

*Returns to Education: Exploring the Link Between Legislators' Public School Degrees and State Spending on Higher Education**

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The United States leads the world in public higher education, with a substantial amount of funding coming from state, rather than federal, government sources. Perhaps not surprisingly, the amount states contribute varies widely, leading researchers to explore the sources of such variation. While numerous factors have been shown to matter, the potential relevance of political representation remains unclear. To address this gap, the relationship between state legislators' own educational backgrounds and state spending on higher education is tested. Utilizing a database of publicly available information on the educational backgrounds of 6,517 state senators and representatives, we find that states with a higher percentage of legislators who attended state colleges and/or universities invest more generously in public higher education than other state legislatures. Results support theories of representation, suggesting that legislators may be directly advocating for spending given their own educational profiles.

Introduction

The United States has the most highly developed system of public higher education in the world. Over 16 million students are enrolled in higher education, and nearly eighty percent of these students attend public facilities (Bergman 2005; Dillon 2005). However, commitments to public higher education vary substantially across states, arguably leading to varying levels of quality in public postsecondary education (Measuring Up 2005; National Center for Education Statistics 2003). While many factors influence this variation, state higher education spending decisions have an inherently political component, as prior research on the role of political context in shaping spending has shown (Dye and MacManus 2003; Leslie and Ramey 1986; McLendon, Hearn, and Mokher 2009; McLendon and Ness 2003). Related research increasingly suggests that policy-makers' personal characteristics (e.g., gender, race, and parental status) affect policy outcomes (Bolzendahl and Brooks 2007; Chattopadhyay and Duflo 2004; Tate 2003; Washington 2008). However, previous research has not considered whether state politicians' educational backgrounds might

matter for public higher education spending outcomes. Exploring a variety of mechanisms, we test the relationship between the educational background of legislators in a state and that state's spending on public higher education.

Below, we briefly review the variation in state public higher education spending. Next, we explore the implications from theories of representation for understanding policy commitments and go onto test the potential significance of legislatures' educational profiles for state spending on public higher education. The results are based on a unique dataset in which the authors coded educational backgrounds for all state legislators in 2005, and all analyses examine the variation in spending between (rather than within) states. We first descriptively analyze the variation in spending and legislative educational profiles before turning to multivariate analyses of spending, controlling for a number of theoretically important influences, including prior levels of spending. Our results confirm a significant, positive relationship between the percent of state legislators with public school degrees and the amount the state spends on public higher education. This relationship is not completely mediated by prior spending levels, suggesting *tentative* evidence for causality.

State Variation in Public Higher Education Spending

Public investments in higher education benefit global and regional development and competition, as well as individual students (Vedder 2004). A large and increasing proportion of support for public higher education occurs at the state level, especially as federal student aid has undergone significant changes in recent decades, notably moving the burden of expenses toward individual and family loans (Berkner 1999; Ehrenberg 2006; Layzell and Lyddon 1990). Within states, higher education competes for support in government budget decisions and the amount states allocate to public higher education varies widely. Further, state support for higher education has declined in recent years (Hossler et al. 1997; National Association of State Budget Officers (NASBO) 2003; Ehrenberg 2006; McLendon, Hearn, and Mokher 2009). Postsecondary education must struggle with other state-assisted services such as prisons, healthcare, elementary and secondary education, transportation services, and law enforcement (Ehrenberg 2006; Hossler et al. 1997; NASBO 2003). Notably, such competition highlights the political framework of education spending outcomes, which is also shaped by a number of economic and demographic forces. We review these and other important factors below.

Economic and Demographic Pressures on State Public Higher Education Spending

A common resource-based theoretical explanation of social spending focuses on the importance of economic and demographic pressures (Myles and

Quadagno 2002). In basic terms, the expansion of spending requires the money for such spending be available, and that there be sufficient pressures for increases. In general, wealthier states have more money to spend, whether wealth is measured as budget size, gross state product, or the size of federal grants provided to a state (Lowry 2001; McLendon, Hearn, and Mokher 2009; Zeigler and Johnson 1972), and research on social provision has consistently shown a positive relationship between wealth and social spending (Hicks and Misra 1993). In a complementary fashion, other demands for public higher education may positively influence spending (McLendon, Hearn, and Mokher 2009; McLendon, Mokher, and Doyle 2009). A state's age profile, for example, the size of the population that could most reasonably be considering a higher education degree, typically peaking among the 18- to 24-year-old cohort (St. John 1991; Toutkoushian and Hollis 1998), is tied to demand for postsecondary support. Studies of various government programs have consistently found that the expansion of spending corresponds to the rising level of need of a population (Amenta, Bonastia, and Caren 2001; Hicks and Misra 1993; Myles and Quadagno 2002).

