

## **School Budgets and Local Teacher's Unions: The Mediating Role of Local Institutions**

Michael Berkman, Penn State University  
[mberkman@la.psu.edu](mailto:mberkman@la.psu.edu)

Eric Plutzer, Penn State University  
[Plutzer@psu.edu](mailto:Plutzer@psu.edu)

Daniel Jones-White, Penn State University  
[drj127@psu.edu](mailto:drj127@psu.edu)

April 11, 2004

Abstract: Do teachers' unions cause school districts to spend more than they would in the absence of unions? Is the ability of unions to induce higher spending a consequence of their collective bargaining power, their ability to mobilize resources politically, or some combination of the two? When unions attempt to influence school budgets, do they weaken the linkage between public preferences and policy outcomes? To answer these questions, we explore how union strength, union size, public opinion, and the state-level budgetary environment contribute to local educational spending for a sample of over 9000 unified school districts in 49 states. We find that unions influence local per pupil spending through their political power (membership) and monopoly control of a critical public service (strength). But we also find that much of this power works at the state level – through the aggregation of local resources. In states with more centralized funding systems, unions have an interest in influencing the state legislature and have less to gain by expending resources in local politics. Consistent with that, we find that local unions are most effective in increasing spending where the state role is small and state-level measures of union strength have their largest effects where the state role is large. Finally, while unions lead schools to spend more, we find that they do so largely within the range of preferences of district residents and do not hinder policy responsiveness.

Terry Moe has argued that “teachers unions have more influence on the public schools than any other group in American society ....the objectives they pursue are reflections of their own interests, which are often incompatible with what is best for children, schools, society” (Moe 2001). Public school administrators and school boards operate in a political rather than a market environment, and the result is that they respond to the demands of unions and other interests rather than parents, homeowners, and other consumers (Chubb and Moe 1990). In this paper we use measures of public preferences and spending outcomes for nearly 10,000 American school districts to investigate the influence of strong teacher unions on instructional expenditures and overall policy responsiveness.

Local control through democratic institutions has long been a feature of American public education. While some, such as Chubb and Moe (1990) see this democratic control as the problem, others glorify American school districts—close to the people, non-partisan, and run by ordinary citizens – as “crucibles of democracy” (Iannaccone and Lutz 1995). In our larger project we examine this democratic control by looking at the extent to which school districts are responsive their publics.<sup>1</sup> We have shown that responsiveness is conditioned by how political institutions—school boards and school districts—are designed. Some rules intended to empower citizens (e.g., referendum rights) or redress discrimination and vote dilution (e.g., ward-based elections) enhance policy responsiveness while others intended to distance school boards from the public (e.g., fiscal independence) retard responsiveness.

---

<sup>1</sup> Berkman and Plutzer (2002, 2003) and *National Science Foundation* grant # 0350541 “Public Opinion and Policy Responsiveness in Small Electorates: Institutions and Spending in American School Districts”.

We have also found (Berkman and Plutzer 2004) that some narrow but unorganized interests can play a critical role in setting overall education spending levels. For example, elderly voters without strong ties to their communities reduce local education spending despite their relatively small numbers and lack of formal organization. Teacher unions are a potentially even more powerful interest. Organized at all levels of government, teachers are unionized to varying degrees in school districts throughout the country and have been shown to have a clear impact on spending levels and budgets (Hoxby 1996; Rose and Sonstelie 2004; Bough and Stone 1987). But the mechanisms through which unions exercise influence and the extent to which they interfere with the translation of public preferences is not well established. While some (Hoxby 1996; Courant et al 1979) emphasize the collective bargaining power of teachers' and other public employee unions, others emphasize their political power (Moe 1994; Rose and Sonsteile 2004). We distinguish between these two mechanisms, as well as how they operate at the state and local levels. .

### The Political Influence American Teachers

The National Education Association (NEA) and the smaller but more urban American Federation of Teachers (AFT) are the most important American public school teacher unions. Both date back to the early 20<sup>th</sup> century but emerged as formidable voices in American education during the 1960s when states began to allow public employees generally or even teachers specifically, the right to bargain collectively for district wide contracts (Berube 1988; Lieberman 1997; Kerchner, Koddich, and Weeres 1997). Although the NEA had been largely a professional organization it too fought for collective bargaining agreements once the AFT secured the right to bargain on behalf of

New York City teachers in 1961 (Moe 2001; Saltzman 1985). While in the early 1960s “the American Federation of Teachers (AFT) was the only teacher union to speak of, and it organized no more than five percent of the nation’s teachers clustered in a few urban areas” (Moe 2001) by 2001 “the vast majority of teachers (outside the South)” were covered by collective bargaining (Moe 2001).<sup>2</sup>

Do teachers unions retard policy responsiveness? Do they cause school boards to spend more? These two questions are related. Public choice models generally anticipate budget maximization from “noise” introduced between the spending preferences of the median voter and public policy (see Farham 1990; Matsusaka 1993; 1995; Steuenberg 1992). This noise comes from representative institutions (*i.e.*, legislatures), public employees seeking higher compensation and a larger work force (Courant et al. 1979), or organized interests pressing their demands. Communities respond to public employees’ monopoly control over public services by providing residents with higher levels of taxing and services than they prefer while these same unions are political actors with the ability to influence the political process. Thus, public choice accounts would expect unions to contribute to higher spending and lower levels of responsiveness to citizens.

Of course, this power is not absolute. Residents can always pick up and move to communities without collective bargaining and households can counter their political influence when given the “opportunity to vote directly on referenda concerning tax collections” (Courant et al 1979, 806). Further, at least in the area of educational financing, teachers’ preferences are not necessarily different from the median voter.

---

<sup>2</sup> The NEA grew from 703,829 members in 1957 to 2,376,108 in 2002, and the AFT from 136,000 members in 1967, to 1,000,000 in 2002 (Berube, 1988; Gale Group, 2002). These estimates of teachers’ union membership include retired teachers, and in the case of the NEA school administrators and health care providers, and other public sector employees.

Most public opinion polls show a majority of the public feels that local, state and federal spending on public schools is too low, rather than too high (Plutzer and Berkman 2004). In particular, parents and homeowners may have a strong interest in higher spending on schools and, comprise a majority in many communities (Fischel 2001; Rose and Sonstelile 2004).<sup>3</sup> This point is important because unions' role in local school politics could be to reinforce support for parents rather than oppose them. Indeed, many residents prefer to spend more on schools than school boards do; we have found (and will show again below), in direct opposition to the standard public choice model, that districts that offer residents the opportunity to vote directly on school budgets through a referendum will spend more than districts where the board is more insulated from the public.<sup>4</sup>

Third, school boards operating in an environment where voters are given the opportunity to vote directly on budgets or taxes through referenda both spend more and are more responsive to public preferences than are school districts in which the board is relatively insulated from the public (Berkman and Plutzer 2003). This suggests that most school boards may actually be heavily influenced by narrowly defined interests like the elderly (Berkman and Plutzer 2004) or anti-tax groups who favor lower spending.

