

Centralized Governance and Student Outcomes: Excellence, Equity, and Academic Achievement in the U.S. States

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Are states with more centralized approaches to education governance more likely to have higher student achievement and lower achievement gaps between poor and nonpoor students? This article addresses that question by theorizing about the effects of political, administrative, and fiscal centralization on student outcomes. It tests competing hypotheses about the degree to which centralization across these three dimensions is associated with the promotion of academic excellence (higher achievement) and equity (narrower achievement gaps). The results demonstrate the virtue of studying academic performance through the lens of governance and more distal system-level variables rather than, as has been common in the literature, more narrow policy-oriented measures. The findings show that strong relationships exist between student outcomes and the degree of political centralization and administrative centralization in a state, yet there are no apparent associations with fiscal centralization. The results also illustrate that governing arrangements are not consistently related to the advancement of excellence and equity. In terms of administrative centralization, specifically, apparent trade-offs may exist.

KEY WORDS: governance, centralization, states, education

Introduction

During the last two decades, institutional reforms that decentralize authority to ground-level officials and citizens have gained much traction in the United States and around the world (Soss, Schram, Vartanian, & O'Brien, 2001; Treisman, 2007). Gerring and Thacker (2008, p. 2) summarize the reason for decentralization's popularity by explaining that "Contemporary writers and commentators usually assume that government works best when political institutions diffuse power broadly among multiple, independent bodies." A related view embraces "polycentric governance," or arrangements where numerous governmental and nongovernmental actors operate in overlapping jurisdictions and share authority (McGinnis, 1999). Authors writing from that perspective note that polycentric systems can cultivate a shared sense of responsibility for society's well-being and, in practical terms, more tailored and nuanced service delivery.

Despite the appeal of decentralizing reforms, support for them is not universal. Some scholars have noted that centralized or decentralized systems can deliver the results that citizens crave while upholding core democratic principles (Treisman, 2007). Others have presented national-level evidence showing that greater centralization, existing in concert with mechanisms to foster political inclusion, is associated with superior results across diverse sets of social and political indicators (Gerring & Thacker, 2008). At the community level, other work has shown that flexible networked arrangements can promote valued social outcomes, such as delivering mental health services, yet a centralizing force in those networks, prompted by “a powerful core agency” is important because it “facilitates both integration and coordination and is relatively efficient” (Milward & Provan, 1998, p. 216).

Although disagreements exist over the merits of centralized or decentralized approaches to governance, one policy domain in the United States has exhibited a generally consistent march toward greater centralization. That area is elementary and secondary education, henceforth simply “education.” During the last several decades, state governments have wielded their powers to reshape the institutions that govern schools and execute education policy. The pace of these changes has varied across the states, providing a valuable arena for understanding the performance of reforms that centralize.

Interestingly, public policy scholars have yet to explore deeply how changes in state institutions that govern education may influence student outcomes. That gap exists despite calls from pioneers who encouraged the pursuit of these and other related lines of inquiry (Campbell & Mazzoni, 1976; Masters, Salisbury, & Eliot, 1964). Researchers have examined other dimensions of education governance in studies of public universities (Hicklin & Meier, 2008; Knott & Payne, 2004; Lowry, 2001; Nicholson-Crotty & Meier, 2003); the impacts of local governance, in particular the institutional pressures facing school superintendents (Hess, 1999) or school boards (Howell, 2005); the rise of mayoral control of urban schools (Henig, 2004); and markets (Chubb & Moe, 1990). That gap in the research represents a missed opportunity because variation in how states govern education can inform more general debates about the relative benefits of centralized versus decentralized institutional reforms.¹

This article examines state education governance and addresses the following research question: Are states with more centralized approaches to education governance more likely to have higher student achievement and lower achievement gaps between poor and nonpoor students? The article makes two main contributions. Empirically, it is the first quantitative study of the relationship between state institutions of education governance and student achievement. Theoretically, it considers multiple dimensions of centralization and in so doing provides a robust test of contrasting theoretical claims about the relative merits of centralized versus decentralized governing approaches. The findings show that greater political centralization is strongly associated with more equitable outcomes via lower achievement gaps. In addition, strong relationships between achievement and the degree of administrative centralization exist, yet here factors associated with increasing achievement and promoting excellence also are associated with wider achievement

gaps, thus diminishing equity. Interestingly, although state-level debates about student funding have raged for decades, centralization of finances appears unrelated to student performance.

Governance, Black Boxes, and Outcomes

Governance is a multifaceted concept in the political science and public policy literatures (Lynn, Heinrich, & Hill, 2001; Manna & McGuinn, 2013). This article delimits the topic by focusing on the role of government institutions whose primary purpose is to make or implement state education policy. Scholars have sometimes defined governance and institutions to involve the formal and informal rules or regimes of rules that attempt to alter behavior (Ostrom, 1986). The focus here is at the organizational level, a higher level of abstraction.

So what do governance systems do, and why are they important to consider? In simple terms a political unit's governance system produces specific policies that are intended to improve real-world outcomes for ordinary people (Eller & Krutz, 2009; Meier & O'Toole, 2006). Researchers and pundits frequently consider how particular governing arrangements (e.g., divided political control of government) might produce certain policies, or whether certain policies (e.g., required student testing) are associated with outcomes. In each case, policy plays a central role in the discussion either as a dependent or an independent variable. In contrast, the analysis in this article leaves the details of policy and its implementation in an unopened black box, as others studying centralization and decentralization have done in different contexts (Chubb & Moe, 1990; Gerring & Thacker, 2008), to explore the relationship between more distal features of governance and outcomes. Thus, in studying governing institutions, the focus here departs from much of the education policy literature that examines student outcomes by focusing on specific policy variables (Dee & Jacob, 2011; Gormley & Phillips, 2005; Hess & Leal, 1997).

Three main reasons motivate my focus on systemic features of governance rather than specific policies and implementation decisions. First, such an approach can help establish baseline relationships between these institutional arrangements and valued outcomes. Working from such a baseline, then, subsequent work can probe how specific policies or the efforts of public managers might nudge those results from baseline. For example, Meier and O'Toole's (2006) model of governance posits that policy outcomes emerge through the combined influence of structure, management, and environmental conditions.² They note one advantage of the model is that researchers can focus on some narrower aspect of it depending on their particular interests or the limits of available data.³ Work on representation in the policy process sometimes follows such a logic by considering how different rules for selecting representatives—one aspect of structure in Meier and O'Toole's (2006) model—are associated with outcomes for different population groups (Marschall & Ruhil, 2007). Those studies focus on the institutional designs for choosing representatives and their relationship to outcomes, rather than the representatives' policies and the implementation decisions of bureaucracies.⁴

Second, in education policy specifically, studying broader institutional arrangements can provide useful conceptual coherence in what can sometimes be an otherwise fragmented field. Theoretically, much education research posits potential relationships between specific policies and student outcomes, including studies of standards and accountability, teacher quality or teacher behavior, and the impact of preschool, just to name a few (Dee & Jacob, 2011; Gormley & Phillips, 2005; Hess & Leal, 1997). In reality, all those policies likely combine or interact to influence student achievement in some way. By implication, then, every study relating an individual education policy lever to an outcome is subject to criticism because by definition focusing on a single area neglects the menu of other potential policies that might correlate with valued outcomes. Two decades ago, John Chubb and Terry Moe criticized scholars studying education for a tendency to focus on narrow policy concerns at the expense of considering broader theoretical perspectives. They noted that “The literature is buried in variables—all of them relevant but without any clear, coherent, connection to one another” (Tweedie, Riley, Chubb, & Moe, 1990, p. 565). I do not take Chubb and Moe’s complaint to mean that studies of individual policies are never valuable. The main problem is that not enough studies in education have focused on the institutions responsible for shaping the environments in which policy formation and implementation occurs.

