

# Birds, Bees, Pregnancy, and STDs: Accounting for Variation for State-Level Sex Education

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## Abstract

Across the United States, curriculum related to sex education differs drastically. A lack of consistent standards amongst the states means that a high schooler in some parts of the country will receive mandatory and medically accurate sex education, but their peers in neighboring states are never required to receive any instruction on these topics at all (Guttmacher Institute, 2020). What causes this profound state-level variation in sex education requirements? In this paper, I hypothesize that religious attitudes, Republican party control, state percentage of rural residents, and state GDP all impact the adoption of sex education policies.

*Key words: sex education, state politics, education policy, morality policy*

## Introduction

There are few issues in American education politics more fraught than sex education. The implementation of sex education has been shown to shape healthy sexual attitudes for life and has been linked to disease prevention, a decrease in risky sexual behavior and teenage pregnancy, and increased gender equality (UNESCO 2018). Sex education also influences the safety and equity of educational environments, particularly for students belonging to sexually marginalized groups (McCarty-Caplan 2013). Sex education has a profound impact on student health, but controversies over what, or even if, students should learn about sex has led to fragmented and uneven curriculum across the fifty states.

A lack of consistent standards amongst the states means that a high schooler in Iowa

will receive mandatory and medically accurate sex education, but a student across the border in Missouri is never required to receive any instruction on these topics (Guttmacher Institute, 2020). Only 27 states and the District of Columbia mandate the implementation of curriculums covering both sex and HIV education. Of these states, only thirteen require the information presented during sex education classes to be medically accurate (Hall et al. 2016). Even when sex education is a curricular requirement, the content of these courses vary drastically. Several states require sex education that focuses only on abstaining from sexual activity. This form of abstinence-only sex education has been proven to undermine public health goals and increase teen pregnancy rates (Stanger-Hall & Hall, 2011). A handful of other states require ‘comprehensive sex education’,

indicating the inclusion of some form of curriculum related to safer sex practices. However, there is no universal definition of ‘comprehensive’ to which these states uniformly adhere (Shapiro & Brown, 2018). While they share broad philosophical similarities in curriculum requirements, these states cannot be lumped into a single cohesive category easily. Given the importance of this curriculum to public health and student well-being, the patchwork nature of sex education in the United States is a puzzle worth examining. While educational experts are rightly concerned with the merits of different kinds of sex education, I will not be substantially engaging with this debate in this paper. Instead, I will focus on the reasons that each state varies so drastically in terms of its sex education. I predict that states with high measures of religiosity and Republican legislative control are more likely to have abstinence-only sex education requirements. I also posit that states with high rural populations and relatively low GDPs are less likely to have any sex education requirements of any kind. The explanatory theories expounded in this paper will contribute to the broader scholarly conversation on sex education and address an interesting puzzle in the public education system.

### **Literature Review**

#### **Variability in Sex Education**

The push for sex education in schools began during the sexual revolution of the 1960s and continued due to high rates of teen pregnancy in the 1970s. This movement progressed and rose in salience as schools sought to inform students about safe sexual practices during the HIV/AIDS crisis of the 1980s (Guttmacher Institute, 2020). Sex

education in the United States is largely defined by the 1980s-era debate between abstinence-only education that discouraged any sexual activity before marriage and a more comprehensive form of sex education that included information about the use of contraceptives and other topics deemed ‘taboo’ by social conservatives.

Most of the research on the subject has focused on the efficacy of certain types of sex education curricula. Organizations dedicated to advancing a specific form of sex education frequently publish data about the kinds of classes offered to students, as well as how many students are required to take sex education in each state. As a result, there is a rich body of research concerning the differing impacts that these educational models have on adolescent behavior. This information is often highly contested. Supporters of comprehensive sex education argue that abstinence-only education models do not meaningfully prevent risky sexual behavior, and that they promote regressive gender stereotypes. On the other hand, proponents of abstinence-only approaches have cited the historically low rates of teen pregnancy as a sign that their preferred teaching style is effective; a claim that is called into question by many public health researchers (Stanger-Hall & Hall, 2011).

