approximately a dozen schools located in districts more than 70

Table 7: Unstandardized Regression Coefficients for Percent White Enrollment on School Percent Black Enrollment, District Percent Black Enrollment and Previous Status of the School for Schools in Districts Desegregating in 1969 or 1970 (N=1368)

	Intercept	School %Black	(School %Black)^2	District %Black	Previous Status: Black	Previous Status: Integrated	R^2
1970-72							
Equation 7.1	-.085	-.067*					.01
Equation 7.2	-.112	.319**	-.555**				.02
Equation 7.3	-.025			-.266**			.03
Equation 7.4	-.097				.040	-.142**	.02
Equation 7.5	-.053	.417**	-.657**	-.268**	.093**	-.111**	.07
1972-74							
Equation 7.6	-.044	-.202**					
Equation 7.7	-.088	.345**	-.737**				.08
Equation 7.8	.008			-.341**			.04
Equation 7.9	-.079				-.070**	-.103**	.01
Equation 7.10	-.031	.410**	-.739**	-.253**	.016	-.028	.10

*Significant at .05
**Significant at .01

percent black in 1972 lost sizeable numbers of whites in the 1970-72 period but then became relatively stable in the 1972-74 period. With these schools removed, the interaction effect between percent black enrollment in the school and percent black enrollment in the district is no longer statistically significant. It should be noted that this effect does suggest a plateau or end of white flight short of complete abandonment.

In summary, among schools in districts desegregating in 1969 or 1970, the percent black enrollment is negatively related to percent white enrollment between 1970 and 1974. This relationship is non-linear. Among schools less than 20 to 30 percent black increasing black enrollment bears little relationship to percent white enrollment change. Among schools more than 20 to 30 percent black, increases in percent black enrollment yield increasingly larger percentage declines in white enrollment. With the exception of schools in a few districts with high percent black enrollment which appear to have stabilized their white enrollment in the 1972-74 period, the relationship between percent black school enrollment and percent white school enrollment change does not vary by the percent black in the district or the previous status of the school.

The relationship between the previous racial status of the school and white withdrawal is erratic. Schools integrated prior to desegregation appear to experience white withdrawal in the 1970-72 time period while previously black schools experience gains. The latter appears to result from continued desegregation efforts. By the 1972-74 period, previous status is unrelated to enrollment change.

Percent black at the district level is also negatively related to percent white enrollment change. Schools located in high percent black districts experience greater percentage declines in white enrollment than

do schools in low percent black districts. As previously noted, a departure from this pattern appears among high percent black districts in the 1972-74 time period. The relationship between percent black district enrollment and percent white enrollment change at the school level differs somewhat from the findings at the district level. At the district level, the relationship between percent black enrollment and percent white enrollment change was non-linear in the 1970-72 period and non-significant in the 1972-74 period. The school level analysis is sensitive to enrollment shifts among the schools in a district (intra-district resegregation) as well as, movement to private schools (extra-district resegregation) and to other districts (inter-district resegregation). The district level analysis only focuses on extra-district and inter-district resegregation. Furthermore, not all the schools in each sampled district are included in the analysis. In particular schools opened since 1967 are omitted. Intra-district movement to these new schools and from the older schools which are included in the study may explain the differences in the findings at the two levels of analysis.

Schools in Districts Desegregating in 1971 or 1972 (N=604)

The relationship between percent white enrollment change and the independent variables among schools in districts desegregating in 1971 or 1972 are shown in Table 8. As predicted, percent black school enrollment is negatively associated with percent white enrollment change among these schools. Higher black enrollment results in greater percentage declines in white enrollment. As was the case for schools in districts desegregating in 1969 or 1970, this relationship is non-linear. Percent black school enrollment squared is significant in equation 8.2. The estimated values of

Table 8: Unstandardized Regression Coefficients for Percent White Enrollment on School Percent Black Enrollment, District Percent Black Enrollment, and Previous Status of the School for Schools in Districts Desegregating in 1971 or 1972 (N=604)

	Intercept	School %Black	(School %Black)^2	District %Black	Previous Status Black	Previous Status Integrated	R^2
1972-74							
Equation 8.1	.056	-.314**					.04
Equation 8.2	-.027	.357*	-.983**				.07
Equation 8.3	.068			-.[illegible]9**			.02
Equation 8.4	-.020				-.035	-.034	.00
Equation 8.5	.002	.423*	-1.045**	-.175	.029	.012	.08

