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## The effects of educational attainment of state legislators on state appropriations to public higher education

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## The effects of educational attainment of state legislators on state appropriations to public higher education

### Abstract

Elected officials come to office from a variety of backgrounds and experiences, and researchers have sought to discover how these characteristics affect the policy making process. There is a gap in the literature pertaining to whether educational attainment of policymakers influences education policy. This research analyzes the educational attainment of state lawmakers and whether higher levels of educational achievement influence the legislative support of public universities as measured by budget appropriations to those schools. Results show there is a statistically significant positive relationship between educational attainment of lawmakers and support of post-secondary education. Future studies should consider developing an improved measure of educational attainment as well as the inclusion of variables that represent other sources of competition for state resources such as Medicare or corrections.

**THE EFFECTS OF EDUCATIONAL ATTAINMENT OF  
STATE LEGISLATORS ON STATE APPROPRIATIONS TO  
PUBLIC HIGHER EDUCATION**

**A Research Paper Submitted in  
Partial Fulfillment of the Requirements for the Degree:  
Master of Public Policy**

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## **Abstract**

Elected officials come to office from a variety of backgrounds and experiences, and researchers have sought to discover how these characteristics affect the policy making process. There is a gap in the literature pertaining to whether educational attainment of policymakers influences education policy. This research analyzes the educational attainment of state lawmakers and whether higher levels of educational achievement influence the legislative support of public universities as measured by budget appropriations to those schools. Results show there is a statistically significant positive relationship between educational attainment of lawmakers and support of post-secondary education. Future studies should consider developing an improved measure of educational attainment as well as the inclusion of variables that represent other sources of competition for state resources such as Medicare or corrections.

## **Introduction**

In a presidential message for American Education Week in 1938, President Franklin D. Roosevelt voiced a sentiment that is common among many Americans, “Democracy cannot succeed unless those who express their choice are prepared to choose wisely. The real safeguard of democracy, therefore, is education” (Roosevelt 1938). More than eighty years after Roosevelt’s speech, few Americans question the importance of a quality education for individuals and society. That said, for many reasons ranging from personal experience to ideological, many Americans now openly question and criticize the system that has developed to deliver that education. A significant number see public school systems as both inefficient with what they are given (resources) and ineffective at what they do (teach). Despite increasing involvement by the federal government over the past few decades, education policy and funding has largely remained an issue of state and local control. As a result, those who have the most power to control education policy are those who are elected to serve on local school boards or in state legislatures.

What has not been well-explored in the literature is the relationship between the educational attainment of members of state legislatures and the education policies implemented by those legislative bodies. This paper looks to fill this gap in the literature by asking the following question: does the educational background of political decision makers influence policy outcomes on education questions? This study specifically looks at the educational attainment of state legislators in Iowa and whether a better educated state legislature results in increased state resources public education as measured by state appropriations to Iowa's three public universities.

While our political leaders already tend to be better educated than the general population, colleges and universities have been awarding degrees at an increasing rate over the past few decades. In 1975-1976, colleges and universities in the United States awarded just under 926,000 bachelor's degrees. Four decades later, that number had increased by nearly 1 million diplomas to 1,920,000 in 2015-2016, a 107 percent increase (National Center for Education Statistics 2018). It is reasonable to believe that the already high numbers of degree-holding legislators will continue to increase in the future.

The following review of the literature will look at two kinds of research. First, it will look at research that analyzes personal characteristics about members of lawmaking bodies, including educational attainment, which may affect the choices a legislator makes while considering legislation and policy. Second, is a review of the research regarding the factors which affect state appropriations to public higher education by state legislatures as a measure of education policy.

### **Educational Attainment of Legislators and its Effect on Policy**

Because legislators at both the state and federal levels wield an enormous amount of power over policy that deeply affects the lives of all their constituents, there is value in examining how the personal characteristics of legislators may affect voting behavior and influence policy outcomes. The existence of conflict of interest statutes and rules in all fifty states regulating the conduct of public officials and public employees to limit or eliminate the possibility for personal financial gain while serving seems to acknowledge this much. Personal characteristics of the legislators themselves are of note. These background details help to form a legislator's world view which in turn impacts the decisions they make as a lawmaker.

While traditionally underrepresented population groups, such as women and racial/ethnic minorities have made significant strides in recent decades in achieving more representation in public service positions including elected offices, their numbers, in most cases are nowhere close to levels of representation that is equal to their proportion within in the general population. That said, maybe the question in regards to representation centers more on the extent to which personal characteristics affect public officials' inclination to partake in active representation and advocate for legislation and policy beneficial for groups they identify with.

In defining active representation, Gibran utilizes a definition developed by Pitkin (1967) and later expanded by Seldon (1997) and Hinderer (1998) as "one who is 'acting for' others in ways that correspond to what he or she represents as a member of a group holding common characteristics and attitudes" and including "representative behavior which benefits minorities even if the administrators are not demographically associated with the minority group in question but whom they believe have special needs requiring their responsiveness" (Gibran 2013). Gibran

then explores the factors that led either active or passive representation by agency administrators on behalf of minority groups within Tennessee state agencies. Gibran found that at the agency level, administrators' willingness to act on behalf of underserved constituencies was driven largely by role expectations held by others (public, agency) as well as the administrators' own perceived authority to act in vague or ambiguous situations (Gibran 2013).