Given the contentious nature of sex in politics and the varying levels of religiosity and party control throughout the states, it is understandable that sex education requirements are not uniform. Not all states require sex education in K-12 curricula, and there is still a lot of variation in how sex education programs are taught. According to a 2020 report from the Guttmacher Institute, fourteen states require

abstinence to be taught as a part of their sex education curriculum, but do not require any information to be taught about alternative contraceptive methods, excluding condoms and other forms of birth control from these classes. 28 of the states are legally required to stress abstinence in their sex education classes as the best way to avoid teen pregnancy and STIs, and twenty states include some information on how to use contraception. The following tables provide an abbreviated breakdown of state sex education requirements, using data from the 2020 Guttmacher Institute Report “Sex and HIV Education”.

### **Morality Policy**

Sex education itself is not well-studied within the discipline of political science, but the overarching topic of morality policy has been a subject of intense interest. Morality policy refers to any policy that a group of people perceive as a threat to their basic moral values (Donovan et al. 2015). These policies are wide-ranging and include topics like abortion, same-sex marriage, capital punishment and other issues related to the ‘culture wars.’ Research on morality policy indicates that it is not pursued in the same way as conventional public policy, as people pursue their values when enacting policy rather than their self-interest. Constitutional provisions in the Tenth Amendment relegate this realm of policy largely to the states, who have increasingly taken up moral issues in their legislative sessions (Mooney, 2000). Diverse political cultures and values in the United States means that morality policy tends to vary dramatically between more conservative and more liberal states (Donovan et al., 2015). The uneven patchwork of sex education policies enacted by the fifty states can be better

understood through the framework of morality policy.

There are many factors that can influence state preferences on morality policy. While not all activists concerned with morality policy are religiously affiliated, the moral and religious values of the Christian Right often determine the contours of the debate (Donovan et al., 2015). Religiously conservative activists are adept at leveraging institutional power to influence policy since the rise of the Christian Right in the 1980s (Wald & Corey, 2002). Proponents of abstinence-only education, including Focus on the Family and the Heritage Foundation, have been successful in their efforts to popularize the spread of abstinence-only education.

Research into morality policy has also shown that Republican politicians are particularly skilled at weaponizing culture war issues and religious beliefs for electoral support (Calfano & Djupe, 2009). Similar to other matters of morality policy, sex education has been influenced by partisan control. The 1981 passage of the Adolescent Family Life Act (AFLA) coincided with the rise of the 97th Congress, the first time that the Republican party controlled a chamber of Congress since 1953. The AFLA codified a policy preference for abstinence-only education that was reinforced with the 1996 implementation of a federal program that exclusively funded sex education that focused on abstinence (“History of Sex Education in the U.S.”, 2016). As federal preferences for abstinence-only education have been closely tied to the GOP’s congressional power, it is not unreasonable to assume that state-level policies would be influenced by Republican legislative control.

**Table 1**  
**General Requirements for Sex and HIV Education (2020)**

<b>General Requirements for Sex* and HIV Education</b>									
STATE	SEX EDUCATION* MANDATED	HIV EDUCATION MANDATED	WHEN PROVIDED, SEX OR HIV EDUCATION MUST				PARENTAL ROLE		
			Be Medically Accurate	Be Age Appropriate	Be Culturally Appropriate and Unbiased	Cannot Promote Religion	Notice	Consent	Opt-out allowed
Alabama		X		X					X
Alaska							X		X
Arizona			HIV	X			X	Sex	HIV
Arkansas		X							
California	X	X	X	X	X	X	X		X
Colorado				X	X	X	X		X
Connecticut		X							X
Delaware	X	X							
Dist. of Columbia	X	X		X			X		X
Florida	X	X		X					X
Georgia	X	X					X		X
Hawaii	X	X	X	X					X
Idaho									X
Illinois		X	X	X					X
Indiana <sup>†</sup>		X					X		X
Iowa	X	X	X	X	X		X		X
Kansas	X								
Kentucky	X	X							
Louisiana			X			X			X
Maine	X	X	X	X					X
Maryland	X	X							X
Massachusetts					X		X		X
Michigan		X					X		X
Minnesota	X	X							
Mississippi <sup>‡</sup>	X			X			X	X	
Missouri		X	X	X			X		X
Montana	X	X		X					
Nevada	X	X		X			X	X	
New Hampshire	X	X					X		X
New Jersey	X	X	X	X	X		X		X
New Mexico	X	X		X					X
New York		X		HIV					HIV
North Carolina	X	X	X	X					X
North Dakota	X	X							
Ohio	X	X							X
Oklahoma		X	HIV				X		X
Oregon	X	X	X	X	X		X		X
Pennsylvania		X		HIV			HIV		HIV
Rhode Island	X	X	X	X	X				HIV
South Carolina	X	X		X			X		X
Tennessee	X <sup>†</sup>	X	X	X	X		X	X	
Texas	X	X		X			X		X
Utah <sup>†</sup>	X	X	X				X	X	
Vermont	X	X		X					HIV
Virginia	X	X	X	X			X		X
Washington	X	X	X	X	X		X		X
West Virginia	X	X							X
Wisconsin		X					X		X
<b>TOTAL</b>	<b>36+DC</b>	<b>39+DC</b>	<b>17</b>	<b>26+DC</b>	<b>9</b>	<b>3</b>	<b>25+DC</b>	<b>5</b>	<b>36+DC</b>