*Significant at .05
**Significant at .01

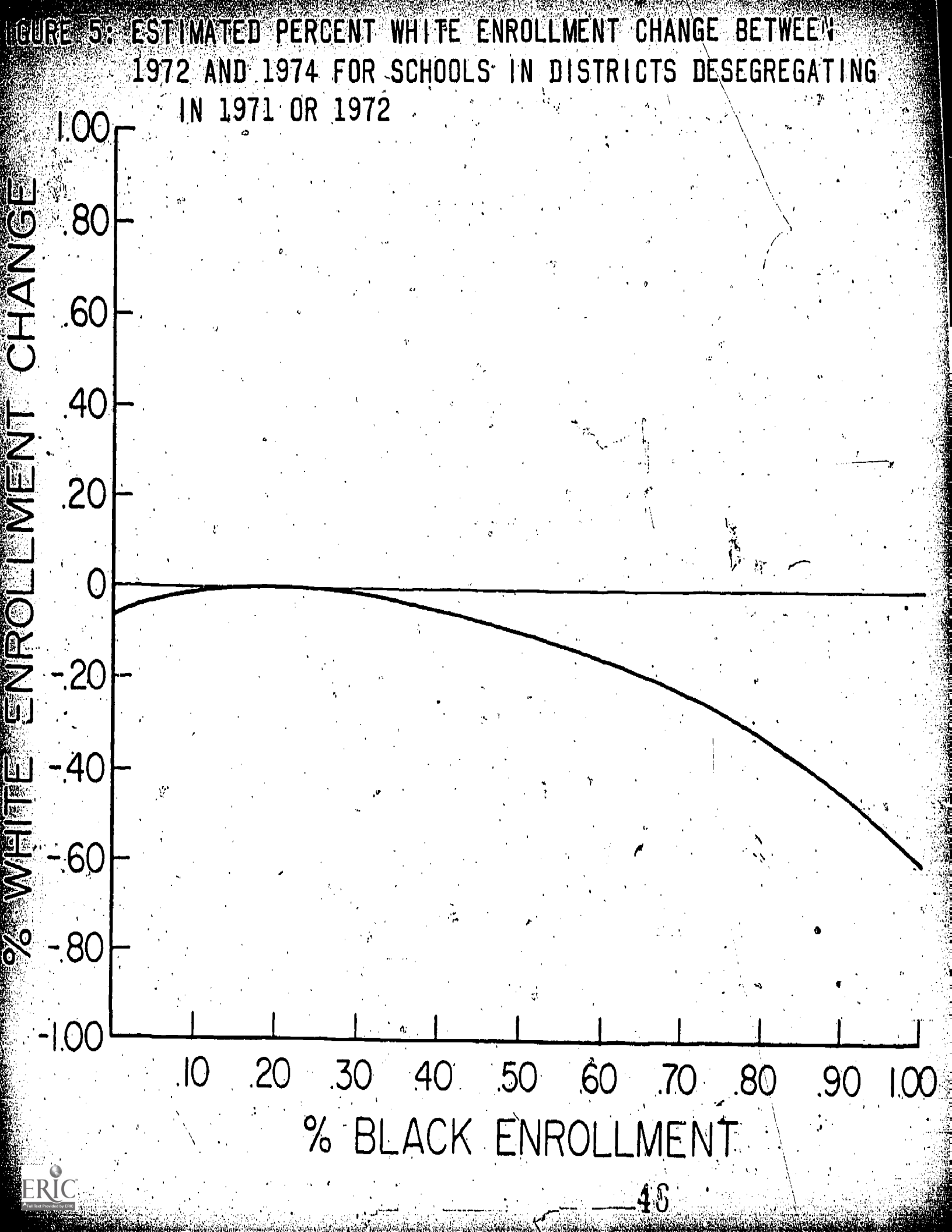
percent white enrollment change for increasing values of percent black school enrollment under equation 8.2 are shown in Figure 5. Again the relationship between percent black enrollment and percent white enrollment change is inconsistent among districts less than 20 to 30 percent black. Among schools more than 30 percent black, higher black enrollments result in increasing percent white enrollment declines. The projected declines among these schools are somewhat greater than for schools desegregating in 1969 or 1970. It should again be noted that the amount of variance explained by percent black enrollment is low indicating considerable variation around the projections in Figure 5.