Somewhat conversely to Gibran's findings, while examining a different level of public service, Neiman (2014) found little evidence that state legislators engaged in what could be defined as active representation, particularly by the narrower Pitkin definition. Neiman analyzed response rates to constituent correspondence by state legislators as well as the level of engagement by those legislators and found that legislators with lower relative levels of educational attainment were not any more sympathetic to constituents with low education levels. Additionally, when testing to see whether legislator educational attainment level corresponded with policies favorable to those with lower educational levels (higher state minimum wage, Medicaid spending), Neiman found no evidence of representative solidarity by legislators from similar educational backgrounds. In fact, the opposite of the hypothesized result was found and legislators with more education were more supportive of both a higher state minimum wage and increased Medicaid spending (Neiman 2014).

Neiman's work brings us to the educational attainment of legislators, a trait that has not been focused on with much regularity in past literature. Often, if educational attainment was included in a study, it was as a secondary control variable and not as the primary independent variable of interest. Research in political representation has shown that members of the political ruling class are in many ways not representative of the country as a whole; they are generally wealthier and much better educated. An article in *The Chronicle of Higher Education* from 2017

noted that while only 31 percent of adults over age 25 have a four-year degree, 95 percent of members of the U.S. House of Representatives hold a bachelor's degree or higher, with 66% of members holding graduate degrees. While educational attainment in state legislatures is more reflective of the general population, particularly when compared to Congress, with nearly 25% of state legislators not possessing a four-year college degree, it still pales when compared to the nearly 72 percent of adults without a college degree nationwide (Hu 2011).

Returning to educational attainment and its effect on legislator behavior, a study on the effects of religion on roll voting in Wisconsin by Yamane and Oldmixon (2006) found that higher educated lawmakers tended to vote more liberally and were less likely to support restrictions on access to abortion. Freeman (1985), looked at cosmopolitanism, defined as the willingness to look outside an organization for ideas, among state legislators and found that educational attainment was one of the variables linked with increased support for cosmopolitanism among legislators surveyed.

Other studies have not found as strong of a link between legislator educational attainment and voting behavior or policy. Ozyimy (2010) did not find that higher levels of legislator education had any effect on self-perceived lobbyist influence either over time or over the legislative process itself. Similarly, Carnes (2012), while looking at members of the U.S. House of Representatives, did not find any statistically significant relationship between legislator educational background and roll-call voting on economic issues. Carnes writes, "representatives general economic orientations appear to be tied to how they previously earned a living, not how much education they received or how much money they earned" (2012, 21–22).

A study looking at policy priorities of African American women in state legislatures by Barrett found that while black women often came from professional backgrounds in education,

the data in the study failed to “demonstrate any interaction between level of education and support for either minority policies or for women’s policies” leading the author to conclude that a legislator’s “level of education does not appear to affect overall policy priorities” (1995).

While Neiman (2014) found that state legislator educational attainment had an effect on support for increased state minimum wage and Medicaid spending, the same paper found no statistically significant relationship between the educational attainment level of state legislators and the response rates or engagement levels with constituent correspondence. Finally, Drucker (1982) when evaluating the pre-legislative educational attainment of members of the New York State Legislature found significant differences in the behavior between lawyer and non-lawyer members of the legislature. For example, Drucker found that non-lawyers were more concerned with the impact on their constituencies when evaluating legislation while lawyers focused on language and intent.

### **State Appropriations to Public Higher Education**

While educational attainment of state legislators is treated as an afterthought by most studies, a variable that is thrown into the mix of other control variables, there is no shortage of studies that look at state appropriations to public higher education. Why focus on higher education? Appropriations to higher education in most states represent a direct expenditure towards education. Because pre-K–12 education in most states is still primarily funded through local property taxes, appropriations from most state legislatures represent supplemental aid for local school districts, rather than the primary funding mechanism. There are of course exceptions to this model, most prominently Michigan which moved away from the traditional model of school funding based on property taxes to a system financed by a statewide sales tax and

distributed to schools on a per-pupil basis. Additionally, there is just more literature and research that is readily available in regards to higher education funding.

Because funds public higher education receive are appropriated by state legislatures, many of the factors driving funding are political in nature. An analysis of article titles on this topic shows a plethora of politics-filled keywords that include “interest groups,” “politics,” “political,” and “partisan” to name a few. Okunade, in a national, 50-state study published in the *Journal of Education Finance* in 2004 found seven independent variables that all had statistically significant relationships with the dependent variable, the public higher education appropriation share of the total state budget. Key findings from the study include a strong positive relationship between a state’s indebtedness in one year and the appropriations to public higher education the following year. Okunade also found strong correlations between two other public programs, corrections and Medicaid spending, that often compete with higher education for resources. As expected, Medicaid spending was negatively correlated with public higher education funding confirming its status as a competitor for resources. Surprisingly though, prison spending was positively correlated with higher education spending. Okunade speculates that state legislatures across the country “simultaneously responded to the voters’ calls for more prison and increased share of state budgets for public higher education” (2004) as a result of increased political pressures from advocates and activists from each group throughout the 1990s. This relationship is certainly worth pursuing in future studies.

In a study that looks at state support for public R1 universities throughout the 1990s, Weerts and Ronca (2006), found three factors spread across three distinct areas that helped to explain the changes in funding appropriated to these institutions: (1) campus commitment to public service (the campus), (2) strength of the higher education governance system (the higher

education governing board), and (3) extent of gubernatorial and legislative support (the state government) (Weerts and Ronca 2006). Their findings suggest that universities and their governing boards need to be proactive in establishing and growing public service and outreach programs, building partnerships among governed institutions and private industry. Most importantly, in order to help build the political support needed to sustain funding, they need to actively raise the awareness of these partnerships and outreach efforts among political leaders in the state government.