Unions, in this case, could help the broader public realize their preference to increase spending by helping to elect school board officials inclined to support higher spending or

---

<sup>3</sup> The preferences of homeowners and parents are not alike either. Renters are more likely to favor higher education spending than homeowners (Berkman and Plutzer 2003), although home buyers will often pay more for higher quality schools (Fischel 2001). Parents generally favor higher education spending than non-parents (Berkman and Plutzer 2003).

<sup>4</sup>Even some teachers' workplace demands may be similar to those of parents. For example, public employees generally may often want to increase the size of their workforce, but teachers can argue that they, like parents, simply want smaller classes. Teachers' emphasis on working conditions and equity for their members, however, could lead to a different distribution of class sizes within a district than parents would prefer.

using their political power “to encourage local voters to support tax increases” (Rose and Sonstelie 2004, 5).

We also expect that strong unions might have a similar impact on responsiveness through their contract negotiations. These negotiations precede the need to gain public approval, in many districts through a referendum on the full budget, on a proposed tax increase, or on a tax increase above a certain amount. In other districts school board officials negotiating contracts do not need to gain approval but must face reelection. In any referendum game public officeholders—in this case the school board—go first by proposing a referendum the public will vote on.<sup>5</sup> It is at this stage that strong unions exercise their power; in effect, they set the agenda with the school board (or their representative) through these contract negotiations. Indeed, we expect that unions are privileged over other organized interests for precisely this reason. In effect, they can influence the budget before other groups have access to it.

The result of this privileged access is that strong unions can push for higher spending if they expect that the public is more supportive than if the board were to expose just their own preferences. The union knows it can push for higher spending than the board might otherwise prefer because the public will give its approval, whether through a referendum or at the next election. Thus, we find in the literature reasons to think that unions might increase or decrease policy responsiveness and we shall explore this without a formal, signed hypothesis.

---

<sup>5</sup> It is this agenda setting role that, for some, distinguishes referenda from initiatives. In an initiative the voters theoretically go first putting an item up for a vote (Steuenberg 1992; Romer and Rosenthal 1982). Elizabeth Gerber (1996) shows that this distinction is not as great as it seems at first because when the initiative is available legislatures will *anticipate* public preferences and go first. In any case, while this agenda setting role for the legislature is recognized as enhancing its power *vis a vis* legislatures operating with initiatives, we have not seen it extended to the unions in negotiation with them.

Whether or not their preferences coincide with those of parents or homeowners, the wage impact of teacher unionization is similar to that expected for other public employee unions. Unionized teachers receive modestly higher salaries than non-unionized ones (Kasper 1970; Hall and Carroll 1973; Baugh and Stone 1982; Eberts and Stone 1984; Easton 1988). Hoxby (1996) estimates the union effect on direct wages to be between three and twelve percent while Rose and Sonsteille (2004) find that unions are successful in securing an “experience premium” that allows for higher salaries than residents should need to pay to keep the same teachers in the district. This, they argue, is probably evidence of broader influence as “unions that are successful in negotiating high experience premiums are likely to be successful in negotiating other terms and conditions favorable to union members” as well (Rose and Sonsteille 2004, 36).

*School Board Elections:*

Contracts are developed in negotiations between the school superintendent or her representative and the AFT or NEA who can, in some districts, monopolize “the services of incumbent teachers” and increase the budget (Hoxby 1996, 676). But teachers are also capable of “creating a political coalition in local elections” (Hoxby 1996, 676). Since the “school district’s representative at the negotiating table is ultimately responsible to the elected school board” (Rose and Sonsteliie, 2004) teachers become involved in school board elections (Moe 2003) where they enjoy organizational advantages for recruiting and financing candidates and mobilizing voters (Moe 2003). Larger teacher unions can also overcome collective action problems faced by more diffuse homeowner groups who, unlike teachers, cannot “organize a union and tax themselves through union fees to support candidates aligned with their interests” (Rose and Sonsteilie 2004, 2). Teachers,

therefore, can influence budgets through collective bargaining and are in the enviable position of playing “a role in determining the agenda for those facing them at the bargain table” (Freeman, 1986).

### *State Politics and the Sources of Educational Revenues*

But as a “powerful political constituency in education” (Berube 1988; 1) teachers are active at the state-level as well where education is the largest state funded function.<sup>6</sup> It is not surprising, therefore, that unions are recognized as second only to business in effectiveness among organized groups in state politics (Thomas and Hrebner, 1999). Although there are many issues of interest to them, their state-level political activity can also influence local spending levels because the revenues available to local school districts are often determined by the state. What matters in this regard is the extent to which education spending in the state is “centrally-determined”; in some states local districts rely much more upon state sources of revenue, while in others they rely much more on their own sources of revenues.<sup>7</sup> Through their state-level political activism unions can therefore influence overall state spending levels. These state spending levels, in turn, effect the resources that localities have available to spend on instructional expenses, especially in those states that are more centrally-determined.

### **Hypotheses**

School districts spend roughly half of their total operating budgets on teacher salaries and benefits. Since these are determined largely through contract negotiations

---

<sup>6</sup> Although on average states are spending a slightly smaller proportion of their overall budgets on education than they had been. In 1995 an average of 30 percent of state spending went to education, with some devoting as little as 20 percent and others as much as 40 percent to schools. In 1992 the average was 31 percent and by 2000 it was down to 27 percent (State Politics and Policy Quarterly data archive).

<sup>7</sup> States have taken on a larger share of educational financing as they have come to take more interest in equalizing revenues across districts. See Wong (1999) on the role court decisions and other political forces have played in this across the states.



between teachers and board representatives, and since unions both strengthen teachers' bargaining position and are actively involved in local politics, we expect first and foremost that the overall effect of unionization on local school district budgets is to increase the amount spent on each pupil. As we discuss in greater detail below, we employ a measurement strategy that distinguishes between the bargaining power of a union—what we refer to as *union strength*—and their political power, which we refer to as *union size*.

All else being equal:

*H1a Spending will be higher in local school districts with strong local unions.*

*H1b Spending will be higher in local school districts with larger local unions.*

The mechanisms through which unions are able to influence overall spending levels are not well understood. Unions attempt to influence education spending at both the state and local level but their influence at each is presumably different. At the local level unions both push for favorable contract terms and mobilize support for board candidates favorable to them (H1). At the state level, unions can push for more spending on education across all districts but are less able to direct *which districts* receive more or less money. As we discuss in greater detail below the literature provides little theoretical basis for characterizing strong unions at the state level and, thus, little guidance on appropriate operationalization.

