Adequacy, Litigation, and Student Achievement*

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Abstract

The court system has been an increasingly important forum in the attempts to remedy the persistent achievement gaps in American education. In the past twenty years, school finance adequacy litigation has replaced desegregation as the most widely used legal strategy in these efforts. Despite the widespread use of adequacy litigation, few researchers have examined the link between adequacy lawsuits and student outcomes. This study analyzed the relationship between school finance adequacy litigation and academic proficiency, as measured by scores on the 2003 National Assessment of Educational Progress (NAEP). The results showed that successful adequacy litigation had a small, significant, positive relationship with NAEP scores, but little differential benefit for students living in poverty or for children of color, with the exception of African American students. Therefore, this evidence suggests that adequacy litigation has had little impact on reducing the achievement gap, though it may have contributed to a small, across the board improvement in student outcomes.

NOTE: This module has been peer-reviewed, accepted, and sanctioned by the National Council of Professors of Educational Administration (NCPEA) as a scholarly contribution to the knowledge base in educational administration.

Introduction

Education reformers employ a variety of options in their endeavors to bring about equitable and adequate educational opportunities for each child. These efforts focus mainly on improving the quality of education provided to traditionally underserved students, including those from poor families and those from African American, Hispanic, and Native American backgrounds. Students from these groups tend to perform at lower levels than their peers (Hunter & Bartee, 2003; Phillips, Crouse, & Ralph, 1998).

School finance litigation offers plaintiffs an attractive means to address issues of educational equity and adequacy, for a number of reasons (Obhof, 2004). First, adequacy litigation rests on the common sense assumption that providing schools with more and better educational resources will improve student learning.

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Second, wide disparities in school funding exist in many states, which opens the door to arguments that states are not providing resources equitably or adequately. Third, the plaintiffs have prevailed in court regularly over the past two decades, as the legal tactics evolved to place more emphasis on "adequacy" arguments (Colwell, 1998; Obhof, 2004; Verstegen, 1994).

Despite its popularity and common sense appeal, some analysts question the effectiveness of school finance litigation as a reform strategy (Koret Task Force, 2006). Several important factors cast doubt on its effectiveness in terms of improving student outcomes, as will be discussed below. The arguments remain mostly theoretical, however, because very little research has been conducted to determine whether school finance litigation leads to meaningful improvement in student achievement. Therefore, an analysis of the relationship between school finance litigation and student outcomes could begin to fill an important gap in the scholarly knowledge base.

This paper makes no pretense of offering a final opinion on the association between school finance adequacy litigation and student outcomes. The issues to be studied in this field are very complex, so several different types of analyses will be needed before a verdict can be rendered. This paper addresses the straightforward issue of whether a significant relationship exists between school finance litigation and student achievement, both in general and with regard to underserved students.

The study possesses some important limitations. First, it uses test scores as a proxy for student outcomes, when a much broader range of outcomes would be more desirable. Second, the study does not consider whether the type of judicial remedy (e.g., specifying a dollar amount, permitting the legislature to remedy the violation, etc.) had any impact on student achievement. Third, it does not consider the link between the amount of money involved in the remedy and student outcomes. This study looks at the question from the perspective of a potential plaintiff who is considering whether filing a lawsuit is a rational course of action without knowing the nature or the amount of the potential remedy.

The paper proceeds in four main sections. First, the literature in the field is reviewed in order to provide the proper context for the study. Second, the methodology used in the study is discussed. Third, the findings are set forth. Fourth, the implications of the findings are considered with regard to the link between school finance adequacy litigation and student outcomes in general and with a specific focus on narrowing achievement gaps.

Contextual Background of School Finance Litigation

School finance adequacy litigation has become one of the more controversial topics in education policy. The issues involved are extremely important and complex. Significant considerations include the role of the courts in education reform, the interplay between democratic government and the protection of minority rights, and whether additional resources increase student achievement.

The legal context for school finance adequacy litigation is fairly straightforward, as it relies on just two categories of laws. First, each state constitution (with the debatable exception of Mississippi's) contains a provision requiring the state to provide some modicum of education, though the provisions are far from uniform (McUsic, 1991). Second, state governments establish statutory school finance systems to pay for education within the state. The plaintiffs in adequacy litigation argue that inadequacies caused by the statutory system violate the constitutional requirement to provide the given level of education.

Given the foregoing, adequacy litigation can be regarded as a clash between majority rule and individual rights. As such, adequacy plaintiffs argue that the courts must act as protectors of individual rights (Hamilton, 1788; Ely, 1980). The defendants take the opposite position and argue against courts even hearing adequacy cases. These arguments can be categorized into two groups: general arguments and arguments specific to school finance.

The most important general arguments are that having the courts rule on issues involving public policy is undemocratic (Koret Task Force, 2006), that the courts lack the expertise to reform school finance (Koret Task Force, 2006), and that the courts are ineffective at protecting minority rights (Sweetland, 2000). The first argument, while literally true, ignores the important role of the courts within the American constitutional republic, which includes placing limits on majority rule (Hamilton, 1788). The second argument has been accepted by some courts in adequacy cases (e.g., Lewis E. v. Spagnolo, 1999; Marrero v. State, 1999). However, most courts have not been swayed by this objection.

The final general argument concerns the ability and inclination of courts to protect minority rights. Theoretical and practical disagreements exist regarding whether courts can contribute to social change and/or protect minority rights (Bickel, 1962; Bork, 1990; Dahl, 1957; Ely, 1980; Feeley & Rubin, 1998; McCloskey, 1960; Mishler & Sheehan, 1993; Reed 1998; Rosenberg 1991; Sweetland, 2000; Wechsler, 1959). For example, Brown v. Board of Education has been lauded a huge success for decades, but some experts now argue that the case and its progeny produced a net negative impact on the education of children of color (Bell, 2004; Ladson-Billings, 2004). For a variety of reasons, the legislature is often regarded as a more effective body than the courts for generating reforms.

As mentioned above, three reasons specific to adequacy also raise questions about whether adequacy lawsuits can lead to improved student outcomes. The first relates to the underlying issue of whether school finance litigation improves the equity and adequacy of resource distributions. Thompson and Crampton (2002) conducted an extensive review of the literature in which they concluded (1) that the majority of studies indicated that no obvious difference in funding equity could be linked to school finance litigation and (2) that vast funding variability exists in states with and without successful litigation. They argued that the most beneficial aspect of litigation was increasing the pressure for legislative reform by drawing attention to the funding inequities.

The second reason to doubt the effectiveness of school finance litigation relates to the magnitude of the link between educational resources and student outcomes. Some researchers have argued that a positive relationship exists between school resources and either test scores (Elliott, 1998; Hedges and Greenwald, 1996; Hedges, Laine, and Greenwald, 1994) or future earnings (Card and Krueger, 1992a & 1992b; Strayer, 2002). Others contend that no systematic link has been detected between resources and student test scores (Glick, 2000; Hanushek, 1996; Jaggia and Kelly-Hawke, 1999) or future earnings (Betts, 1996), or that such an effect appears only very weakly (Eide, Showalter, and Sims, 2002). Some scholars have found that a relationship with future earnings exists only if a student reaches certain milestones (such as college graduation) (Heckman, Layne-Farrar, & Todd, 1996) or if the student comes from certain groups of people (e.g., African American women) (Betts, 2001). These issues remain the subject of considerable unresolved debate.

The third reason to doubt the effectiveness of adequacy litigation concerns whether a reform that addresses problems at the school level offers the correct approach to improving educational outcomes. While some analysts regard schools as the primary vehicle to achieve these objectives (Reeves, 2006; Snipes & Casserly, 2004; Thernstrom & Thernstrom, 2003), others argue that many factors outside of the control of the schools, such as the social class of the students, have more influence on educational outcomes (Rothstein, 2004). Those holding the latter opinion would argue that it is unlikely that schools alone can overcome those outside factors.