In their 2009 study, McLendon et al. look at the role political factors play in state higher education funding and similar to Okunade's paper, their analysis found several variables included in their study were statistically significant in predicting public higher education appropriations. Most notable was the role political variables played in the higher education appropriations process. This study found evidence that partisanship plays a significant role in state higher education policy, finding "that Republican governors and Republican-dominated legislatures tend to be associated with somewhat lower appropriations for higher education" (McLendon et al. 2009). An interesting finding from this paper is the positive correlation term limits have with appropriated public higher education funds. The authors suggest that this finding is maybe explained by the possibility that less experienced lawmakers are more likely to be captured by higher education lobbyists.

There are many variables that appear across multiple studies all of which look at factors that affect appropriations for public higher education: gubernatorial power in regards to budget, higher education governing board structure, higher education interest group density, and legislative professionalism. First, the governor of a state appears to be a considerable factor in public higher education appropriations. This effect is stronger when the governor's office has

strong budgetary powers and several studies found that a governor with strong budget powers may have a negative impact on public higher education funding. Studies by McLendon et al. (2009), and Ness and Tandberg (2013) all found that a governor with strong budgetary powers can have a negative effect on public higher education funds. Weerts and Ronca (2006) conclude there is “clear evidence that political priorities of the governor and legislators may be a better predictor of higher education appropriations than is the economic condition of the state.”

Another variable that was found across several studies was in regards to the structure of the state’s higher education governing board. Researchers typically look at whether the governance structure is a single, consolidated governing board like the University of Wisconsin System or a coordinating board system consisting of a Board of Regents-like organization similar to what is found in Ohio and Iowa. The reason for including governance structure as a variable is that “theoretically, a more powerful centralized agency or structure would have more resources and have more influence within state government. Therefore, states with centralized higher education governance structures may appropriate more money to higher education” (Tandberg 2010).

The papers that included higher education governance as a variable are a mixed bag of results. Studies from Tandberg (2010) and McLendon et al. (2009) did not find that higher education governance structure had a statistically significant effect on state appropriations to higher education. On the other hand, a study from Ness and Tandberg (2013) found that states with a consolidated higher education governance board could expect a decrease in funds appropriated by the legislature. Conversely, Weerts and Ronca’s found evidence that research institutions operating under a single governance system are more likely to receive higher appropriations than research institutions operating under a coordinating board structure (2006).

The third factor that was common among multiple studies reviewed was a measure of higher education interest groups in the state but how this was calculated differed from study to study. All attempted to measure the lobbying effectiveness of higher education interest groups in a state. For example, the data used to measure this variable in the McLendon et al. study was simply “defined as the total number of state higher education institutions and registered interest groups lobbying for higher education in a given state” (2009). This study found that every registered higher education lobbyist increased state appropriations to public higher education by \$0.05 per \$1,000 of personal income ( McLendon et al. 2009). Another study by Toutkoushian and Hollis (1998) using the proportion of the population age 18 and younger as a measure for a competing K-12 interest group found that K-12 education demand can draw funding appropriations away from higher education.

The primary purpose of Tandberg’s paper was to investigate the relationship between interest group activity and higher education funding measured as a proportion of the state general fund expenditure. Tandberg constructed a measure of non-higher education interest group density by “taking the total number of registered interest groups minus the total number of registered higher education interest groups” (2010) and found that the density of non-higher education interest groups in a state had a significant and negative effect on higher education’s share of the state general fund expenditure. Finally, Ness and Tandberg’s (2013) research looking at differences between capital project funding and general fund appropriations took still another approach to measuring interest group effectiveness by coming up with what the authors called a higher education interest group ratio and is a modification of Tandberg’s non-higher education interest group density above. This variable was found to have a statistically significant

positive effect on both capital project funding and general fund appropriations but had a more pronounced effect on capital projects.

The final common cross-study variable is legislative professionalism and measures what percent of a full-time job is required to serve in the state legislature in a given state. There are multiple ways to measure legislative professionalism. Neiman (2014) uses the measure from the National Conference of State Legislatures which breaks states into 5 groups based on average job time, compensation and staff size. Another scale is one developed by Squire in 1992 and is an index of the state legislature's average member pay, average days in session, and average staff per member relative to Congress (a value of 1.0 means a perfect resemblance to Congress). This scale is used by McLendon et al. (2009) and was found to have a statistically significant positive relationship to public higher education appropriations. Both Tandberg (2010) and Ness and Tandberg (2013) greatly simplify this measure by using legislative salary as a proxy for legislative professionalism and both studies and confirming statistically significant positive relationships with their respective dependent variables.

One final paper by Humphreys (2006) has some interesting findings for public higher education appropriations. Humphreys' study investigated whether there was any relationship between state appropriations and schools with big-time football programs. Humphrey found that schools with Division 1-A (now Football Bowl Subdivision) programs could expect 6 percent more than schools that do not. Additionally, schools with successful football programs may receive between 3 percent and 8 percent increases in appropriations in the following years. Finally, schools that win "the big game" defined as a frequent (annual) game between two large programs in the same state may see a 7 percent increase in appropriations the following year. Humphreys considers these schools, their alumni, boosters, and fans a pressure group and the

athletic program and success on the field are very effective at generating pressure on state legislatures to support those schools through increased appropriations.

### **Research Question and Hypothesis**

As the literature review showed, there is not a shortage of studies that focus on individual legislator characteristics, specifically legislator educational attainment, and their impact on other areas of policy. Nor is there a shortage of research looking at the range factors that can affect state appropriations to public higher education. That said, there is a gap in the literature at the intersection of these two areas which looks at the educational attainment of state legislators as it relates to the education funding in the state. This study asks the following question: does the educational background of political decision makers influence policy outcomes on education questions? More precisely, this study will look at whether legislator educational attainment has any effect on state support for higher education as measured by annual state appropriations to institutions of higher education.