*H2a When unions are stronger at the state level, spending in all districts will be higher (regardless of local union strength).*

*H2b When there are more union members in the state, spending in all districts will be higher (regardless of local union size).*

Further, state decisions about funding should be of greatest importance to unions in states that centrally-determined--where states are responsible for a larger percentage of local funding—and of less importance in states that require localities to rely more on their own sources. We expect unions to direct their energies at the venue in which their interests are most at stake and their influence more likely to matter. We therefore expect that the effect of state and local unions should be greater when the state (or local) share is greater. This suggests:

*H3a/b The effect of strong/large local unions on spending levels will be greatest when the state share of education spending is low.*

*H4a/b The effect of strong/large state unions on spending levels will be greatest when the state share of education spending is high.*

If unions seek higher education spending at the state and district level in spite of the spending preferences of the public we would consider their effect on policy responsiveness to be pernicious: They maximize budgets beyond that preferred by the mass public. But we have argued that unions may act in accordance with public preferences and actually enhance responsiveness. We conclude the paper by testing these contradictory expectations empirically.

## DATA AND METHODS

Our analysis focuses on the universe of fiscally independent, unified (K through 12) school districts that enrolled 250 or more students in the 1989-1990 school year. After eliminating outliers on the dependent variable (districts that ranked in the top or bottom 2½ % in per pupil spending) and accounting for missing data, our analytic sample consists of 9235 school districts.

Dependent Variable: 1995 Per-Pupil Instructional Expenditures

Our dependent variable is a district's total per-pupil instructional (transportation cost and capital costs are excluded) expenditures in fiscal year 1995 (the 1994-95 academic year). We select 1995 because it occurs later than the measurement of all independent variables (most variables are measured in 1990 and our opinion measure, though centered on 1990, is based on polling data through 1994).

Primary Independent Variables: Union Strength and Union Size

The most recent nationwide survey of school district unionization was the 1987 Census of Governments. The Census provides for every district three measures: the percentage of all full time teachers who are members of teachers unions, whether the union is legally recognized to conduct collective bargaining, and whether a contract between the union and district is actually in place. Hoxby (1996) has argued that it is important to utilize all three measures in order to classify districts properly because the percentage of union members alone overestimates union strength by including members of NEA chapters that function primarily as professional associations and do not engage in collective bargaining. As a result, we utilize Hoxby's dichotomous measure that codes a district as having a strong union if (a) 50% or more of full-time teachers are members of unions, (b) the union is recognized as a collective bargaining unit and (c) a union contract is in place. By this measure, 43% of all school districts in our sample are classified as having strong unions.<sup>8</sup>

---

<sup>8</sup> We investigated using more complex operationalizations that took into account the percentage unionized – reasoning that unions with 95% membership would be stronger than those with 55%. We used validation criteria suggested by Witte et al (2003): to assess the correlation with the generosity of employee benefits. In these analyses, the simple dichotomy performed as well or better as more complex measures.

On the other hand, it is precisely the size of the union that Moe (2003) contends is critical in determining their political strength. As a measure of union size we take the total number of unionized members, irrespective of their collective bargaining power. Since the average local has only 134 members and a district one standard deviation above about 1040 members it is easy to see that smaller unions will be much less able to bring meaningful political resources to bear in an election although they may be quite strong in contract negotiations. Thus we employ a measure of local membership (logged to adjust for a high degree of skewness).

In our analytic sample, 41% of all school districts (representing about 46% of all students) had strong unions. Among the strong union districts the mean number of union members is 253 and in more than half these districts, all or almost all teachers are members. Among the districts without collective bargaining, about 35% have zero members of any labor organization. These districts tend to be somewhat larger than average, have higher property values, and we estimate them to be somewhat liberal in their preferences for educational spending (the method is explained below). The remaining districts without strong unions have varying levels of union membership with the average of just over 60%. These districts tend to behave somewhat lower housing values and are somewhat more conservative than average.

We also created state-level aggregates of both the union strength and union size measure. Union strength is the percentage of teachers in each state who are members of strong unions. Union size is the total number of unionized teachers. Our local measures are based on a two dimensional view of union power: local unions that are *strong* in the collective bargaining relationship and *large* to assemble the organizational resources to

influence elections each contribute to union power. We believe the state aggregates have slightly different meanings and expect different results.

First, because at the state level unions are competing for a piece of total state expenditures against other organized interests it is not at all obvious or established that *larger* unions will be more effective. Further, the mean school district is in a state with 50,000 union members so it seems to us that even a “small” state level teachers’ union has substantial political and organizational resources. An additional one thousand or even ten thousand members would seem less significant at the state level than a comparable marginal increase at the local level. Given the lack of guidance on what makes a state level teachers’ union politically powerful we proceed with this measure of state-level size but do not expect it to have the same explanatory power as the disaggregated local level measure.

Second, we believe that aggregates of strong local unions also do not directly translate to state-level power since negotiating power is not used at the state level. However, aggregate strength does indicate the percentage of teachers that are involved in meaningful collective bargaining within the state and who are presumably more militant.

#### School District Public Opinion

Economists argue that local citizens’ “taste” or “demand” for education is increasingly important in explaining differences in district per-pupil spending (e.g., Hoxby 1998). Economists never attempt to measure such tastes directly but instead look to home values or demographic proxies. Assessing policy responsiveness requires measures of preferences toward spending on public schools at the school district level.

We created a measure by the method we call “small polity inference.” Small polity inference combines the features of three related methods:

- (1) state level aggregation (Brace, Butler, Arceneaux, and Johnson 2001; Erikson, Wright and McIver 1993)
- (2) simulation by demographics (Pool, Abelson and Popkin 1965; Weber and Shaffer 1972; Weber, Hopkins, Mezey and Munger 1972), and
- (3) Bayesian hierarchical models with post-stratification weighting (Gelman and Little 1997; Park, Gelman and Bafumi 2003)

To see the relationship among the three methods, consider the following equations for predicting the opinions of a person who is of voter type  $j$  in place  $k$ . In the *simulation* method, each voter type  $j$  is determined by the intersection of demographic variables  $X$ , ignoring geography (Equation 1, next page).

The aggregation method calculates the mean opinion for each place. It can also be thought of as a special case of simulation in which demographics are ignored and voter types are entirely determined by geography. The estimation of opinion is a simple analysis of variance in which place is the independent variable. Equation (2) describes this analysis in regression form, where  $\alpha_k$  is a vector of regression weights for each place  $k$  and  $PLACE$  denotes a vector of dummy variables for each place (with the demographic characteristics of each original survey respondent ignored). Equation (3) is the estimation process used by Park, Gelman and Bafumi (2003, 7). Considering the three models side by side, it is easy to see that Gelman and his colleagues have simply added the two methods together – essentially treating geographic location is one additional dimension that can be used to define voter types.