The disagreements over these basic issues raise doubts about the effectiveness of adequacy litigation as a means for improving student achievement. Very few studies discuss whether school finance lawsuits lead to better educational outcomes. The results of those studies are not entirely consistent either. Most studies of individual states report that school finance lawsuits do not lead to more equitable student outcomes (Coate & VanderHoff, 1999; Peevey & Ray, 2001; Ritter & Lauver, 2003). Downes and Figlio (1998), however, detected a litigation effect in their national study of the impact of school finance litigation. They found that both court mandated and legislative reforms correlated with increased levels of student performance, but that legislative reforms more effectively reduced the achievement gap between students from districts with low initial spending levels and those with higher spending levels. The Author (2006) found that adequacy litigation had a positive relationship with African American achievement.

The foregoing discussion shows that we lack definitive answers regarding whether school finance litigation improves student outcomes. These open issues call into question whether school finance litigation provides a reasonable option for increasing the equity of student outcomes. This paper takes a step toward answering that question.

Methodology

Adequacy litigation occurs primarily at the state level, though some cases have involved a subset of the districts within a state. A study of this issue within one state would face the problem that variables such

as whether an adequacy suit was filed, whether such a suit was successful, etc. would have the same values for each child in the state. Therefore, comparisons of student outcomes must be made across states. Since students achievement must be measured using a common assessment, a national assessment had to be used in this study.

The National Assessment of Educational Progress (NAEP) is the most highly regarded national assessment of student proficiency. The restricted use NAEP dataset also contains a wealth of information about students and schools that can be used to control for the effects of factors that impact educational outcomes and enable one to isolate the effects of adequacy litigation. This study used data from the 2003 NAEP and merged it with a file containing the author's coding of legal variables. The variables will be described in greater detail in the next section of this paper.

1 Data

The models used in this study controlled for a wide variety of factors that influence student achievement. Some of these variables relate to traits of the student (such as his/her race) (Phillips, Crouse, & Ralph, 1998), others to family characteristics (such as the education level of the parents) (Chall & Jacobs, 2003; Hunter & Bartee, 2003; Ogbu, 2003), and yet others to the child's school (such as teacher credentialing and preparedness) (Arnold, 1995; Darling-Hammond, 1999; Goddard, Sweetland, & Hoy, 2000; Hanushek, Kain, Markman, & Rivkin, 2003). The control variables operate at different levels, which causes several problems for traditional regression analyses (Pedhazur, 1997). These difficulties include aggregation bias, incorrectly estimated precision, and unit of analysis problems (Raudenbush & Bryk, 2001). Faulty conclusions can be drawn if the level of data issue is ignored (Raudenbush & Bryk, 2001; Pedhauzer, 1997).

The existence of different levels of data suggested the use of Hierarchical Linear Modeling (HLM) in this research. HLM facilitates the use of a dataset with multiple levels of data (Raudenbush & Bryk, 2001). It also permits the simultaneous estimation of the parameters of the different levels of data, which leads to better estimates (Bagaka's & Wyman, 2004). HLM, therefore, fit the needs of this analysis.

A preliminary issue had to be resolved before proceeding with the HLM analysis. Most school finance litigation operates at the state level, which suggested a three level HLM model with data from the student, school, and state levels. However, the litigation and remedies were limited to a subset of the schools and districts in certain states. Coding litigation at the state level would introduce an inaccuracy into the model, since many schools in those states were not impacted by the litigation. This problem could be avoided by using a two level model, with the legal variables introduced at the school level, but that choice would involve introducing the legal data at the wrong level for most states. Neither alternative was perfect, but for the purposes of this study, the benefit of accurately coding the legal variables for each school outweighed the fact that legal variables operate at the state level in most instances. This choice was consistent with those of researchers who combine data from across levels when using NAEP data, such as including teacher data at the student level (Raudenbush, Fotiu, & Cheong, 1999).

Dependent Variables

2 Four separate HLM models were built, each of which used data from a different NAEP assessment as the dependent variable. The NAEP exams used in this study were Fourth Grade Reading, Fourth Grade Math, Eighth Grade Reading, and Eighth Grade Math. The dependent variable in each model was the assessment scores from the relevant NAEP examination.

Two design factors complicate the analysis of NAEP data. First, the NAEP data was gathered by selecting a group of schools, then choosing students non-randomly from that sample of schools (Lee & McIntire, 2000; Rogers & Stoeckel, 2004). This nested, non-random sampling technique causes problems in a linear regression analysis (Lee & McIntire, 2000; Rogers & Stoeckel, 2004). However, HLM precisely models the multilevel sampling design of NAEP, which eliminates the complications related to the non-random nature of the study (Arnold, 1995; Lee & McIntire, 2000).

Second, none of the students responded to every question on the NAEP assessment. The NCES used Item Response Theory (IRT) to estimate the proficiency of each student given their performance on the subset of questions that they answered (Rogers & Stoeckel, 2004). Thus, the student achievement scores were latent variables, not actual test scores, meaning a degree of variance was associated with them (Arnold, 1995; Lee & McIntire, 2000). Because no individual student answered enough questions to permit the precise estimation of his/her proficiency, the NCES determined 5 plausible values for each student's proficiency through a process of imputation of scores (Rogers & Stoeckel, 2004).

The use of plausible values presented no difficulties in this analysis. The HLM program contains a plausible values feature that facilitates the use of NAEP proficiency scores. The program estimates the parameter values for each of the five plausible values and averages them to obtain parameter estimates (Raudenbush, Bryk, Cheong, & Congdon, 2004). Averaging results causes an underestimation of the standard errors, which could lead to insignificant results being deemed significant (Arnold, 1995). However, HLM corrects automatically for the underestimation (Raudenbush, Bryk, Cheong, & Congdon, 2004), so that was not a factor in this study.

Student Level Variables

The independent variables for this study fell into three primary categories: student and teacher characteristics, characteristics of the school, and legal data. The data for the first two categories came from the relevant 2003 NAEP exam. The legal variables derived from a textual analysis of legal opinions in school finance cases and commentaries on the decisions.

Student level variables consisted of three broad categories of information: data about the student, data about the student's family, and data about the student's teacher and classroom. Each variable was included in the model due to its theoretical impact on student achievement. The data regarding the student and the family were identical in each of the four models. The teacher and classroom data exhibited minor differences in terms of the variables that were selected, as will be summarized below.

Student characteristics. The student characteristics variables controlled for traits of students that research has linked to proficiency. Most of the student characteristic variables that were controlled in the model would be expected to have a negative relationship with student proficiency. These include the racial variables "African American", "Hispanic", and "Native American", the special education indicator "IEP", the English Learner indicator "LEP", and the poverty indicator "Free/Reduced Lunch." The gender indicator "Male" would be expected to be positive in the math models, but negative in the reading models. The racial variable "Asian" would be expected to have a positive value, as would the attendance indicator "Few Absences", defined as two or less absences in the previous month.

Family characteristics. Family characteristics and the home environment play important roles in the education of children (Anglum, Bell, & Roubinek, 1990, Foy & Mann, 2003; Molfese, Modglin, & Molfese, 2003). The family characteristics in this study were modeled similarly to the home environment variables used by Raudenbush, Fotiu, & Cheong (1999). The variables included "Newspaper at Home", "Magazines at Home", "26 or more Books" at home, "Parent Education: High School" and "Parent Education: College", "1 hour TV or less" per day, "Computer at Home", and "Little English Spoken: Home". Each of these variables would be expected to have a positive relationship with achievement, except the last one.

Teacher and classroom characteristics. The teacher and classroom variables differed somewhat between the models. The variables included in the fourth grade models were whether the teacher had "Graduate Education", "Years Teaching", "Regular Credential", "National Board Certification", whether the teacher spent at least "Language: 10 hours" (Reading model) or "Math: 7 hours" (Math model) per week on the relevant subject, and "Class Size: 20 or less." Each of these variables would be expected to have a positive relationship with achievement.