Specifically, the study will be a multivariate regression analysis that will primarily evaluate the relationship between the educational attainment of state legislators in the Iowa Legislature and the appropriations made by the Iowa Legislature to Iowa's three public higher education institutions, the University of Iowa (UI or Iowa), Iowa State University (ISU or Iowa State), and the University of Northern Iowa (UNI) starting with fiscal year (FY) 1987 and ending with FY 2016, encompassing 30-years worth of data. Because this will be a multivariate study, the model will be an ordinary least squares (OLS) regression. While not of principle interest, this study allows for comparing funding for two different types of public higher education institutions. Two of Iowa's state universities, Iowa and ISU are classified as R1: Doctoral

Universities or “institutions that awarded at least 20 research/scholarship doctoral degrees and had at least \$5 million in total research expenditures” by the Carnegie Classification of Institutions of Higher Education (n.d.). The third state university, UNI, is classified as an M1: Master's Colleges and Universities – Larger programs or an “institution that awarded at least 50 master's degrees and fewer than 20 doctoral degrees” (“Carnegie Classifications | Basic Classification” n.d.). This study may uncover differences in how these two types of schools are handled when funds are appropriated by the state legislature and would be a possible topic for future research.

The literature on higher education funding has shown that other factors, particularly those that are rooted in politics or economics play a larger role in state appropriations to any public program, not just higher education. While there is evidence that one’s world view can certainly affect one’s individual behavior, there are limits on what a lone individual can do to affect a process as complicated and multifaceted as budget appropriations, particularly in a highly political environment like the state legislature. Therefore, it is hypothesized that the educational attainment of state legislators will not have a significant relationship to appropriations to public higher education by the state legislature.

### **Variables**

The dependent variable in this model, higher education funding will be measured as higher education appropriations as a percent of General Fund appropriations for that fiscal year. State appropriations data for both the State of Iowa General Fund as well as appropriations to the general funds of each of the three public universities during this time frame came from the Legislative Services Agency with the State of Iowa. Regression models were developed to look

at appropriations to each of the three schools separately as well as the collective appropriation to the three state schools.

It should be noted that this study focuses solely on the state appropriation to the general fund for each of the state universities as well as the “total” appropriation which is the aggregate of the three individual appropriations. This study does not include other sources of funding the schools may receive such as donations, endowments, or grants nor does it include funding these schools received to operate satellite campuses (i.e. UI Oakdale campus) or auxiliary programs (ISU Extension, UNI Recycling and Reuse Center). It also does not encompass funding received by the Iowa Board of Regents to maintain office operations, which averages approximately 0.20% of total appropriations to the Board of Regents System, or to other Iowa Board of Regents institutions such as the Iowa School for the Deaf.

The primary independent variable of interest is the educational attainment of the legislators as measured by *EDU\_AVG*. Each individual legislator is assigned a number from a five-point scale (1=High School, 2=Some College, 3=Completion of Associates or equivalent, 4=Completion of Bachelor’s or equivalent, 5=Completion of a Graduate Degree) that best represents their level of educational attainment. While some legislators disclosed coursework towards a particular degree in their official biographies, only completed degrees were counted. Because there are approximately 150 legislators serving per annual legislative session and because most of the other data points being used in this study are annual statistics (i.e. Iowa GDP), an average of educational attainment of the legislators for each year was calculated. The median and mode of educational attainment were initially included but these two measures of central tendency did not result in any useful information as there was little to no variation within the data and were removed from the model.

Other individual biographic/demographic information about legislators that was included in the model as independent control variables include: gender, political party identification, and the legislative chamber (House, Senate) served. The following independent control variables are gleaned from this data: Party ID of Governor (*GOV\_Party*, 1=D. 2=R, ), Party ID of State House Majority (*House\_Party*, 1=D. 2=R), Party ID of State Senate Majority (*Sen\_Party*, 1=D. 2=R), Percent of Legislature Democratic (*LEGIS\_DEMS*), Percent of Legislature Female (*LEGIS\_FEMALE*), and Percent of Legislature Black (*LEGIS\_BLACK*)

Most of the demographic data about state legislators was taken from the *Iowa Official Register* (informally known as the *Red Book*) published for each General Assembly. Data from the *Red Book* was supplemented with information found in newspaper articles, obituaries, political party websites, and campaign websites to fill in any biographical information missing in the *Iowa Official Register*. Gross Domestic Product (GDP) measured in chained dollars for the State of Iowa is included in the model (*IA\_GDP\_Raw*, *IA\_GDP\_ADJ*) as a proxy of the health of the economy of the state. GDP data was acquired from the U.S. Bureau of Economic Analysis.

One thing to note about Iowa GDP data used in this model. In 1997, the Bureau of Economic Analysis changed the industrial classification for reporting GDP from Standard Industrial Classification (SIC) in 1997 to the North American Industry Classification System (NAICS) in 1998 with data for 1997 included in both datasets. The change in industry classification resulted in a rescaling of reported GDP data from 1998 onward when compared to data from previous years. An effort was made for this study to adjust all reported NAICS data to an approximate SIC value by comparing the 1997 NAICS value (\$113,365 million) and 1997 SIC value (\$83,113.2 million). The change to the NAICS classification from the old SIC classification increased reported GDP in 1997 by 36%. Subsequent NAICS classified GDP data

was then adjusted by this percentage to come up with the variable *IA\_GDP\_ADJ* and the adjusted 1997 NAICS value was used for the 1997 data point. Both versions of the GDP variable (*IA\_GDP\_Raw*, *IA\_DGP\_ADJ*) were included in the final model.