Doing so would seemingly increase the data demands substantially. Park et al. (2003) use four demographic variables to define 64 voter types in each state but adding state of residence creates  $64 \times 51 = 3264$  types. Using OLS, estimating each type individually, and employing (say) 100 respondents per type would create a need for over three million original respondents. However, hierarchical Bayesian estimation reduces the data demands enormously. Hierarchical Bayes estimates for units with few (or no) cases draw on information from other similar units and this allows Park, Gelman and Bafumi to estimate the partisanship of African American residents of Wyoming even though not a single such person exists in their original survey data. In essence, Gelman's approach begins with "shrunkened" dummy variable effects for place, and adjusts these with additional demographic information. As they point out, this is much like post-survey weighting of polling data to conform with known demographic compositions of electorates, which is why they refer to their method as a form of *post-stratification*.

First Stage Estimation

Post-estimation Aggregation

**(1, Weber)**  $\hat{y}_{jk} = \sum_j \beta X$

$$Opinion_k = \sum_j \phi_{jk} \hat{Y}_{jk}$$

**(2, EWM)**  $\hat{y}_{jk} = \sum_k \alpha_k PLACE$

$$Opinion_k = \hat{Y}_{jk} \quad (none)$$

**(3, Gelman)**  $\hat{y}_{jk} = \sum_j \beta X + \sum_k \alpha_k PLACE$

$$Opinion_k = \sum_j \phi_{jk} \hat{Y}_{jk}$$

We developed our method of small polity inference in order to make out of sample estimates for spatial units that are smaller than the smallest identifiable unit in national sample surveys. Demographic composition is used to in order to account for the

differences between, let us say, adjacent suburbs that differ substantially in their racial or age composition. Simply knowing that both are in a particular state – or even suburbs of the same central city – provides little information on how their citizens’ preferences might differ.

In addition, models (1) and (3) assume that basic social cleavages are comparable across places. This may be defensible for partisanship because it is shaped by nation-defining events (New Deal, Civil Rights Era) and nationwide cleavages concerning labor, environment and moral issues. But for many issues, including school finance, one cannot assume that the differences between whites and blacks, young and old, or between college graduates and high school dropouts will be the same everywhere. We therefore treat the  $\beta$ ’s in equation (3) as random effects that vary from context to context. Our model then can be written in the form of a hierarchical, random effects model (Bryk & Raudenbush 1992):

$$\text{For every place } k: \quad y_i = \sum \beta X + \alpha + r_i \quad (4)$$

Where,  $y_i$  is the opinion of the  $i^{\text{th}}$  person in place  $k$   
 $X$  is a vector of place-centered demographic variables ( $X_{ik} - \bar{X}_k$ )  
 $\beta$  is a vector of regression slopes  
 $\alpha$  is the mean opinion in place  $k$ , and  
 $r_i$  is the person-level error term

The place effects,  $\alpha$ , and demographic effects,  $\beta$  are modeled as random effects, with each having a unique deviation from the average state’s effect. By substituting values of  $X$  that correspond to citizen types, it is a matter of simple algebra to calculate the opinion of each voter type within each place. Census data for each school district provide the appropriate post-stratification weights. In other words, rather than adding



state effects to each nationally determined voter type, we allow place  $\times$  demographic interactions for every demographic variable.

To calculate each voter type's opinion, we utilize the General Social Survey's question on educational spending:

*We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount.*

*Are we spending too much, too little, or about the right amount **on improving the nation's education system?***

We refer readers to our NSF proposal to view the details of the estimation and detailed assessments of validity of the measure. Since this measure is but one of many in the current paper, we simply note that it is standardized across school districts with a mean of zero, standard deviation of one, and that high scores denote a district that favors especially high levels of spending.

#### Other Variables in the Models

All models contain measures of local wealth (median housing value, in \$1000s and median income, in \$1000s) and the natural logarithm of district population; these three variables are standard control variables in school finance research and are derived from the US Census's "Special Tabulation" of school district demographics. In addition, we control for three institutional factors that we have shown to be important previously. These are whether the district is fiscally dependent (from the 1992 Census of Governments), whether the district uses town meetings to approve its annual budget (364 New England school districts we identified from primary documents and state reports), and three dummy variables indicating the level of direct democracy permitted to residents of the community. The omitted category for this measure denotes districts in which

citizens have no referendum rights with indicators for places in which (a) referenda are triggered by tax increases above a specified threshold, (b) all tax increases are subject to referenda, and (c) where the annual budget – even when taxes remain the same – must be approved by voters.

In addition, certain models have state-level aggregate measures: the state's per capita income, the per capita educational expenditures of the state government, and the state's share of educational expenditures as a percentage of all expenditures for public schools in the state.

## RESULTS

Table 1 reports our initial model estimating the effects of local unions on per pupil instructional spending. The table reports slopes for the presence of strong unions, large unions and our control variables, along with their robust standard errors (Huber White SEs accounting for clustering within states) and two tailed significance levels.

**Table 1. Effect of local union size on per pupil instructional expenditures**  
(N=9,119)

	Robust				Robust			
	B	SE	t	p	B	SE	t	p
Strong Union in District	<b>353.04</b>	<b>131.28</b>	<b>2.69</b>	<b>.01</b>	<b>-431.6</b>	<b>334.6</b>	<b>-1.29</b>	<b>.20</b>
ln(Unionized teachers)	<b>-14.40</b>	<b>18.48</b>	<b>-.78</b>	<b>.44</b>	<b>-32.0</b>	<b>19.6</b>	<b>-1.63</b>	<b>.11</b>
ln(Unionized teachers) X Strong Union					<b>182.7</b>	<b>66.0</b>	<b>2.77</b>	<b>.01</b>
Median Income (1000s)	16.50	11.57	1.43	.16	16.5	11.4	1.45	.16
Median Housing Value (\$1000s)	6.27	4.42	1.42	.16	6.1	4.4	1.41	.17
ln(Population)	-70.62	58.54	-1.21	.23	-125.6	58.8	-2.14	.04
District is fiscally dependent	120.04	310.69	.39	.70	125.1	310.3	.40	.69
Qualified referendum rights	30.84	299.59	.10	.92	26.0	298.5	.09	.93
Tax referendum requirement	-252.21	311.53	-.81	.42	-265.5	314.5	-.84	.40
Budget referendum requirement	2528.29	370.54	6.82	.00	2,497.5	369.8	6.75	.00
Uses town meeting	269.66	433.40	.62	.54	247.9	432.0	.57	.57
Intercept	4897.27	560.89	8.73	.00	5,435.4	562.3	9.67	.00
	5,961.3	584.5	10.20	.00				
R <sup>2</sup>	.49				.50			

All of the control variables have effects consistent with previous research: affluent communities spend more,<sup>9</sup> and districts requiring voter approval of budgets spend more. Of primary interest is the effect of strong local unions and large local unions. Districts with strong locals spend roughly \$353 (or \$8800 per year for a classroom of 25 students) – about 7% - more than similar districts without them. However, the number of unionized teachers has no impact on spending. This is surprising, given the arguments advanced by Moe about organizational strength. However, Moe may have had in mind unions with strong collective bargaining powers and maybe the effect of union size *depends* on union power.<sup>10</sup> To explore this, we added the interaction of strong union with membership size to the model and the results appear on the right side of Table 1. The estimates are striking.