Similarly, state budgets generally increase over time, as do other relevant socioeconomic characteristics, such as student enrollments (Leslie and Ramey 1986; Toutkoushian and Hollis 1998). However, a positive relationship between increased enrollments and increased spending fails to explain variance among states in higher education spending. Take, for example, New Hampshire and Nevada, which each have similar full-time student enrollments at 4-year public colleges and universities, 42,500 and 38,300, respectively. New Hampshire spends \$2,491 per student on public higher education, and Nevada spends \$9,534 per student on public higher education (Measuring Up 2005; National Center for Education Statistics 2003:391). The above factors are better suited toward explaining very broad and general patterns in spending over time and may be less helpful in explaining the wide variation that exists among states at any given point in time (Amenta, Bonastia, and Caren 2001).

To better account for variation in spending, scholars have examined other contextual factors, which vary substantially from state to state (Squire and Hamm 2005), to reveal more nuanced state demographic and educational profiles (McLendon, Hearn, and Mokher 2009; Peterson 1976; Zeigler and Johnson 1972). First, spending on public higher education may be influenced by the private education sector. Some argue this effect is negative, such that the demand for research and other institutional services from public universities may lessen where these services are also provided by the private sector (Lowry 2001; McLendon, Hearn, and Mokher 2009). And, historically states with a larger number of private institutions have been less supportive of

large public education facilities compared with states with a smaller number of private institutions (Hines, Hickrod, and Pruyn 1989; Peterson 1976).

For example, the discrepancy between funding in New Hampshire and Nevada may be partially explained by the differences in their private higher education sector. Just <10 percent of all students in Nevada are enrolled in private institutions, whereas over 40 percent of New Hampshire's students attend private institutions (Almanac 2009).¹ Arum (1996), however, shows that elementary and secondary public schools benefit by way of increased state resources when a large private sector is present. Second, the field of public education is differentiated, particularly between elementary and secondary on the one hand and postsecondary on the other. While logically it may seem that a state's spending on elementary and secondary education would be indicative of a supportive educational environment in general, these two sectors may compete for limited state funds, such that spending at the elementary and secondary levels is negatively related to spending on higher education (Hossler et al. 1997). Third, the makeup of the state's non-student population may influence support. For example, government funding for public universities is lower in states with a large elderly population (Lowry 2001; McLendon, Mokher, and Doyle 2009). As a whole, these interests contextualize the politics involved in shaping spending on higher education. However, such factors only indirectly track the political influences working on spending outcomes, suggesting the need to more directly test and explore political mechanisms (McLendon, Hearn, and Mokher 2009; Squire and Hamm 2005).

Educational Politics: Political Context, Representation, and Policy Feedback

Arguably, state legislators are the most influential actors concerning policy change (McLendon and Ness 2003). They must consider the costs and benefits likely to derive from allocating scarce resources to public higher education and make decisions based on their interpretations of a state's resources (Lowry 2001). Research suggests that each legislative body is unique and legislator calculations are shaped, in particular, by the professionalism and partisanship of their various legislative bodies (Dar and Spence 2010; Dye and MacManus 2003; Lowry 2001; McLendon, Mokher, and Doyle 2009).

Greater average length of incumbency fosters organizational stability, resources, and legitimacy (Dye and MacManus 2003),² and legislatures that are more professional, as seen by rates of incumbency, average pay, average days spent in session, and the ratio of staff members to legislators, spend more per person on education than less professional legislatures (McLendon, Hearn,

and Mokher 2009; Moncrief and Thompson 1991; Moncrief, Thompson, and Cassie 1996).

As for partisanship, a Democratic majority in a state legislature is largely viewed as favorable for state spending on higher education (Koshal and Koshal 2000; McLendon, Hearn, and Mokher 2009). Recent and nuanced research affirms that partisanship matters, but that a linear positive relationship between democratic strength and spending on higher education is oversimplified and inaccurate. In fact, the relationship between political partisanship and spending on higher education is a complex process, dependent on contextual factors such as economic conditions and the political polarization of individual state legislatures (Dar and Spence 2010).

While telling, neither of the above contextual explanations can speak to influences at the intersection of state-specific educational and political environments, and they do not directly address the theories of representation and individual agency among legislators. To address this gap and to further illuminate important influences within legislative bodies, we suggest analyzing state legislators' own education backgrounds, based on theories regarding the policy impact of individual legislators' characteristics (Chattopadhyay and Duflo 2004; Washington 2008). While the causal mechanisms and relationships differ, all suggest that the percent of legislators with a public higher education degree should be positively related to state public higher education spending and will help explain the variation in spending among the states. Below, we review these theories and their implications for spending in more detail.