Finally, popular political debates also advance theories about how certain institutional designs can generate positive outcomes. Haggling over specific policies sometimes is less central in these arguments because the working assumption is that getting the institutions right is the most critical task. The framers of the U.S. Constitution adopted such an approach by focusing much effort on engineering a set of governing arrangements organized around federalism and separation of powers that they believed would produce effective future policies. More recently in education, governors have advocated for greater control over state education policy, arguing that a more coherent governance system, with governors serving as a primary and visible point of accountability, will produce better results than systems with more fragmented governance (Shober, 2010). At the local level, mayors have made similar claims about their own need for greater control versus other institutions, such as local school boards and district departments of education (Henig, 2004).

Three Dimensions of Centralization

Before discussing key components of state education governance, this section defines centralization and decentralization. To keep the exposition clear, the article will use the term “centralization” and characterize states as relatively more or less centralized in how they govern education. Borrowing from Treisman’s (2007, p. 28) framework, there are three dimensions of governance on which a state might decide to centralize: political, administrative, and fiscal.⁵

Political centralization can include features of governance that define the locus of decision-making authority on public matters, paths to power for government officials, and the degree of involvement by state and local officials in designing constitutional provisions. This article focuses on the second component by examining the

degree to which power over appointments to key positions in state government is relatively centralized into the hands of fewer people. Variation in who is empowered to select government officials creates different principal-agent relationships as well as different networks, which can affect policy implementation and results (Lewis, 2007; Meier & O'Toole, 2006).

Administrative centralization involves the degree to which a central authority develops and uses bureaucracies to carry out public policy. As state legislatures and governors collaborate to create laws, for example, they must identify the combinations of state or local agencies (or nongovernmental groups) that should implement them. Those administrative choices can have substantively important implications for how policies operate in the field (Meier & O'Toole, 2006; Pressman & Wildavsky, 1984; Wilson, 1989).

Finally, fiscal centralization concerns the allocation of responsibility across levels of government for raising and spending public revenues. One could imagine several program areas where either raising revenue or spending it, or both, might be relatively more centralized. In Treisman's (2007) discussion, fiscal centralization is essentially a more specific subset of the broader category of political centralization that he describes, which includes policymaking power and federalism issues. He singles out fiscal centralization, though, given that the specific ability to raise and spend public resources has such important governance implications. The golden rule of policy nicely captures this idea: he who has the gold gets to make the rules.

State Education Governance

This section describes state education governance using the three dimensions just defined. The fact that state constitutions empower all states to establish and maintain free systems of public education is why observers assign to states primary responsibility for the nation's schools (Howell, 2005). Despite that commonality, the states' institutional choices about education governance have produced varying levels of political, administrative, and fiscal centralization.

Start with political centralization and the paths to power for two types of key state officials who govern education. First are state education chiefs, who exist in all states. Sometimes called state superintendents of schools or chief state school officers, these people run state education agencies, the primary state-level bureaucracies responsible for implementing education policy. Their work involves administering dozens of state and federal education programs and allocating federal and state resources to fund local school district activities. Chief state school officers are policymakers because they help craft and enforce regulations that assist their agencies and localities in executing their duties. Second are members of state boards of education. Presently, all but Wisconsin and Minnesota have these institutions. State boards are policymaking bodies whose responsibilities vary across the states. Generally speaking, they tend to play some role in setting academic standards, approving standardized tests, certifying test results, and setting high school graduation requirements. By analogy, they are parallel to local school boards, but their

decision-making authority is over the content of state policies, whereas local boards address matters arising in their particular communities.

The selection methods for state chiefs and board members vary across the states. In 2012, for example, 13 states allowed governors to appoint the chief; 24 had the state board appoint the chief; while the remaining 13 had voters select the chief in statewide elections. The selection of state board members also varied. In 33 states, governors appointed those members, in 6 states voters elected them, and varying arrangements existed in the 11 other states, including boards with a combination of elected and appointed members (National Association of State Boards of Education, 2012). The most centralized states empower governors to select these officials. Others have more fragmented or nuanced systems that leave the governor with less formal control over appointments.

Consider administrative centralization next. Although state governments are responsible for education, provision of schooling is generally considered a local function. That is because with extremely rare exceptions state governments do not run schools and instead have delegated that task to local school districts. Despite conjectures about local control of education, school districts exist as administrative agents of the states and owe their existence, including their powers and geographic boundaries, to state governments (Howell, 2005). States often create school districts to operate apart from cities or counties making them one of the most common single-purpose governments in the country (Burns, 1994).

One way to assess the degree of administrative centralization in state education governance is to consider how many school districts states have created to help them fulfill their constitutional responsibilities to provide education. In 2008–09, the most recent year for which data are available (U.S. Department of Education, 2011), there were 13,809 school districts nationwide. Not surprisingly, the data show variation in the degree of administrative centralization across the states. The interquartile range for that year varied from 89 to 362 districts per state. Interestingly, some relatively populous states operated few districts and some smaller states operated many. For example, Florida maintained only 67 districts, while Iowa had 362 and Oklahoma had 534.

Finally, fiscal centralization is a last dimension of state education governance. The focus here is on the allocation of responsibility for providing revenues for education. Considering 2008–09 again, the most recent school year with available data, shows how state responsibilities vary. In that school year, 30 states clustered between providing 40 and 60 percent of the revenues for their public schools. Among the remaining states, 12 provided less than 40 percent and 8 provided more than 60 percent (U.S. Department of Education, 2011).

Competing Hypotheses

Some state education reformers have argued that greater political, administrative, and fiscal centralization of education governance will promote academic excellence and equity. The arguments for greater centralization suggest that it will foster program coherence, improved efficiency, clearer lines of accountability, and better

economies of scale that make it possible to offer students more advanced courses. Advocates for less centralization maintain that schools will operate better and students will enjoy as much or more academic success in states with less centralized arrangements. That view posits that decentralized governance is likely to improve responsiveness, create more proximate face-to-face accountability, and allow for customized learning to meet individual students' needs. Because reasonable theoretical arguments support both sides, and because no empirical studies have examined the relationship between degrees of centralization in state education governance and student outcomes, in this section I consider some of these competing arguments over the merits of greater political, administrative, and fiscal centralization.