Membership has a strong impact on spending only when the union is strong. Going from the mean of 135 unionized teachers to 1,000 unionized teachers (slightly less than a standard deviation increase) increases instructional spending by about \$365 per pupil. The apparent negative impact of a strong union is misleading as this is the estimated impact when the union has no members (an impossibility). The actual effect is more easily seen graphically. Figure 1 shows the effect of membership size on spending in districts with strong and weak unions. The lines cross at a very low number of members—approximately eight to ten—demonstrating that the negative impact of strong unions rarely occurs. Indeed, we noted above that districts without either strong collective bargaining or any union members at all tended to have greater resources and a

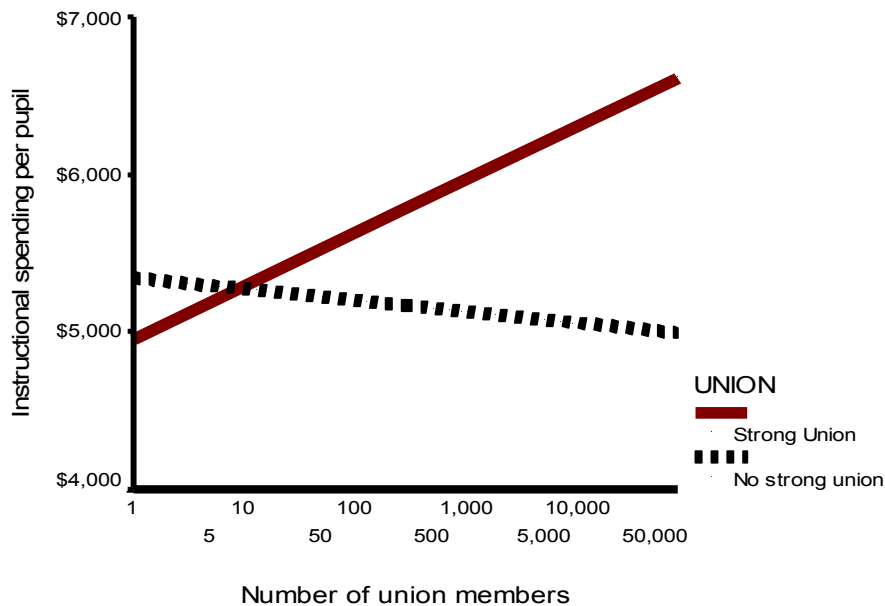
---

<sup>9</sup> Neither income nor housing values achieve significance due to high multicollinearity. Nevertheless, they have a large combined effect on spending, explaining 24% of the variance by themselves.

<sup>10</sup> Moe's empirical analysis includes only districts in California.

greater propensity to spend so we are not surprised they can afford more spending in the absence of strong unions. But in nearly all other cases strong union districts spend more, and the gap between strong and weak unions grows as the size of the union grows.

**Figure 1. Effect of membership size on spending for districts with and without strong unions**



Unions organize politically at both the local and state levels. In Table 2 we add to the model two state-level measures of union strength and union size. The first is the percentage of teachers in each state who are members of strong unions – a measure, we believe, of militancy at the state level. The effects on the model are dramatic. Stronger state unions increase per pupil spending as well – statewide, an increase of ten percent more teachers in strong unions leads to an additional 135 dollars per pupil in every district in the state. The intercept for local level union strength is now negative – about \$300 lower than in the previous model – indicating that the impact of strong local unions operates largely through the aggregation of resources, which are applied in state-level politics. In contrast, the effect of local membership size is robust – declining only about

15% - suggesting that the impact of union size operates through local mechanisms, such as elections.

**Table 2. Effects of local and state-level union strength on per pupil spending**

	When State Level Union Measure Is:					
	% of State's Teachers in Strong Local Unions		ln(Number of Unionized Teachers)		ln(Members in Strong Unions)	
	B	p	B	p	B	p
Strong Union in District	-751.04	.04	-405.74	.23	-536.13	.14
ln(Unionized teachers)	-7.19	.63	-31.53	.10	-19.26	.17
ln(Unionized teachers) X Strong Uni	154.98	.05	168.62	.01	163.41	.03
<b>State Level Union Measures</b>	<b>13.49</b>	<b>.00</b>	<b>102.29</b>	<b>.26</b>	<b>110.37</b>	<b>.13</b>
Median Income (1000s)	9.55	.39	15.09	.21	13.19	.27
Median Housing Value (\$1000s)	6.48	.16	6.03	.19	6.05	.20
ln(Population)	-106.46	.10	-120.85	.05	-119.60	.06
District is fiscally dependent	232.81	.48	222.15	.48	229.27	.48
Qualified referendum rights	143.03	.62	41.16	.89	108.46	.71
Tax referendum requirement	-193.03	.47	-196.23	.52	-210.12	.49
Budget referendum requirement	2,269.06	.00	2,414.33	.00	2,402.64	.00
Uses town meeting	262.59	.57	314.39	.48	299.41	.51
Intercept	4,968.86	.00	4,371.75	.00	5,176.94	.00
R <sup>2</sup>	.53		.50		.50	

In the second model, we test an alternative operationalization of union power at the state level, the absolute number of unionized teachers in the state (logged). At the local level we found that membership size makes a difference. But at the state level this is not the case. Finally, the third model tests the impact of the absolute number (logged) of union members in districts with strong unions. This measure also fails to achieve significance or mediate the impact of local union strength. Thus the first model in Table 2 becomes our baseline model and we now move to more precisely specify how unions impact spending levels.

To confirm that state-level union strength operates via state politics, we added state educational expenditures to our model. If unions increase local spending through higher state allocations, the effect of state level union strength should disappear when we

control for state expenditures. The right hand side of Table 3 shows precisely this: the effect of state-level union strength is now substantively tiny and no longer significant.