Links between Representative Characteristics and Policy Outcomes

A positive relationship between the percent of legislators with a public higher education degree and a state's spending on public higher education may reflect a number of underlying mechanisms and causal relationships. Research on women's and minority representation has often found differences in policy output according to gender and minority group membership. For example, female legislators are more likely to support bills deemed particularly relevant to women's interests, such as childcare and reproductive rights (O'Regan 2000; Swers 1998), and black legislators are considerably unified in their policy priorities (Barrett 1995; Tate 2003).³ While theory suggests that elected representatives (at some level) should reflect the wishes of the voters (Urbinati and Warren 2008), a representative's own characteristics may shape preferences in ways that influence their voting decisions (Chattopadhyay and Duflo 2004).

Along these lines, one reason a legislator's personal characteristics might influence policy outcomes is that voters use descriptive cues as a means of

organizing their political support and pressuring legislators for policy actions. In this case, *descriptive* characteristics lead to *substantive* representation, by which legislators come to represent the interests of key groups in the population. Research shows, for example, that citizens are more likely to contact their legislator if he or she shares their racial category (Gay 2002; see also Tate 2003; Barrett 1995), and female voters are significantly more aware of gender when evaluating a particular legislator or political candidate (Rosenthal 1995). Thus, voters may strongly influence the characteristics of those elected as well as the policy priorities pursued once in office. In this case, a legislator's educational background may serve as a cue for constituents to lobby the legislator for spending that benefits higher education.

However, legislators obviously carry their own biases and interests, which may influence their policy priorities and decisions directly and indirectly. For example, female legislators are more likely to see themselves as the representatives of women (Reingold 1992), but it is not clear the extent to which constituents shape this attitude or whether it is used to argue for policies in the legislator's own self-interest. Some research in economics focuses on the self-interest motivation, arguing that legislators support policies that reflect their own interests, as can be inferred from their personal characteristics. For example, a study in India found that female local policy-makers favor women's petitions (Chattopadhyay and Duflo 2004), and in the United States, research finds that legislators with more daughters are more concerned about issues affecting women (Washington 2008). These researchers find that legislators' personal characteristics (as women or parents) shape their preferences in ways that more closely align them with related policy outcomes. Thus, legislators holding public higher education degrees could have developed a set of preferences that lead them to prioritize public higher education.

Both of the above approaches suggest a positive relationship between the percent of legislators in a legislature with public higher education degrees and state spending on public higher education. While we cannot adjudicate as to which particular mechanisms are most influential, we suspect that the effect should be strongest for the measure of legislator's education that can be most specifically associated with a state's public higher education. Specifically, the strongest relationship should be found for legislatures with a higher percent of *in-state* public higher education degrees, as opposed to the percent with any public higher education degree. However, it may be that theories of substantive representation and preference influence fail to apply when it comes to legislator's educational profile. In this case, the percent public degrees in any legislature may not matter, and simply having a more educated legislature, regardless of public or private degree receipt, may reflect higher education spending.

Omitted Variable Bias

The analysis to follow is not longitudinal, and without data over time in states, we cannot specify significant influences in spending *within* a given state over time. Here, we focus on characteristics that might differentiate spending levels *between* states at a given time. The primary drawback is the inability to address the issues of causality and with that the possibility that we may be omitting important factors that would explain a positive relationship between legislator's public educational profiles and spending on higher education. For example, legislators with public higher education degrees may not be driving increased spending, but rather states that spend more on public higher education have a larger pool of publicly educated candidates, increasing the chances such candidates will be elected. Thus, "looking like" a population in terms of education is not an outstanding characteristic for a legislature and thus will not increase the likelihood of any particular policy commitments across states. Given that longitudinal data are not available, we provide an initial robustness check of our models by also controlling for prior levels of spending. We find that legislator's public higher education degrees remain significantly related to public higher education spending, demonstrating initial though tentative evidence for a causal effect.

Data

Dataset Construction

In order to test the variation in public higher education spending among states, the analysis uses a unique dataset constructed by the authors. We include measures for the percent of legislators with (1) high school as their highest degree, (2) public postsecondary degrees, and (3) public postsecondary degrees from institutions in the state in which they currently serve. Data for higher education degrees include both 2- and 4-year degrees received from public colleges and/or universities.⁴ To our knowledge, this is the first dataset to directly consider legislators' educational profiles. All data were directly gathered and coded from both primary and secondary sources over the spring and summer of 2005. The primary resource for this data collection was the Project Vote Smart organization.⁵ We supplemented these data with information from the state libraries in Arkansas, Kansas, and New Hampshire, all of which contained the lowest data availability in our primary source. Colorado and Montana were also among the five states with the lowest percentage of data available. However, we were unable to find additional information, and for these two states, we only have the educational histories of 58 percent and 59 percent of the legislators, respectively.⁶ We have postsecondary data on 90 percent of the remaining 48 state legislatures. However, we did not interpolate

any missing data, which results in our dataset having information for a total of 88 percent of all state legislators, after outliers are removed.