Proponents of greater political centralization typically make two broad arguments to justify empowering governors to name state education chiefs and state board members. Because governors are state chief executives, greater political centralization is likely to foster coordination during policy implementation. Like presidents at the national level (Lewis, 2003), governors are the only state officials that have incentives to manage the entire enterprise of government. That responsibility contrasts with legislators, whose committee assignments tend to narrow their concerns, or judges, who focus on interpreting laws and constitutions but not on guaranteeing that bureaucracies can function well (Wilson, 1989). Governors possessing authority to name the chief of the state's education bureaucracy or members of the state's education board are much better positioned to influence and coordinate education policy than governors in states where these officials attain their offices through some other means. By analogy, at the local level Provan, Huang, and Milward (2009) reveal how such positioning matters in their study of health and human services networks. They find that organizations with high centrality can assert much influence over other network actors given the central player's control over "material resources, information, and social and political support (legitimacy)" (Provan et al., 2009, p. 877). Advocates of centralization would point to the governor's potentially high influence over similar factors. The quality of a governor's information also may increase with gubernatorial appointments by enhancing professionalism or candor, or both, within a governor's inner circle. Not having to develop an independent political base to win elections to their positions, state chiefs and board members appointed by governors can be somewhat shielded from political attacks, and thus governors may receive more honest and timely advice from them.

Proponents of political centralization also argue that empowering governors to appoint state education chiefs or board members is likely to foster effective accountability for results. In state politics, governors are the most visible and well-known political actors, commanding the greatest attention in state elections (Wattenberg, McAllister, & Salvanto, 2000). Chief executives at all levels of government, such as presidents, governors, and mayors, are particularly attuned to accountability challenges because citizens typically blame them for failures, even when these officials may lack the institutional authority or resources to succeed (Lewis, 2003).

Competing claims challenge the virtues of allowing governors to appoint state education chiefs or board members. Greater coordination or accountability for results

may ensue with enhanced gubernatorial power, but it is not guaranteed (Treisman, 2007). Successful coordination depends upon governors possessing knowledge about and interest in education policy, which can help them select capable chiefs or board members and develop a coordinated policy agenda. Critics of centralization note that because not all potential governors are skilled at these things, it is risky to centralize power in their hands. As Ostrom (1999) cautions, unified authority does not necessarily result in greater responsibility. In fact, it may undercut efforts to improve human welfare and, in the process, suggest to citizens that distant powers, not they themselves, play the most important role in holding their local public authorities to account.

Further, chief executives may not necessarily be more interested in effective, technically competent governance than in pleasing various constituencies that helped them win office (Salmore & Salmore, 1996; Wayne, 2005). Governors serve as political party leaders who, through appointments, can dispense patronage to party loyalists. Seeing appointments through a strong partisan lens may dilute any potential gains in professionalism that the pro-centralization arguments suggest. Also, if the goal is to shield state education chiefs from the political winds, for example, one could more easily accomplish that goal by having the less visible state board of education, rather than the governor, pick the chief. Finally, on certain issues governors may be as vulnerable to interest group pressures as legislators. Given the strength of state teacher unions (Rosenthal, 1998), the growing power of the business community in state education matters (Goertz, 1996), and the power of both groups to influence state elections, effective governance of education policy may be difficult for governors to achieve in practice.

Consider next the debates over administrative centralization. Advocates of this approach have argued that potential gains in efficiency and quality justify consolidating many smaller school districts into fewer larger ones (Strang, 1987). Larger districts can offer more diverse and challenging courses, including low-stress electives but also substantively demanding ones, such as foreign language study in Chinese or advanced science and mathematics. Also, these districts can more easily employ specialists to address the needs of students with disabilities and immigrants who are still learning English. Small districts are especially disadvantaged in serving the former group given that appropriate accommodations for even a single disabled student can cost a district several tens if not hundreds of thousands of dollars per year. At the local level, administrative arrangements organized around larger school districts eliminate bureaucratic duplication as fewer superintendents and central offices are required. Due to improved economies of scale, larger districts can leverage their purchasing power to acquire supplies and equipment. State overseers of local school districts also see some advantages with greater centralization. Fewer administrative agents in the field simplify state officials' responsibilities for monitoring, offering technical assistance, and coordination because there are simply fewer agents to oversee. The existence of fewer districts can attenuate the cognitive demands facing state officials and help them make better decisions as they use scarce resources to improve student results (Jones & Baumgartner, 2012).

Critics of administrative centralization counter that greater efficiencies and better performance can occur with less centralized approaches. The proliferation of smaller and more diverse school districts is likely to initiate local-level competition that can spur innovation and a tailoring of local program offerings to best educate a community's students (Tiebout, 1956). Smaller districts are likely more adaptable to local circumstances and rapidly changing conditions. That adaptability makes timely and tailored responses to individual students more likely. Although large school districts may employ more specialists or offer more student assistance programs, students may encounter bureaucratic hurdles in finding and then accessing those resources. Further, the existence of many school districts does nothing to preclude locally initiated consolidations of ideas or resources as needed. Such sharing can occur when local officials collaborate across district boundaries through informal or sometimes formal networks (Meier & O'Toole, 2006), something that advocates of polycentric governance would find attractive (McGinnis, 1999). Those collaborations can create timely economies of scale and allow local governments to exploit targets of opportunity without the administrative overhead involved in maintaining larger more bureaucratic districts.

Finally, debates also exist over the merits of fiscal centralization. Those who support having schools rely more on nonlocal revenues suggest that more centralized arrangements are likely to promote coordination and enhance equity. Treisman (2007, p. 15) calls suggestions for fiscal coordination, among the arguments for greater centralization, perhaps "the most convincing." Less centralization on fiscal matters can create problems, he explains, because "When local or central governments can independently tax the same base or are expected by voters to spend on the same items, they may tend to overtax or underspend." As a result, academic performance in a state may suffer given a less-than-optimal allocation of responsibility for raising revenues. Greater centralization of revenues also can produce more equitable educational outcomes, given that central authorities are more able to redistribute funds to needy communities. Since the early 1970s, the equity impulse has been a major assumption driving efforts to increase state control of education funding (Hanushek & Lindseth, 2009).

Appeals for less fiscal centralization in education governance extend some of the same arguments that support less administrative centralization. A functional perspective holds that local school districts will be more adept at identifying their particular educational needs (Peterson, 1995). That view implies they will make wiser decisions on fiscal matters if they have the power to generate revenues to fund their own priorities, which might include reducing class sizes, providing after-school learning opportunities, or using variants of teacher merit pay. Admittedly, equity may suffer with more local control, but those losses may be attenuated by the wiser use of revenues to promote overall student success that local responsibility would cultivate. When distant, central authorities are more responsible for revenues, local communities have incentives to overstate their challenges to capture resources beyond their actual needs. That rent-seeking behavior can create lost opportunities when truly needy communities are shortchanged.

Data and Methods

This section describes the data and methods used to examine the competing hypotheses summarized in the previous section. Table 1 presents descriptive statistics on all variables in the analysis. The dependent variables focus on state-level performance using data from 4th and 8th grade National Assessment of Educational Progress (NAEP) tests in reading and math for the years 2003, 2005, 2007, and 2009.⁶ The federal NAEP test is an ideal measure because it is the only test administered to representative samples of students in each state that is comparable across states and over time. State NAEP scale scores range from 0 to 500 with higher scores associated with higher levels of understanding.