*Source: Guttmacher Institute, 2020*

**Educational Resource Constraints**

This research must also consider alternative explanations for a lack of sex education requirements. While sex education is uniquely impacted by moral questions in the policymaking arena, it also functions more or less as a component of K-12 public education. Educational requirements of any kind are necessarily a financial and logistical challenge for states, particularly those that rely more heavily on funds from the federal government (Shelly,

2012). Requirements necessitate resources, which can place a strain on low-income states; the lack of a sex education requirement could be due more to budgetary limitations in poorer states than a moral argument against it. If rural states are not required by the federal government to provide sex education as a part of regular curriculums, it is logical to assume that they will not prioritize its implementation.

As well, rural schools typically have fewer resources to hire specialized teachers for

**Table 2**  
**Content Requirements for Sex and HIV Education (2020)**

<b>Content Requirements for Sex* and HIV Education</b>							
State	When provided, sex education must include:					When provided, HIV education must include:	
	Contraception	Abstinence	Importance of sex Only within marriage	Sexual orientation	Negative outcomes of teen sex	Condoms	Abstinence
Alabama	X	Stress	X	Negative		X	Stress
Arizona		Stress			X		Stress
Arkansas		Stress	X				Stress
California	X	Cover		Inclusive		X	Cover
Colorado	X	Stress		Inclusive	X	X	Cover
Connecticut	X	Cover		Inclusive	X		
Delaware	X	Stress		Inclusive		X	Stress
Dist. of Columbia	X	Cover		Inclusive	X		Cover
Florida		Stress	X	Negative	X		Stress
Georgia		Stress	X				Cover
Hawaii	X	Stress				X	Stress
Idaho		Stress					
Illinois	X	Stress	X	Negative	X	X	Stress
Indiana		Stress	X		X		Stress
Iowa				Inclusive			
Kentucky		Stress					
Louisiana		Stress	X				Stress
Maine	X	Stress				X	Stress
Maryland	X	Cover		Inclusive		X	Cover
Michigan		Stress	X				Stress
Minnesota							Cover
Mississippi <sup>2</sup>		Stress	X		X		Stress
Missouri		Stress	X		X		Stress
New Hampshire		Cover					Cover
New Jersey	X	Stress		Inclusive	X	X	Stress
New Mexico	X	Cover		Inclusive	X	X	Stress
New York							Stress
North Carolina	X	Stress	X		X	X	Stress
North Dakota		Cover	X		X		
Ohio		Stress	X		X		Stress
Oklahoma		Stress		*		X	Stress
Oregon	X	Stress		Inclusive		X	Stress
Pennsylvania							Stress
Rhode Island	X	Stress		Inclusive	X	X	Stress
South Carolina	X	Stress	X	Negative			Stress
South Dakota		Cover					
Tennessee		Stress	X		X		Stress
Texas	X	Stress	X	Negative	X	X	Stress
Utah <sup>3</sup>		Stress	X				Stress
Vermont	X	Cover			X	X	Cover
Virginia	X	Cover	X		X	X	Cover
Washington	X	Stress		Inclusive		X	Stress
West Virginia	X	Cover			X	X	Cover
Wisconsin		Stress	X				Stress
<b>TOTAL</b>	<b>20+DC</b>	<b>39+DC</b>	<b>19</b>	<b>17+DC</b>	<b>19+DC</b>	<b>19</b>	<b>37+DC</b>

*Source: Guttmacher Institute, 2020*

sex education and health classes. Rural school districts also tend to face higher scrutiny from local organizations and governments, who are likely to hold religious and conservative views (Blinn-Pike 2008). States with high rural populations may find education requirements in general more difficult to accomplish and may be opposed to codifying any sex education requirements into law. These logistical constraints are perhaps even more likely to

impact sex education requirements than ideological concerns, as they will have an impact in all states regardless of their politics. I predict that states with higher percentages of rural dwellers and lower GDPs are less likely to require any sex education in K-12 curricula.