**Table 3. Adding State Government Educational Expenditures as an Intervening Variable**

	Robust				Robust			
	B	SE	t	p	B	SE	t	p
Strong Union in District	-751.04	349.70	-2.15	.04	-786.05	294.04	-2.67	.01
ln(Unionized teachers)	-7.19	14.97	-.48	.63	4.58	13.01	.35	.73
ln(Unionized teachers) X Strong Union	154.98	76.08	2.04	.05	145.25	65.16	2.23	.03
<b>State: % Teachers in Strong Unions</b>	<b>13.49</b>	<b>3.22</b>	<b>4.19</b>	<b>.00</b>	<b>2.76</b>	<b>2.12</b>	<b>1.31</b>	<b>.20</b>
Median Income (1000s)	9.55	11.03	.87	.39	-1.29	8.75	-.15	.88
Median Housing Value (\$1000s)	6.48	4.48	1.45	.16	7.48	3.71	2.02	.05
ln(Population)	-106.46	62.70	-1.70	.10	-67.69	54.89	-1.23	.22
District is fiscally dependent	232.81	328.74	.71	.48	254.25	187.14	1.36	.18
Qualified referendum rights	143.03	284.76	.50	.62	-71.48	190.24	-.38	.71
Tax referendum requirement	-193.03	265.06	-.73	.47	-38.07	189.10	-0.20	.84
Budget referendum requirement	2269.06	396.74	5.72	.00	1,045.92	321.22	3.26	.00
Uses town meeting	262.59	453.19	.58	.57	-51.46	277.85	-.19	.85
<b>State level educational expenditures</b>					<b>5.80</b>	<b>0.80</b>	<b>7.29</b>	<b>.00</b>
State level per capita income					-0.03	0.04	-.70	.49
Intercept	4968.86	666.13	7.46	.00	1,074.02	865.89	1.24	.22
R <sup>2</sup>	.55				.63			

To this point, our results are consistent with other studies (Hoxby 1996) that show that districts with strong collective bargaining units spend more per pupil. But the explanation for this is somewhat surprising—this comes about not solely due to local bargaining strength nor absolute union size but the interaction of the two factors. In addition, some of this effect occurs because the unions representing teachers in individual communities are able to aggregate their resources at the state level and increase expenditures of the state government.

Earlier we argued that interest groups should direct their energies at the venue in which their interests are most at stake and their influence more likely to matter. In states with very centralized funding systems, local school boards have discretion over relatively few funds and even strong local unions will have limited impact in dollar terms. In contrast, where the state share of educational expenditures is small, strong local unions should have their greatest potential impact. We test this idea in Table 4.

Since we have three different measures of union power—local membership size in strong unions, local union strength, and the interaction of the two (membership in strong local unions) – we would ideally like to estimate the effects of all and each interacted with the size of state share. In addition, we need to include our measure of state union strength interacted with state share as well since the expectation is that these unions become more influential as state share increases while local unions become more influential as state share decreases. This would create substantial multicollinearity – not only because state share would be in the model multiple times but also because state level strength and the size of strong local unions are correlated at a level of .57.

To simplify, we drop the main effect of state union strength since its effect is mathematically defined as the impact of state unions when the state role is zero. We also limit our analysis to the combined local power measure – the number of unionized members in strong local unions – since neither main effect is significant. Thus, we begin with the first model in Table 3 and add the state share of all educational spending in the state and the interaction of this with the local measure that has shown the most explanatory power as well as state union strength. The results are reported in Table 4.

**Table 4. Effect of union strength interacted with state share of educational spending**

	B	Robust SE	t	p
Strong Union in District	-754.48	341.06	-2.21	.03
ln(Unionized teachers) X Strong Union	300.70	79.54	3.78	.00
Median Income (1000s)	9.46	10.25	.92	.36
Median Housing Value (\$1000s)	6.46	4.28	1.51	.14
ln(Population)	-102.30	61.68	-1.66	.10
District is fiscally dependent	210.79	331.98	.63	.53
Qualified referendum rights	101.27	301.51	.34	.74
Tax referendum requirement	-226.65	258.54	-.88	.39
Budget referendum requirement	2,273.29	391.39	5.81	.00
Uses town meeting	217.16	449.44	.48	.63
State share of educational spending	-6.76	7.02	-.96	.34
<b>Membership in Str Local X State Share</b>	<b>-3.34</b>	<b>1.35</b>	<b>-2.48</b>	<b>.02</b>
<b>State Union Strength X State Share</b>	<b>0.28</b>	<b>0.06</b>	<b>4.50</b>	<b>.00</b>
Intercept	5,307.32	760.11	6.98	.00
R <sup>2</sup>	.53			

Table 4 shows several interesting results. First, both interactions are in the expected direction. Large, strong local unions become less efficacious as the state role increases. In contrast state-level union strength increases steadily as more and more of local budgets originate in the state capital. To see this more clearly, we report variable effects for two fixed levels of state share in Table 5.

**Table 5. Effects of union measures for top and bottom fifth of state share of educational funding.**

	Bottom Fifth (38.5% state share)	Top Fifth (55.5% state share)
Effect of going from 135 to 1000 local members in strong locals	343.92	230.22
Effect of 10% increase in state union strength	106.44	153.44

Here, we can see that across the range of actual conditions, the impact of local membership declines as states play a more prominent role. This decline is sharp and is not compensated for by a correspondingly large increase in returns at the state level



(cross sectionally, a shift from 135 to 1000 members is associated with an 11% increase in state strength). We believe this is because strong locals contribute to a strong statewide teachers' lobby, but the inability to redirect state funds only to their own places of local power dilutes these gains and spread them to non-unionized as well as unionized school districts. This would create something of a free rider incentive for non-unionized districts to remain non-unionized and this might explain the net negative impact of local unionization.

#### Assessing Policy Responsiveness

We have seen that unions have a substantial impact on school budgets and that unions seem to be opportunistic by influencing state spending generally, and influencing local spending in venues where the local role is much larger. But this does not tell us whether or not unions dilute the ability of local citizens to translate their preferences into policy. To assess this we utilize our measure of local preferences for higher or lower educational spending. If unions have a pernicious impact on policy responsiveness, we should see two different, though related, outcomes. First, the impact of strong, large local unions should remain even after controlling for local opinion. This would indicate that on average, unionized districts spend more than the public desires. Second, tendencies toward budget maximization are expected to produce noise and we should therefore see that the relationship between public opinion and spending is weaker as unions gain strength – a negative interaction between strong union size and public opinion.