The analysis uses NAEP scale scores to examine two sets of dependent variables with four variables in each set. One set focuses on all students, looking at achievement in 4th grade reading, 4th grade math, 8th grade reading, and 8th grade math. The other set examines these same grades and subjects but considers achievement gaps between students in poverty and students not in poverty. Students are defined as being in poverty if they received federally subsidized breakfast or lunch. These two sets of variables help to examine whether centralization is associated with greater academic excellence (the achievement measures for all students) and equity (the achievement gap measures), two goals that have animated the nation's education agenda for three decades.

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
Dependent				
4th grade reading scale score, all students	219.49	6.42	203.19	235.75
4th grade math scale score, all students	237.90	6.02	222.52	252.43
8th grade reading scale score, all students	262.78	6.08	248.51	273.72
8th grade math scale score, all students	280.02	7.70	260.91	298.85
4th grade reading achievement gap	24.30	4.58	12.10	37.84
4th grade math achievement gap	20.24	3.93	10.92	30.69
8th grade reading achievement gap	20.95	4.14	11.78	31.96
8th grade math achievement gap	24.35	4.45	14.62	37.07
Independent				
Governor appoints chief	0.23	0.42	0	1
Governor appoints board	0.61	0.49	0	1
Logged number of school districts	5.13	1.25	0.00	6.95
% nonlocal education revenues	59.40	13.24	33.88	98.34
% white students	66.29	17.99	19.46	96.08
% students on meal subsidy	38.73	11.02	12.02	69.01
Logged population density	4.45	1.40	0.12	7.08
% with bachelor's degree or higher	26.52	4.65	15.30	38.10
Homeownership rate	70.43	4.77	54.80	80.30

Note: Dependent variables are state NAEP scale scores. Achievement gaps are calculated as the scale score difference between students not receiving a meal subsidy (e.g., nonpoor) and students receiving a meal subsidy (e.g., poor). $N = 200$ for all variables except for % white students ($N = 197$) and % students on meal subsidy ($N = 195$).

Four key independent variables capture the degree of political, administrative, and fiscal centralization in the states. Two variables tap political centralization and were measured during the school year that a given NAEP test was administered (e.g., the 2007 NAEP was administered during the 2006–07 school year). The first is coded 1 if the state’s governor has the power to appoint the chief state school officer, and 0 otherwise. The second also is a dummy variable coded 1 if the governor appoints all state board members, and 0 otherwise.⁷ As reviewers for this article pointed out, the dummy variable approach presented here elides some of the nuance that exists in the state processes for selecting chiefs and board members and the powers that those officials wield. Still, the approach here is useful and reasonable given past research on other levels of government that has followed a similar approach (Lewis, 2007). Empirically, it also is difficult to capture such nuance in a quantitative study, given that it would require loading up the article’s statistical models with numerous dummy variables, including many that would not vary much due to the particulars of different state arrangements, to account for various scenarios. Finally, this relatively straightforward issue of control over appointments has animated numerous state discussions about the proper balance of power between governors and these other state institutions (Shober, 2010). Establishing a set of baseline results tied to the appointment powers of governors hopefully will prompt future studies that incorporate more nuance.

The level of administrative centralization is measured as the logged number of school districts that existed during the school year that each NAEP test was administered.⁸ For this variable, lower values, which denote fewer districts, are associated with greater centralization.

Finally, I operationalize fiscal centralization as the percent of revenues for education that came from nonlocal sources during the school year in which NAEP tests were administered. This measure combines funds coming from state and federal sources.⁹ The reason for distinguishing between nonlocal and local, rather than federal, state, and local, is that the federal government’s main education funding sources, the Elementary and Secondary Education Act and the Individuals with Disabilities Education Act, are administered by state-level authorities. In fact, each state’s own policy choices and regulatory interpretations have a tremendous impact on how local school districts use federal funds (Manna & McGuinn, 2013). In essence, federal dollars are handed off to the states and local districts, yet the states themselves are responsible for interpreting federal law as they help local school districts manage how those funds are spent. Higher values on the measure of nonlocal revenues indicate greater centralization.

The models also incorporate five variables to account for key environmental factors.¹⁰ Two consider the test-taking population. The first is the percent of students who are white and the second is the percent of students in poverty. The latter is measured as the percent of students receiving federally subsidized breakfast or lunch. Both are measured during the school year that NAEP tests were administered.¹¹ These two measures recognize well-documented empirical findings that have related achievement to student characteristics. Dozens of studies, including those analyzing NAEP data, have found that white students tend to outperform their

peers who are racial minorities (U.S. Department of Education, 2007). Similarly, studies have found strong associations between economic disadvantage and lower student achievement (Ladd, 2012). Studies also find that these income and demographic features of states and schools are associated with the presence of achievement gaps (Bali & Alvarez, 2004; Lee & Reves, 2012). The third variable, population density, is a logged measure of population per square mile of land area in each state.¹² This variable captures the additional educational challenges confronting more urban states, including the presence of larger non-English-speaking populations, that the race and poverty measures might not perfectly capture. The fourth and fifth measures are designed to assess the degree to which a state's citizens might demand excellent schools. One measure is the percent of state residents at least 25 years old who have a bachelor's degree or higher.¹³ A state with a more highly educated population is likely to demand a certain level of quality in its elementary and secondary schools, which could translate into higher NAEP scores. The other is the homeownership rate, a measure of owner households as a percentage of all households in the state, which also is a useful measure capturing state wealth. Prior research has shown that homeownership is associated with better outcomes for students, and given that good schools improve home values, states with large percentages of homeowners are likely to demand high quality schools (Haurin, Parcel, & Haurin, 2002).¹⁴

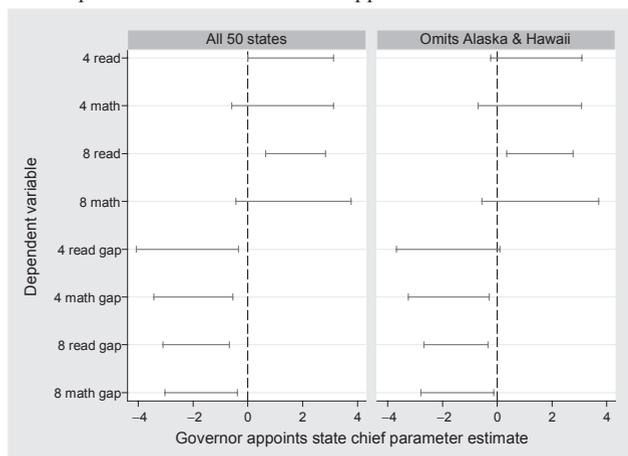
I analyze each dependent variable using ordinary least squares regression with robust standard errors clustered by state. This approach accounts for nonindependence across observations, given that each state appears in each model multiple times. Each model also contains individual dummy variables for the years 2005, 2007, and 2009, with the omitted category being 2003. The dummy variables control for potential unmeasured factors associated with each year that may be related to student achievement.¹⁵ Finally, given the unique populations, geographies, and institutional features of Alaska and Hawaii, I present results including and omitting these two states, which produces 16 regression models in all to consider.¹⁶

