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INTRODUCTION

Most of the public policy that affects average Americans every day is determined not only by the legislature, but also by departments within the executive branch (Weiss 1982). One of the questions that arises from this power-sharing model is the extent to which people actually have a say in choosing the people who make final policy decisions. In every state, the legislature and the governor are directly elected, but no state has a completely elected executive branch. That being said, the executive branch still remains a force in the ultimate outcomes of public policy due to discretion granted in legislation. It is important, therefore, to study how much impact the state legislature's actions have on the executive branch's implementation decisions.

Since Weiss (1982) confirmed that both the legislative and executive branches come together to make public policy decisions, the way that they work together is of great interest to the people. Usually the legislature will pass a bill, and the executive branch, through the governor and his or her departments, approves and implements a program or policy out of that bill.

In an ideal majoritarian democracy, the branches work together to develop the exact policy desired by the majority of the voting public. Yet, when looking at recent history, it is obvious that the federal government does not represent an ideal democracy. During the 113th Congress, the government was shut down due to stalled budget negotiations, and the economy shook when the legislators waited until minutes before the deadline to raise the debt ceiling. The picture is much less bleak in state capitols, however. Many states have been able to pass and sign legislation without much problem,

but some are just as dysfunctional as Congress.

Out of the dysfunction of Congress has come executive action by President Obama on a number of issues, most recently immigration. This phenomenon is mirrored in states by governors and their officials using discretion to implement portions of legislation as they would like, not necessarily as written in the legislation. By doing this, it takes the final policy decisions away from the elected state legislature and shifts it to the un-elected executive branch. This results in decisions ultimately being made by officials who are not directly responsible for the wishes of the people, but rather the executive department who hired them.

This is an important issue to study. Because the executive branch is mostly an appointed body of civil servants, it is difficult to hold it accountable to the will of the voters. Even when the governor as chief executive is replaced, many lower level workers remain in their positions. The legislature is arguably the most accessible forum for the voters, as they directly elect the actors in that body. Randolph (2010) even finds that states with an easier path for direct democracy tend to have more productive legislatures, emphasizing the importance of citizens' input in the development of their laws. According to Randolph, the legislature responds to the people, but the question is whether the executive listens to the people's voice through the state legislature. As a function of direct election, it can be argued that if the executive branch ignores legislative impetus, it does not act on behalf of the people. This question of true representation makes this study so important. Accountability in government is an essential part of an effective democracy, and without it, the people are not being fairly represented.

Signaling is how branches of government can indirectly communicate with one another through actions. For example, after the judicial branch issues a large number of rulings on gun rights, the legislature could choose to receive this signal and legislate, or reject the signal and ignore the issue. By passing a large quantity (or not) of bills that address a certain issue, the legislature can signal to the executive branch whether or not it cares very much about that issue.

In this paper, I examine the relationship between the quantity of legislative signals and the variance in education proficiency standards in order to determine whether there is a relationship between the quantity of signals and changes in public policy in general terms. If there is such a relationship, it would suggest that the legislature has a substantial voice in policymaking and that the people will be more directly responsible for policy outcomes

through elections. Conversely, if there is no such relationship, it would suggest that the executive branch, which is largely unelected, is more responsible for policy outcomes, meaning less direct representation of the people of that state. Ultimately, I find that the legislative signal is received by the executive branch, but it is weakened by the existence of a directly elected official in the specific policy area.

LITERATURE REVIEW

In modern political science literature, signaling has been studied in many different ways. Scholars have examined if and how executives signal courts, how courts signal legislatures, how executives signal legislatures, and vice versa.

Rogers (2001) and Stiles and Bowen (2007) inspect how legislatures respond to signals from the courts. Rogers takes a game theory approach to the question and shows that the concept of judicial review alters the strategy of the legislature to comply with existing constitutional law, rather than passing a bill and hoping that the courts do not overturn it. Bowen and Stiles found a similar strategic shift based on whether a court's ideology could determine the judicial success of legislation. Schwartz, Spiller, and Urbiztando (1994) look at the flipside of the argument; they find that the courts tend to respond to legislative intent when deciding statutory cases. Sullivan (1990) and Calvo (2007) both examine the link between executive successes in the legislature and signals that the executive branch can provide. This shows that the legislature does in fact give and receive signals from other branches of government, making it plausible that a legislature could influence public policy decisions of a bureaucracy.