Because the state level variables exert such a strong influence, we shift to fixed effects regression models that include a dummy variable for each state. Table 6 reports

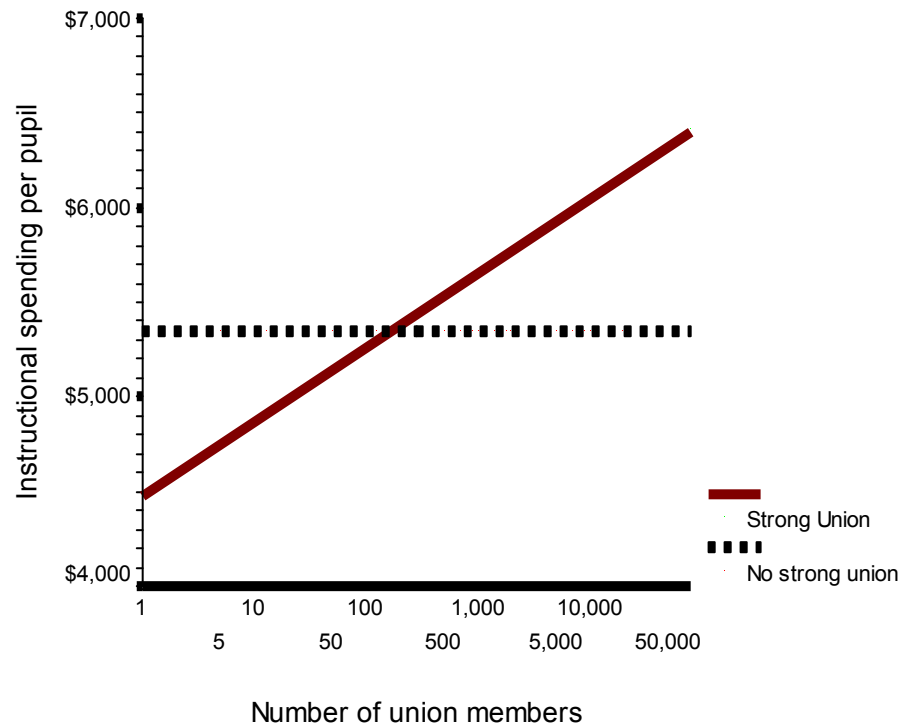
two models. The first introduces the measure of public opinion and we see that it has a strong, positive impact. Districts whose citizens are one standard deviation more liberal than the mean spend an average of \$258 more per pupil. Note, however, that the main effect of strong unions is now much lower than before, while the impact of strong union size is essentially unchanged. The import of this is seen in Figure 2, below, which graphs the combined effects of strong unions and union size, net of public opinion and our control variables. For the 75% of school districts having between 35 and 2000 members, the net effect of unions is quite small. Thus, unions bring about greater spending but, except in the case of the very large cities, this greater spending is not substantially more than the public wants.

To model the impact on responsiveness more precisely, we calculate the interaction between local opinion and size of strong local unions. If union power interferes with the translation of public preferences into policy, this interaction term should be negative. The results are in the second model in Table 6 and we see that the interaction is positive but not significant.

**Table 6. Fixed effects regression of policy responsiveness to public opinion**

	B	SE	t	p	B	SE	t	p
Strong Union in District	<b>-915.39</b>	<b>81.31</b>	<b>-11.26</b>	<b>.00</b>	-867.60	86.23	-10.06	.00
ln(Unionized teachers)	-0.06	6.00	-.01	.99	-0.58	6.01	-.10	.92
ln(Unionized teachers) X Strong Union	175.61	17.64	9.95	.00	166.33	18.50	8.99	.00
<b>Local Opinion</b>	<b>258.09</b>	<b>24.61</b>	<b>10.49</b>	<b>.00</b>	250.50	25.03	10.01	.00
<b>Opinion X Strong Union Members</b>					<b>6.93</b>	<b>4.17</b>	<b>1.66</b>	<b>.10</b>
Median Income (1000s)	-3.38	1.56	-2.17	.03	-3.37	1.56	-2.16	.03
Median Housing Value (\$1000s)	8.67	.38	23.01	.00	8.67	.38	23.01	.00
ln(Population)	-172.78	11.61	-14.88	.00	-170.26	11.71	-14.54	.00
District is fiscally dependent	133.91	122.30	1.09	.27	129.50	122.31	1.06	.29
Intercept	6,600.38	106.36	62.06	.00	6,577.66	107.22	61.35	.00
R <sup>2</sup>	.68				.69			

**Figure 2. Effect of membership size on spending, net of public opinion, for districts with and without strong unions**



### Conclusion

Our results confirm findings by others that teachers' unions increase per pupil spending at the district level. We identify two sources of this union influence. The first, emphasized by Hoxby (1996) and students of public employee unions more generally (Courant et al. 1979) is unions' monopoly control through collective bargaining. The second, emphasized by Moe (2003) but noted by others as well (Hoxby 1996), is the political advantage that results from the mobilization of union resources and their ability to overcome organizational barriers. Our results not only confirm our first two hypotheses on the effect of local unions, but specify how both dimensions – strength and size – interact to achieve union's spending goals. This union influence is not restricted to the district level. Unions that are strong at the district level can aggregate this into

statewide power, generally confirming our second set of hypotheses. However, it is not larger unions *per se* are not the most effective; rather, it is the aggregation of members who, at the local level, retain the most power in collective bargaining who appear to be able to exert influence at the state level. We are not clear at this point why this is so.

We also find, however, that this union influence is not constant across all states and we extend the works of Moe (2003) and Rose and Sonstelie (2004) specifying state-level conditions under which unions are more or less likely to exert pressure for higher spending. In states that take on a larger share of educational spending union influence primarily is found at the state level where they compete with other organized interests over the size and distribution of state spending. These union gains find their way to all districts in the state, including those lacking strong local unions. State union strength, in other words, can undercut the power of local unions as it promotes state spending which is distributed by formulas that do not take into account local union power. Our third set of hypothesis, therefore, is also confirmed.

But in districts that retain responsibility for their own spending unions are important ballast to the power of anti-tax and anti-spending groups. Through their influence over the initial selection of board members, referenda elections, and the budget proposal put up for public approval, unions can push for higher per pupil spending. In doing this they do not act counter to the preferences of the public at large. Indeed, we find some evidence that they may help to reinforce public preferences although this effect is modest and statistically insignificant. If it is the case that unions serve to facilitate responsiveness rather than retard it we should, in future research, be able to identify the conditions under which this is most likely to occur.