The eighth grade models included "Undergraduate Language Arts" and "Graduate Language Arts" (Reading model) or "Undergraduate Math" and "Graduate Math" (Math model), "Years Teaching Language Arts" or "Years Teaching Math", "Regular Credential", "National Board Certification", "Language: 7 hours" or "Math: 4 hours", "Analyze Literature: 41% of class" or more and "Student Writing: 41% of class" or more (Reading model) or "Write: Problem Solving" and "Discuss Problem Solving" (Math model), "Math Class Grade 8: Grade 8 or lower" and "Anticipated Grade 9 Math: Below Algebra" (Math model). Each of these

variables would be expected to have a positive relationship with achievement, except the last two.

3 School Level Data

The school level variables were nearly identical for the four models. These variables included "Percent Minority" (the sum of the percentage of students at the school who were African American, Hispanic, or Native American), "Free/Reduced Lunch: 50%" or more, "LEP: 50%" or more, "Charter School" (Fourth Grade models), "Extracurricular Language Arts" or "Extracurricular Math" (Eighth Grade models), "Algebra Offered: Eighth Grade" (Eighth Grade Math model), "Class Assigned by Ability", "Parent Volunteers: 25%+" of the families volunteered at the school, "Very Positive Student Attitudes" toward school, "Very Positive Parental Support", and "Very High Teacher Expectations."

4 Legal Data

The legal data consisted of two pieces of information determined by a textual analysis and dummy coded to be included in the regression. The first question asked "Was a school finance lawsuit ongoing in the jurisdiction at any time between 1989 and 2001?" This variable was labeled "Lawsuit Filed". The second question was "Did the plaintiffs in the jurisdiction prevail in a school finance adequacy lawsuit between 1989 and 2001 in the highest state court that the case reached?" This variable was labeled "Lawsuit Successful." The coding of the legal variables is presented in Appendix A.

It was difficult to predict what to expect in terms of the legal coefficients because of the scarcity of research describing the effects of lawsuits on student achievement. However, some basic assumptions could be made. If school finance lawsuits are worthwhile, one would expect them to possess a positive relationship with student achievement. In addition, one might expect the effect of successful lawsuits to be more positive than that of lawsuits in general, unless one thinks that the benefit of filing lawsuits is to spur legislative action. In that case, the success of the lawsuit might be less relevant. One might also expect to find a stronger relationship at Fourth Grade than at Eighth Grade because it would take more time for any positive effects to filter through the system to the higher grade level.

The Models

The basic models for the two-level HLM analysis will be discussed in this section. For each model, the first step in the analysis involved using an unconditional model with random effects. The form of such a model is: Yij = γ00 + u0j + rij, where Y is Student Proficiency, r is the student level random effect, γ is the school level intercept, and u is the school level random effect (Raudenbush & Bryk, 2001). In other words, the Student Proficiency for each student is equal to the overall (grand) mean of the sample, adjusted for a school level random effect and a student level random effect.

An unconditional model provides information regarding an intercept, a student level variance (σ2) and a school level variance (τ) (Raudenbush & Bryk, 2001). σ2 and τ enable one to estimate the percentage of the variation at each level of the analysis (Raudenbush & Bryk, 2001). The values of σ2 and τ in the unconditional model also can be compared with their respective values in the full model to determine the percentage of the variance that the model explained.

5 Full Model

The full model included all of the predictors at both levels. The general form of the model at the student level is: Yij = β 0j + β1jX1ij + β2jX2ij + . . . + βQjXQij + rij (Raudenbush & Bryk, 2001), where Y is Student Proficiency, βs are the regression coefficients, Xs are the values of the student level independent variables, Q is the number of student level independent variables in the model, and r is the student level random effect. In words, the Proficiency Score for student "i" at school "j" equals the mean score at school "j" plus, for each student level independent variable, the regression coefficient for that variable times the student's value for the variable, plus a random student level effect.

The school level model had two general forms. The school model intercept and the student level variables African American, Hispanic, Native American, and Free/Reduced Lunch, used the form: Bqj = γq0 + γq1W1j + γq2W2j + . . . + γqSW1S + u0j (Raudenbush & Bryk, 2001), where β is the student level regression coefficients, γs are the school level coefficients, Ws are the values of the school level independent variables, S is the number of school level independent variables in the model, and u is the school level random effect. In other words, each student level regression coefficient equaled the mean effect for that variable at school "j" plus the regression coefficient for each school level variable times the school's value for the variable, plus a school level effect. The school level effect was assumed to be random for the intercept, but was fixed as non-random for the βs for African American, Hispanic, Native American, and Free/Reduced Lunch.

For the other student level variables, the form was: Bqj = γq0 + u0j, where β and γ are as defined in the preceding paragraph and u is the non-random school level effect. The African American, Hispanic, Native American, and Free/Reduced Lunch variables were examined in more depth because they represented students who tend to be underserved. Students from these groups should receive a differential increase in proficiency if litigation served a social justice function. Due to their importance, these students will be referred to collectively as the "Focus Students".

6 Results

6.1 Table 1 shows the estimates for the unconditional models. As discussed above, σ2 represents the estimated variance of the student level data, while τ represents the estimated variance of the school level data. The percentage of the total variation at the school level can be calculated using the formula: School Level Variation = τ / (σ2 + τ), while the percentage of the total variation at the student level is one minus the School Level Variation. In each model, approximately 75% of the variation can be explained at the student level and 25% at the school level. These results suggest that the majority of the variation between children results from factors that act at the student (and teacher) level, but a substantial amount of the difference can be attributed to school level effects.

Table 1 Unconditional HLM Models Sigma and Tau.

Model	Intercept	σ2	τ
Fourth Grade Reading	216.500	1079.083	323.713
Fourth Grade Math	233.787	606.849	208.986
Eighth Grade Reading	261.139	829.060	255.691
Eighth Grade Math	275.264	821.242	303.943

Table 1

Table 2 contains the estimates of the legal variables for the full models. Complete estimates for all of the parameters are presented in Appendix B. The values in the Overall Intercept section of the table indicate how the variables related with the overall NAEP scores. The values under each of the Focus Students show how the school level variables impacted the specific performance of students from the particular group. The estimates will be discussed in detail in the Implications section.

Table 2: Legal Variable Parameter Estimates.				
Variable	Grade 4 Reading	Grade 4 Math	Grade 8 Reading	Grade 8 Math
Overall Intercept				
Lawsuit Filed	-2.528***	0.069	-0.773	0.293
Lawsuit Successful	3.052***	1.768***	1.308*	1.441**
African American				
Lawsuit Filed	-1.056	-1.459	-1.004	-1.230
Lawsuit Successful	2.093	2.034**	1.740	3.570**
Hispanic				
Lawsuit Filed	-1.978	-1.223	2.023	-1.888
Lawsuit Successful	1.627	2.120*	1.188	2.353
Native American				
Lawsuit Filed	-1.276	-3.578	-6.377*	-7.151*
Lawsuit Successful	4.017	-0.889	-2.570	-3.412
Free/Reduced Lunch				
Lawsuit Filed	1.205	-0.351	1.576	0.951
Lawsuit Successful	-0.675	-0.033	-0.740	-0.706

Table 2

In order to place the findings in a comprehensible context, the effect size of the variables must be considered. The scale of the effect sizes will follow the conventional standards, namely that 0.1 standard deviations constituted a small effect, 0.3 signified a moderate effect, and greater than 0.5 constituted a large effect (Von Secker & Lissitz, 1999).

These effect sizes seemed appropriate for this research, given Cohen's (1992) rule of thumb that a moderate effect is one "likely to be visible to the naked eye of a careful observer". The standard deviation of the Proficiency Scores was about 35 for the each of the models, except for Fourth Grade Math, in which it was about 28. A moderate effect size (SD = 0.3) would be about 9 - 10 points. Eighth Graders scored approximately 44 points higher than Fourth Graders (43 in math and 45 in reading). Therefore, one can make the crude estimate that 11 points on the Student Proficiency scale equals about 1 grade level. One would expect a careful observer to notice a grade level difference among students, so the scaling for a moderate effect seems reasonable for the purposes of this study.