Balk (1984) begins the discussion of how the legislature can signal the bureaucracy. He looks at productivity from the perspective of the specific actions of employees within the executive branch. He posits that the legislature has a role to play in persuading the executive branch to boost its output productivity. Foster (2006) and Halfteck (2008) seem to agree with Balk's assertion that the legislature has some sort of signaling power to the bureaucracy. Foster recognized the link between legislative approval of executive foreign policy and the executive's susceptibility to targeting from abroad. Specifically, if a legislature chooses to defy the wishes of the executive when it comes to foreign policy legislation, the executive will be more likely to receive threats towards his policies. Halfteck strikes at the heart of my question by finding that legislative threats affect public policy in the sense that they cause executives to be compliant. So, instead of facing legislative

scrutiny, executives choose to obey the wishes of the legislature when making specific policy decisions.

Posner and Vermeule (2007) find that a lack of legislative oversight tends to result in a less motivated executive branch, which results in a less motivated bureaucracy. The fact that legislative oversight tends to motivate an executive shows the real possibility that public policy outcomes could be affected by legislative signaling. After all, more advanced public policy outcomes result from a bureaucracy willing to raise standards, and to raise standards, one must be motivated to move away from the current position.

THEORY

In this paper, I study the relationship between legislative signals and variance in public policy implementation. In the legislative context, signaling can be shown in the amount of bills passed by a legislature, or its productivity. Specifically, I am studying whether more signals from a state legislature result in a larger variance of implementation from the executive branch. Variance shows that the Executive Branch is acting through changing policy implementation, and a higher variance results in more executive action.

Scholars have defined productivity in a variety of ways. Squire (1998) notes that professionalism and interest group activity in a state are better indicators of positive productivity than membership changes. Rogers (2005) looks into whether the difference of parties in the legislature and executive's chair has any impact on legislative production. He claims that it has no statistical impact. Coleman (1999), on the other hand, notes that a legislature with a less divided party makeup is more likely to pass more impactful legislation. Howell et al (2000) notes that a divided government does indeed reduce the amount of landmark legislation. The scholars also go one step further and note that trivial legislation is more likely to be passed in a strongly divided setting. Krutz (2000) finds that increased omnibus legislation did end up boosting legislative production. It is important to reiterate before comparing state legislatures to recognize some differences that occur between states.

Looking at the sheer number of signals is one way to study if signaling affects policy and follows the logic that more is better. The assumption behind each of these methods is that the more times someone sees something, the more likely they will pay attention to it.

The signaling hypothesis I put forward follows this commonly held belief. If my hypothesis is correct, when legislatures send more signals, more actions

will be taken by the executive branch to adjust implementation of public policy. For signaling, it is important to make a distinction between legislative effort and production. I focus on production, due to the likelihood of the signal reaching the Executive Branch. There are hundreds of bills that never have a probability of passing both houses of a legislature, which are introduced for the sake of shaping debate, providing radical solutions to problems, or moving towards an ideal at one end of the political spectrum. It is more meaningful to see a large number of education bills sent out of the legislature with affirmative votes from both houses than a large number of ideas that may never even receive a floor vote. Substantive legislation leads to executive action, but radical ideas that may have no basis in political reality will probably not affect the policy adapted by the Executive Branch. For the sake of this study, I therefore focused on those substantive signals that have passed both houses of the legislature when collecting my data.

A more involved legislature may encourage the executive to make more policy decisions based on the actions of the legislature.[1] This is the basis for my argument in this study. Legislatures using their signaling power to persuade a governor and his executive departments to make changes to public policy provides the foundation for me to study if the number of signals makes a difference.

Hypothesis 1: The larger the number of bills a state legislature passes in a policy area, the more the executive branch will make adjustments in the implementation of policy in that policy area.

METHODOLOGY

To determine if there is a causal link between the number of signals from a legislature and increased adjustments to public policy, I examine my hypothesis in the area of education policy, specifically variance in state proficiency standards.