Statistical Results

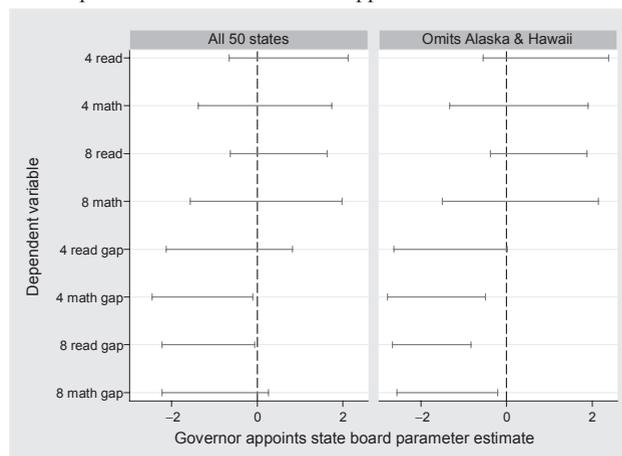
Proponents of greater centralization would expect higher achievement and lower achievement gaps in states where governors appoint state chiefs, governors appoint state board members, the logged number of school districts is low, and the percent of nonlocal spending is high. Advocates for less centralization would expect the opposite for each of these variables. The results provide advocates on both sides with some evidence to bolster their case, although greater centralization tends to be more strongly associated with lower achievement gaps.

Full results from all regressions appear in Tables A1 and A2 in the appendix. Due to the large number of models in the analysis the discussion here focuses on key results that appear visually in Figure 1. Each of the figure's four parts considers all 16 regressions but focuses on results for an individual governance variable. For example, part A considers the independent variable of whether the governor appoints the state chief. Within this part and the others, results are divided

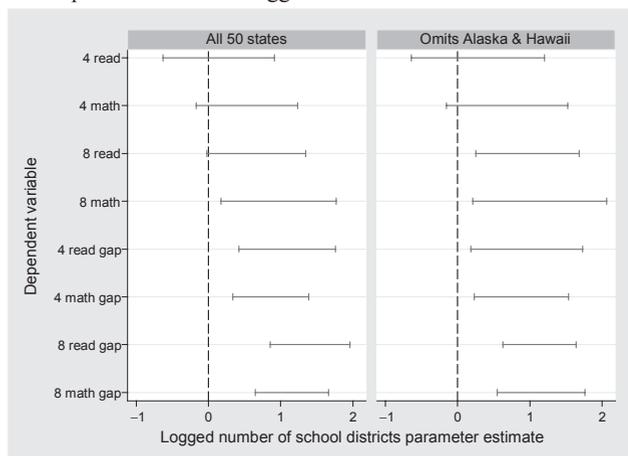
A. Independent variable: Governor appoints state chief



B. Independent variable: Governor appoints state board



C. Independent variable: Logged number of school districts



D. Independent variable: % of nonlocal revenues for education

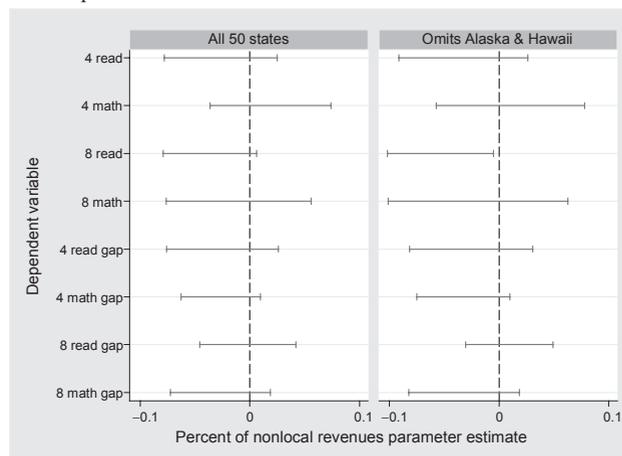


Figure 1. Plots of 90 percent confidence intervals for parameters estimating relationships between NAEP scale scores and governance.

Note: Confidence interval bands that do not include 0 represent regression parameters statistically significant at $p < 0.10$. Full results appear in Tables A1 and A2. The first four rows in each plot examine achievement of all students; the last four examine achievement gaps between nonpoor and poor students.

between models including all states and those omitting Alaska and Hawaii. The horizontal axis represents different possible values for the regression coefficient. In part A, then, each capped range plot reports the 90 percent confidence interval estimate for the governor appoints the state chief coefficient in an individual regression model, beginning with the 4th grade reading model and extending down to the model for achievement gaps in 8th grade math. The midpoint of each range plot is the point estimate for the coefficient. Range plots that overlap with the dotted line, corresponding to a parameter value of 0, fall short of statistical significance at $p < 0.10$.

Part A provides evidence to support the claim that more centralized governance, here measured as allowing the governor to appoint the state chief, is associated with better outcomes. The point estimates, which appear in Tables A1 and A2, are all positive in 4th and 8th grade reading and math achievement, whereas point estimates for achievement gaps are all negative. In only two models on achievement is a parameter statistically significant, however, which is for the 8th grade reading results for all 50 states and for the model that omits Alaska and Hawaii. In contrast, the results are quite strong on the achievement gap models, where in seven of eight cases the coefficient is statistically significant. Substantively, the relationships are small but noticeable nevertheless. For example, for 8th grade reading, the model with all 50 states predicts states with a chief appointed by the governor to have higher achievement by 1.74 NAEP scale score points, or 0.29 of a standard deviation, compared with states without appointed chiefs.¹⁷ On the achievement gap models, the point estimates fall between -1.45 and -2.21 and have substantively larger relationships with the dependent measures. The parameter estimate of -2.21 from the 4th grade reading gap model with all 50 states shows that states with chiefs appointed by the governor have lower achievement gaps by almost half (0.48) of a standard deviation compared with other states, while the 4th grade math model, with a parameter of -1.99 , predicts gaps that are lower by 0.51 of a standard deviation.

Part B considers the governor's ability to appoint members of the state board. The results provide little or no evidence of an association between governor-appointed boards and student achievement in models with all 50 states and those omitting Alaska and Hawaii. Nearly all of the capped range plots in the upper half of part B fall far from the $p < 0.10$ threshold. The results on achievement gaps are different, though, given that all point estimates are negative, and 5 of 8 are statistically significant at $p < 0.10$ (additionally, the p -value for the 4th grade reading gap model without Alaska and Hawaii rounds to 0.10). In contrast to the models that include all 50 states, those omitting Alaska and Hawaii reveal larger parameter estimates with stronger statistical relationships and an overall similar pattern. Some of those results are substantively significant, as well. For example, in the 8th grade reading gap model with all 50 states, the point estimate is -1.14 , which predicts states with governor-appointed boards to have narrower achievement gaps by 0.28 of a standard deviation. For that same grade and subject, in the model that omits Alaska and Hawaii the parameter estimate of -1.75 predicts a gap that is narrower by 0.42 of a standard deviation.