6.1.1 Lawsuit Filed

The filing of a lawsuit had no significant relationship with overall Student Proficiency in the Fourth Grade Math model or in either of the Eighth Grade models. It had a negative relationship, -2.528 ($p = 0.000$) with the Student Proficiency intercept in the Fourth Grade Reading model. Fourth Grade students attending schools that were involved in litigation had a reading proficiency score significantly lower than the average student.

Lawsuit Filed had no significant effect on the scores of the Focus Students in most of the models. However, it had a negative relationship, -6.377 ($p = 0.036$) and -7.151 ($p = 0.016$), with Native American scores in the Eighth Grade Reading and Math models, respectively.

6.1.2 Lawsuit Successful

Lawsuit Successful had a very small, yet significant, relationship with overall Student Proficiency in each model. The coefficients were 3.052 (p = 0.000) for Fourth Grade Reading, 1.768 (p = 0.000) for Fourth Grade Math, 1.308 for Eighth Grade Reading (p = 0.024), and 1.317 for Eighth Grade Math (p = 0.017). Students who attended schools in areas with successful litigation outscored their peers in each model.

Lawsuit Successful significantly impacted very few of the Focus Students. It had a positive relationship with the Fourth Grade Math performance of both African Americans, 2.034 (p = 0.006), and Hispanics, 2.120 (p = 0.021). It also had a positive connection with African American proficiency, 3.590 (p = 0.003), in Eighth Grade Math.

Discussion

The results contain several implications regarding the effectiveness of school finance litigation as an education reform strategy. This section considers the general results first, followed by the results for the focus Students.

General Results

First, the results suggest that adequacy lawsuits have had a small, but positive, relationship with student achievement. The low magnitude of the impact is not surprising given the fact that schools are but one influence in the lives of children (Rothstein, 2004). In addition, the results of this study indicate that student level variables accounted for nearly three-quarters of the variance that the model explained, while school factors accounted for just over one-quarter. Adequacy litigation addresses problems at the school level, so its impact is necessarily limited for that reason.

Second, the evidence from this study does not support the argument of Thompson and Crampton (2002) that the primary benefit of school finance litigation results from spurring legislative action. If this theory were accurate, one would expect to find positive coefficients for Lawsuit Filed, while the variable Lawsuit Successful would be of lesser importance in terms of predicting student outcomes. The results of this study were precisely the opposite of those, with the coefficients for Lawsuit Filed being negative and insignificant in most cases, while Lawsuit Successful was far more likely to be positive and significant. It appears from this evidence that educators and governmental leaders do not make changes simply because they are faced with a lawsuit, but rather that a successful judicial determination plays an important role in the reform of the system. More study is necessary to understand the mechanism of how and why this occurs. Nevertheless, this study suggests that the courts can provide a modest influence on educational reform.

Third, the impact of successful litigation was slightly larger for Fourth Grade students than for Eighth graders, with effect sizes of 0.10 and 0.08 in the Fourth Grade models and 0.05 and 0.06 in the Eighth Grade models. These results make sense if one assumes that educational reforms take time to filter through the system and, therefore, that it would take more time to influence student outcomes in the higher grades.

Fourth, the effect sizes of Lawsuit Successful, though very small, are similar in magnitude to those for parental volunteerism, very positive student attitudes, very strong parental support, and very high teacher expectations. The effect sizes of these other variables on student scores in general are contained in Table 3. Educators make great efforts to create a school climate that includes these factors, so the impact of Successful Litigation may not be as trivial as the effect sizes would suggest.

Table 3Effect Sizes of Selected School Level Variables.

Variable	Grade 4 Reading	Grade 4 Math	Grade 8 Reading	Grade 8 Math

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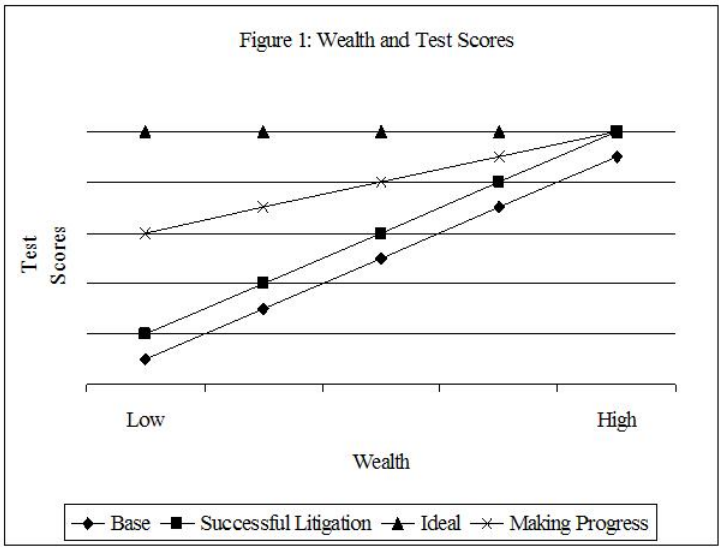
Lawsuit Successful	0.08	0.06	0.04	0.04
Parental Volunteerism	0.10	0.10	0.06	0.04
Very Positive Student Attitudes	0.04	0.05	0.05	0.10
Very Positive Parental Support	0.05	0.05	0.07	0.06
Very High Teacher Expectations	0.05	0.07	0.05	0.04

Table 3

Fifth, it is important to emphasize that this study found a positive, though weak, connection between successful litigation and the achievement of children as a whole. This across the board improvement fulfills one goal of adequacy litigation, which is raising the achievement level of students in general. While a positive result, the primary aim of educational reformers consists of raising the performance of the neediest students to a greater extent than that of their more privileged counterparts.

Results for Focus Students

The type of effects one would expect to result from adequacy litigation can be seen in Figure 1, which depicts a simplified relationship between wealth and student proficiency. The diamond line depicts the usual relationship between wealth and achievement, in which wealthier students perform at higher levels. The triangle line displays the ideal situation in which all children achieve at a high level regardless of their wealth. The change from the diamond line to the triangle line requires two steps: raising the line (improving the achievement across the board) and rotating it to be horizontal (eliminating achievement gaps). The square line indicates improved proficiency across the board from successful litigation, as was found in this study. A rotation to the X line would represent progress in terms of moving toward the triangle line and narrowing, but not eliminating, the achievement gap. It would be unrealistic to think that adequacy litigation alone could lead to the ideal outcome, but one would expect to see a rotation such as the one depicted on the X line depicting a reduction of achievement gaps.



This study raises serious questions regarding how successful adequacy lawsuits have been with regard to equalizing outcomes. The lack of a significant relationship between successful litigation and the achievement of poor students represents one of the more surprising findings in the study. School finance litigation focuses on reducing wealth based differences, but even successful litigation lacked a significant relationship with the free and reduced lunch variable, the proxy for poor children. This study also found little evidence showing that school finance litigation narrowed the racial/ethnic achievement gap.

African American students were the primary Focus Students that seemed to receive a differential benefit from adequacy litigation. Successful litigation related positively to the math proficiency of African American students in Fourth and Eighth grades and to the math proficiency of Hispanic children in Fourth Grade, but the effect sizes of the gains were very small. The evidence showed no significant relationship between successful litigation and the achievement of Native American students. For a more in depth discussion of the impact of school finance litigation on African Americans, see Author (2006).

Conclusion

These data indicate that adequacy litigation related positively with student proficiency in general, but raise questions regarding whether school finance litigation plays a large role in narrowing the achievement gaps or in reducing the connection between wealth and achievement. This study suggests that successful litigation improves achievement in an across the board manner, rather than having a disproportionate impact on the neediest children, with the possible exception of African Americans. The across the board nature of the improvement may explain why backlashes against adequacy rulings have not arisen more frequently.

The results suggest that adequacy litigation can play a useful role in education reform. However, this study also lends support to the idea that courts possess limited ability to influence policy outcomes. One cannot expect adequacy litigation alone to produce the changes so vitally needed. However, this study supplies evidence that adequacy litigation can be effective as part of a comprehensive school reform strategy.