Education is an issue that is always politically relevant. No matter the time or place, parents want their children to be educated in order to become productive citizens. This makes education a compelling issue to examine the public policy effects of legislative productivity over time. Emerging from the No Child Left Behind Act of 2001 (NCLB) was the concept of adequate yearly progress which required every student to perform at a "proficient" level by 2014. NCLB allowed each state to set their own standard for what

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1   Since Posner and Vermeule (2007) found that a lack of legislative oversight results in a less motivated executive, there exists the possibility that the opposite could also be true.

proficient performance entailed, which created a substantial variation in state standards.

My dependent variable, proficiency standard variance, is calculated based on data from the 2009 National Assessment of Educational Progress (NAEP) State Mapping Analysis[2], which developed a common scale for determining each state's proficiency levels in Grades 4 and 8 for reading and mathematics. Data for standardized tests' proficiency levels is available for the years 2005, 2007, and 2009. I only used a data point if that category (Grade 4 Mathematics, for example) is available for all three years. There are 96 state standards that fit this criterion. The reason for only using data available for all 4 categories is that I will be looking to establish the variance[3] in the data over this time period. I calculated the variance as the standard deviation of the change in standards across the three years I studied. The resulting variable had a mean of about 6 and a standard deviation around 5, which indicates a heterogeneous sample.

My independent variable, legislative index, will be defined as the total number of education-specific bills passed in the legislature divided by the total number of all bills passed.[4] To determine what bills are "education-specific," I selected those bills which were assigned to or originated in a legislature's committees that have jurisdiction over education policy.[5] A list of such committees can be found in Appendix B.

Since standardized tests are administered in each state in the spring of each year, I examine legislation data for the session before the test is given. This addresses the time the Education Department of each state would need to develop and print the following year's test before administration. There may be some doubt as to how long it actually takes test changes to take effect, but the session prior to administration provides a time period where legislation could not be construed to affect other data points in my study.

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2   U.S. Department of Education. National Center for Education Statistics. 2011. Mapping State Proficiency Standards Onto the NAEP Scales: Variation and Change in State Standards for Reading and Mathematics, 2005-2009. Washington, DC: Department of Education.

3   Just because legislatures pass education bills, does not mean that they are necessarily pro-education. Often, legislatures pass bills intended to cut education budgets, and these instances must be controlled for in this study.

4   This is to produce a percentage of the total productivity rather than a raw number of bills. Since some legislatures are more productive than others, using a raw number skews the data towards states that pass more bills in general.

5   Higher Education and Education-specific Appropriations committees, while not dealing directly with the proficiency standards tested in this study, have been included to compare committees across states. A committee dealing with education as a whole focuses on higher education issues as well. If I did not include all education-related committees, there would be a serious lack of internal validity.

In addition to my main independent variable, I control for three additional variables: legislative professionalism, party makeup, and whether or not the state superintendent of education is elected by the people.

Legislative professionalism can be defined in terms of whether being a legislator is one's primary job. If a legislator receives a living wage and works most of the time at the state capitol, the legislator is said to be professional. Some states have representatives known as "citizen legislators" who spend more time in their districts and have a job other than a legislator that they rely on for income. Professionalism of state legislatures has also been shown to lead to effective governing by the executive, making it an interesting control variable to compare to my selection (Dilger, Krause, & Moffett 1995). It may have an effect on public policy outcomes because the governor will be more likely to listen to a legislature whose primary job it is to read bills and vote on behalf of their constituents than a legislature who simply takes on being a legislator as an extracurricular activity. To measure professionalism, I utilized the index developed by Squire (1994)[6] that factors in salary, number of staff, and session days and compares them to Congress.[7]

Party makeup of a legislature may also have an effect on my dependent variable, variance in proficiency standards. According to Frantzich (1979), Democrats are, in general, more likely to introduce bills in a legislature than Republicans. With more Democrats advocating for more bills, that legislature will be more interested in affecting change with their bills. This, then, implies that Democrats will want to achieve a higher variance in standards. A prediction could be made that a higher percentage of Democrats in a legislature could result in a higher variance in standards. Therefore, I control for the percentage of Democrats in the state legislature.[8]

