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ABSTRACT

This paper considers the effect of high stakes promotion tests on early high school dropout patterns. Analysis of data from the National Educational Longitudinal Survey of 1988, a nationally representative survey of 8th grade students in the United States, indicates that the presence of an 8th grade promotion test requirement is strongly associated with an increased probability of dropping out. This association persists even after controlling for a moderate range of school and individual level characteristics associated with dropping out. The difference in dropout rates between students taking and not taking promotion tests is not trivial, particularly for students with low achievement, low grade point average, and low socioeconomic status, where the difference in dropout probabilities is as much as two percentage points. (Contains 18 references.) (SM)

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Do High-Stakes Tests Affect Students' Decisions to Drop Out of School? Evidence from NELS

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INTRODUCTION

High-stakes testing has been on the national policy agenda and in the news now for some years. In particular, the practice of requiring students to pass a test in order to be promoted from grade to grade or to graduate from high school has grown increasingly common in U.S. public schools in the last two decades. Catterall (1989)reports that nine states required the class of 1984 to pass a test for high school graduation; Jacob (2001) reports that 15 states had such a requirement for the class of 1992; and Warren and Edwards (2001) report that 18 states required students in the class of 2000 to pass a test for high school graduation, and 8 additional states planned the requirement for later graduation classes. This increase has occurred despite a lack of substantial empirical evidence about the effectiveness of such testing policies and even as major educational research organizations have cautioned against the use of such tests for grade promotion (American Educational Research Association 2000; National Council of Teachers of Mathematics 2000).

In the absence of concrete empirical evidence, proponents and opponents of minimum competency testing have argued, sometimes vehemently, over the probable consequences of conditioning grade promotion or graduation on test results. While proponents of the tests have generally argued that such requirements provide incentives for students and schools, particularly those at the low end of the achievement spectrum, to improve their performance, opponents have argued that the tests lead to a low-level basic skills curriculum and increase dropout rates by discouraging students who fail the tests from continuing in school. This paper uses data from the National Educational Longitudinal Survey (NELS) to examine one area of this debate—the relationship between high stakes tests used for grade promotion and dropout rates.

Before the late 1970's, few states and districts required students to pass a test to be promoted or to graduate. By 1984, however, 19 states required students to pass at least one test in order to graduate from high school (Winfield 1991), and 24% of all tests given in U.S. public schools were used for grade promotion or graduation (United States General Accounting Office 1993). The proliferation of such testing policies grew with demands for public accountability of schools through the 1970s and 1980s, driven by a belief that schools' low academic standards and "social promotion" practices were to blame for a perceived lack of high-level job skills (and of low-level skills as well—reports of high school graduates unable to read have fueled the fervor for high stakes graduation and promotion testing) among young high school graduates (Jaeger 1982). The practice is not without a certain simple logic: if all it takes to earn a high school diploma is sitting in a classroom for 12 years, then schools and students have little incentive to ensure that substantial learning is taking place; consequently, a diploma is meaningless. Thus, policies that condition grade promotion or graduation on successful passage of a test are intended to give meaning to the high school diploma by ensuring a minimum level of proficiency in certain basic skills—generally Math, Reading, English, and sometimes Science, History, and/or Social Studies. In North Carolina, for example, the law enacting the testing requirement states that the tests are intended "to assure that graduates of the public high schools… possess those skills and that knowledge necessary to function independently and successfully in assuming the responsibilities of citizenship" (General Assembly of the State of North Carolina, Art. 39A, §115-320.6 'Purpose,' 1977, quoted in Jaeger 1982, p. 223).

The rhetoric underlying high stakes promotion and graduation tests assumes, among other things, that withholding promotion and/or diplomas from students until they demonstrate a required standard of proficiency will create a set of incentives for both schools and students to change in ways that will result in increased learning for those students who would otherwise be graduated without the required skills. The state legislatures and school boards that have adopted promotion and graduation tests argue that raising graduation standards—by increasing course requirements and conditioning grade promotion and/or graduation on the passage of standardized, machine-scorable, multiple-choice basic skills tests—creates incentives for low-performing schools and students to improve their performance. Opponents of the tests argue, however, that by creating additional hurdles for students to cross, the tests increase may dropout rates rather than improving achievement (see, e.g., Darling-Hammond 1991; Orfield 1988). For low-achieving students, particularly those in schools with inadequate resources and learning opportunities, opponents argue, the tests create more incentives to drop out than to improve achievement. Moreover, they claim, the negative effects of the tests are concentrated on those already at risk of dropping out—disproportionately minority and low-income students—a situation with serious equity and civil rights ramifications (Archer and Dresden 1987; Kreitzer, Madaus, and Haney 1989; McDill, Natriello, and Pallas 1986).

EXISTING EVIDENCE ON THE EFFECTS OF HIGH STAKES TESTING

Six years ago, when Reardon reviewed existing research, there was almost no empirical evidence regarding the effects of high-stakes testing on student motivation, achievement, and dropout patterns (Reardon 1996). In recent years, however, several analyses of survey data have been published. The evidence from these, however, is mixed.