### Methods and Hypotheses

To provide an explanation of state-level sex education variation, I will categorize states according to their educational

requirements. For the purposes of this study, the fifty states and Washington, D.C. will be coded based on their sex education requirements or lack thereof, including any required emphases on abstinence, contraceptive measures, STI prevention, consent, and dating violence. Using data collected by government agencies including the Centers for Disease Control and Prevention and leading interest groups like the Guttmacher Institute and SIECUS, I will catalog each state's sex education requirements.

I will then compare this compiled data with the potential independent variables contributing to state variability of sex education, including state GDP, percentage of rural residents, legislative party control, and religiosity. Using the most recently available information, I will conduct chi-square analyses using the analytical software STATA to determine whether the proposed independent variables are statistically significant. I will also conduct multivariate regression analysis to control for spurious relationships and validate my earlier analysis. This paper proposes four hypotheses in total, falling into two categories. The first set of hypotheses is based on the literature of morality policy. Key actors in the realm of morality policy include religiously focused activists and Republican lawmakers (Wald & Corey, 2002) and their prominence in a state could indicate whether abstinence-only education is required.

**H1:** States with high measures of religiosity are more likely to have abstinence-only sex education requirements.

**H2:** States with high measures of Republican legislative control are more

likely to have abstinence-only sex education requirements.

The second set of hypotheses relate to the pragmatic aspects of providing education. States face constraints outside of the policy pressures that influence morality policy, such as geographic remoteness or a lack of funding. Using multivariate regression, I will test whether the potentially confounding variables of state GDP and rural population impact sex education requirements.

As well, I predict that the logistical factors mentioned in this second set of hypotheses will have a greater impact than those related to morality policy. These factors will impact liberal states just as much as their conservative counterparts and may be able to explain the notable left-leaning sex education outliers included in this dataset, such as Colorado and Massachusetts.

**H3:** States with higher percentages of rural dwellers are less likely to require any sex education in K-12 curricula.

**H4:** States with lower GDPs are less likely to require any sex education in K-12 curricula.

**H5:** The factors mentioned in Hypotheses 3 and 4 will have a statistically greater impact than those mentioned in Hypotheses 1 and 2.

There are a few conceptual challenges related to operationalizing the variables of interest.

As previously mentioned, there is no single definition of what comprises “comprehensive” sex education, and proponents of comprehensive sex education often disagree about the most important aspects to include (Shapiro & Brown, 2018). Due to the lack of scholarly consensus on this definition, I have structured my analysis to focus on whether a sex education program requires abstinence-only lessons. I will operationalize the variable of abstinence-only sex education as programs that have two strict requirements: stressing abstinence, and not requiring any education on various methods of contraception. Using this limited definition of abstinence-only sex education is the best way to ensure that I am accurately measuring educational programs that intend to propose abstinence as the only way to practice safe sex.

I will operationalize the dependent variable of sex education using comprehensive data collected by SIECUS, the Guttmacher Institute, and other watchdog groups. These groups have compiled information about sex education requirements and curriculum features by state, allowing me to examine not only the broader pattern of which state have sex education requirements, but what exactly those requirements may consist of. I will be using the most recently available data, which measures the state of state-level sex education in 2020. Past years do not have complete data sets and therefore will be less useful in any analysis. Any future continuations of this work should consider using a longitudinal analysis to capture more information. To reflect the current nature of the independent variable, I will consider the values for the dependent variable for the year 2020.