Lastly, I control for whether the state has an elected superintendent. The State Superintendent of Education is an elected position in some states that oversees a particular state's Department of Education. Most states have an executive-appointed "cabinet"[9] member known as the Secretary of Education, or some similar title. Having a directly elected head of education in a state could lead to less variance in the dependent variable, since the elected Superintendent would also have the direct backing of the people. More

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6   Squire, Peverill. 1994. "Legislative Professionalization and Membership Diversity in State Legislatures." Legislative Studies Quarterly 17 (February): 69-79.
7   The data can be found in Appendix C under the variable sqindx.
8   Data taken from: United States Census Bureau. 2008. "Table 399: Composition of State Legislatures by Political Party Affiliation: 1990 to 2007." The 2008 Statistical Abstract, The National Data Book: Washington, DC: Department of Commerce.
9   Many states do not have cabinets per se, yet the Department of Education remains an integral part of the government of almost all states, giving them quasi-cabinet status.

importantly, the elected Superintendent could limit the effectiveness of legislative signals coming to the executive.

FINDINGS

To test my hypothesis, I began by conducting correlation tests between my main dependent and independent variables (variance of proficiency standards and legislative productivity, professionalism, and party makeup).[10] The correlation in Table 2 indicated that there is a statistically significant (p < .003), moderately weak (r = .301) positive relationship between legislative productivity and proficiency standard variance, which demonstrates preliminary support for my hypothesis. Neither legislative professionalism nor the percentage of Democrats in the legislature were found to be correlated in a statistically significant manner.

To find if there was a relationship between the ballot status and standard variance, I first ran a difference of means test between the two variables which indicated that when the Superintendent is not elected, the standard variance was an average of 4.954 points, but when the Superintendent was elected, the mean standard variance was 10.433. This shows that a higher variance is more likely to occur when the State Superintendent is elected by the people.

Next, I conducted a multiple regression analysis to simultaneously control for all factors. The results of the first multiple regression model can be found in Model 1 of Table 4. This model shows that legislative productivity continued to have a significant positive effect on the variance of proficiency standards, albeit to a lesser extent. For every 1% increase in the amount of legislation that relates to education, there is a 0.27 increase in proficiency level variance. This is a small amount of variance, indicated by the standard deviation of over 5 points for the variance variable. Based on the outcome of these tests, I conclude that legislative productivity has a positive, albeit small, impact on variance of proficiency standards, as predicted by Hypothesis 1. None of my control variables were statistically significant in Models 1 or 2.

To determine if the ballot status variable had an effect on the legislative index's ability to affect the variance of standards as I suggested, I created an interaction term, yielding the new variable legislative index x elected superintendent. I then ran a multiple regression that included legislative productivity and ballot status, the professionalism and party average variables, and

10   All of the output tables associated with these statistical models can be found in Appendix D.

the new multiplied variable. I found that the multiplied variable was the only statistically significant one in this test, and it provided a substantial difference in variance explained. When the Superintendent is elected, there is a statistically significant impact of the legislative index on variance in proficiency standards. When the Superintendent is not elected, the legislative index has no statistically significant impact.

This regression strongly supports a relationship between variance and whether the state superintendent is elected and renders my hypothesis conditional on that basis.

CONCLUSION

My main hypothesis was that legislative productivity in the form of quantity signaling to a state executive will lead to higher variance in standardized tests' proficiency levels. According to the tests run in this study, my hypothesis is conditionally supported by my findings.

Using my control variables, I also found that neither a higher level of professionalism in a state legislature nor a higher percentage of Democrats in a legislature tends to lead to higher proficiency standard variance.

The presence of the State Superintendent of Education on the statewide ballot negatively impacted the ability of the legislative index to affect standard variance and rendered my hypothesis conditional on whether the superintendent was on the ballot. Figure 1 shows the different effects that the legislative signals have when the State Superintendent is and is not elected, respectively.

The implications of this study, while interesting and suggestive, should not be widely interpreted to indicate that all legislature/governor dynamics will work in the same fashion. For one, this study focused on a very narrow part of public policy, one that many other factors can contribute to. In addition, education is a very specialized sector in policy. There is no evidence that the same results will necessarily be found when studying a different issue, like healthcare or military spending.