The best quality evidence on the association between high stakes testing and dropping out comes from two recent analyses of the relationship between high school graduation test requirements and school completion using NELS data (Jacob 2001; Warren and Edwards 2001). Although Jacob (2001) found no reading and math achievement differences associated with the presence of graduation tests, he found that dropout rates are roughly 6.5% greater among students in the bottom quintile on achievement tests in states with high school graduation test requirements than comparable students in states without such tests. Warren and Edwards (2001), however, find no effect of graduation tests on the probability of dropping out. Warren and Edwards, moreover, like Jacob, test for an interaction between the graduation test requirement and student achievement levels, in order to see if test policies disproportionately impact low-achieving students, but they find no interaction.

The discrepancy between the Jacob (2001) and Warren and Edwards (2001) results is puzzling, since both use the same data. There are some differences in the variables included in their models, but not dramatic ones. A close examination of the precise NELS sample they use, however, reveals a potential reason for the discrepancy. Warren and Edwards use school administrator reports about the presence of a graduation test requirement as their treatment variable. Jacob points out, however, that this data is missing for a number of students (971 of 12,171 students in his sample are missing this variable). Importantly, it is missing in most of these cases because these students had dropped out of school and so had no school administrator questionnaire in their record. Warren and Edwards drop these students from their analyses, greatly reducing the proportion of their sample who are dropouts. Jacob, however, retains them in his sample and uses state-level data on whether students were subject to a high stakes graduation test in 1992 as his treatment variable. Warren and Edwards find no effect of the tests on dropout rates, but that may be because they have excluded from their sample a large number of dropouts, who may have disproportionately dropped out of schools with graduation test requirements.

A second possible reason for the discrepancy lies in differences in the regression models each employs. Jacob uses OLS regression to estimate a linear probability model for dropping out of school, rather than hierarchical logistic regression as do Warren and Edwards. While Jacobs notes that his OLS regressions give the same results as a probit regression (implying that no harm is done by using a linear probability model rather than a logit or probit model), he does not address the clustered nature of the data, which may result in an overestimation of significance levels.

On balance then, neither Jacob's nor Warren and Edwards' results can be taken as definitive. It would be useful to reanalyze the NELS data using Jacob's sample and Warren and Edwards' models.

Some other recent studies provide additional evidence related to this issue. Griffin and Heidorn (1996), using data on 77,000 students from 75 schools in Florida, found that failing a high stakes graduation test increased the probability of dropping out for students with higher GPAs; they found no effect on dropping out for students with lower GPAs. Unlike the NELS data, Griffin and Heidorn's data include information on whether students failed the test, so they are able to test for a dropout effect associated with *failing* the test, not simply with *taking* it. Their observed effect, however, is relatively small.

Catterall (1989) interviewed 736 students about their experiences with high school graduation tests. He found that students who had failed the test at least once reported much more doubt about their likelihood of completing high school. This effect was strongest among students with higher grades, similar to the pattern found by Griffin and Heidorn (1996). Catterall did not collect data on whether students actually completed high school, however, so his results should be interpreted with some caution.

Hoffer (1997) used NELS data to investigate the relationship between increased course requirements (specifically, the requirement that students take three math classes in high school rather than two in order to graduate) and high school math achievement and dropout rates. He found that increased course requirements were not associated with either higher achievement or higher dropout rates. Moreover, he finds no interaction between course requirements and SES on the probability of dropping out. Increased course requirements may affect students' dropout decisions quite differently than the presence of a graduation test, so it is not clear whether Hoffer's findings can be extrapolated to apply to graduation tests.

Most prior research has focused on high stakes graduation tests given in high school. This paper, however, focuses specifically on high stakes tests given in eighth grade as a requirement for promotion to ninth grade. We examine both the prevalence of eighth grade high stakes tests in eighth grade schools and its relationship to early high school dropout patterns. Though many students are subject to a variety of standardized, state- and district-mandated tests (United States General Accounting Office 1993), the analysis here is restricted to these high stakes tests because they are the most likely to influence students' decisions to drop out of school.

The first part of the paper uses data from the 1988 NELS student and administrator surveys to describe the prevalence of promotion test requirements in public eighth grade schools, both nationally and among various population subgroups. The second part of the analysis examines the relationship between test requirements and early high school dropout patterns. Using longitudinal data from the 1988 and 1990 NELS surveys, we test whether students who were required to pass a reading or math test in eighth grade in 1988 were more likely to have dropped out of school two years later (by 10th grade) than students who were not required to pass such a test.