Percent black district enrollment also appears to be negatively related to percent white enrollment change (eq. 8.3). However, when the percent black enrollment in the school and the previous status of the school are controlled in equation 8.5, district level percent black is no longer significant. It should be remembered that only eleven districts are involved in this analysis. Thus, the basis for inference about the effects of district level black enrollment is very limited.

The previous status of the school is unrelated to percent white enrollment change among these schools (eq. 8.4). Controlling for the percent black in the school and the district does not alter this finding (eq. 8.5).

Does the relationship between the percent black enrollment in a school and percent white enrollment change vary with the previous status of the school or the black concentration in the district? To answer this question interaction terms between school percent black and the remaining independent variables were computed and added to equation 8.5. Only the interaction effect of percent black enrollment in the school and percent black enrollment in the district proved to be significant. The sign of this term was positive

FIGURE 5: ESTIMATED PERCENT WHITE ENROLLMENT CHANGE BETWEEN 1972 AND 1974 FOR SCHOOLS IN DISTRICTS DESEGREGATING IN 1971 OR 1972



indicating that the relationship between the percent black in the school and percent white enrollment change was weaker among schools located in higher percent black districts. Again, few districts are involved in this analysis. Furthermore, with one district, which is approximately 46 percent black and has 37 schools, excluded from the analysis the interaction term between school and district percent black becomes non-significant. Thus, outside of this one district the effect of percent black enrollment at the school level on percent white enrollment change does not vary by the previous status of the school or the percent black concentration in the district.

In summary, among schools in districts desegregating in 1971 or 1972 percent black enrollment is negatively related to percent white enrollment change. This relationship is non-linear with a threshold around 20 to 30 percent black enrollment. Neither the percent black in the district nor the previous status of the school is related to percent white enrollment change once the effects of the percent black enrollment in the school is controlled. With the exception of one district, the relationship between percent black enrollment in the school and percent white enrollment change does not vary by the previous status of the school or the percent black enrollment.

Summary

Recent studies have produced conflicting evidence on the relationship between school desegregation and white enrollment declines. Several studies have found desegregation to be unrelated to changes in white enrollment. In contrast many other studies have clearly linked school desegregation to white enrollment declines. Assuming the methodological soundness

of both sets of studies, the central question is no longer whether school desegregation results in declining white enrollment, but rather what factors influence white enrollment stability and instability in desegregated schools.

The results of the present analysis indicate that, at least at the district level, percent black enrollment is one such factor. Among the sampled districts white enrollment declines are associated with percent black enrollment in two of the four time periods--1968 to 1970 and 1970 to 1972. Within these two periods, changes in white enrollments were relatively minor and generally unassociated with the level of black concentration among districts with less than 30 percent black enrollments. However, among districts above that threshold, white enrollments decreased exponentially with increases in the percent black enrollment.

The relationship between percent black enrollment and white withdrawal at the school level is less clear. Higher black enrollments are significantly associated with declines in white enrollment for two sets of schools--those in districts desegregating in 1969 or 1970 and those in districts desegregating in 1971 or 1972. The structure of these relationships is similar to that at the district level. White enrollments are unrelated to black enrollments among schools less than roughly 30 percent black but decline exponentially as enrollments exceed the 30 percent black threshold. The insensitivity of white enrollment change to school enrollments of less than approximately 30 percent black explains the lack of a relationship between percent black enrollment and white enrollment change among the third set of schools examined, those in districts desegregating in 1968.

Virtually all of those schools had enrollments less than 20 percent black. Hence, the lack of a relationship between percent black and white enrollment change among these schools is consistent with the findings for schools desegregating in 1969 through 1972.

While the structure of the relationship between percent black and white withdrawal is consistent across the subsets of schools and time periods examined, in no case does this relationship explain a substantively significant amount of the variance in white enrollment change. In practical terms this means that predictions of white enrollment change based on percent black enrollment (such as Figures 3 and 4), are imprecise and that even high percent black schools may experience little decline in white enrollments.