Compiling data on legislators’ personal characteristics is highly time- and labor-intensive. This limits us to information on legislators’ educational profiles at one point in time. While this narrows our ability to fully address the questions of causality raised here, we argue that the available data provide an initial baseline with which to compare future more comprehensive data, and are suggestive of processes that must be tested in future work. Definitions and sources for all data used in our analyses are shown in Table 1. Descriptive statistics are shown in Table 2.

Table 1
Sources, Year, and Definitions for All Dependent and Independent Variables

Variable Name (Year)	Definition	Source
Spending on Higher Education		
Higher education spending as a percent of GSP (2006)	Total education spending as a percent of gross state product (multiplied by 10)	National Center for Education Statistics (http://nces.ed.gov/); GSP from U.S. Census Bureau (http://www.census.gov/govs/estimate/historical_data_2006.html)
Higher education spending (1996)	Total education spending as a percent of gross state product (multiplied by 10)	National Center for Education Statistics (http://nces.ed.gov/)
Legislators’ Education		
Legislators with high school degree as highest degree (2005)	% of Total	Project Vote Smart (http://www.vote-smart.org)
Legislators with public higher education degrees (2005)	% of Total	Project Vote Smart (http://www.vote-smart.org)

(Continued)

Table 1
(Continued)

Variable Name (Year)	Definition	Source
Public higher education degrees awarded in-state (2005)	% of Total	Project Vote Smart (http://www.vote-smart.org); state libraries: AR, KS, NH
Control Variables		
State budget (2002)	Total state budget (millions of \$; divided by 1,000)	National Association of State Budget Officers (http://www.nasbo.org)
Adult population with postsecondary degree (2004)	% of Total	Lumina Foundation for Higher Education (http://www.lumina-foundation.org)
Private school density (2004)	Number of private schools in state, % of population	National Center for Public Policy and Higher Education report "Measuring Up"
Lower education spending (2004)	State spending on elementary and secondary education, K-12 (millions of \$; divided by 1,000)	American Legislative Exchange Council report "Report Card on American Education"
Female legislators (2005)	% of Total	Project Vote Smart (http://www.vote-smart.org); legislators' web pages

State Spending on Higher Education

The outcome variable of this study is state spending on public higher education as percent of total gross state product (GSP). Standardizing by GSP

Table 2
Descriptive Statistics for Dependent and Independent Variables

	Mean (SD)	Minimum	Maximum
Spending on Higher Education			
Higher education spending, 2006 ^a (% GSP)	4.43 (1.42)	1.75	7.89
Higher education spending, 1996 ^a (% GSP)	6.46 (2.11)	2.47	11.03
Legislators' Education			
% Legislators with high school as highest degree	3.12 (3.13)	.00	11.27
% Legislators with public degrees from any state	72.42 (12.86)	43.00	93.00
% Public degrees awarded in-state	82.14 (9.88)	58.33	96.55
Control Variables			
State budget ^b	22.17 (25.09)	1.60	145.84
Adult population with postsecondary degrees	37.97 (5.69)	25.60	49.60
Private school density ^b (%)	4.55 (2.44)	1.26	17.60
Lower education spending ^b	.72 (.85)	.07	4.29
% Female legislators	22.06 (7.25)	8.88	33.51

Notes: ^aValues multiplied by 10. ^bValues divided by 1000.

evaluates public higher education spending relative to a state's wealth making spending more comparable and avoiding potential theoretically conflated issues such as political budgetary decisions. This approach is standard practice in the majority of social spending research (Bolzendahl and Brooks 2007; Huber and Stephens 2000). In 2006, total state expenditures for public higher education ranged from \$63 million in Vermont to \$8.28 billion in California (National Center for Education Statistics 2003:391). Data for GSP are from the U.S. Census Bureau's information on State and Local Government Finance. After standardizing state spending by gross state product, state spending in 2006 ranges from .18 percent (equivalent to \$114 million of GSP) in New Hampshire to .79 percent (or \$774 million of GSP) in Mississippi. Although the percentages may seem small, in relation to GSP, they represent large resource

commitments. In addition, we test models that include the dependent variable, calculated from the same sources, lagged to 1996 where state spending as percent of total resources ranges from .25 percent or \$79 million in New Hampshire to 1.1 percent or \$570 million in Mississippi (all again standardized by GSP).