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Appendix A

Table A1

Coding of Legal Variables

State	LawsuitFiled	Lawsuit Successful
Alabama	1	1
Alaska	1	0
Arizona	1	1

continued on next page

Arkansas	1	1
California	1	0
Colorado	1	0
Connecticut	1	0
Delaware	0	0
Florida	1	0
Georgia	0	0
Hawaii	0	0
Idaho	1	0
Illinois	1	0
Indiana	1	0
Iowa	0	0
Kansas	1	0
Kentucky	1	1
Louisiana	1	0
Maine	1	0
Maryland	1	0
Massachusetts	1	1
Michigan	1	0
Minnesota	1	0
Mississippi	0	0
Missouri	1	1
Montana	1	1
Nebraska	1	0
Nevada	0	0
New Hampshire	1	1
New Jersey	1	1
New Mexico	1	1

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New York	1	1
North Carolina	1	1
North Dakota	1	0
Ohio	1	1
Oklahoma	0	0
Oregon	1	0
Pennsylvania	1	0
Rhode Island	1	0
South Carolina	1	0
South Dakota	1	0
Tennessee	1	1
Texas	1	1
Utah	0	0
Vermont	1	1
Virginia	1	0
Washington	0	0
West Virginia	1	1
Wisconsin	1	0
Wyoming	1	1

Table 4

Appendix B

Table B1:					
Fixed Effects with Robust Standard Errors: Fourth Grade Reading					
Fixed Effect	Coefficient	Error	T-ratio	E.S.	p
Overall Effects					
Intercept	218.536	0.468	466.728		0.000***
Percent Minority	-0.033	0.012	-2.729	-0.05	0.008**
Free/Reduced Lunch: 50%	-6.332	0.609	-10.391	-0.22	0.000***
LEP: 50%	-3.252	2.049	-1.587	-0.11	0.113

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Charter School	-5.319	2.040	-2.608	-0.18	0.012*
Class Assigned by Ability	0.796	0.649	1.227	0.03	0.220
Parent Volunteers: 25%+	3.634	0.709	5.129	0.12	0.000***
Very Pos. Stud. Attitudes	1.562	0.599	2.606	0.05	0.011*
Very Pos. Par. Support	1.858	0.579	3.210	0.06	0.002**
Very High Teach. Expect.	1.911	0.651	2.937	0.07	0.005**
Lawsuit Filed	-2.528	0.646	-3.915	-0.09	0.000***
Lawsuit Successful	3.052	0.567	5.384	0.10	0.000***
Missing Teacher Data	0.013	1.349	0.010	0.00	0.992
Student Characteristics					
Male Intercept	-6.124	0.328	-18.651	-0.21	0.000***
African American					
African American Intercept	-12.762	1.100	-11.598	-0.43	0.000***
Percent Minority	-0.048	0.025	-1.907	-0.07	0.065
Free/Reduced Lunch: 50%	-0.116	1.182	-0.098	0.00	0.923
LEP: 50%	-2.211	3.183	-0.695	-0.08	0.487
Charter School	8.324	3.604	2.310	0.28	0.022*
Class Assigned by Ability	-0.979	1.317	-0.743	-0.03	0.459
Parent Volunteers: 25%+	-2.316	1.459	-1.587	-0.08	0.119
Very Pos. Stud. Attitudes	-0.982	1.344	-0.731	-0.03	0.470
Very Pos. Par. Support	-0.688	1.256	-0.548	-0.02	0.584
Very High Teach. Expect.	1.253	1.176	1.066	0.04	0.289
Lawsuit Filed	-1.056	1.413	-0.747	-0.04	0.461
Lawsuit Successful	2.093	1.186	1.764	0.07	0.082
Missing Teacher Data	0.369	2.181	0.169	0.01	0.866

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Hispanic					
Hispanic Intercept	-3.440	1.430	-2.406	-0.12	0.019*
Percent Minority	-0.045	0.031	-1.479	-0.07	0.145
Free/Reduced Lunch: 50%	0.938	1.696	0.553	0.03	0.581
LEP: 50%	-1.453	3.026	-0.480	-0.05	0.635
Charter School	4.450	2.980	1.493	0.15	0.137
Class Assigned by Ability	0.316	2.065	0.153	0.01	0.879
Parent Volunteers: 25%+	0.470	1.743	0.270	0.02	0.788
Very Pos. Stud. Attitudes	0.595	1.546	0.385	0.02	0.700
Very Pos. Par. Support	-1.309	1.766	-0.741	-0.04	0.463
Very High Teach. Expect.	1.240	1.664	0.745	0.04	0.458
Lawsuit Filed	-1.978	1.894	-1.044	-0.07	0.302
Lawsuit Successful	1.627	1.401	1.162	0.06	0.251
Missing Teacher Data	1.026	2.595	0.395	0.03	0.694
Asian Intercept	4.071	0.903	4.508	0.14	0.000***
Native American					
Native American Intercept	-5.985	2.024	-2.957	-0.20	0.004**
Percent Minority	-0.127	0.058	-2.188	-0.19	0.034*
Free/Reduced Lunch: 50%	5.409	3.135	1.725	0.18	0.090
LEP: 50%	-1.090	4.560	-0.239	-0.04	0.811
Charter School	4.412	10.887	0.405	0.15	0.687
Class Assigned by Ability	-0.154	2.997	-0.051	-0.01	0.959
Parent Volunteers: 25%+	0.221	3.223	0.069	0.01	0.946
Very Pos. Stud. Attitudes	-2.976	2.770	-1.074	-0.10	0.286
Very Pos. Par. Support	0.044	3.086	0.014	0.00	0.989
Very High Teach. Expect.	1.064	3.226	0.330	0.04	0.742

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Lawsuit Filed	-1.276	2.994	-0.426	-0.04	0.670
Lawsuit Successful	4.017	4.350	0.923	0.14	0.357
Missing Teacher Data	4.535	4.732	0.958	0.15	0.342
IEP Intercept	-31.296	0.623	-50.233	-1.07	0.000***
LEP Intercept	-14.725	0.937	-15.715	-0.50	0.000***
Free and Reduced Lunch					
Free/Reduced Lunch Int.	-10.258	0.891	-11.514	-0.35	0.000***
Percent Minority	0.015	0.014	1.055	0.02	0.292
Free/Reduced Lunch: 50%	0.512	0.883	0.580	0.02	0.562
LEP: 50%	4.260	2.801	1.521	0.15	0.144
Charter School	-4.435	2.673	-1.659	-0.15	0.100
Class Assigned by Ability	0.642	1.025	0.626	0.02	0.532
Parent Volunteers: 25%+	-1.055	1.366	-0.772	-0.04	0.450
Very Pos. Stud. Attitudes	0.434	1.027	0.423	0.01	0.674
Very Pos. Par. Support	-0.693	0.967	-0.716	-0.02	0.475
Very High Teach. Expect.	-1.622	0.955	-1.698	-0.06	0.094
Lawsuit Filed	1.205	0.969	1.244	0.04	0.218
Lawsuit Successful	-0.675	0.963	-0.701	-0.02	0.485
Missing Teacher Data	-0.306	2.166	-0.141	0.01	0.888
Few Absences Intercept	4.355	0.425	10.241	0.15	0.000***
Family Characteristics					
Newspaper at Home	0.562	0.335	1.676	0.02	0.097

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Magazine at Home	2.608	0.308	8.462	0.09	0.000***
26 or more Books	9.498	0.348	27.304	0.32	0.000***
Computer at Home	3.104	0.432	7.193	0.11	0.000***
Parent Educ.: HS	6.284	0.889	7.068	0.21	0.000***
Parent Educ.: Coll.	6.293	0.942	6.677	0.21	0.000***
1 Hour TV	-1.608	0.404	-3.981	-0.05	0.001***
Little English: Home	-3.724	0.481	-7.737	-0.13	0.000***
Teacher and Classroom Characteristics					
Years Teaching	0.044	0.019	2.278	0.01	0.023*
Regular Credential	1.750	0.778	2.251	0.06	0.026*
National Board Cert.	-1.177	0.804	-1.463	-0.04	0.154
Graduate Education	-0.025	0.392	-0.063	0.00	0.950
Class Size: 20 or less	-2.489	0.529	-4.701	-0.08	0.000***
Language: 10 hours	-0.371	0.378	-0.981	-0.01	0.327
Missing Data Flag	0.015	1.117	0.013	0.00	0.990
Note. Sigma squared = 862.715. τ = 89.436. *p< 0.05. **p< 0.01. ***p< 0.001.					