We assumed that school level conditions were the focal point of parental decisions to withdraw from desegregated schools (i.e. parents reject schools not school district.) However, while school enrollment declines are related to the percent black enrollment in the school, they are also related to the percent black enrollment in the district. At the school level, the percent black in the district is related to white withdrawals in both the 1970-72 and 1972-74 time periods among schools desegregating in 1969 and 1970. Among schools in districts desegregating in 1971-72 the relationship between district level black concentration and percent white enrollment change at the school level is significant but does not withstand controls for the percent black enrollment in the school. The latter result probably reflects the presence of only eleven districts in the analysis. The relationship between percent black enrollment and white withdrawal at the district level appears to

be curvilinear with a threshold around 30 percent, whereas, at the school level the relationship is basically linear. Furthermore, the relationsip between percent black and percent white enrollment change at the district-level disappears in the 1972-74 time period. These results suggest that intra-district resegregation commences at a relatively low percent black district enrollment and continues to be sensitive to the percent black enrollment in the district after extra-district and inter-district resegregation have ceased.

The previous status of the school appears to have little impact on percent white enrollment change after desegregation. Schools that were black or integrated prior to desegregation do not experience consistently greater declines in white enrollment after desegregation than do previously white schools. One explanation for this unexpected result is that parents who object to the assignment of their child to a previously black or integrated school refuse to allow their child to attend the school in the initial year of desegregation. Giles (1977a) found evidence of such a pattern in one southern metropolitan district. If the impact of the previous status of a school is confined to the first year, then the focus of the present study on stability and instability after desegregation would overlook that effect. It should also be noted that if the impact of the percent black enrollment in a school is confined to the first year, then that effect would also be ignored by the present study design.

Policy Implications

Before proceeding to the policy implications of the study, a few caveates are in order. First, while the over-all pattern of results is consistent, the findings of the study do vary somewhat among the levels of analysis, time-periods and sets of schools examined. Furthermore, the poor fit of the data at the school level has already been noted, but even at the district level there is substantial variation around the estimates. Therefore, the predictions of the study with regard to the location of the threshold and the percent white enrollment decline for a given level of black enrollment above the threshold should be taken as rough approximations.

Second, the districts examined in the present analysis experienced government induced desegregation. The predictions, therefore, would be modified for districts where residential desegregation is occurring or where whites are leaving for other reasons (e.g. general trends toward suburbanization.) Third, the research has focused on southern districts and schools and in the strictist statistical terms is only generalizable to that region. Until sufficient desegregation occurs outside the South to provide a basis for research, however, reliance on the experience of the South would appear the only alternative to speculation. Finally, the influence of compensatory strategies for maintaining white enrollments has not been examined r example, the location of special educational programs in high percent black schools may attract enough white students to offset losses due to the percent black enrollment.

With these caveates in mind, the results of this study suggest that, on average, school districts with less than roughly 30 percent black enrollment can be desegregaed without experiencing drastic declines in white enrollment. For districts with enrollments more than approximately 30 percent black, the results support the need for multiple district desegregation plans. By combining high percent black districts with surrounding low percent black districts, the over-all black concentration can be reduced below the 30 percent black threshold and the problem of white withdrawal reduced correspondingly. Failing the adoption of multiple district plans or successful compensatory strategies, desegregation of districts with high percent black enrollments is predicted to be costly in terms of white withdrawals.

At the school level the policy implications, like the results, are less clear. The large variation in percent white enrollment change around the estimates based on percent black school enrollment suggests that percent black school enrollment has little influence on white withdrawals. But, the consistency with which the relationship between percent black enrollment and white withdrawal appears in the various sets of schools and time-periods examined and the lack of information concerning the influence of black enrollment on white withdrawals in the first year of desegregation, suggest that a prudent desegregation planner would be wise to keep school enrollments when possible at or below 30 percent black.

Footnotes

[1]The effects of residential desegregation are not eliminated by focusing on districts experiencing government induced desegregation.

[2]For a list of districts see Appendix C.

[3]Preliminary analysis was also conducted for schools with white enrollment greater than or equal to 100. The results were comparable to the analysis for schools with white enrollments greater than or equal to 50.