Finally, this model incorporates a variation on what Humphreys wrote about in his paper on college football and higher education appropriations. Humphreys provided evidence that college athletics can have a significant positive relationship with public higher education appropriations from the state legislature. In fact, data about the State of Iowa and the state's two R1 research schools, Iowa and ISU, which both play at the NCAA Division I Football Bowl Subdivision (FBS) level of competition and were included in Humphreys' original study. This study adopts two variables from Humphreys, "Football Wins" and "Team appeared in Bowl Game" (Humphreys 2006) and includes the football results for all three state school teams.

The variable measuring wins by the school's football team in a given year are represented by the variables "*Iowa\_W*," "*ISU\_W*," and "*UNI\_W*." The variable measuring whether the school's football team participated in postseason play is a binary variable (1 or 0) with "1" coded as participation in the playoffs and are represented by "*Iowa\_Bowl*", "*ISU\_Bowl*", and "*UNI\_PO*" in the model. As might be deduced from the *UNI\_PO* label, this variable was modified for the UNI football team which plays at the NCAA Division I Football Championship Subdivision (FCS) level of competition and is not eligible to play in postseason bowl games. Instead, UNI is eligible for the FCS playoffs (*UNI\_PO*). This is coded in the same binary way as invitations to bowl games with "1" representing a playoff invite. It is hoped that UNI's inclusion in the dataset could provide insight on how appropriations to non-R1 schools are affected by the success of their athletic programs.

In general, Iowa is an ideal state to further test several variables and their relationships with higher education appropriations as discussed in the literature review. Iowa offers the opportunity to test the partisan strength of both the legislature and the governorship with regards to public higher education appropriations. The presence of three state universities, two of which are R1 research institutions with “big-time football programs” which would allow us to test differences in how money is appropriated between two different classifications of schools.

Finally, because this study will focus exclusively on the state of Iowa, several variables from studies discussed in the literature review that were significant factors on appropriations to higher education will not apply to this study. For example, legislative professionalism, gubernatorial budgetary powers, and higher education governance will not apply as Iowa only has one example of each and therefore no comparison can be made nor differences determined.

## Methodology and Results

As previously mentioned, this study is a multivariate regression analysis that evaluates the relationship between the educational attainment of state legislators in the Iowa Legislature and the annual appropriations from fiscal year 1987 to fiscal year 2016 made by the Iowa Legislature to Iowa's three public higher education institutions resulting in a timeframe of thirty years. The dependent and independent variables used in this regression model are listed in Figure 1. The dependent variable, which is a measure of funding to public higher education is analyzed as higher education appropriations as a percent of General Fund appropriations for that fiscal year (*Total\_%GF*, *UNI\_%GF*, *Iowa\_%GF*, *ISU\_%GF*) and were further analyzed in aggregate and by individual school.

**Figure 1: Variables**

<i>Dependent Variables</i>	
<i>Total_%GF</i>	Total Appropriated to Iowa Regents Schools (% of General Fund Appropriations)
<i>UNI_%GF</i>	Total Appropriated to UNI as a Percent of General Fund Appropriations
<i>Iowa_%GF</i>	Total Appropriated to Iowa as a Percent of General Fund Appropriations
<i>ISU_%GF</i>	Total Appropriated to ISU as a Percent of General Fund Appropriations
<i>Independent Variables</i>	
<i>EDU_AVG*</i>	Educational Attainment (Mean, House/Senate Combined, All Political Parties)
<i>IA_GDP_Raw</i>	Iowa GDP (Chained Dollars, SIC 1987-1997 to NAICS, 1998-2016)
<i>IA_GDP_ADJ</i>	Iowa GDP (Chained Dollars, adjusted to approximate SIC)
<i>GOV_Party</i>	Political Party in Control of Iowa Governor (1 = Democrats, 2 = Republicans)
<i>House_Party</i>	Political Party in Control of Iowa House (1 = Democrats, 2 = Republicans)
<i>Sen_Party</i>	Political Party in Control of Iowa Senate (1 = Democrats, 2 = Republicans)
<i>LEGIS_DEMS</i>	Percent of Legislature made up of Democrats (House/Senate Combined)
<i>LEGIS_FEMALE</i>	Percent of Legislature made up of Female Legislators (House/Senate, All Parties)
<i>LEGIS_BLACK</i>	Percent of Legislature made up of Black Legislators (House/Senate, All Parties)
<i>Iowa_W</i>	Number of wins in a season by the Iowa Hawkeyes Football Team
<i>Iowa_Bowl</i>	Did Iowa Football play in a bowl game (1 = Yes, 2 = No)
<i>ISU_W</i>	Number of wins in a season by the Iowa State Cyclones Football Team
<i>ISU_Bowl</i>	Did Iowa State Football play in a bowl game? (1 = Yes, 2 = No)
<i>UNI_W</i>	Number of wins in a season by the UNI Panthers Football Team
<i>UNI_PO</i>	Did UNI Football make the I-AA/FCS Playoffs? (1 = Yes, 2 = No)

\* *Independent Variable of Interest*

The primary independent variable of concern is *EDU\_AVG* and represents an attempt to capture a measure of the overall educational attainment of the Iowa Legislature. This is the variable that is of most interest to the author as the primary question is whether the education attainment level of a state legislature plays a role in how much money is appropriated to the public universities which stands in as a proxy for legislative support for education. Other independent variables included in the model are included in order to provide possible explanations for higher education appropriations ranging from economic (*IA\_GDP\_Raw*, *IA\_GDP\_ADJ*), political (*GOV\_Party*, *House\_Party*, *Sen\_Party*, *LEGIS\_DEMS*), demographic (*LEGIS\_FEMALE*, *LEGIS\_BLACK*), and extracurricular (*Iowa\_W*, *Iowa\_Bowl*, *ISU\_W*, *ISU\_Bowl*, *UNI\_W*, *UNI\_PO*).