Legislators' Educational Profiles

Our analysis focuses on the effects of legislators' educational profiles on three dimensions. We consider the effects of the percent of a state legislature (1) whose highest degree is high school, (2) that attended public colleges and/or universities anywhere, and (3) of those that attended public colleges and/or universities received their degrees in the state of their current service. In order to create these variables, we compiled a database on the educational profiles of state senators and representatives serving in 2005. The data include education information on 6,517 state representatives, or 88 percent of the total state legislators. There is a considerable variation on the independent variable. Nine states have no representatives whose highest degree is high school: Hawaii, Indiana, Maine, Montana, New Jersey, North Dakota, Oregon, Pennsylvania, and Utah. South Dakota has the highest percentage of legislators with high school as their highest degree at 11.27 percent. The percentage of legislators with postsecondary public degrees from any public higher education institution ranges from 43 percent in Rhode Island to 93 percent in North Dakota. Of the legislators with higher education degrees, New Hampshire's legislature has the lowest percentage who received them in the state of their current service at 58 percent. Louisiana has the highest percentage of legislators who received their postsecondary degrees in-state at 97 percent.⁷

Control Variables

As suggested above, a number of theoretical influences must also be taken into account. Through a multistep process, outlined below, we identified five control variables for inclusion in our analyses. In order to control for legislators' gender, we calculated the percentage of each state legislature that is comprised of women in 2005. We inferred legislators' gender based on their names listed in the Project Vote Smart data. In the case of ambiguous or gender neutral names, we consulted the legislators' web pages and/or news articles in which they appeared. Economic factors are measured through the size of the state budget and percent of adult population with postsecondary degrees. For the budget, we used the 2002 per capita total state expenditures, retrieved from the National Association of State Budget Officers (NASBO) (2003). Data for percent adult population with postsecondary degrees are from the Lumina Foundation for Education.

In addition, we include the political context factors of private school density and state spending on primary and secondary education. We measure private school density as the number of private postsecondary institutions, including 2- and 4-year degree granting institutions in each state as a percent of the state population. Data on private schools per capita are from the Measuring Up (2005) dataset produced by the National Center for Public Policy and Higher Education. Data for state spending on elementary and secondary education (K-12) are reported for 2004 by the American Legislative Exchange Council's "Report Card on American Education" (LaFevre 2005).

Analytic Strategy

As the data are cross-sectional, our models explain the variation in spending *between* states (not within states over time). Thus, significant relationships in this article explain higher or lower spending among states, not within a given state over time. The limitations of 1 year of data across 46 states mean that models must remain parsimonious in order to be efficient and reliable. In particular, shared variation among state-level variables is problematic for obtaining robust results. We tested all theorized control variables for their significance in predicting state spending on higher education as a bivariate relationship. With only 46 cases, we run the risk of overfitting our models. Therefore, we excluded the following controls from our final analyses because of their lack of significance and the need for parsimony in the face of small sample sizes: average years served on the state legislature, percent Democrats,⁸ and percent of the population aged 65 and older.⁹ Analyses of excluded control variables are available upon request.

Having arrived at a final set of variables to test, below we analyze the correlations among the variables, in particular examining the relationships between spending and legislators' educational profiles.¹⁰ We then consider a series of ordinary least squares (OLS) regression models. First, we re-examine the bivariate relationships between each of the legislators' education indicators and spending. Next, we evaluate full models with legislators' educational profiles and all controls for each indicator of legislators' education. Finally, we add a measure of lagged education spending as a more stringent test of causality. Lagging the dependent variable predicts especially conservative coefficients because values at the two points in time are highly correlated. Given our small sample size and because this model yields such conservative estimates of the effect of independent variables, we consider a p -value of $<.10$ to be the threshold of significance. The final, lagged dependent variable model is represented by the following equation (Equation 1):

$$Y_{i1} = \alpha + \beta_j Y_{i2} + \sum \beta_j X_{ji} + e_i \quad (1)$$

In addition, we specify robust standard errors in order to account for any potential heteroskedasticity in the error term.

Finally, postestimation diagnostics of added-variable plots revealed four significant outliers: New Mexico, Wisconsin, Alaska, and Colorado (as noted above, information for Colorado was incomplete).¹¹ Added-variable plots consider the effect of each variable in the model, taking into account the effect of all other variables. The above states depart from the mean by at least four standard deviations on at least half of the variables in the “legislators’ educational profiles” model, which includes all significant control variables and percent legislators educated in-state public institutions. In the results below, we exclude these states from the analysis. The inclusion of these states mediates the final significant effect of legislators’ education. To evaluate whether such changes in the results are because of the changes in the sample size (from 50 to 46), we randomly excluded four states at a time from the analysis in five additional models. The only change to the model occurs when the outlier states are included, further demonstrating the disproportionate effect these states have on the results.