[4]The first dummy variable was coded "1" if a school was black prior to desegregation and "0" otherwise. The second dummy variable was coded "1" if a school was integrated prior to desegregation and "0" otherwise. With both varibles included in a regression equation the first contrasts percent white enrollment change in previously black and previously white schools and the second contrasts percent white enrollment change in integrated and previously white schools.

[5]This analysis was conducted with two extreme outlying districts removed. One was approximately 8 percent black and had increased its white enrollment by approximately 40 percent between 1968 and 1970. The other district was approximately 80 percent black and had lost about 66 percent of its white enrollment over the same time period. These gains and losses are consistent with a relationship between percent black and white enrollment decline. However, the values for these districts departed to such a degree from the other districts that a truer picture of that relationship was provided by deleting them from the analysis.

[6]The combined mean percent white enrollment change between 1972 and 1974 was -.02 for districts desegregating in 1969 or 1970.

[7]Year of desegregation is coded "1" for 1969 and "0" for 1970.

[8]For the formula for calculating the confidence interval for the predicted value of an individual observation see, Franklin Graybill, An Introduction to Linear Statistical Models, (New York: McGraw-Hill: 1961). The actual size of this interval will increase as the observed value of an independent variable departs from the mean for the variable. The figure of $\pm$ .05 percent is roughly accurate for schools around 80 percent black. Schools with higher black ratios would have slightly larger confidence intervals.

[9]Tests of the linearity of the relationship between all the independent variables and percent white enrollment decline were actually conducted as a preliminary step in the analysis. The non-linearity of the relationship between school percent white enrollment change and district percent black was discovered in this preliminary analysis.

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Appendix A: Predicted Percent White Enrollment Change in the District for Various Levels of Percent Black Enrollment

Percent Black Enrollment	Time Period 1968-70	1970-72
.00	.0347	-.0286
.01	.0352	-.0251
.02	.0355	-.0218
.03	.0358	-.0187
.04	.0359	-.0158
.05	.0358	-.0130
.06	.0357	-.0105
.07	.0354	-.0081
.08	.0350	-.0060
.09	.0345	-.0040
.10	.0338	-.0022
.11	.0331	-.0005
.12	.0322	+.0008
.13	.0311	+.0021
.14	.0300	+.0031
.15	.0287	+.0040
.16	.0273	+.0047
.17	.0258	+.0052
.18	.0241	+.0055
.19	.0224	+.0057
.20	.0205	+.0056
.21	.0184	+.0054
.22	.0163	+.0050
.23	.0140	+.0044
.24	.0116	+.0036
.25	.0091	+.0026
.26	.0064	+.0015
.27	.0037	+.0001
.28	.0008	-.0013
.29	-.0022	-.0030
.30	-.0053	-.0049
.31	-.0086	-.0070
.32	-.0120	-.0093
.33	-.0155	-.0117
.34	-.0191	-.0144
.35	-.0229	-.0172
.36	-.0268	-.0202
.37	-.0308	-.0234
.38	-.0350	-.0268
.39	-.0392	-.0303
.40	-.0436	-.0341
.41	-.0482	-.0380
.42	-.0528	-.0421
.43	-.0576	-.0464
.44	-.0625	-.0509
.45	-.0675	-.0556
.46	-.0726	-.0605
.47	-.0779	-.0655
.48	-.0833	-.0707
.49	-.0888	-.0762
.50	-.0945	-.0818

Appendix A (continued)