There are several independent variables

included in my analysis. I will be operationalizing the religiosity measure using data from the Pew Research Center. This widely respected organization ranks religiosity on a combined index of belief in God, participation in weekly religious services, frequency of prayer, and a self-reported measure of the importance of religion in one’s life. Religiosity will be measured as the percentage of adults in each state that are highly religious, a continuous variable. I will be measuring Republican party control using publicly available information from the National Conference of State Legislatures (NCSL) on the composition of state legislatures, the party represented by the state’s governor, and whether government control is divided along partisan lines. Republican party control is a categorical variable. To clearly illustrate the impacts of Republican governance, only states that are unified under state-level legislative and executive control of the GOP will be considered “Republican” for the purposes of this analysis.

I will measure the independent variable of state GDP using publicly available data collected by the Bureau of Economic Analysis, a division of the U.S. Department of Commerce. This variable is continuous, as it is measured in dollars. I will operationalize the independent variable of percentage of rural and urban residents using information gathered by the Pew Research Center. In order to have more up-to-date information on social and demographic trends, I have opted to use their data over the data collected in the 2010 Census. They define urban and rural categories using the criteria developed by the National Center for Health Statistics, counting counties with more than one million people as “urban.” The measurement of

the percentage of rural residents is a continuous variable.

### Data Analysis<sup>1</sup>

I began my analysis by determining whether the potential independent variables included in my hypotheses had a statistically significant relationship to my dependent variable of sex education. To evaluate the accuracy of my first hypothesis, I generated a categorical dummy variable for the continuous variable of religiosity, splitting the variable into a high and low category based on the mean produced through the descriptive statistics functions on STATA (mean=54.77% religious adults). I was then able to use a chi-square test, or tabular analysis, to estimate the relationship between religiosity and abstinence-only sex education. The re-coded dummy variable expressing religiosity was not statistically significant ( $p=0.233$ ). On the basis of this tabular analysis, Hypothesis 1 must be rejected.

Chi-square analysis also allowed me to examine the relationship between party control and abstinence-only sex education, as all operationalized variables in this relationship are categorical in nature. As predicted in Hypothesis 2, unified Republican control of both the legislature and the governorship in a state had a statistically significant association with abstinence-only education ( $p=0.005$ ) providing some initial evidence for Hypothesis 2.

To control for spurious relationships, I conducted a multivariate regression test. When religiosity and Republican party control undergo regression, only the continuous religiosity measure is statistically significant (Coef.=0.015,  $P=0.019$ ), with Republican party control not having a statistically significant systematic relationship with abstinence-only sex education

(Coef.=-0.002,  $P=0.974$ ). It seems that religiosity mediates Republican partisan control. Due to the overlap of constituencies represented by the Christian Right, it makes sense that the prevalence of religious beliefs in a state can drive Republican control over governmental institutions. The continuous variable of religiosity has a clear statistically significant relationship with the dependent variable of abstinence-only sex education. However, the small coefficient associated with the continuous religiosity measure in this regression means that it does not have a great deal of explanatory power when it comes to the proliferation of abstinence-only policies. Neither Hypothesis 1 nor Hypothesis 2 comes close to explaining the phenomena causing the popularity of this kind of sex education.

When the dummy religiosity variable is included in multivariate regression analysis, it is not statistically significant (Coef.=0.164,  $P=0.250$ ). The difference in results between the full religiosity measure and the re-coded dummy variable suggests that the re-coded variable does not accurately capture the nuances of religiosity's impact. Further research into the role that religion plays in promoting abstinence-only education is needed to fully understand this systematic relationship.

In order to examine the implementation of sex education requirements in more depth, I generated dummy variables for the continuous variables of state GDP and percentage of rural population to run tabular analyses. Neither the re-coded state GDP variable ( $p=0.661$ ) nor the re-coded percentage rural variable ( $p=0.390$ ) were found to be statistically significant. In subsequent multivariate regression, the continuous versions of these variables were also not found to be



statistically significant. Hypothesis 3 must be rejected, as the percentage of rural residents is not statistically significant (Coef.=-0.002, p=0.967). Hypothesis 4 must also be rejected, as state GDP has no statistically significant impact on the presence of sex education requirements (Coef.=8.80e-06, p=0.347). As no predicted relationships produced a statistically significant effect, none of the four factors examined in this research outweigh each other and Hypothesis 5 must be rejected.

### **Discussion and Future Directions**

With the possible and qualified exception of Hypothesis 1, none of the arguments advanced in this paper thus far have demonstrated a statistically significant impact on sex education. It is possible that religiosity, through its influence over the related variable of Republican party control, has a relatively small impact on the implementation of abstinence-only sex education policies. However, this connection is tenuous and explains very little of the variance amongst states with regard to this policy choice. While the hypotheses were logical and well-supported by inferences from existing research, this paper unfortunately cannot answer the puzzle of the United States' fragmented approach to sex education policy.