Herein lies some interesting opportunities for further research, however. Studying a different issue could provide results inconsistent with this study and could limit its findings to education. Looking at another dimension of this study, like the effect on all standards in a particular year rather than each standard separately across three years, may have an impact on these findings and could provide a better causal relationship.

This study should be viewed as a beginning to the future of signaling litera-ture, where real changes in public policy are put under the microscope. It is important to continue this scholarship to determine how public policy deci-sions are really made and who has a say in the outcome. Hopefully in future years, signaling literature will expand to study these issues.

APPENDIX A

Map and list of states studied in this paper for Grades 4 and 8 reading and mathematics[1]
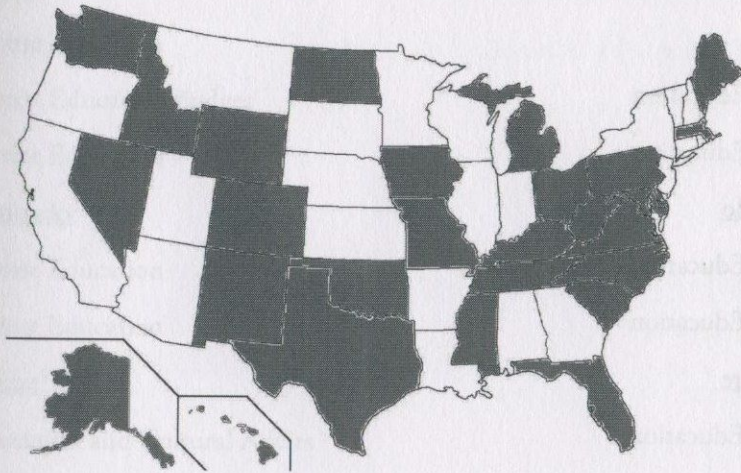
Alaska	Nevada
Colorado	New Mexico
Delaware	North Carolina
Florida	North Dakota
Hawaii	Ohio
Idaho	Oklahoma
Iowa	Pennsylvania
Kentucky	South Carolina
Maine	Tennessee
Maryland	Texas

[1]   Explanations for why states were omitted can be found in Appendix B.

Massachusetts	Virginia
Michigan	Washington
Mississippi	West Virginia
Missouri	Wyoming

APPENDIX B

List of legislative committees used to collect "education-specific" bill totals sorted by state[2]

Alaska

House Education

Senate Education

Colorado

House Education

Senate Education

Delaware

House Education

Senate Education

Florida

House Education

Senate Education

Hawaii

House Education

House Higher Education

Senate Education

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2   Alabama, Arizona, Arkansas, California, Georgia, Illinois, Indiana, Louisiana, Minnesota, Montana, Nebraska, New Hampshire, Rhode Island, South Dakota, Utah, and Vermont were omitted from this study completely due to lack of sufficient data as explained in the methodology. New Jersey was omitted due to its legislative sessions occurring on years not consistent with the other states.

Idaho

House Education

Senate Education

Iowa

House Education

Senate Education

Kansas

House Education

House Education Budget

Senate Education

Kentucky

House Education

Senate Education

Maine[3]

Education and Cultural Affairs

Maryland[4]

Senate Education, Health, and Environmental Affairs

Massachusetts[5]

Joint Education

Joint Higher Education

Michigan

House Education

Senate Education

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3   Maine and Wyoming only have joint committees that meet each legislature, so they have been included here as such.

4   Maryland's House of Delegates does not have a committee pertaining education

5   The Massachusetts House & Senate committees function as select committees. Joint committees are more similar to the other states' standing committees, so they have been included here as such.

Mississippi[6]

House Education

House Universities & Colleges

Senate Education

Senate Universities & Colleges

Missouri

House Appropriations – Education

House Elementary & Secondary Education

House Higher Education

Senate Education

Nevada

Assembly Education

Senate Education

New Mexico

House Education

Senate Education

North Carolina

House Education

Senate Education & Higher Education

North Dakota

House Appropriations – Education & Environment Division

House Education

Senate Education

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6   Mississippi & Virginia have legislative sessions that begin on off-years, but have data available from each calendar year rather than for the entire session, and thus have been included.