Results

Correlations and Bivariate Relationships

Bivariate analyses shown in Table 3 indicate initial support for our hypothesis that legislators’ educational profiles affect state spending on higher education. A positive and significant coefficient of .65 and .35 for percent legislature with public postsecondary degrees generally and percent of those degrees awarded in-state respectively suggests that states with high proportion of publicly educated legislatures also appropriate more state funds to those institutions. The very low and statistically insignificant bivariate correlation (.02) between the percent of legislatures with high school as their highest degree and spending on higher education suggests that the primary rift is between public and private education rather than secondary and postsecondary education and supports the expectations related to public degree as a salient representative characteristic. However, the relatively low incidents of legislators with high school as their highest degree may contribute to the small effect. Next, we examine whether the relationship between legislators’ education and spending remains with the inclusion of other theoretically important factors.

Table 3
Pairwise Correlation Coefficients for Dependent and Independent Variables

	Higher education spending, 2006	Higher education spending, 1996	% Legislative HS highest degree	% Legislative public degrees	% Public degrees awarded in-state	State budget	% Adults with HE degrees	Private school density	Lower education spending
Higher education spending, 1996	.96***								
% Legislative HS highest degree	.02	.02							
% Legislative public degrees	.65***	.60***	-.24						
% Public degrees awarded in-state	.35*	.40**	-.28*	.30*					
State budget	-.29*	-.28**	-.37**	-.06	.20				
% Adults with higher education degrees	-.41***	-.43*	.05	-.59***	-.25	.07			
Private school density	.42***	.36**	-.05	.25	-.02	-.11	-.13		
Lower education spending	-.34**	-.32**	-.38**	-.11	.19	.98***	.09	-.09	
% Legislature female	-.38*	-.40***	.21	-.23***	-.54***	.12	.45	-.26	.09

Notes: *** $p < .01$, ** $p < .05$, * $p < .10$.

Table 4
Coefficients from OLS Regressions of Legislators' Education and Controls on Higher Education Spending, $N = 46$

	Bivariate Models			Controls			Prior Spending		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
% Legislators with...									
High school degrees	.010 (.068)		-.009 (.073)				-.004 (.022)		
Public higher education degrees	.073 (.013)***			.056 (.015)***				.012 (.006)**	
Public HE degrees awarded in-state		.053 (.019)***			.061 (.020)***				.049 (.009)***
Controls									
State budget ^a			.068 (.025)***	.043 (.022)*	.058 (.017)***	.025 (.007)***	.022 (.007)***	.023 (.008)***	
% Adult population with higher education degrees			-.063 (.035)*	.010 (.033)	-.063 (.034)*	-.000 (.014)	.013 (.013)	-.003 (.014)	

(Continued)

Table 4
(Continued)

	Bivariate Models			Controls			Prior Spending		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Private school density				.193 (.069)***	.135 (.058)**	.230 (.055)***	.058 (.024)*	.053 (.021)*	.070 (.027)***
Lower education spending ^a				-2.448 (.812)***	-.671 (.712)**	-2.294 (.565)***	-.814 (.241)***	-.725 (.250)***	-.770 (.277)***
% Female legislators				-.038 (.032)	-.046 (.026)*	-.017 (.028)	-.001 (.010)	-.006 (.008)	.010 (.014)
Higher education spending, 1996 ^b							.600 (.040)***	.566 (.039)***	.589 (.046)***
Constant	4.427 (.287)	-858 (.982)	.047 (.669)	7.109 (1.143)	.584 (2.108)	.766 (2.356)	.429 (.716)	-.688 (.786)	-.142 (.970)
R-square	<.001	.418	.124	.456	.6003	.548	.943	.943	.930
BIC	161	138	158	150	137	145	59	54	68

Notes: *** $p < .01$, ** $p < .05$, * $p < .10$; two-tailed tests; robust standard errors in parentheses. ^aVariable values originally divided by 1000. ^bVariable values originally multiplied by 10.

Multivariate Analysis of Spending on Public Higher Education

Table 4 presents the results from multivariate OLS regressions. As expected based on the correlation results, the bivariate relationship in models 1–3 between legislator's postsecondary education and spending is positive and significant for public education generally and for degrees awarded in the state of current service. At the bivariate level, a one standard deviation increase in the proportion of legislators with public postsecondary degrees from any institution predicts a .073 standard deviation increase in spending per GSP. Similarly, a one standard deviation increase in the percent of legislators with a public higher education degree from an in-state institution predicts that a state will spend .053 standard deviations more. In 2006, average GSP was \$332 billion (with a standard deviation of \$396 billion), making that increase equivalent to \$28,908,000,000 and \$20,988,000,000 of average state GSP, respectively. There is no relationship in any of the models between percent of legislators with high school degrees and higher education spending, indicating that the significant public school effect is not simply a general higher education effect.