Percent Black Enrollment	1968-70	1970-72
.51	-.1002	-.0875
.52	-.1061	-.0935
.53	-.1121	-.0997
.54	-.1183	-.1060
.55	-.1246	-.1125
.56	-.1309	-.1192
.57	-.1375	-.1261
.58	-.1441	-.1332
.59	-.1509	-.1405
.60	-.1578	-.1479
.61	-.1648	-.1556
.62	-.1719	-.1634
.63	-.1792	-.1714
.64	-.1866	-.1796
.65	-.1941	-.1880
.66	-.2017	-.1965
.67	-.2095	-.2053
.68	-.2174	-.2142
.69	-.2254	-.2233
.70	-.2335	-.2326
.71	-.2418	-.2421
.72	-.2502	-.2518
.73	-.2587	-.2617
.74	-.2674	-.2717
.75	-.2761	-.2819
.76	-.2850	-.2924
.77	-.2940	-.3030
.78	-.3032	-.3137
.79	-.3124	-.3247
.80	-.3218	-.3359
.81	-.3313	-.3472
.82	-.3410	-.3587
.83	-.3507	-.3704
.84	-.3606	-.3823
.85	-.3706	-.3944
.86	-.3808	-.4067
.87	-.3910	-.4191
.88	-.4014	-.4318
.89	-.4119	-.4446
.90	-.4225	-.4576
.91	-.4333	-.4708
.92	-.4442	-.4842
.93	-.4552	-.4977
.94	-.4663	-.5115
.95	-.4776	-.5254
.96	-.4890	-.5395
.97	-.5005	-.5538
.98	-.5121	-.5683
.99	-.5239	-.5830

Appendix B: Predicted Percent White Enrollment Change in Schools with Various Levels of Percent Black Enrollment

Percent Black Enrollment	Schools in Districts Desegregating in 1969 or 1970		Schools in Districts Desegregating in 1970 or 1971
	1970-72	1972-74	1972-74
.00	-.1120	-.0880	-.0270
.01	-.1088	-.0846	-.0235
.02	-.1058	-.0813	-.0202
.03	-.1029	-.0783	-.0171
.04	-.1001	-.0753	-.0142
.05	-.0974	-.0725	-.0116
.06	-.0948	-.0699	-.0091
.07	-.0923	-.0674	-.0068
.08	-.0900	-.0651	-.0047
.09	-.0877	-.0629	-.0028
.10	-.0856	-.0608	-.0011
.11	-.0836	-.0589	.0003
.12	-.0817	-.0572	.0016
.13	-.0799	-.0556	.0028
.14	-.0782	-.0541	.0037
.15	-.0766	-.0528	.0044
.16	-.0751	-.0516	.0049
.17	-.0738	-.0506	.0052
.18	-.0725	-.0497	.0054
.19	-.0714	-.0490	.0053
.20	-.0704	-.0484	.0050
.21	-.0694	-.0480	.0046
.22	-.0686	-.0477	.0039
.23	-.0679	-.0476	.0031
.24	-.0674	-.0476	.0020
.25	-.0669	-.0478	.0008
.26	-.0665	-.0481	-.0006
.27	-.0663	-.0485	-.0022
.28	-.0661	-.0491	-.0041
.29	-.0661	-.0499	-.0061
.30	-.0662	-.0508	-.0083
.31	-.0664	-.0518	-.0108
.32	-.0667	-.0530	-.0134
.33	-.0671	-.0544	-.0162
.34	-.0677	-.0559	-.0192
.35	-.0683	-.0575	-.0224
.36	-.0690	-.0593	-.0258
.37	-.0699	-.0612	-.0294
.38	-.0709	-.0633	-.0332
.39	-.0720	-.0655	-.0372
.40	-.0732	-.0679	-.0414
.41	-.0745	-.0704	-.0459
.42	-.0759	-.0731	-.0504
.43	-.0774	-.0759	-.0552
.44	-.0790	-.0788	-.0602
.45	-.0808	-.0819	-.0654
.46	-.0827	-.0852	-.0707
.47	-.0846	-.0886	-.0763
.48	-.0867	-.0922	-.0821
.49	-.0889	-.0959	-.0880
.50	-.0912	-.0997	-.0942

Appendix B (continued)