Ohio

House Education

Senate Education

Oklahoma

House Common Education

House Higher Education & CareerTech

Senate Education

Oregon

House Education

House Higher Education & Workforce Development Senate Education & Workforce Development

Pennsylvania

House Education

Senate Education

South Carolina

House Education & Public Works

Senate Education

Tennessee

House Education

Senate Education

Texas

House Higher Education

House Public Education

Senate Education

Senate Higher Education

Virginia[6]

House Education

Senate Education & Health

Washington

House Education

House Higher Education

Senate Early Learning & K-12 Education

Senate Higher Education

West Virginia

House Education

Senate Education

Wyoming[3]

Education

APPENDIX C

Statistical Analysis Result Tables

Table 1. Descriptive statistics of all variables

Variable	Description	Range	Mean	St. Dev.
Proficiency Standard Variance	Variance of state standard-ized tests' proficiency standards 2005-2009	[0, 27.154]	6.438	5.725
Average Legislative Index	Average % of bills passed that arose in the education commit-tee in state legislatures 2003-2008	[0, 0.210]	0.082	0.049
Squire Index	Profession-alism index developed by Squire (1994)	[0, 0.597]	0.225	0.131
Party Make-up Average	Average % of Demo-crats in state legislature 2003-2008	[0, 0.641]	0.499	0.149
Superinten-dent Elected	Is the State Superin-tendent of Education an elected position?	[0, 1]	0.270	0.447
Legislative Index X Superinten-dent Elected	Interaction between legislative productivity and elected superinten-dent	[0, 0.225]	0.027	0.055

Table 2. Correlates of Proficiency Standard Variance

|	Proficiency Standard Variance	
	Pearson's r	P-Value
Legislative productivity	0.301	0.003
Legislative professionalism	-0.148	0.150
% Democrats in Legislature	-0.088	0.395
N	96	

Table 3. Difference of Means between Superintendent Elected and Proficiency Standard Variance

Superintendent Elected	Proficiency Standard
Mean (Unelected SSE)	4.954
Mean (Elected SSE)	10.433
Mean difference	-5.479
Std. error of the difference	1.195
Degrees of freedom	94
T-statistic	-4.586
P-value	0.001

Table 4. Predictors of Proficiency Standard Variance

	Model 1		Model 2	
	Coefficient (Std. Error)	p-value	Coefficient (Std. Error)	p-value
Average Legislative Index	27.302 (11.424)	0.019	-1.078 (16.157)	0.947
Squire Index	1.399 (4.451)	0.754	-2.107 (4.571)	0.646
Party Makeup Average	4.923 (3.964)	0.217	4.868 (3.862)	0.211
Superintendent Elected	5.693 (1.347)	0.000	.538 (2.500)	0.830
Legislative Index X Superintendent Elected			55.145 (22.758)	0.017
Constant	-.113 (2.548)	0.965	2.943 (2.784)	0.293
R-squared	0.210		0.250	
N	96			

Figure 1. Predicted Results of Multiple Regression Model 2
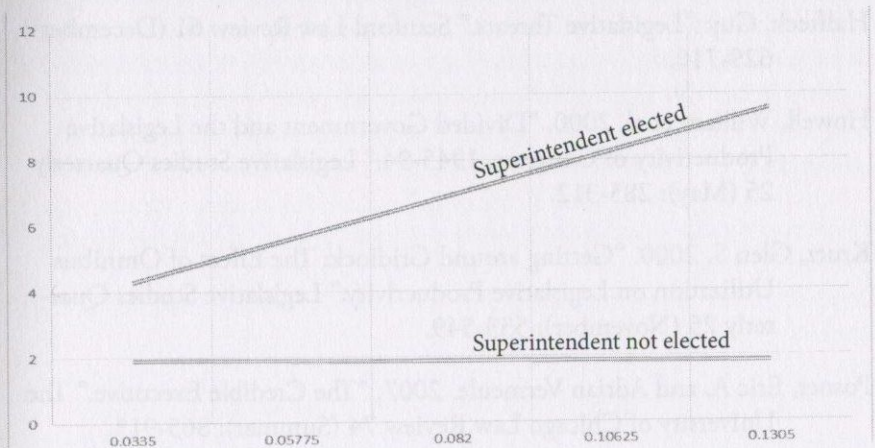
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