In models 4 through 6, we consider the effects of legislators' education while controlling for an additional set of theoretically relevant variables. We find that even when controlling for other influences, the bivariate relationships between legislators' education and spending found in Table 2 are consistent. States where more legislators have public school degrees spend more on public higher education than other states, regardless of whether those degrees were received in- or out-of-state. Further, we find that states where a greater percentage of the higher education degrees received are awarded in-state are more likely to spend a higher percentage of GSP on higher education. This supports the expectations from theories of representation, suggesting that legislators might be directly advocating for such spending given their own educational profile.

Turning to control variables, we find a number of interesting (non-)relationships. We find little to suggest that the percent of women in legislature independently impacts higher education spending, in line with prior research suggesting that their effect is more limited to "women's issues" (Reingold 2000; Swers 1998). The percent of the adult population with postsecondary degrees is not significantly linked to spending with the exception of one model where the relationship is negative. This suggests that higher education spending is not simply the result of more college-educated adults demanding increased spending, and provides some evidence that legislators advocate for higher education spending for reasons other than descriptive representation. Also contrary to some earlier research, we find that in states where there are

more private sources of higher education, there is also more spending on public higher education. Such findings suggest that rather than providing competition, a more pervasive atmosphere of higher education may be mutually beneficial for both types of schools. Yet, as expected, spending on public higher education does appear to compete with spending on lower levels of public education. Also, as predicted, we find that the size of the state budget is positively related to overall spending. Prior research on social spending has found that as government wealth increases, an increasing portion of that wealth is devoted to social programs (Wilensky 1975). Our results suggest that bigger budgets are associated with a state spending a greater share of its wealth on higher education.

Finally, in models 7 through 9, we add a 10-year lagged measure of public higher education spending. As shown in Table 3, the two spending measures are extremely correlated, thus absorbing a great deal of the variation to be explained. Despite such obstacles, we still find evidence of a positive relationship between legislators' state schooling experience and spending on higher education for both in-state and out-of-state degrees. These relationships are significantly smaller than in the previous models without the lagged spending measure. However, the results still suggest that an increase of one standard deviation in the percentage of state legislators with public degrees translates to a roughly .012 and .019 standard deviation increase in spending on public higher education as a proportion of GSP, or 4.752 and 7.524 billion additional dollars, respectively, on average of state GSP. As a whole, these results suggest that although spending is slow to change, the influence of state legislators cannot be fully attributed to prior spending circumstances, and help allay concerns over omitted variable bias. Thus, offering initial evidence that legislators who are publically educated both in- and out-of-state may independently influence state public higher education spending.

Conclusion

Appraisals of the U.S. system of social provision from a comparative perspective often neglect important variation within the country. While the United States has the reputation of expansive public higher education, a closer look reveals great variation across states in spending on public higher education. Previous work on economic and demographic variation cannot fully account for these spending differences. While some studies have tested the importance of political context in general, none have been able to capture a measurement of the direct effect individual legislators may have on spending, although prior literature confirms that individual legislators influence policy. Along these lines, theories of representation, such as at the intersection of descriptive and substantive representation and the influence of policy-maker's embedded

preferences, suggest the possibility that state legislators with public education degrees will be more likely to advocate for public higher education spending. The hypothesized effect from these theories is causal, but alternative approaches may question this causal interpretation. Reverse causality and omitted variable bias threaten the results. We cannot fully control for all of the possible influences on public higher education spending, and the possibility remains that prior high levels of spending may be creating larger pools of publically educated legislators and higher current levels of spending across states.

In our results, there is a strong positive bivariate relationship between the percent of legislators with public higher education degrees and spending on public higher education. The majority of the variation in spending among the states is determined by standard pressures (e.g., resources) and even more so by earlier levels of spending in a path-dependent fashion. Nevertheless, we find evidence that the educational profiles of legislatures matter independently. Final models show that this relationship is significantly mediated by prior spending, yet still substantive. The results suggest that variation *among states* is at least partly because of the election of publicly educated legislators who advocate for public higher education spending. However, these findings cannot fully disentangle the extent to which the direct effect of legislators is because of legislator's own preferences, substantive representation of voter's interests, or the cognitive feedback effects of being educated in a public university or college. Thus, the question remains, *why are* legislators more or less likely to advocate for public higher education spending?