Percent Black Enrollment	Schools in Districts Desegregating in 1969 or 1970		Schools in Districts Desegregating in 1970 or 1971
	1970-72	1972-74	1972-74
.51	-.0936	-.1037	-.1006
.52	-.0961	-.1078	-.1071
.53	-.0988	-.1121	-.1139
.54	-.1015	-.1166	-.1208
.55	-.1044	-.1211	-.1280
.56	-.1074	-.1259	-.1353
.57	-.1104	-.1308	-.1428
.58	-.1136	-.1358	-.1506
.59	-.1169	-.1410	-.1585
.60	-.1204	-.1463	-.1666
.61	-.1239	-.1517	-.1750
.62	-.1275	-.1574	-.1835
.63	-.1313	-.1631	-.1922
.64	-.1351	-.1690	-.2011
.65	-.1391	-.1751	-.2102
.66	-.1432	-.1813	-.2195
.67	-.1474	-.1876	-.2290
.68	-.1517	-.1941	-.2387
.69	-.1561	-.2008	-.2486
.70	-.1606	-.2076	-.2587
.71	-.1652	-.2145	-.2690
.72	-.1700	-.2216	-.2795
.73	-.1748	-.2289	-.2902
.74	-.1798	-.2362	-.3011
.75	-.1849	-.2438	-.3121
.76	-.1901	-.2514	-.3234
.77	-.1954	-.2593	-.3349
.78	-.2008	-.2672	-.3466
.79	-.2063	-.2754	-.3584
.80	-.2120	-.2836	-.3705
.81	-.2177	-.2921	-.3827
.82	-.2236	-.3006	-.3952
.83	-.2295	-.3093	-.4078
.84	-.2356	-.3182	-.4207
.85	-.2418	-.3272	-.4337
.86	-.2481	-.3363	-.4470
.87	-.2545	-.3456	-.4604
.88	-.2610	-.3551	-.4740
.89	-.2677	-.3647	-.4879
.90	-.2744	-.3744	-.5019
.91	-.2813	-.3843	-.5161
.92	-.2882	-.3944	-.5305
.93	-.2953	-.4045	-.5451
.94	-.3025	-.4149	-.5600
.95	-.3098	-.4253	-.5750
.96	-.3172	-.4360	-.5902
.97	-.3247	-.4467	-.6056
.98	-.3324	-.4577	-.6212
.99	-.3401	4687	-.6370

Appendix C: Districts Included in the Study by State and County

State	District	County
Alabama	Athens	Limestone
	Attalla	Etonah
	Baldwin	Baldwin
	Bessemer	Jefferson
	Birmingham	Jefferson
	Gadsden	Etowah
	Jasper	Walker
	Jefferson	Jefferson
	Limestone	Limestone
	Montgomery	Montgomery
	Phenix City	Russell
	Russell	Russell
	Walker	Walker
Arkansas	Altheiner	Jefferson
	Crawfordsville	Crittenden
	Dollarway	Jefferson
	Earle	Crittenden
	Little Rock	Pulaski
	Texarkana	Miller
	Turrell	Crittenden
Florida	Alachua	Alachua
	Broward	Broward
	Dade	Dade
	Duval	Duval
	Escambia	Escambia
	Hillsborough	Hillsborough
	Leon	Leon
	Orange	Orange
	Palm Beach	Palm Beach
Georgia	Dougherty	Dougherty
	Fulton	Fulton
	Gwinnett	Gwinnett
	Walker	Walker
Louisiana	Bossier	Bossier
	Caddo	Caddo
	Calcasieu	Calcasieu
	Jefferson	Jefferson
	Lafayette	Lafayette
	St. Bernard	St. Bernard
	St. Tammany	St. Tammany
Mississippi	Biloxi	Harrison
	Rankin	Rankin

Appendix C (continued)

State	District	County
North Carolina	Ashboro City	Randolph
	Cumberland	Cumberland
	Durham City	Durham
	Durham	Durham
	Fayetteville City	Cumberland
	Guilford	Guilford
	Orange	Orange
	Raleigh City	Wake
	Wake	Wake
South Carolina	Berkeley	Berkeley
	Charleston	Charleston
	Lexington #5	Lexington
	Pickens	Pickens
Texas	Amarillo	Potter
	Chapel Hill	Smith
	Cleveland	Liberty
	Conroe	Montgomery
	Houston	Harris
	Lamar	Fort Bend
	Liberty	Liberty
	Lubbock	Lubbock
	Mart	McLennan
	Plano	Collin
	Port Author	Jefferson
	Richardson	Dallas
	San Angelo	Tom Green
	South Park	Jefferson
	Wilmer Hutchins	Dallas
Virginia	Amherst	Amherst
	Campbell	Campbell
	Chesterfield	Chesterfield
	Dinwiddie	Dinwiddie
	Henrico	Henrico
	Loudoun	Loudon
	Roanoke	Roanoke