**Figure 2: Descriptive Statistics**

	Mean	Median	Mode	SD	Variance
<i>Total_%GF</i>	10.23%	10.78%	N/A	1.66%	0.000276445
<i>UNI_%GF</i>	1.68%	1.76%	N/A	0.21%	4.41815E-06
<i>Iowa_%GF</i>	4.76%	5.02%	N/A	0.78%	6.13679E-05
<i>ISU_%GF</i>	3.79%	3.98%	N/A	0.67%	4.49867E-05
<i>EDU_AVG</i>	3.651	3.699	3.180	0.254	0.064
<i>IA_GDP_Raw*</i>	\$100,578.16	\$ 80,973.65	N/A	\$ 43,149.95	1.86192E+21
<i>IA_GDP_ADJ*</i>	\$82,226.47	\$ 78,880.63	N/A	\$ 15,208.68	2.31304E+20
<i>GOV_Party</i>	1.600	2.000	2.000	0.498	0.248
<i>House_Party</i>	1.667	2.000	2.000	0.479	0.230
<i>Sen_Party</i>	1.200	1.000	1.000	0.551	0.303
<i>LEGIS_DEMS</i>	49.85%	48.37%	59.33%	6.48%	0.00419
<i>LEGIS_FEMALE</i>	19.88%	21.43%	14.67%	3.17%	0.00100
<i>LEGIS_BLACK</i>	1.98%	0.67%	0.66%	1.51%	0.00023
<i>Iowa_W</i>	7.23	7.00	8.00	2.61	6.81
<i>Iowa_Bowl</i>	0.73	1.00	1.00	0.45	4.60
<i>ISU_W</i>	4.13	3.50	3.00	2.15	4.60
<i>ISU_Bowl</i>	0.27	0.00	0.00	0.45	0.20
<i>UNI_W</i>	8.43	8.00	7.00	2.22	4.94
<i>UNI_PO</i>	0.57	1.00	1.00	0.50	0.25

\*In Millions of Dollars

Figure 2 shows the descriptive statistics for variables used in the regression model. The mean of *EDU\_AVE*, the independent variable of interest has a mean of 3.651 which indicates that the typical legislator from the dataset will have close to a bachelor's degree. This supports previous research in that lawmakers are generally better educated than the general population. Second, data about partisan control of the legislative chambers and the Governor's mansion show which party has tended to control which of these institutions. With the means of *GOV\_Party* ( $\mu = 1.600$ ) and *House\_Party* ( $\mu = 1.667$ ) indicate that the Republican Party has controlled both the Iowa Governor and the Iowa House more than the Democratic Party during the years covered. The data for both of these variables had modes of 2 which support also support this conclusion. The opposite is true for the Iowa Senate ( $\mu = 1.200$ , mode = 1) which indicates mostly Democratic Party control in the same period and that the state of Iowa was often dealing with a divided government during much of the time covered. What this raises is that despite significant philosophical and ideological differences over education, a divided government would require a tempering of ideological desires within both parties in order to pass required appropriations bills. Therefore, it is possible that funding neither increased as much as nor was cut as much as legislators would have preferred and resulted in a fairly consistent level of funding, extenuating political circumstances notwithstanding.

**Figure 3: Regression Results**

	Multiple R	R Square	Adj R Square	Standard Error	F-Statistic	Significance F
<i>Total_%GF</i>	0.985891011	<b>0.971981085</b>	0.941960819	0.004005577	32.37749735	2.82534E-08
<i>Iowa_%GF</i>	0.985653159	<b>0.971512149</b>	0.940989452	0.001902985	31.82917124	3.16479E-08
<i>ISU_%GF</i>	0.987916913	<b>0.975979827</b>	0.950243927	0.001496115	37.92289489	9.84081E-09
<i>UNI_%GF</i>	0.974194201	<b>0.949054341</b>	0.894469707	0.000705769	17.38684063	1.62254E-06

As can be seen in Figure 3, the resulting R squares for aggregate funding as well as funding to the individual schools all extremely close to 1 and indicate a near-perfect fit of the model to the data in nearly every model variation. The R squares range from  $R^2$  (*UNI\_%GF*) = 0.949 to  $R^2$

(*ISU\_%GF*) = 0.976. The  $R^2$  for *Total\_%GF*, representing the aggregate of all three Regents universities, was 0.972 indicating near-perfect fit of the model to the data.

As would be expected when adjusting for the number of variables in the model (15), the R squares drop, but the resulting Adjusted R Squares still are incredibly high, with *UNI\_%GF* being the only dependent variable to have an Adjusted R Square below 0.9 (0.894). Regardless, both the R Square and the Adjusted R Square for all variants indicate that these models can explain 90% or more of the variation in funding to the regent universities when measured as a percent of appropriations to the state’s general fund with the variables that are included in the model. All four percent models are highly significant at even the highest confidence levels.