DATA AND METHODS

Data

Data for these analyses are drawn from the National Educational Longitudinal Study (NELS). NELS contains data on a nationally-representative longitudinal survey of eighth-grade students in the U.S. in 1988. A majority of the students were then resurveyed in 1990, 1992, and 1994. Student characteristics—including age, race/ethnicity, sex, family SES, GPA, and eighth grade composite reading and math test scores—were taken from the 1988 base year survey. Dropout status was taken from the

1990 first follow-up survey.[1] Eighth grade school characteristics used as controls—including average SES, test scores, and GPA of students in the school, total enrollment, percentages of minority, free lunch eligible, ESL, and bilingual education students, student teacher ratio, percentage of teachers with advanced degrees, community type (urban, suburban, rural), and region—were taken from the eighth grade school administrator questionnaire. The independent variable of key interest—the presence of a test requirement for promotion to ninth grade—was taken from variables BYSC38A (are students retained in eighth grade for failing a required math test?) and BYSC38B (are students retained in eighth grade for failing a required reading test?) in the eighth grade NELS administrator questionnaire. Schools were coded as having a test requirement if the administrator answered yes to either of these items.

Students were included in the analytic sample used here if they met the following criteria: 1) they were in the 1988 sample; 2) their dropout status in 1990 could be determined from the data; 3) they were in a public school in 1988; 4) school-level data were available from the 1988 principal survey; and 5) student-level data were available from the 1988 student survey. In the 808 public schools in the 1988 NELS sample, there are 14,463 students in the NELS panel sample (participated in NELS in 1988 and 1990). Of these, 13,332 student records (in 778 schools) contained complete student data for the variables of interest here. School-level data were missing for 603 of these students (from 38 schools), leaving a final analytic sample of 12,729 students in 740 public eighth grade

[1] A student is defined as dropout if he or she has was absent for at least 20 consecutive days with out an excuse and did not return to school. Students who dropped out and then returned to school were not considered dropouts unless they had more than one dropout episode between 1988 and 1990.

schools (88% of the eligible students; 92% of eligible schools).[2]

Methods

In order to investigate the relationship between a school-level variable (the presence of an eighth-grade high stakes test) and a student-level outcome (dropout status), we use hierarchical models that correctly account for the clustered nature of the sample (Bryk and Raudenbush 1992). Because the dependent variable is dichotomous, we use a hierarchical logistic regression model. Specifically, our models are of the form below:

$$\begin{aligned} \eta_{ij} &\equiv \ln\left(\frac{PR(Y_{ij}=1)}{1-PR(Y_{ij}=1)}\right) = \beta_{0j} + \beta_{mj}X_{mij} \\ \beta_{0j} &= \gamma_{00} + \gamma_{01}HS_j + \gamma_{0n}Z_{nj} + u_{0j} \\ \beta_{mj} &= \gamma_{m0} \end{aligned} \tag{1}$$

In this model, Y_{ij} is a dummy variable indicating dropout status in 1990 (when most sample members are in tenth grade), with $Y=1$ indicating the student is not enrolled in school in 1990; η_{ij} is the log-odds that student i from eighth-grade school j has dropped out by 1990; m and n index the student and school variables included in the models, with X_{mij} the m^{th} student-level variable for student i from eighth-grade school j and Z_{nj} the n^{th} school-level variable for eighth-grade school j; HS_j is a dummy variable indicating whether school j has a high stakes test; and u_{0j} is a school-specific error terms for school j. We use the HLM software package (Raudenbush, Bryk, Cheong, and Congdon 2000)

[2] A comparison of the 740 schools included in the sample with the 68 excluded schools shows no significant differences between those excluded and included. Within the 740 schools included in the sample, however, there are some differences between the students analyzed (12,729) and those excluded (1734). Within a given school, students in the analytic sample (those with complete data) tend to be from higher SES families, be younger, have higher test scores and grades than those excluded from the analysis; additionally, they are more likely to be females and less likely to have dropped out by the 1990 survey.

to estimate these models.

We estimate a series of models of this form, beginning with a null model (model 1), then adding the student-level variables (model 2), then the high stakes test variable (model 3), and then the full set of school control variables (model 4).

We next test for interaction effects to determine whether the strength of the relationship between high stakes testing and dropping out varies with student characteristics. In particular, we hypothesize that high stakes tests will have a larger effect on the likelihood of dropping out for students with lower grades and lower test scores. In addition, in order to test whether the tests have a disproportionate effect on minority students and students from low SES backgrounds, we also test interactions of the high stakes testing variable with the SES and race/ethnicity variables. These models have the general form shown below:

$$\begin{aligned} \eta_{ij} &\equiv \ln\left(\frac{PR(Y_{ij}=1)}{1-PR(Y_{ij}=1)}\right) = \beta_{0j} + \beta_{1j}X_{ij} + \beta_{mj}X_{mij} \\ \beta_{0j} &= \gamma_{00} + \gamma_{01}HS_j + \gamma_{0n}Z_{nj} + u_{0j} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}HS_j \\ \beta_{mj} &= \gamma_{m0} \end{aligned} \tag{2}$$

In model 2, X_{ij} is the student characteristic in the interaction and m indexes all the remaining student characteristics. We test for interactions with SES (model 5), test scores (model 6), GPA (model 7), and race/ethnicity (model 8).