While the answer to this question is beyond the scope of this project, our results provide strong initial evidence that legislator's education profiles matter. Further, descriptive evidence bolsters our findings, suggesting that publicly educated legislators often act as advocates for public higher education. Across the United States, state legislators who are state school alums express their commitment to their alma mater in a variety of political forms. Representative Hollis Downs who returned to his alma mater, Louisiana Tech, to speak in 2004, "Since my days as an undergraduate, I have maintained a strong passion for the university...[and]...I have tried to continue that since being elected to the [Louisiana] House of Representatives" (Metcalf 2004:1). Constance Howard, Illinois, is considered a "guardian angel" and one of Chicago State University's "Friends in Government" (Chin 2001; Wheeler 2005). The board of trustees of CSU praise her saying, "Howard has been there to help us do what we need to do get funding in the Illinois General Assembly" (Chin 2001:1). Any search of legislative and university news reports is replete with examples of connections between legislative alumni and their alma maters.¹² There is both qualitative and quantitative evidence for a positive relationship between legislators with public higher education degrees and spending on public higher education.

These data provide an initial baseline of findings, but are not without important limitations. In particular, we look forward to future research with longitudinal data that can more robustly test these theoretical expectations. If research continues to demonstrate such relationships, it suggests that public higher education may benefit financially from supporting publicly educated candidates and by cultivating relationships with current state legislative alumni. With a focus on spending, we did not include data on voters' expectations, which kinds of educational policies are being supported or legislator's individual voting records. Additionally, the larger question of whether increased economic resources lead to greater quality of education is unanswered, as we do not include measures for the quality of education by state (Friedman 2005). Our work finds that a previously unexplored mechanism in the higher education system, the relationship between the educational backgrounds of legislators and spending, warrants further analytical attention in future work.

ENDNOTES

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¹Our analyses use the number of private schools per capita rather than enrollment figures to indicate private school density which accounts for the slight discrepancy between these figures and our descriptive statistics.

²In both cases, causality is not clearly established, and there may be feedback loops similar to those we describe below. In the case of partisanship, when Democratic strength is shown to matter, the positive relationship may be because Democrats are more likely to campaign on education spending or they are more likely to be elected in states that spend more on education. In the case of incumbency, this may increase organizational resources, as well as suggests that legislators with greater policy skills stay in office longer.

³A somewhat overlapping theoretical concept in this vein is that of target populations. Social constructions of target populations emerge from a variety of sources, including personal experiences and observations (Schneider and Ingram 1997). The construction of target populations by policy-makers affects the generosity of a policy; the design and implementation of these policies affect target populations (Schneider and Ingram 1997; Schneider and Ingram 2005). Constructions of target populations come to define the recipients of certain public provisions, and these social constructions are reinforced through policy (Schneider and Ingram 1997:104; Schneider and Ingram 2005:17).

⁴This measurement may underestimate the percentage of legislators educated in public institutions as they may have attended out-of-state colleges or universities and therefore yields conservative estimates of the effect of public education.

⁵Project Vote Smart is a citizen's organization that provides voters with neutral facts on politicians including biographical information, issue positions, voting records, campaign finances, and interest group ratings (<http://www.vote-smart.org>).

⁶Postestimation diagnostics indicate that Colorado is an outlier and is therefore removed from the final analyses reported here.

⁷An Appendix Table with legislators' educational profiles and spending by state is available upon request.

⁸Recent research (Dar and Spence 2010) also supports the preclusion of percent Democrat, based on the documented complexity and bidirectional relationship between partisanship and state spending on higher education.

⁹Source information on omitted control variables and results including them are available upon request.

¹⁰Only variables included in OLS regression analyses are reported.

¹¹An examination of each outlier state's situation reveals a unique set of circumstances, which we are unable to fully represent here. For example, Alaska's sparse population and non-contiguous geography are often cited as a reason for exclusion; Colorado has been found to have significantly disinvested in higher education; New Mexico has instituted a remarkably generous program of funding; and Wisconsin has benefitted from non-state funding and slow returns. For more detailed information on these cases, please contact the authors.

¹²Case study data demonstrating these ties are voluminous. Some further examples: Representative Eddie Fields "proudly serves his alma mater on the Oklahoma State University Alumni Leadership Council" (Oklahoma 2010). Representative Dwayne Bohac graduated from Texas A&M University and was recently recognized for his leadership in public education (Marketwire 2010; Texas 2010). Representative Arnie Roblan was recognized by the University of Oregon, as a Distinguished Alumnus and is said to have an "unwavering commitment to improve the quality of education" (Oregon 2010). Some legislators may even find employment in their alma maters such as Representative Thomas Murt who teaches part-time in the Business Department at Penn State.

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