The results in part C reveal compelling statistical and substantive results on the logged school district variable, with both advocates and critics of centralization finding evidence to support their views. Regarding achievement, the point estimates are all positively signed, suggesting that less centralization is associated with better achievement across 4th and 8th grade reading and math. Interestingly, the results are only statistically significant in the 8th grade achievement models. For that grade level, the substantive results are impressive, though. For example, in 8th grade math, the model using all 50 states predicts that a shift from the lowest to highest value on this variable is associated with a substantively large increase in 8th grade math achievement, equivalent to 0.88 of a standard deviation of the dependent variable.

The part C results focusing on achievement gaps reveal statistically and substantively strong relationships across all models, which, in contrast to the achievement results, suggest advantages for more centralized approaches to governance. In other words, less centralization is associated with higher achievement (improved excellence), but also with greater disparities between nonpoor and poor students (diminished equity) across grades and subjects. The school district coefficients on the achievement gap models all are positively signed and range from 0.86 to 1.41. All are statistically significant at $p < 0.05$, and they are substantively important as well. The model with all 50 states for 8th grade reading gaps provides an illustration. Here a shift from the lowest to the highest value on the logged district measure is associated with a large 9.80 point widening of the achievement gap, equivalent to 2.17 standard deviations on the dependent variable. Even when one omits Alaska and Hawaii, the latter of which accentuates this result given that it has only 1 school district (for a logged value of 0 on the independent variable) and thus makes the shift from the lowest to highest value more extreme, the results are still substantively large. Considering a minimum to maximum shift in the school districts variable from the 8th grade reading gap model that omits Alaska and Hawaii still predicts a gap that is wider by 5.81 points, equal to 1.41 standard deviations.

Finally, part D of Figure 1 reports results on the independent variable measuring the percent of nonlocal revenues. Other than the suggestive results for 8th grade reading achievement, which seem to be negatively associated with greater funding centralization, the parameter estimates generally fall well short of the $p < 0.10$ threshold. These statistically insignificant results are somewhat interesting nevertheless. Battles about the proper level of government to fund education have consumed much political energy in the states (Hanushek & Lindseth, 2009). Still, the results here suggest no relationship between achievement or achievement gaps and the amount of nonlocal revenues provided. Neither the advocates nor the critics of greater centralization gain much traction for their arguments based on these results.¹⁸

Discussion

Debates about the benefits of centralized versus decentralized governance have persisted since the earliest days of the United States. At the nation's founding, Hamiltonians and Jeffersonians challenged each other about the appropriate balance

of power between national and state institutions. Today, such arguments continue in many contexts, although political scientists have shown that much popular support exists for the Jeffersonian view that less centralized governance is preferable. As Treisman (2007, p. 1) notes, "Along with democracy, competitive markets, and the rule of law, decentralized government has come to be seen as a cure for a remarkable range of political and social ills." By exploring state governance of education, a policy area where centralization varies along multiple dimensions, this article helps contribute to the ongoing debate over the relative benefits of particular institutional arrangements.

Theoretically, the results help bolster the view that one should consider centralization a multidimensional concept (Treisman, 2007). Not all forms of centralization behave similarly when examined against measurable outcomes. In this analysis of state NAEP results, more political centralization, as measured by the governor's ability to appoint state education chiefs or state board members, revealed support for those who believe that greater centralization can attenuate achievement gaps between poor and nonpoor students. In contrast, the findings on fiscal centralization, a topic that prompts impassioned debates across the country, suggested essentially no relationship between the percent of nonlocal revenues for education and student success, measured either as academic achievement or achievement gaps between nonpoor and poor students. Different governing arrangements can produce tensions as well, as the results on administrative centralization illustrated. Having more school districts is associated with higher achievement in 8th grade but also larger achievement gaps in 4th and 8th grade, suggesting a possible trade-off between excellence and equity.

Interestingly, the results also reveal that the association between centralization and outcomes sometimes depends on the particular outcome in question. For example, while more decentralized administration, as measured by the logged number of school districts, was associated with higher achievement, the results were more statistically significant for 8th graders than for 4th grade students. What might account for this difference across grade levels? One potential explanation, which opponents of centralization might advance, flows from the argument that smaller school districts can offer more personal and less bureaucratic assistance to their students, which can help them succeed. Such an advantage may not necessarily exist at the elementary school level, where officials in large and small districts alike try to operate schools on smaller scales with fewer students per teacher and a more home-like atmosphere. But once students arrive in middle school or junior high, typically in 6th or 7th grade, the advantages of smaller districts may begin to manifest themselves. Students in that stage of education may be more likely to get lost in the crowd in large districts with bigger middle schools. Smaller districts may be able to continue offering a more personal touch to their middle schoolers, which could help them excel academically or at least prevent them from slipping through the cracks. That kind of attention might be especially helpful for middle school students given the emotional and physical changes associated with the onset of puberty, which typically occurs at this time, along with their added need to become more serious about academic work as they prepare for success in high school and beyond.

The results in the top four capped range plots in part C of Figure 1 may be revealing the advantage of more decentralized administration in dealing with these emotional, physical, and academic demands.

Still, as the bottom four plots in part C show, it is crucial to consider gaps between students and not just the performance of all students. It could be that a more personal touch in middle school tends to benefit students already poised for high school success, thus accelerating their achievement and driving up overall averages, but in the process widening gaps between students. Deeper study of these dynamics seems warranted. If education is indeed the civil rights issue of the twenty-first century, as some politicians and activists have increasingly claimed, then any systemic feature of governance that appears to diminish equity would merit close scrutiny.

The findings also help to shed valuable light on contemporary education debates. Because education has become a more salient and consequential policy area, governors have clamored for more control over their state systems. As the most recognizable political figure in a state, governors have assured voters that locating accountability for education performance in the governor's mansion will boost student achievement. To date, however, the governors' claims have persisted despite lacking hard evidence to back them. The results on the state chiefs and state boards variables provide at least some suggestive evidence to support the governors' views. Subsequent research that probed more deeply the nuanced connections between governors, state boards, and state chiefs could further test the governors' arguments. For example, the power to appoint may matter more in states where governors take an active rather than a hands-off approach to education policymaking. Alternatively, a governor who is enthusiastic and knowledgeable about education policy may be able to lead and coordinate regardless of the appointment powers that he or she possesses. Such nuances may produce added insights given that in the present analysis, in order to specify a tractable statistical model, the state chief and state board measures have necessarily simplified the arrangements that exist. As reviewers pointed out, it is worth noting that additional variation is embedded in the cases coded "0" on these two measures. More qualitative work that probed some of these nuances could generate added insights that could help inform future state-level debates about the proper way to connect governors, state chiefs, and state boards. Similarly, more detailed coding of the specific powers that chiefs and boards possess—admittedly, a challenging task to accomplish for all 50 states—could reveal the mechanisms by which these leaders exercise influence. It could be that the specific menu of powers and responsibilities themselves are more important than whether gubernatorial appointments are the path to power for these officials.