RESULTS

We begin by reporting descriptive data on the prevalence of eighth grade high stakes testing policies in the United States.[3] For these descriptive analyses, we use the full sample of 797 public eighth grade schools in NELS for which data are available on the presence of high stakes testing requirements.

The NELS data indicate that in 1988, 20% of public eighth grade schools reported that they required students to pass a test in at least on subject in order to be promoted to ninth grade. Most eighth grade schools with such high stakes test requirements, however, required students to pass more than one such test to be promoted: 91% of schools with a test required students to pass tests in at least two subjects (usually in Reading and Math); 63% required at least three such tests; and 22% required students to pass tests in six subjects. Among schools with high stakes test requirements, Math, Reading, and English were the most commonly required subjects (see Table 1).

[Table 1 here]

Eighth grade testing policies are related to several other retention policies. Among schools that retain students for failing a required course, tests required for promotion are more common—25% of such schools have MCTs, as opposed to 14% of those that do not retain students for failing courses (Chi-square=14.597; df = 1; p-value<0.001). And in states that require all students to pass a test in order to graduate from high school, eighth grade schools are more likely to use tests for promotion as well—30% of eighth grade schools in states with high school graduation test requirements had their own promotion test requirements, compared to 15% of schools in states without high school graduation test

[3] The descriptive analyses here of the distribution of high stakes testing draw heavily on those in Reardon (1996). Minor discrepancies between those earlier statistics and these are attributable to subsequent

requirements (Chi-square=25.753; DF=1; p-value<0.001).

Although high school graduation test requirements are often set at the state level, no state required eighth grade schools to use high stakes tests to make grade promotion decisions in 1988. Instead, eighth grade testing policies are more commonly set at the district or school level. Though the NELS sampling design makes it impossible to generate reliable estimates of the prevalence of eighth grade promotion test requirements within particular states from NELS data, a state by state breakdown of schools in the NELS sample reveals no states where eighth grade promotion tests were required in all schools within that state. Apparently, local conditions more than state policy influence the presence of high stakes test requirements in eighth grade.

Though NELS does not allow state-by-state estimates of eighth grade high stakes testing prevalence, regional estimates and urban/suburban/rural breakdowns are possible. Table 2 describes the distribution of high stakes testing policies in eighth grade schools by region and type of community. The data show that in 1988 students in southern and western states and in urban schools were subject to eighth grade promotion test policies at about double the rate of students in other areas.

[Table 2 here]

Because of the concern that low-income and minority students might be disproportionately impacted by any adverse consequences of high stakes testing policies, we examine the distribution of high stakes testing practices by students race/ethnicity and socioeconomic status. From Table 3, it is clear that minority and low-income students are

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cleaning of the NELS data by NCES.

most likely to be subject to eighth grade high stakes grade promotion tests. In public schools nationwide, 35% of Black eighth graders and 27% of Hispanic eighth graders are subject to such requirements, compared to 16% of White eighth graders; moreover, 25% of eighth graders from low-SES families, against 14% of those from high-SES families, must pass such tests to advance to ninth grade.

[Table 3 here]

We turn next to the results of our regression models (Table 4). Model 1 is simply a null model. Model 2 includes the individual level covariates in the model—gender, race/ethnicity, SES, age, GPA, and math and reading test scores. The inclusion of these variables reduces the estimated between-school variance in the log-odds of dropping out (the τ_{00}) by about 40% from the null model. The remaining variance is still statistically significant ($p<.001$). Models 3 and 4 add school-level variables to explain this remaining between-school variation in dropout rates.

[Table 4 here]

Model 3 adds the high stakes testing dummy variable to the model. The results indicate that there is a strong and positive association between eighth grade high stakes promotion test requirements and the probability that students will drop out in the two next two years. Being subject to an eighth grade promotion test requirement is associated with an increase in the log-odds of dropping out of 0.43 (odds ratio=1.54, $p<.01$). The inclusion of the high stakes testing variable reduces the remaining between-school variance in the log-odds of dropping out by 6%.

Model 4 adds a host of school-level control variables to the model. Despite the fact that many of these variables are correlated with the high stakes test variable, the estimated coefficient on the test variable is reduced only slightly in this controlled model (beta-hat = 0.35, odds ratio = 1.42, $p<.01$). High stakes testing requirements remain a strong predictor of dropping out, even after controlling for a number of school-level covariates.

Figure 1 illustrates the predicted probability of dropping out as a function of eighth grade reading and math test scores for students in schools with and without and eighth grade promotion test. The predicted probabilities here are computed for a White female student with average values on all other individual and school variables. Recall that the tests have a mean of 50 and a standard deviation of 10, so the figure illustrates prototypical dropout rates for students in a range of +/- two standard deviations from the mean test score.