**Figure 4: P-Values**

	<b>Total_%GF</b>	<b>Iowa_%GF</b>	<b>ISU_%GF</b>	<b>UNI_%GF</b>
<i>EDU_AVG</i>	<b>0.057422054</b>	<b>0.038574171</b>	<b>0.044634814</b>	0.374422412
<i>IA_GDP_Raw</i>	0.798411279	0.971338721	0.995963552	0.192910855
<i>IA_GDP_ADJ</i>	0.182942156	0.169614988	0.116135256	0.626764353
<i>GOV_Party</i>	<b>0.001755046</b>	<b>0.001285501</b>	<b>0.002676788</b>	<b>0.004889179</b>
<i>House_Party</i>	<b>0.063473662</b>	<b>0.060227099</b>	<b>0.0569159</b>	0.148626454
<i>Sen_Party</i>	0.216660191	0.163316083	0.192254527	0.6444021
<i>LEGIS_DEMS</i>	0.294875471	0.326197657	0.217656585	0.49760917
<i>LEGIS_FEMALE</i>	0.200638829	0.150276679	0.228572586	0.410011524
<i>LEGIS_BLACK</i>	0.404793037	0.327634714	0.336760595	0.975068369
<i>Iowa_W</i>	0.772089695	0.730459497	0.898825434	0.656883294
<i>Iowa_Bowl</i>	0.604292053	0.607634469	0.640394822	0.570694905
<i>ISU_W</i>	0.207922301	0.174320147	0.274541154	0.241314898
<i>ISU_Bowl</i>	0.198019691	0.16291181	0.23319619	0.308511225
<i>UNI_W</i>	<b>0.045060888</b>	<b>0.047773081</b>	<b>0.031027954</b>	0.141584826
<i>UNI_PO</i>	0.307104069	0.340851978	0.241454433	0.457417334

Figure 4 contains the P-Values for each of the variables in the percent models. For the model with aggregate *Total\_%GF* as the dependent variable, the significant independent variables at  $\alpha = 0.05$  were *GOV\_Party* and *UNI\_W* with P values of 0.00176 and 0.0451 respectively. The aggregate variation of the percent model had two variables that did not reach significance at  $\alpha = .05$ , *House\_Party* (P = 0.0635) and *EDU\_AVG* (0.0574) but they both

approach significance in the correct direction and are worth noting because the overall model itself is both explanatory and statistically significant.

The findings in the aggregate model are further supported when looking at the state's two R1 schools separately. It is clear in Figure 3 the R-Squares in that table for the Iowa and Iowa State models are very similar to the R Squares for the aggregate model. Looking at the P values in Figure 6, like the aggregate model, *GOV\_Party* and *UNI\_W* are both significant at  $\alpha=0.05$  for both the Iowa and the Iowa State models. As with the aggregate model, the variable *House\_Party* only approaches significance at  $\alpha=0.05$  in both the Iowa and the ISU models. However, the independent variable of primary interest for this study, *EDU\_AVG*, does reach significance at  $\alpha=0.05$  in both school-specific models. Given how close *EDU\_AVG* was to being significant in the aggregate model, it is not unexpected that *EDU\_AVG* reaches significance in the school-specific models and helps to bolster the aggregate model's predictive power.

The UNI models both seem to be the outliers when looking at all of the regression and p-value results as a group. While the UNI specific models fit the data well, it is clear that the models are a degree less predictive when compared to the models for the two larger schools as well as the model for the three schools in aggregate. In regards to significant independent variables ( $\alpha=0.05$ ), both UNI models had a single significant variable and that variable aligned with the significant variables found in the models for the other two schools as well as the aggregated funds model. A bit unexpectedly, the variable *UNI\_W*, which was significant for all other percent models, was not significant for UNI itself. Outside the single significant variable, no UNI model had any other variables that approached significance.

## Discussion

The primary purpose of this study was to identify whether the educational achievement of state lawmakers had an effect on funding appropriations to education by the state legislature. This study was premised on the idea that the personal characteristics of individual lawmakers have an effect on the policies they pursue while in office. At first glance this is a reasonable presumption to make, particularly in an election year when the airwaves are saturated with campaign ads highlighting a candidate's background which is connected to policy through rhetoric. An elected official's personal background certainly does inform and shape their world view. Therefore, it would seem reasonable to think that one's world view would affect one's policy priorities but is there a limit that one's world view can have on policy outcomes? For example, there are many politicians opposed to the existence of abortion who then state their opposition is rooted in their personal faith and/or religious upbringing, two things that can certainly shape their existing world view. That said, these same politicians have repeatedly found it extremely difficult to either establish or remove policies that accomplish that goal.

Educational attainment would appear to be one of those personal characteristics that would reasonably be expected to play a large role in shaping a lawmaker's world view yet have a limited effect on influencing policy outcomes. It is a topic that does not have a large body of existing literature though there are some studies that look at the role educational attainment plays in influencing lawmaker behavior. Neiman (2014) found no evidence that educational attainment encouraged representative solidarity among legislators. Similarly, Ozymy (2010) & Carnes (2012) both found that educational attainment had a limited effect on voting policy and behavior among legislators. This study is similar to those studies but looks to determine if there is a relationship between educational attainment and support for education and the data is focused on

the state of Iowa with monies appropriated to the state universities as the simplest proxy for “support for education.” To restate the hypothesis: it is hypothesized that the educational attainment of state legislators will not have a significant relationship to appropriations to public higher education by the state legislature.

Overall, an unexpected result in the regression results was the fit of the model to the funding data. Whether it was measured by dollars appropriated or as a percentage of the appropriation to the state’s general fund, most variations of the regression model (Aggregate, Iowa, ISU, UNI) were highly explanatory in regards to the variation in the funding data. All regression models were highly significant at even the highest confidence levels.

What was possibly more unexpected was how the regression model became more explanatory when the dependent funding variable changed from raw dollars appropriated to a percentage. Measuring university funding as a percent of the general fund appropriation came about because of the high R Square value in the dollars appropriated model. It was hypothesized that the raw dollar amounts were causing some of the correlation and that switching how funding was measured to a percent measure would eliminate some of that correlation. To see the model become more explanative went against the expectations surrounding the inclusion of the percent measure of the dependent variable.

Results regarding the primary variable of concern, educational attainment, are a bit of a mixed bag when viewed across both funding versions of the model. In the raw dollar amount version, educational attainment was not statistically significant along with most of the other variables in that model. The only significant variable in any of the raw dollar amount variations of the model was the percentage of Black Legislators. That result was viewed with caution and that significance disappeared when the dependent variable shifted from raw dollar to percentage.