Finally, an important caveat is in order. Despite the relationships revealed in the analysis, one should be cautious about the claims that an observational study such as this one can support. Making descriptive inferences that show associations between variables is different than showing that a causal relationship between those variables exists. While policy advocates supporting centralization may wish to claim that providing governors with more enhanced appointment powers would cause

achievement to increase or that consolidating school districts will produce narrower achievement gaps, deeper analysis is required before reaching those conclusions.

Yet as the opening pages of this article noted, studying state governing arrangements rather than specific policies can help to identify baseline relationships between the systemic features of governance and valued outcomes. Subsequent research can explore these associations in more detail to uncover potential causal mechanisms at work. Knowing that the number of school districts is associated with certain outcomes produces a nice launching pad for more work that could help explain why this association exists. In its conceptualization and approach, then, this article has revealed that a focus on structural characteristics of states can serve valuable analytical purposes even though such structures are somewhat distant from ultimate outcomes than more proximate state or local policies that operate in classrooms each day. Such an approach that focuses on governing institutions rather than policy levers can help scholars assist policymakers as they assess the potential value of different institutional designs.

If the evidence suggests that beneficial outcomes are associated with certain institutional arrangements, then digging deeper to understand the reasons why and then potentially reforming the institutions themselves may prove promising and a more efficient way to create positive change. In short, a small number of major institutional changes may end up being substantively more valuable than tinkering with many more narrow policy levers. Political scientists who explored state education governance several years ago recognized the potential value in considering state institutions, and urged others to analyze such matters more deeply (Masters et al., 1964). This article has made some progress on that front, but clearly much potential work remains given the diverse governing arrangements in the states and the variety of valued educational outcomes that scholars might consider.

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Notes

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1. Some education policy scholars have published more recent accounts of state education governance (Conley, 2003), and applied reports are widely available (NASBE Study Group on Education Governance, 1996). Generally speaking, that work has been descriptive and lacked theoretical grounding. An exception is Shober (2010).
2. Meier and O'Toole (2006) use the word "outputs" not "outcomes," but their discussion embraces both ideas. In this article, I draw on Wilson's (1989) definitions of these concepts to preserve the distinction. I consider policy outputs to be specific policies that the governance system produces and policy outcomes to be the results for people that ultimately emerge.
3. This study focuses on structural factors, while accounting for key environmental conditions.

4. A long tradition of research in public policy and political science has recognized the analytical value of leaving policies and implementation decisions in black boxes to examine broader associations between institutional arrangements and results. See, for example, Doyle (1986), Russett (1994), Coleman and Parker (2009), and Gerring and Thacker (2008).
5. Treisman (2007) frames his analysis by discussing degrees of “decentralization,” but the basic logic is the same whether one uses that term or “centralization.”
6. The year 2003 was the first that the federal government required states to participate in NAEP as a condition of receiving federal Title I dollars. Before 2003, state participation was optional. NAEP data were downloaded from the National Assessment of Educational Progress website located at <http://nces.ed.gov/nationsreportcard/naepdata/dataset.aspx>.
7. Data on paths to power for chiefs and board members come from the author’s coding and cross-checking of various primary source documents. Most sources are from either the Council of Chief State School Officers, the National Association of State Boards of Education, or the Education Commission of the States. Additional sources were consulted for the small number of years when these sources disagreed on a state’s arrangement.
8. School district data come from the U.S. Department of Education (at <http://nces.ed.gov/Programs/digest/>).
9. Revenues data come from the U.S. Department of Education (at <http://nces.ed.gov/Programs/digest/>).
10. A reviewer suggested that correlations between independent variables may have induced multicollinearity. Post-estimation VIF tests on all models never produced values higher than 3.2, which is far below 10.0, the threshold at which multicollinearity might merit additional attention.
11. Student race and poverty measures were downloaded from the U.S. Department of Education’s Common Core of Data located at <http://nces.ed.gov/ccd/bat/>.
12. Measures of total population were downloaded from the U.S. Census Bureau at <http://www.census.gov/popest/data/intercensal/state/state2010.html>; total land area in the states came from U.S. Census Bureau (at <http://www.census.gov/compendia/statab/>). These measures were used to calculate population density.
13. State-level educational attainment was compiled from U.S. Census Bureau (at <http://www.census.gov/compendia/statab/>).
14. Berkman and Plutzer (2005) make a related argument by noting that under certain conditions senior citizens who own their homes may be induced to support higher school expenditures, given the link between school quality and home values. Data on homeownership come from the U.S. Census Bureau (at <http://www.census.gov/housing/hvs/data/ann11ind.html>). Many thanks to the reviewer who suggested this measure.
15. Given the relatively short time series involving only four time periods (T), I chose not to use other time-series-cross-section (TSCS) methods, such as a random-effects specification or panel-corrected standard errors, given the caution from Beck (2001, p. 274) that “one ought to be suspicious of TSCS methods used for, say, $T < 10$.”
16. Alaska and Hawaii are both geographically distant from the other states and contain unique disadvantaged populations, comprised primarily of Native Americans (Alaska) or Pacific Islanders (Hawaii). In addition, Alaska is geographically vast and sparsely populated. Hawaii is institutionally atypical given that it has a single school district. A comprehensive examination of bivariate relationships between each dependent variable with each independent variable, as well as plots of regression residuals with all states in the models, revealed these two states to be outliers in enough instances to warrant presenting results from models with and without them. Theoretically, that was better than including a dummy variable (coded 1 if Alaska or Hawaii, and 0 otherwise) because such an approach would consider these states to be two of the same kind, which is unwarranted because on most measures they are outliers for very different reasons.
17. These predictions and others discussed in the article are made while holding other variables in the models constant.
18. In response to a reviewer’s query, I also ran all models using just the percent of revenues from state sources, rather than the combined measure that looked at federal and state revenues. The results,

available upon request, were nearly identical in terms of the size of the parameter estimates and the measures that came up as statistically significant.