Table 5

Table B2:					
Fixed Effects with Robust Standard Errors: Fourth Grade Math					
Fixed Effect	Coefficient	Error	T-ratio	E.S.	p
Overall Effects					
Intercept	233.513	0.344	679.108		0.000***
Percent Minority	-0.024	0.009	-2.740	-0.04	0.007**
Free/Reduced Lunch: 50%	-4.816	0.463	-10.397	-0.22	0.000***
LEP: 50%	-2.794	1.386	-2.016	-0.13	0.044*
Charter School	-4.338	1.551	-2.797	-0.20	0.006**
Class Assigned by Ability	1.009	0.553	1.823	0.05	0.068
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Parent Volunteers: 25%+	2.770	0.506	5.474	0.13	0.000***
Very Pos. Stud. Attitudes	1.461	0.460	3.173	0.07	0.002**
Very Pos. Parental Support	1.513	0.479	3.160	0.07	0.002**
Very High Teacher Expect.	2.069	0.447	4.633	0.09	0.000***
Lawsuit Filed	0.069	0.434	0.160	0.00	0.873
Lawsuit Successful	1.768	0.402	4.395	0.08	0.000***
Missing Teacher Data Flag	-0.592	0.813	-0.728	-0.03	0.469
Student Characteristics					
Male Intercept	3.976	0.177	22.431	0.18	0.000***
African American					
African American Int.	-13.362	0.686	-19.484	-0.61	0.000***
Percent Minority	-0.057	0.014	-4.074	-0.09	0.000***
Free/Reduced Lunch: 50%	0.375	0.802	0.468	0.02	0.640
LEP: 50%	3.011	2.428	1.240	0.14	0.215
Charter School	3.396	2.461	1.380	0.16	0.168
Class Assigned by Ability	0.100	0.970	0.103	0.00	0.919
Parent Volunteers: 25%+	-1.537	0.952	-1.616	-0.07	0.114
Very Pos. Stud. Attitudes	-1.170	0.855	-1.369	-0.05	0.172
Very Pos. Parental Support	-1.205	0.874	-1.379	-0.06	0.168
Very High Teacher Expect.	0.336	0.764	0.440	0.02	0.660
Lawsuit Filed	-1.459	0.810	-1.801	-0.07	0.072
Lawsuit Successful	2.034	0.738	2.757	0.09	0.006**
Missing Teacher Data Flag	0.412	1.546	0.267	0.02	0.790
Hispanic					
Hispanic Intercept	-4.778	0.764	-6.252	-0.22	0.000***

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Percent Minority	-0.024	0.018	-1.332	-0.04	0.183
Free/Reduced Lunch: 50%	1.399	1.132	1.236	0.06	0.220
LEP: 50%	2.195	1.885	1.165	0.10	0.245
Charter School	-3.710	2.166	-1.712	-0.17	0.090
Class Assigned by Ability	0.355	1.336	0.266	0.02	0.790
Parent Volunteers: 25%+	0.457	1.015	0.450	0.02	0.652
Very Pos. Stud. Attitudes	-0.593	1.224	-0.484	-0.03	0.628
Very Pos. Parental Support	0.129	1.074	0.120	0.01	0.905
Very High Teacher Expect.	-0.764	1.074	-0.711	-0.04	0.477
Lawsuit Filed	-1.223	0.990	-1.235	-0.06	0.217
Lawsuit Successful	2.120	0.900	2.357	0.10	0.021*
Missing Teacher Data Flag	0.541	1.851	0.292	0.02	0.771
Asian Intercept	7.432	0.796	9.337	0.34	0.000***
Native American					
Native American Int.	-2.343	1.198	-1.955	-0.11	0.050*
Percent Minority	-0.092	0.035	-2.637	-0.14	0.009**
Free/Reduced Lunch: 50%	0.865	1.739	0.498	0.04	0.619
LEP: 50%	9.877	3.330	2.966	0.45	0.004**
Charter School	-3.734	9.136	-0.409	-0.17	0.683
Class Assigned by Ability	1.034	2.390	0.433	0.05	0.666
Parent Volunteers: 25%+	1.671	3.054	0.547	0.08	0.586
Very Pos. Stud. Attitudes	-2.275	2.008	-1.133	-0.10	0.259
Very Pos. Parental Support	-0.912	2.042	-0.446	-0.04	0.655
Very High Teacher Expect.	1.539	1.645	0.935	0.07	0.352
Lawsuit Filed	-3.578	2.186	-1.637	-0.16	0.102
Lawsuit Successful	-0.889	2.115	-0.420	-0.04	0.674

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Missing Teacher Data Flag	-5.532	4.790	-1.155	-0.25	0.254
IEP Intercept	-20.321	0.353	-57.644	-0.93	0.000***
LEP Intercept	-10.152	0.590	-17.201	-0.47	0.000***
Free/Reduced Lunch					
Free/Reduced Lunch Int.	-6.621	0.451	-14.672	-0.30	0.000***
Percent Minority	0.013	0.010	1.257	0.02	0.213
Free/Reduced Lunch: 50%	1.337	0.577	2.317	0.06	0.021*
LEP: 50%	1.649	1.551	1.063	0.08	0.290
Charter School	-0.270	1.999	-0.135	-0.01	0.893
Class Assigned by Ability	-0.969	0.755	-1.283	-0.04	0.200
Parent Volunteers: 25%+	-1.078	0.620	-1.739	-0.05	0.082
Very Pos. Stud. Attitudes	-0.466	0.598	-0.778	-0.02	0.437
Very Pos. Parental Support	0.042	0.614	0.069	0.00	0.945
Very High Teacher Expect.	0.142	0.656	0.216	0.01	0.829
Lawsuit Filed	-0.351	0.599	-0.586	-0.02	0.557
Lawsuit Successful	-0.033	0.656	-0.050	0.00	0.961
Missing Teacher Data Flag	-1.130	1.221	-0.926	-0.05	0.359
Few Absences Intercept	4.990	0.236	21.173	0.23	0.000***
Family Characteristics					
Newspaper at Home	0.569	0.192	2.960	0.03	0.004**
Magazine at Home	0.930	0.196	4.744	0.04	0.000***
26 or more Books	8.697	0.216	40.211	0.40	0.000***
Computer at Home	3.054	0.258	11.842	0.14	0.000***

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Parent Educ.: HS	2.412	0.539	4.479	0.11	0.000***
Parent Educ.: Coll.	3.469	0.528	6.568	0.16	0.000***
1 Hour TV	-2.991	0.212	-14.132	-0.14	0.000***
Little English: Home	-2.248	0.304	-7.399	-0.10	0.000***
Teacher and Classroom Characteristics					
Years Teaching	0.028	0.014	2.024	0.01	0.043*
Regular Credential	1.173	0.503	2.330	0.05	0.020*
National Board Cert.	0.544	0.606	0.897	0.02	0.370
Graduate Education	-0.053	0.265	-0.198	0.00	0.843
Math Leadership	1.609	0.342	4.702	0.07	0.000***
Class Size: 20 or less	-1.685	0.366	-4.604	-0.08	0.000***
Math: 7 hours	0.403	0.305	1.323	0.02	0.187
Abil. Grouping in Class	-0.267	0.266	-1.003	-0.01	0.317
Missing Data Flag	-1.628	0.643	-2.531	-0.07	0.012*
Note. Sigma squared = 476.334. τ = 58.003. *p< 0.05. **p< 0.01. ***p< 0.001.					