[Figure 1 here]

Figure 1 shows that the difference in predicted dropout probabilities associated with the presence of a high stakes test in eighth grade is not trivial, particularly for students at the low end of the achievement continuum. For students performing two standard deviations below the mean in eighth grade reading and math, the difference in dropout rates is roughly two percentage points. This is a sizable difference when we consider that these figures refer to dropout patterns *prior to tenth grade*, when dropout rates are relatively low in general. The difference in dropout rates for students at the higher end of the achievement continuum is relatively small, as we would expect.

Model 4 shows a substantial main effect of high stakes testing on the likelihood of dropping out. Our next models test for the presence of interaction effects between high stakes testing and the individual-level covariates—test scores, grades, SES, and race/ethnicity. Table 5 shows the results of these interaction models. In each case, we find no evidence for an interaction effect.

Note, however, that our finding of no interaction effect does not mean that high stakes tests are not associated with higher dropout rates among students otherwise at risk of dropping out. Because these are logistic regression models, the relationship between a variable and the *log-odds* of dropping out may be linear, while the relationship between the same variable and the *probability* of dropping out is non-linear. This can be seen in Figure 1, where it is clear that the association between high stakes tests and dropping out differs across the range of test scores, even though model 6 shows no interaction between the high stakes test requirement and achievement test scores. In fact, if the difference in the *probability* of dropping out were the same for students at all achievement levels, we would expect to find a positive coefficient on the interaction term in model 6.

In a linear model predicting school-level dropout rates, Reardon (1996) found the effect of high stakes tests on dropout rates varied with the SES of the school. We find no such interaction here, though again, an interaction that is significant in a linear model may not be significant in a logit model, and vice versa. Figure 2 shows the predicted probability of dropping out for students in schools with and without high stakes test requirements, by student SES. As in Figure 1, it is clear that high stakes tests are associated with a larger increase in the probability of dropping out for low-SES students than for high SES students, despite the absence of a significant interaction effect in model 5.

[Figure 2 here]

CONCLUSION

The proliferation of high stakes testing policies in the absence of quality empirical evidence of the tests' effects on learning and dropping out is no less a problem than it was a decade ago. While some recent studies have investigated this relationship, problems in the study designs or analyses still limit the usefulness and validity of their results. This paper attempts to add to the body of research on the topic by considering the effect of high stakes promotion tests on early high school dropout patterns.

We find that the presence of an eighth grade promotion test requirement is strongly associated with an increased probability of dropping out prior to tenth grade. This association persists even after controlling for a moderate range of school and individual-level characteristics associated with dropping out. The difference in dropout rates between students taking and not taking promotion tests is not trivial, particularly for students with low achievement, low GPA, and from low-SES families), where the difference in dropout probabilities is as much as two percentage points. This is a sizable difference when we consider that these are dropout rates early in high school, when aggregate dropout rates generally below 5%.

The association we find in the NELS data should be interpreted with some caution, as it is not clear that the relationship between testing and dropping out is causal. The best way to conclusively investigate the causal effects of high stakes testing policies on dropout and achievement might be to conduct a randomized experiment. For example, in a state that is planning to implement a high stakes testing requirement, school districts might be randomized to two groups, one of districts that implemented the test in a given year, and another of districts that delayed implementation for a year or two. A comparison of dropout rates and achievement levels between the two districts during the year(s) when they had different policies would yield more valid estimates of a causal effect than would be possible with survey data analysis. Such an experiment would cost relatively little in a state that was already planning to implement high stakes tests, though there would be some logistical issues to attend to. In particular, one would have to attend to the possibility that the different policies might create selection bias for families moving among school districts. The benefit of such a study would be potentially quite large, as it would provide far clearer evidence than existing data. The experience of the Tennessee STAR class size experiment shows that randomized experiments in educational research have considerable influence in shaping policy.

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Table 1: Incidence of High Stakes Testing and Retention Policies in Public Eighth Grade Schools, 1988 (weighted percentages)

Promotion to Ninth Grade Withheld for…	Percentage of Schools (*n=797*)
Failing test in at least one subject	19.8
Failing test in Math	17.1
Failing test in Reading	18.3
Failing test in English	13.3
Failing test in Science	6.2
Failing test in History	6.3
Failing test in Social Studies	6.1
Failing a required course[a]	55.2

[a] Note: *n=749*

Table 2: Incidence of High Stakes Testing in Public 8th Grade Schools by Region and Type of Community, 1988 (weighted percentages)

	Percentage of Schools with High Stakes Test	Average Number of Subjects Tested (among schools with at least one)
Region[a]		
Northeast	16.4	2.5
North Central	9.7	2.5
South	29.4	3.7
West	23.6	4.0
Community Type[b]		
Urban	36.0	2.8
Suburban	16.5	3.1
Rural	17.6	3.9

[a] *Chi-Square 34.048; df= 3; p-value<0.001*
[b] *Chi-Square 21.539; df= 2; p-value<0.001*