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Appendix: Regression Tables

Table A1. Achievement models

	4th Grade Reading		4th Grade Math		8th Grade Reading		8th Grade Math	
	All states	Omit AK & HI	All states	Omit AK & HI	All states	Omit AK & HI	All states	Omit AK & HI
Governor appoints chief	1.56 [†] (0.94)	1.42 (0.99)	1.26 (1.11)	1.19 (1.13)	1.74** (0.65)	1.56** (0.72)	1.67 (1.26)	1.57 (1.27)
Governor appoints board	0.73 (0.83)	0.92 (0.87)	0.18 (0.93)	0.29 (0.96)	0.50 (0.68)	0.75 (0.67)	0.20 (1.06)	0.32 (1.09)
Logged # of school districts	0.14 (0.46)	0.28 (0.55)	0.53 (0.42)	0.68 (0.50)	0.66 (0.41)	0.97** (0.43)	0.97** (0.48)	1.14** (0.55)
% nonlocal educ. revenues	-0.03 (0.03)	-0.03 (0.04)	0.02 (0.03)	0.01 (0.04)	-0.04 (0.03)	-0.05* (0.03)	-0.01 (0.04)	-0.02 (0.05)
% white students	0.19** (0.05)	0.19** (0.05)	0.11** (0.05)	0.11** (0.05)	0.19** (0.04)	0.19** (0.04)	0.14** (0.05)	0.14** (0.06)
% students on meal subsidy	-0.12** (0.06)	-0.13* (0.07)	-0.21** (0.06)	-0.20** (0.08)	-0.10** (0.05)	-0.10 (0.06)	-0.24** (0.07)	-0.24** (0.09)
Logged pop. density	0.91** (0.34)	0.73* (0.41)	0.35 (0.32)	0.26 (0.40)	-0.03 (0.30)	-0.24 (0.33)	-0.64* (0.37)	-0.73 (0.44)
% in state with bach. or higher	0.45** (0.10)	0.46** (0.11)	0.30** (0.13)	0.31** (0.14)	0.47** (0.09)	0.49** (0.09)	0.56** (0.15)	0.58** (0.16)
Homeownership rate	0.01 (0.12)	0.03 (0.13)	-0.01 (0.12)	0.01 (0.13)	-0.01 (0.09)	0.04 (0.09)	0.02 (0.14)	0.05 (0.15)
Year is 2005	0.89** (0.38)	0.86** (0.42)	3.61** (0.32)	3.58** (0.35)	-0.75** (0.35)	-0.89** (0.39)	1.31** (0.45)	1.30** (0.49)
Year is 2007	3.41** (0.47)	3.39** (0.49)	6.00** (0.39)	5.96** (0.40)	0.25 (0.41)	0.15 (0.43)	4.75** (0.49)	4.78** (0.51)
Year is 2009	3.30** (0.49)	3.40** (0.49)	6.62** (0.47)	6.58** (0.48)	1.56** (0.48)	1.43** (0.49)	6.80** (0.55)	6.80** (0.56)
Constant	193.18** (8.38)	192.17** (10.74)	221.53** (8.97)	219.32** (11.21)	240.46** (6.73)	236.19** (7.67)	258.99** (10.44)	256.45** (12.52)
Adjusted R ²	0.75	0.73	0.69	0.68	0.80	0.80	0.74	0.72
Model F-test	26.46**	21.83**	45.24**	44.95**	39.23**	37.75**	24.58**	22.48**
Model std. error	3.19	3.23	3.33	3.39	2.70	2.66	3.93	4.00
N (clusters)	194 (50)	186 (48)	194 (50)	186 (48)	194 (50)	186 (48)	194 (50)	186 (48)

Note: [†] p -value rounds to 0.10; * $p \leq 0.10$; ** $p \leq 0.05$. "AK & HI" = Alaska and Hawaii. Cells report parameter estimates with robust standard errors in parentheses. Standard errors are clustered by state. Dependent variables are NAEP scale scores.

Table A2. Achievement gap models

	4th Grade Reading		4th Grade Math		8th Grade Reading		8th Grade Math	
	All states	Omit AK & HI	All states	Omit AK & HI	All states	Omit AK & HI	All states	Omit AK & HI
Governor appoints chief	-2.21* (1.11)	-1.79 (1.13)	-1.99** (0.86)	-1.77** (0.88)	-1.89** (0.72)	-1.51** (0.70)	-1.71** (0.79)	-1.45* (0.79)
Governor appoints board	-0.65 (0.88)	-1.31 [†] (0.79)	-1.28* (0.70)	-1.64** (0.68)	-1.14* (0.65)	-1.75** (0.55)	-0.98 (0.74)	-1.38* (0.70)
Logged # of school districts	1.09** (0.40)	0.96** (0.46)	0.86** (0.31)	0.88** (0.39)	1.41** (0.33)	1.13** (0.30)	1.16** (0.30)	1.15** (0.36)
% nonlocal educ. revenues	-0.02 (0.03)	-0.03 (0.03)	-0.03 (0.02)	-0.03 (0.03)	0.002 (0.03)	0.01 (0.02)	-0.03 (0.03)	-0.03 (0.03)
% white students	-0.16** (0.04)	-0.12** (0.04)	-0.13** (0.03)	-0.10** (0.03)	-0.13** (0.03)	-0.10** (0.02)	-0.11** (0.03)	-0.09** (0.03)
% students on meal subsidy	-0.08 (0.06)	-0.03 (0.04)	-0.08* (0.04)	-0.04 (0.03)	-0.10** (0.05)	-0.07** (0.03)	-0.06 (0.05)	-0.02 (0.04)
Logged pop. density	0.52 (0.57)	1.23** (0.35)	0.91** (0.38)	1.34** (0.29)	1.07** (0.46)	1.68** (0.24)	1.13** (0.40)	1.60** (0.29)
% in state with bach. or higher	0.17* (0.08)	0.17** (0.08)	0.16** (0.07)	0.17** (0.07)	0.07 (0.07)	0.06 (0.07)	0.24** (0.09)	0.25** (0.10)
Homeownership rate	0.17 (0.12)	0.14 (0.12)	0.22** (0.11)	0.22* (0.12)	0.16* (0.09)	0.10 (0.07)	0.22** (0.10)	0.21* (0.11)
Year is 2005	-1.13** (0.52)	-1.20** (0.54)	-0.95** (0.37)	-0.94** (0.39)	-1.23** (0.49)	-1.20** (0.48)	-1.41** (0.46)	-1.51** (0.49)
Year is 2007	-0.97* (0.53)	-0.96** (0.53)	-0.56 (0.39)	-0.59 (0.39)	-0.98* (0.49)	-0.91* (0.48)	-1.44** (0.45)	-1.52** (0.46)
Year is 2009	-1.14* (0.59)	-1.33** (0.59)	-0.18 (0.42)	-0.26 (0.43)	-0.48 (0.47)	-0.39 (0.46)	-0.67 (0.49)	-0.73 (0.52)
Constant	16.49 (10.28)	11.85 (8.94)	6.44 (8.12)	1.82 (8.60)	10.01 (8.20)	9.40 (6.32)	4.91 (8.21)	0.31 (8.14)
Adjusted R ²	0.39	0.50	0.54	0.60	0.53	0.64	0.54	0.60
Model F-test	7.33**	9.12**	8.76**	11.49**	12.40**	19.22**	13.13**	17.51**
Model std. error	3.58	3.24	2.68	2.55	2.85	2.48	3.03	2.86
N (clusters)	194 (50)	186 (48)	194 (50)	186 (48)	194 (50)	186 (48)	194 (50)	186 (48)

Note: [†]*p*-value rounds to 0.10; **p* ≤ 0.10; ***p* ≤ 0.05. “AK & HI” = Alaska and Hawaii. Cells report parameter estimates with robust standard errors in parentheses. Standard errors are clustered by state. Dependent variables are gaps in NAEP scale scores between students ineligible for meal subsidy (e.g., nonpoor) and students eligible for meal subsidy (e.g., poor). Negatively signed coefficients are associated with lower achievement gaps.