Table 6

Table B3					
Fixed Effects with Robust Standard Errors: Eighth Grade Reading					
Fixed Effect	Coefficient	Error	T-ratio	Eff. Size	p
Intercept	263.021	0.480	547.718		0.000***
Percent Minority	-0.048	0.011	-4.224	-0.06	0.000***
Free/Reduced Lunch: 50%	-2.436	0.658	-3.704	-0.10	0.000***
LEP: 50%	-1.557	2.868	-0.543	-0.06	0.591
Extracurricular Lang. Arts	1.005	0.597	1.683	0.04	0.095
Class Assigned by Ability	-0.154	0.480	-0.321	-0.01	0.748
Parent Volunteers: 25%+	2.020	0.618	3.268	0.08	0.002**
Very Pos. Student Attitudes	1.782	0.910	1.959	0.07	0.050*
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Very Pos. Parental Support	2.551	0.801	3.183	0.10	0.002**
Very High Teacher Expect.	1.564	0.586	2.668	0.06	0.008**
Lawsuit Filed	-0.773	0.669	-1.156	-0.03	0.249
Lawsuit Successful	1.308	0.575	2.274	0.05	0.024*
Missing Teacher Data Flag	-1.823	2.378	-0.767	-0.07	0.444
Student Characteristics					
Male Intercept	-8.552	0.272	-31.432	-0.35	0.000***
African American					
African American Int.	-13.070	1.058	-12.348	-0.53	0.000***
Percent Minority	-0.051	0.021	-2.474	-0.07	0.015*
Free/Reduced Lunch: 50%	1.232	1.237	0.996	0.05	0.324
LEP: 50%	-7.582	5.370	-1.412	-0.31	0.159
Extracurricular Lang. Arts	0.413	1.015	0.407	0.02	0.685
Class Assigned by Ability	-0.791	0.928	-0.852	-0.03	0.395
Parent Volunteers: 25%+	-0.906	1.125	-0.805	-0.04	0.422
Very Pos. Student Attitudes	2.388	1.631	1.464	0.10	0.146
Very Pos. Parental Support	0.407	1.533	0.265	0.02	0.791
Very High Teacher Expect.	-0.597	1.094	-0.546	-0.02	0.585
Lawsuit Filed	-1.004	1.186	-0.847	-0.04	0.399
Lawsuit Successful	1.740	1.050	1.657	0.07	0.098
Missing Teacher Data Flag	2.234	2.944	0.759	0.09	0.450
Hispanic					
Hispanic Intercept	-4.903	1.115	-4.398	-0.20	0.000***
Percent Minority	-0.068	0.027	-2.544	-0.09	0.014*
Free/Reduced Lunch: 50%	3.234	1.314	2.460	0.13	0.014*

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LEP: 50%	-4.053	4.092	-0.991	-0.17	0.330
Extracurricular Lang. Arts	1.597	1.151	1.387	0.07	0.168
Class Assigned by Ability	-1.582	1.204	-1.313	-0.06	0.200
Parent Volunteers: 25%+	-0.302	1.333	-0.227	-0.01	0.822
Very Pos. Student Attitudes	-1.428	1.405	-1.017	-0.06	0.310
Very Pos. Parental Support	0.648	1.484	0.437	0.03	0.664
Very High Teacher Expect.	0.852	1.171	0.728	0.03	0.468
Lawsuit Filed	2.023	1.534	1.319	0.08	0.194
Lawsuit Successful	1.188	1.462	0.813	0.05	0.421
Missing Teacher Data Flag	0.804	2.168	0.371	0.03	0.711
Asian Intercept	3.552	0.966	3.677	0.14	0.001***
Native American Intercept	-3.394	1.988	-1.707	-0.14	0.088
Percent Minority	-0.090	0.057	-1.579	-0.12	0.115
Free/Reduced Lunch: 50%	-1.970	3.325	-0.593	-0.08	0.554
LEP: 50%	-5.666	5.976	-0.948	-0.23	0.344
Extracurricular Lang. Arts	1.909	2.656	0.718	0.08	0.474
Class Assigned by Ability	-3.071	2.600	-1.181	-0.13	0.239
Parent Volunteers: 25%+	-2.953	3.074	-0.961	-0.12	0.338
Very Pos. Student Attitudes	-6.445	4.077	-1.581	-0.26	0.117
Very Pos. Parental Support	3.418	2.984	1.145	0.14	0.253
Very High Teacher Expect.	-2.379	3.015	-0.789	-0.10	0.433
Lawsuit Filed	-6.377	3.042	-2.096	-0.26	0.036*
Lawsuit Successful	-2.570	5.024	-0.512	-0.10	0.616
Missing Teacher Data Flag	3.955	5.722	0.691	0.16	0.492

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IEP Intercept	-34.174	0.553	-61.789	-1.39	0.000***
LEP Intercept	-19.360	1.040	-18.622	-0.79	0.000***
Free/Reduced Lunch					
Free/Reduced Lunch Int.	-6.142	0.692	-8.871	-0.25	0.000***
Percent Minority	0.006	0.014	0.459	0.01	0.647
Free/Reduced Lunch: 50%	-0.112	0.889	-0.126	0.00	0.901
LEP: 50%	8.933	4.966	1.799	0.36	0.097
Extracurricular Lang. Arts	-0.030	0.807	-0.037	0.00	0.971
Class Assigned by Ability	-0.043	0.654	-0.066	0.00	0.947
Parent Volunteers: 25%+	0.607	0.863	0.703	0.02	0.486
Very Pos. Student Attitudes	-0.146	1.283	-0.114	-0.01	0.911
Very Pos. Parental Support	-0.973	0.901	-1.080	-0.04	0.282
Very High Teacher Expect.	-0.987	1.052	-0.938	-0.04	0.367
Lawsuit Filed	1.576	0.919	1.714	0.06	0.090
Lawsuit Successful	-0.740	0.791	-0.936	-0.03	0.352
Missing Teacher Data Flag	0.488	2.124	0.230	0.02	0.819
Few Absences Intercept	5.720	0.380	15.065	0.23	0.000***
Family Characteristics					
Newspaper at Home	1.130	0.247	4.581	0.05	0.000***
Magazine at Home	4.917	0.330	14.878	0.20	0.000***
26 or more Books	10.734	0.351	30.560	0.44	0.000***
Computer at Home	4.142	0.441	9.395	0.17	0.000***
Parent Educ.: HS	4.119	0.811	5.079	0.17	0.000***
Parent Educ.: Coll.	7.088	0.787	9.007	0.29	0.000***
1 Hour TV	0.119	0.329	0.362	0.00	0.718

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Little English: Home	-3.302	0.595	-5.545	-0.13	0.000***
Teacher and Classroom Characteristics					
Years Teaching English	0.069	0.019	3.609	0.03	0.001***
Regular Credential	0.694	0.589	1.179	0.03	0.240
National Board Cert.	-0.858	0.926	-0.927	-0.03	0.354
Undergrad Language Arts	1.516	0.352	4.309	0.06	0.000***
Graduate Language Arts	0.574	0.444	1.294	0.02	0.197
Language: 7 hours	-0.624	0.556	-1.122	-0.03	0.263
Analyze Lit: 41% of class	0.886	0.425	2.084	0.04	0.041*
Stud. Writ.: 41% of class	0.217	0.450	0.483	0.01	0.631
Missing Data Flag	-4.644	0.576	-8.063	-0.19	0.000***
Note. Sigma squared = 601.267. τ = 68.854. *p< 0.05. **p< 0.01. ***p< 0.001.					