In the aggregate funding variation of the percentage model, educational attainment did not quite reach statistical significance but it came very close and when considered in the context of the model, this variable's inclusion did contribute significantly to the model and helped to increase its predictive power. This result was bolstered by the school models for Iowa and Iowa State where the educational attainment did reach statistical significance along with the variables for the Political Party of the Governor and State GDP.

Regardless of the money's ultimate destination, because budget appropriations are conducted by the state legislature, they are inherently a political process. Therefore, politics may be the reason these regression models fit the funding data so well. Even though it is possible to designate some variables as "demographic," others as "political," and still others as "extracurricular" as this study did, one can ultimately provide a political explanation for any of the variables included in this study. There are variables included in the model that explicitly captured partisan political data such as which political party controls the office of the governor as well as the state senate and the state house.

But even data that is not explicitly partisan or political in nature can be exposed as political or partisan in some way. For example, as written about in the literature review section, a study by Yamane & Oldmixon (2006) found that higher educated lawmakers tended to vote more liberally showing that educational attainment could have a political effect. A state's GDP is reflective of economic policies put into place by the legislature and the executive branches. While this study did not look explicitly at the partisan trends for race and gender, it would not be unreasonable to expect that both of those identities would drive a political process. For example, a survey of Iowa's 88<sup>th</sup> General Assembly, about 32 percent of female members in the legislature (14) identify as Republican (5 Senate, 9 House), while all five black legislators belong to both

the Iowa House and identify as Democrats. Even variables as innocuous as number of wins and an appearance in the postseason by a school's football team can have political implications one views the universities, their alumni, and athletic booster clubs collectively as an interest group vying for political attention and influence in the state legislature. Success on the football field has the potential to lead to additional resources for the school.

As demonstrated in the previous paragraph, all of the independent variables that were included in the regression model have political implications in an inherently political process and the regression model used in this study may be finding those relationships amongst the data. Given that, it is not particularly surprising that the bulk of the variation in appropriations to the state universities in the state of Iowa is explained by the political party (particularly the party identification of the governor can influence where the budgeting process starts in the state legislature) or by state GDP which will affect the amount of money lawmakers have to appropriate to services like higher education. The addition of education attainment of legislators as a variable is novel, and in the percent funding model, did contribute significantly to the model and increased its predictive power.

### **Study Limitations and Future Research**

Despite the results of this study, there are several areas where the author ran into limitations with the data or where methods might be improved. First, a better way to quantify educational attainment should be developed. While the five-point system used in this study accomplished the goal of quantifying educational attainment for an individual lawmaker, it was not immediately obvious how to translate 150 individual pieces of data in a given legislative session over a thirty-year time frame into a measure that could be used with other annualized data such as state appropriations or state GDP figures. The solution of taking the mean of all 150 legislators in a given legislative session to devise a single data point that represents the educational attainment of that particular General Assembly certainly accomplished the goal, but the solution felt crude and there were questions regarding what the resulting datapoint as calculated from the mean was actually measuring.

Another limitation with the educational attainment data had to do with the large number of ways an individual can be credentialed by an institution of higher education and the subjectivity involved in assigning a number to that credential. Several times during data collection, the author wondered how to classify a leadership certificate or business certificate. A final challenge with educational attainment data is two-fold. One is that our elected officials are generally better educated than the public which can be seen in the data which consists of majority 4s (Completed Bachelors) and 5 (Completed Graduate Degrees). Second, despite being the majority, the frequency of 4s and 5s increased in the dataset as we moved from 1987 to 2016. This no doubt reflects the growing rate at which bachelor's degrees are being awarded over the last few decades. It would not be unexpected to see a natural positive correlation emerge as both funding to universities and educational achievement levels in the population increase over time.

There are ways to adjust the measure of funding to account for natural growth, as this study did by adjusting for inflation and capturing funding as percent but there was not an obvious way to account for the increasing education levels in the dataset.

There were a number of variables the author would have liked to include in this study which could be a starting point for future studies about public university funding. For example, the share of general fund expenditures devoted to Medicaid, and the share of general fund expenditures devoted to corrections are two public programs which are in direct competition with higher education for state funding would have tested competition for scarce state resources. Other population demographic data might have been included as proxies for the demand of certain state programs such as percent of Iowa population age 5-17 (as a proxy for competition from K-12 interest groups), percent of Iowa population between ages 18-24 (a proxy for higher education demand), or percent of Iowa population 65 and over (a proxy for Medicaid demand).

Finally, analysis of this data with a statistical package such as SPSS would be preferable as the author did not have any training using SPSS and limited access to the software. Using Microsoft Excel's Data Analysis ToolPak to analyze this data introduced limitations and challenges that would not have existed with more sophisticated statistics software. For example, even though the author would have liked to include additional variables, the model was limited to 16 dependent variables due to limitations with Excel. Additionally, a method to annualize data about the state legislature and the legislators had to be chosen as Excel's ToolPak required there to be the same number of data points for each variable ( $n = 30$  for all variables). Because Iowa General Assemblies exist over two years, typically, very little changes between the first year and the second year of a general assembly in terms of member composition and it could be argued

that doubling up the data from the odd years into the even years is unnecessary and is a potential flaw in the data used in this study.

Finally, the results of this paper should be of interest to those who are interested in advocating for more robust support of public education. While further research is needed, the results from this study found that recruitment of well-educated candidates for seats in a state legislature (or other public policy-making positions) is a strategy that could pay dividends for public education advocates and may be particularly relevant in an era of rising tuition, declining enrollment, and declining government financial support of higher education across the board. This study also appears to confirm a hypothesis, that those who pursue additional education are more supportive of the institutions and systems they themselves attended.

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