### References

- Baugh, William H. and Joe A. Stone. 1982. "Teachers, Unions, and Wages in the 1970s: Unionism Now Pays." *Industrial and Labor Relations Review*. 35(3): 368-376.
- Berkman, Michael B. and Eric Plutzer. 2002. "Paying to Educate 'Other People's Children': Race, Ethnicity, and Public School Finance." Paper Presented at the 2002 Annual Meeting of the American Political Science Association.
- Berkman, Michael B. and Eric Plutzer. 2003. "The Consequences of State Institutions for Local Policy Responsiveness: Policy Preferences and Spending in American School Districts." Paper Presented at the 2003 Annual Meeting of the American Political Science Association.
- Berube, Maurice R. 1988. Teacher Politics: The Influence of Unions. New York:Greenwood Press.
- Brace, Paul, Sims-Butler, Kellie, Arceneaux, Kevin and Martin Johnson. 2002. "Public Opinion in the American States: New Perspectives Using National Survey Data." *American Journal of Political Science*. 46(1): 173-189.
- Bryk, A., and Raudenbush, S. W. 1992. Hierarchical Linear Models for Social and Behavioral Research: Applications and Data Analysis Methods. Newbury Park, CA: Sage.
- Chubb, John E. and Terry M. Moe. 1990. Politics, Markets & America's Schools. Washington: The Brookings Institution.
- Courant, Paul N., Gramlich, Edward M., and Daniel L. Rubinfeld. 1979. "Public Employee Market Power and the Level of Government Spending." *American Economic Review*. 69 (5): 806-817.
- Easton, Todd. 1988. "Bargaining and the Determinants of Teacher Salaries." *Industrial and Labor Relations Review*. 41(2): 263-278.
- Eberts, Randall and Joe Stone. 1984. Unions and Public Schools: The Effect of Collective Bargaining on American Education. Lexington MA: Lexington Books.
- Farnham, Paul G. 1990. "The Impact of Citizen Influence On Local Government." *Public Choice*. 64:201-212.
- Fischel, William A. 2001. The Homeowner Hypothesis. Cambridge, MA: Harvard University Press.
- Freeman, Richard B. 1986. "The Effect of the Union Wage Differential on Management Opposition and Union Organizing Success." *American Economic Review*. 76(2): 92-96.

- Freeman, Richard B. 1986. "Unionism Comes to the Public Sector." *Journal of Economic Literature*. 24(1): 41-86.
- Gelman, Andrew and Thomas C. Little. 1997. "Poststratification Into Many Categories Using Hierarchical Logistic Regression." *Survey Methodology*. 23: 127-135.
- Hall, W. Clayton and Norman E. Carroll. 1973. "The Effect of Teachers' Organizations on Salaries and Class Size." *Industrial and Labor Relations Review*. 26(2): 834-841.
- Hoxby, Caroline M. 1996. "How Teachers' Unions Affect Education Production." *Quarterly Journal of Economics*. 111(3): 671-718.
- Iannaccone and Lutz. "The Crucible of Democracy: The Local Arena," in Jay D. Scribner and Donald H. Layton (eds.) The Study of Educational Politics: The 1994 Commemorative Yearbook of the Politics of Education Association. Washington, D.C.: The Falmer Press. 39-52.
- Kasper, Hirschel. 1970. "The Effects of Collective Bargaining on Public School Teachers' Salaries." *Industrial Labor Relations and Review*. 24(1). 57-72.
- Kerchner, Charles T., Koppich, Julia E., and Joseph G. Weeres. 1997. United Mind Workers: Unions and Teaching in the Knowledge Society. San Francisco: Jossey Bass.
- Lieberman, Myron. 1997. The Teachers Unions: How the NEA and AFT Sabotage Reform and Hold Students, Parents, Teachers, and Taxpayers Hostage to Bureaucracy. New York: Free Press.
- Matsusaka, John G. 1995. "Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years". *Journal of Political Economy*. 103 (3):587-623.
- McIver, John P., Erikson, Robert S. and Gerald C. Wright. 1993. "Public Opinion and Public Policy: A View From the States," in Lawrence C. Dodd and Calvin Jillson (eds.) *New Perspectives in American Politics*. Washington, DC: Congressional Quarterly Press.
- Moe, Terry M. 2001. "Teachers Unions and the Public Schools," in Terry M. Moe (ed.) *A Primer on America's Schools*. Stanford, CA: Hoover Press.
- Moe, Terry M. 2001. "A Union by Any Other Name." <http://www.educationnext.org/20013/38moe.html>>.
- Moe, Terry M. 2003. "Political Control and the Power of the Agent." Paper presented at the 2003 Annual Meeting of the Midwest Political Science Association.
- Moe, Terry M. 2003. "Teacher Unions and School Board Elections." Paper prepared for the 2003 School Board Politics Conference.

- Park, David K., Gelman, Andrew and Joseph Bafumi. "State-Level Opinions from National Surveys: Postratification using Hierarchical Logistic Regression." Paper presented at the 2002 Summer Methods Conference and the 2002 Annual Meeting of the American Political Science Association.
- Bafumi, Joseph, Gelman, Andrew and David Park. "Innovations to Bayesian Ideal Point Estimation." (work in progress).
- Plutzer, Eric and Michael B. Berkman. (forthcoming) 2004. "Gray Peril or Loyal Support? The Effects of the Elderly on Educational Expenditures." Social Science Quarterly
- Popkin, Samuel L., Pool, Ithiel de Sola, and Robert Abelson. "A Postscript on the 1964 Election." *American Behavioral Scientist*, May 1965.
- Rose, Heather and Jon Sonstelie. 2004. "School Board Politics, School District Size and the Bargaining Power of Teachers' Unions."
- Saltzman, Gregory M. 1985. Bargaining Laws as a Cause and Consequence of the Growth of Teacher Unionism. *Industrial and Labor Relations Review*. 38(3): 335-351.
- Steunenberg, Bernard. 1992. "Referendum, Initiative, and Veto Power: Budgetary Decision Making in Local Government." *Kyklos* 45:501-529.
- Thomas, Clive S. and Ronald J. Hrebennar. 1999. "Interest Groups in the States," in Virginia Gray, Russell L. Hanson, and Herbert Jacob (eds.) *Politics in the American States: A Comparative Analysis*. Washington D.C.: Congressional Quarterly Inc.
- Weber, Ronald E. and William R. Shaffer. 1972. "Public Opinion and the American State Policy-Making." *Midwest Journal of Political Science*. 16(4): 683-699.
- Weber, Ronald E., Hopkins, Anne H., Mezey, Michael L. and Frank J. Munger. 1972. "Computer Simulation of State Electorates." *Public Opinion Quarterly*. 36(4): 549-565.
- Witte, John F., Arnold F. Shober and Paul Manna. 2003. "Analyzing State Charter School Laws and Their Influence on the Formation of Charter Schools in the United States." Paper presented at annual meetings of the APSA, Philadelphia, August 28-31, 2003.
- Wong, Kenneth K. 1999. Funding Public Schools: Politics and Policies. Lawrence: University Press of Kansas.