Table 3: Incidence of High Stakes Testing in Public Eighth Grade Schools by Student Race/Ethnicity and Family Socioeconomic Status, 1988 (weighted percentages)

	Percentage of Students Required to Pass High Stakes Test	Mean Number of Subjects Tested (among students taking at least one test)
Race/Ethnicity[a]		
White, not Hispanic	15.8	3.5
Black, not Hispanic	35.0	2.9
Hispanic any race	26.9	3.1
American Indian/Alaskan Native	36.6	2.3
Asian / Pacific Islander	15.1	3.0
Socioeconomic Status[b]		
Top quartile SES	14.4	3.3
Third quartile SES	18.0	3.3
Second quartile SES	21.0	3.2
Bottom quartile SES	25.2	3.2

[a] *Chi-Square 631.164; df= 4; p-value<0.001*
[b] *Chi-Square 185.740; df= 3; p-value<0.001*

Table 4: Estimated Coefficients From Regression Models

	Model 1	Model 2	Model 3	Model 4
Intercept	-3.2748**	-4.0826**	-4.0661**	-3.9477**
	(0.0675)	(0.1155)	(0.1157)	(0.2264)
Individual variables				
Male		-0.4908**	-0.4877**	-0.4875**
		(0.1094)	(0.1096)	(0.1130)
SES		-0.5965**	-0.5900**	-0.5706**
		(0.0808)	(0.0806)	(0.0874)
Grades		-0.7240**	-0.7232**	-0.7671**
		(0.0719)	(0.0717)	(0.0753)
Composite test score		-0.0543**	-0.0537**	-0.0503**
		(0.0082)	(0.0082)	(0.0084)
Asian/Pacific Islander		-0.6495*	-0.6500*	-0.7972*
		(0.3093)	(0.3071)	(0.3118)
Hispanic		-0.0687	-0.0780	-0.3299*
		(0.1297)	(0.1281)	(0.1513)
Black		-0.6874**	-0.7551**	-0.9862**
		(-0.1491)	(0.1550)	(0.1733)
American Indian		-0.0143	-0.0369	-0.0895
		(0.3840)	(0.3889)	(0.4030)
Age		1.5685**	1.5607**	1.5318**
		(0.0697)	(0.0694)	(0.0725)
School variables				
High Stakes Test (reading or math)			0.4309**	0.3505**
			(0.1312)	(0.1332)
Minority Percentage				0.0041
				(0.0033)
Mean SES				-0.4674
				(0.2646)
Mean Grades				0.3435
				(0.2829)
Mean Composite Score				-0.0110
				(0.0184)
Percentage of Students in Free Lunch				-0.0041
				(0.0033)
Percentage of Students in Bilingual Education				-0.0134
				(0.0103)
Percentage of Students in ESL				-0.0356
				(0.0198)
Proportion of Teachers with Graduate Degree				0.0001
				(0.0026)
Student Teacher Ratio				-0.0291
				(0.0181)
Total Enrollment in School				0.0000
				(0.0002)
Urban				0.3385*
				(0.1637)
Rural				-0.2604
				(0.1415)
North Central				-0.2928
				(0.2096)
South				-0.0791
				(0.2051)
West				0.1169
				(0.2456)
Deviance Statistic	28175.3783	26740.8340	26730.4699	26294.1287
τ_{00}	0.7111	0.4284	0.4022	0.3073
Percent reduction in τ_{00}		39.75	6.16	23.60

** p-value < 0.01 * p-value < 0.05

Table 5:

	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	-3.9477**	-3.9165**	-3.9544**	-3.9401**	-3.9413**
	(0.2264)	(0.2276)	(0.2294)	(0.2312)	(0.2278)
Individual variables					
Male	-0.4875**	-0.4871**	-0.4874**	-0.4872**	-0.4850**
	(0.1130)	(0.1133)	(0.1137)	(0.1129)	(0.1143)
SES	-0.5706**	-0.6158**	-0.5705**	-0.5709**	-0.5688**
	(0.0874)	(0.1022)	(0.0876)	(0.0876)	(0.0883)
Grades	-0.7671**	-0.7675**	-0.7670**	-0.7568**	-0.7663**
	(0.0753)	(0.0754)	(0.0753)	(0.0877)	(0.0755)
Composite test score	-0.0503**	-0.0501**	-0.0514**	-0.0504**	-0.0500**
	(0.0084)	(0.0085)	(0.0095)	(0.0085)	(0.0085)
Asian/Pacific Islander	-0.7972*	-0.7972*	-0.7970*	-0.7986*	-0.5709
	(0.3118)	(0.3115)	(0.3121)	(0.3121)	(0.3301)
Hispanic	-0.3299*	-0.3392*	-0.3306*	-0.3297*	-0.2233
	(0.1513)	(0.1530)	(0.1513)	(0.1513)	(0.1646)
Black	-0.9862**	-0.9836**	-0.9850**	-0.9882**	-0.9701**
	(0.1733)	(0.1742)	(0.1740)	(0.1734)	(0.2169)
American Indian	-0.0895	-0.0926	-0.0896	-0.0890	-0.1637
	(0.4030)	(0.4046)	(0.4033)	(0.4027)	(0.5265)
Age	1.5318**	1.5317**	1.5320**	1.5317**	1.5351**
	(0.0725)	(0.0725)	(0.0728)	(0.0726)	(0.0727)
School variables[a]					
High Stakes (reading or math)	0.3505**	0.4470*	0.3851	0.3256*	0.4901**
	(0.1332)	(0.1759)	(0.2020)	(0.1652)	(0.1749)
Interactions with High Stakes Test					
High Stakes Test * SES		0.1733			
		(0.1774)			
High Stakes Test * Test Score			0.0043		
			(0.0186)		
High Stakes Test * Grades				-0.0411	
				(0.1487)	
High Stakes Test * Asian/Pacific Islander					-1.4276
					(1.1558)
High Stakes Test * Hispanic					-0.5021
					(0.3061)
High Stakes Test * Black					-0.1317
					(0.3208)
High Stakes Test * American Indian					0.1547
					(0.8079)
Comparison to Model 4					
Deviance Statistic	26294.1287	26693.1461	26694.0701	26694.0598	26689.7898
Chi-square and df		0.9826; df=1; p > 0.5	0.0586; df=1; p > 0.5	0.0689; df=1; p > 0.5	4.3389; df=4; p = 0.362

[a] *Note: All other school-level variables included in Model 4 (Table 4) are included in each of these models, but are not shown here).*
***p-value < 0.01*
**p-value < 0.05*

Figure 1: Predicted Prbability of Dropping Out between Eighth and Tenth Grade, by Test Scores and Presence of Eighth Grade Promotion Test Requirement