Table 7

Table B4					
Fixed Effects with Robust Standard Errors: Eighth Grade Math.					
Fixed Effect	Coefficient	Error	T-ratio	E.S.	p
Intercept	276.815	0.268	1031.012		0.000***
Percent Minority	-0.054	0.012	-4.517	-0.07	0.000***
Free/Reduced Lunch: 50%	-4.361	0.626	-6.964	-0.19	0.000***
LEP: 50%	-1.435	2.061	-0.696	-0.06	0.487
Class Assigned by Ability	-0.388	0.559	-0.694	-0.02	0.487
Algebra Offered Eighth Grade	-0.345	0.588	-0.586	-0.01	0.557
Extracurricular Math	1.673	0.486	3.443	0.07	0.001***
Parent Volunteers: 25%+	1.374	0.528	2.605	0.06	0.010**
Very Pos. Stud. Attitudes	3.553	0.730	4.866	0.15	0.000***
Very Pos. Parental Support	2.013	0.659	3.052	0.09	0.003**
Very High Teach. Expect.	1.522	0.509	2.991	0.07	0.003**
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Lawsuit Filed	0.293	0.638	0.459	0.01	0.646
Lawsuit Successful	1.441	0.551	2.618	0.06	0.009**
Missing Data Flag	0.190	1.366	0.139	0.01	0.890
Student Characteristics					
Male Intercept	4.497	0.243	18.499	0.19	0.000***
African American					
African American Int.	-18.675	0.684	-27.311	-0.80	0.000***
Percent Minority	-0.050	0.019	-2.705	-0.07	0.007**
Free/Reduced Lunch: 50%	1.422	1.255	1.133	0.06	0.263
LEP: 50%	-1.603	8.158	-0.196	-0.07	0.845
Extracurricular Math	0.166	1.170	0.142	0.01	0.888
Class Assigned by Ability	0.863	1.357	0.636	0.04	0.528
Algebra Offered Eighth Grade	-0.622	1.007	-0.618	-0.03	0.537
Parent Volunteers: 25%+	-0.551	1.122	-0.491	-0.02	0.625
Very Pos. Stud. Attitudes	-0.572	1.467	-0.390	-0.02	0.696
Very Pos. Parental Support	0.631	1.318	0.479	0.03	0.632
Very High Teach. Expect.	-0.392	1.158	-0.339	-0.02	0.736
Lawsuit Filed	-1.230	1.164	-1.057	-0.05	0.293
Lawsuit Successful	3.570	1.176	3.036	0.15	0.003**
Missing Teacher Data Flag	-3.964	2.357	-1.682	-0.17	0.096
Hispanic					
Hispanic Intercept	-6.162	0.766	-8.049	-0.26	0.000***
Percent Minority	-0.007	0.026	-0.261	-0.01	0.794
Free/Reduced Lunch: 50%	2.726	1.505	1.811	0.12	0.070
LEP: 50%	-2.593	2.848	-0.910	-0.11	0.366

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Extracurricular Math	-0.192	1.285	-0.149	-0.01	0.882
Class Assigned by Ability	-0.306	1.596	-0.192	-0.01	0.848
Algebra Offered Eighth Grade	-0.337	1.379	-0.244	-0.01	0.809
Parent Volunteers: 25%+	1.360	1.548	0.879	0.06	0.383
Very Pos. Stud. Attitudes	-0.979	1.899	-0.515	-0.04	0.607
Very Pos. Parental Support	0.093	1.784	0.052	0.00	0.959
Very High Teach. Expect.	-1.571	1.225	-1.283	-0.07	0.201
Lawsuit Filed	-1.888	1.742	-1.084	-0.08	0.283
Lawsuit Successful	2.353	1.336	1.761	0.10	0.079
Missing Teacher Data Flag	-2.176	2.615	-0.832	-0.09	0.408
Asian Intercept	7.093	0.823	8.619	0.30	0.000***
Native American					
Native American Int.	-5.624	1.674	-3.361	-0.24	0.001***
Percent Minority	-0.082	0.045	-1.823	-0.11	0.069
Free/Reduced Lunch: 50%	4.863	2.583	1.883	0.21	0.061
LEP: 50%	-6.164	4.495	-1.371	-0.26	0.173
Extracurricular Math	3.255	2.199	1.480	0.14	0.139
Class Assigned by Ability	-5.857	3.508	-1.669	-0.25	0.095
Algebra Offered Eighth Grade	2.373	2.330	1.018	0.10	0.311
Parent Volunteers: 25%+	-1.506	3.527	-0.427	-0.06	0.669
Very Pos. Stud. Attitudes	0.677	4.570	0.148	0.03	0.883
Very Pos. Parental Support	-0.093	4.530	-0.021	0.00	0.984
Very High Teac. Expect.	-1.176	2.479	-0.474	-0.05	0.635
Lawsuit Filed	-7.151	2.941	-2.431	-0.31	0.016*
Lawsuit Successful	-3.412	3.417	-0.999	-0.15	0.319
Missing Teacher Data Flag	-1.928	4.787	-0.403	-0.08	0.687

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IEP Intercept	-30.739	0.455	-67.612	-1.32	0.000***
LEP Intercept	-14.696	0.762	-19.277	-0.63	0.000***
Free/Reduced Lunch					
Free/Reduced Lunch Int.	-5.363	0.335	-16.007	-0.23	0.000***
Percent Minority	0.023	0.014	1.683	0.03	0.095
Free/Reduced Lunch: 50%	-0.627	0.818	-0.766	-0.03	0.446
LEP: 50%	6.721	4.911	1.369	0.29	0.171
Extracurricular Math	-1.169	0.720	-1.624	-0.05	0.104
Class Assigned by Ability	1.217	0.872	1.396	0.05	0.165
Algebra Offered Eighth Grade	-2.068	0.634	-3.261	-0.09	0.002**
Parent Volunteers: 25%+	-0.546	0.795	-0.687	-0.02	0.494
Very Pos. Stud. Attitudes	1.444	1.084	1.332	0.06	0.183
Very Pos. Parental Support	-1.135	0.853	-1.331	-0.05	0.184
Very High Teach. Expect.	-0.389	0.661	-0.589	-0.02	0.556
Lawsuit Filed	0.951	0.824	1.155	0.04	0.250
Lawsuit Successful	-0.706	0.709	-0.996	-0.03	0.320
Missing Teacher Data Flag	0.368	1.305	0.282	0.02	0.778
Few Absences Intercept	6.580	0.299	22.041	0.28	0.000***
Family Characteristics					
Newspaper at Home	0.763	0.229	3.334	0.03	0.001***
Magazine at Home	3.144	0.279	11.262	0.14	0.000***
26 or more Books	9.917	0.271	36.589	0.43	0.000***
Computer at Home	4.122	0.398	10.346	0.18	0.000***
Parent Educ.: HS	3.473	0.571	6.088	0.15	0.000***

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Parent Educ.: Coll.	5.924	0.564	10.506	0.25	0.000***
1 Hour TV	-0.297	0.307	-0.966	-0.01	0.338
Little English: Home	-3.103	0.516	-6.011	-0.13	0.000***
Teacher and Classroom Characteristics					
Years Teaching Math	0.171	0.022	7.697	0.06	0.000***
Regular Credential	2.206	0.590	3.742	0.09	0.000***
National Board Cert.	0.247	0.860	0.287	0.01	0.774
Undergraduate Math	2.577	0.461	5.593	0.11	0.000***
Graduate Math	1.545	0.517	2.986	0.07	0.003**
Math: 4 hours	0.107	0.377	0.284	0.00	0.776
Write: Problem Solving	-4.192	0.394	-10.638	-0.18	0.000***
Discuss: Problem Solving	2.773	0.266	10.432	0.12	0.000***
Math Class: Gr. 8 or less	-9.431	0.318	-29.629	-0.41	0.000***
Gr. 9 Math: Below Alg.	-12.268	0.355	-34.536	-0.53	0.000***
Missing Teacher Data Flag	-4.621	0.511	-9.045	-0.20	0.000***
Note. Sigma squared = 541.120. τ = 83.793. *p< 0.05. **p< 0.01. ***p< 0.001.					

Table 8