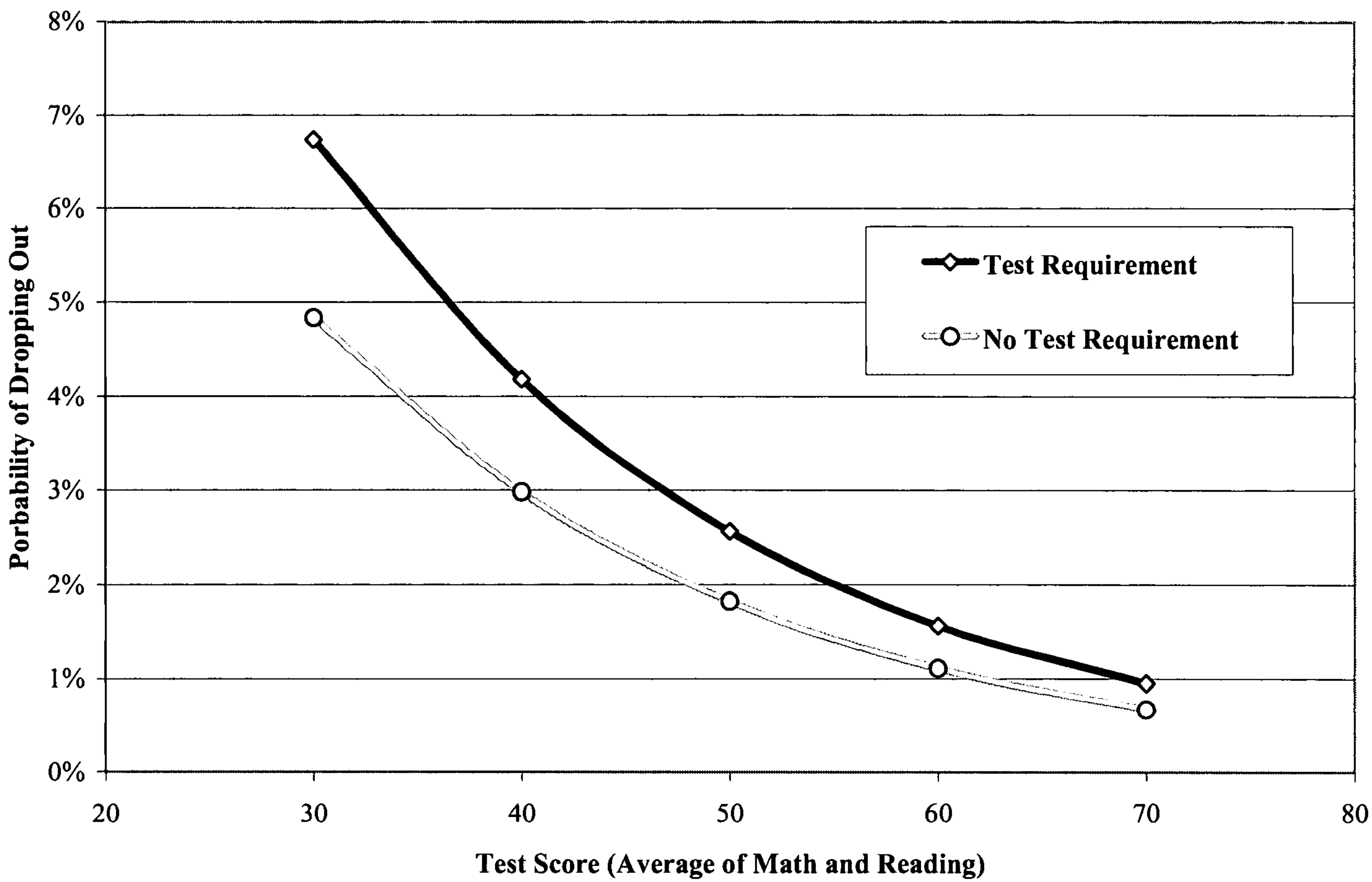
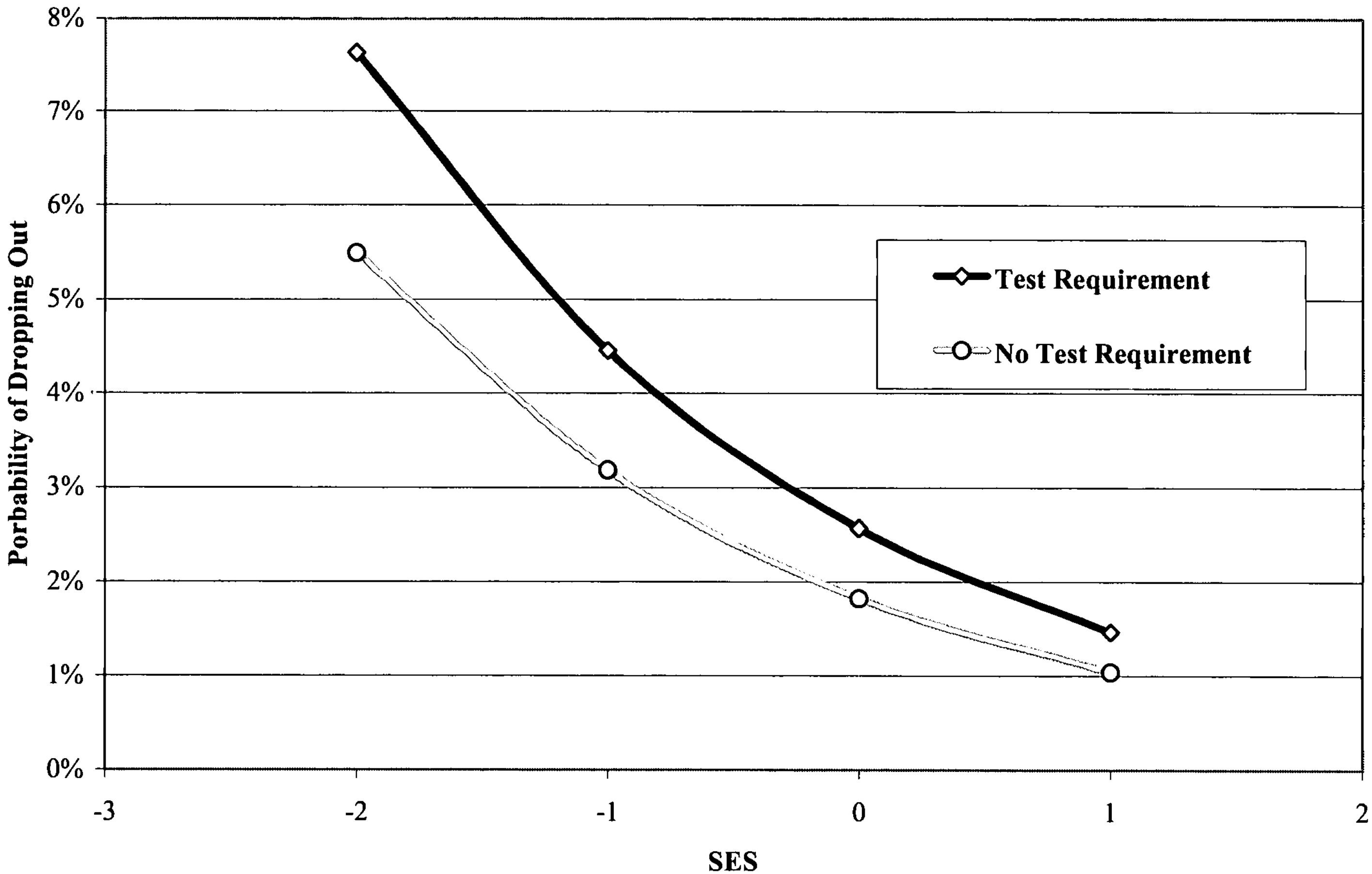


Figure 2: Predicted Prbability of Dropping Out between Eighth and Tenth Grade, by SES and Presence of Eighth Grade Promotion Test Requirement



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