However, the failure of the hypotheses proposed herein contributes to our current understanding of state-level variation on sex education. At the very least, this research rules out state GDP, percentage of rural population, and Republican partisan control as explanatory theories. The sound logical framework of the four hypotheses also suggests avenues for further research into sex education. Further research could investigate related variables that may operationalize the core concepts of these

hypotheses more effectively. For example, it is possible that a variable measuring the levels of social conservatism amongst the states explains much of the variation in the implementation of abstinence-only sex education. If the distinct metric of social conservatism motivated both religiosity and Republican political control, that variable may have a substantial and statistically significant relationship with abstinence-only policies. It may also be worth investigating alternative operationalizations of religiosity, as the Pew Research Center may be overlooking some key aspect of religious affiliation and practice that could be crucial to explaining the way religion impacts abstinence-only sex education.

The rejection of these proposed hypotheses also underscores the need for sex education research that extends over multiple years. This study was necessarily limited by available data, and 2020 was the only year for which SIECUS and the Guttmacher Institute collectively produced data for all 50 states. A detailed examination of the legislative records of each state over a longer period could help to expand the data included in this set, which may improve the accuracy of explanatory theories in future research.

Future researchers interested in this topic could further stratify the unit of measurement to see whether a more fine-grained analysis could produce more compelling explanations for sex education policies. In many states, particularly those that have no overarching sex education requirements, localities and school districts have control over the curriculum presented to students in sex education classrooms. These smaller units of government are likely to be more homogenous, and analysis at this detailed level may more

clearly illuminate the independent variables that have the most impact on sex education policies. Examining the policies of smaller municipalities or unified school districts may provide more insight as to how decisions are made on the curricular level. Data collection for a comprehensive study of this nature would be extraordinarily challenging, but it is not unprecedented. Many researchers interested in investigating the effectiveness of sex education in preventing risky sexual behavior utilize district- and even school-level teacher surveys to gauge the content presented to students (Hall et al.2016). Using a case study approach, a researcher could select several diverse districts and administer these kinds of studies, measuring relevant variables using surveys and publicly available data from the state's demographer's office or other governmental sources. Taking this tactic could produce very interesting results and reveal determinants of sex education policy that are obscured in a broader statewide analysis.

A final avenue for future research would be expanding the scholarly conversation to include explanations of the implementation of comprehensive sex education. Due to time constraints and a lack of scholarly consensus as to what "comprehensive" means, I chose to largely define sex education negatively by creating a binary between abstinence-only sex education and all other iterations of sex education. However, advocacy groups like SIECUS and the Guttmacher Institute have collected state-level data available for public use regarding various dimensions of comprehensive sex education, including content on consent, healthy decision-making, contraception, and inclusion of LGBTQ+ identities (Guttmacher Institute, 2020). It may be possible to glean a better understanding of the

factors impacting sex education policy if research focuses on these aspects of sex education.

While this paper does not explain the state-level variation in sex education requirements, it nonetheless sheds light on an understudied topic in the morality policy literature and advances our understandings on what factors lead to these divergences. This area of research should be developed further based on the research suggestions given therein. The topic of sex education is vital to our nation's public health, and the field of political science could benefit from a greater comprehension of the factors that influence its implementation. Sitting at the nexus of morality policy and educational policy, sex education is ripe for continued academic investigation.

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## Appendix A: Screenshots from STATA Analysis

Figure 1

### *Chi-Square Analysis of Religious Dependent Variable*

```
. recode relig (0/54.7=0 "Low Relig") (54.7/77=1 "High Relig") (.=), generate (religdum)
(50 differences between relig and religdum)
```

```
. tab abstonly religdum, col nokey chi2
```

abstonly	RECODE of relig (relig)		Total
	Low Relig	High Reli	
0	20 68.97	11 52.38	31 62.00
1	9 31.03	10 47.62	19 38.00
Total	29 100.00	21 100.00	50 100.00

Pearson chi2(1) = 1.4219 Pr = 0.233

Figure 2

### *Chi-Square Analysis of Republican State Control Dependent Variable*

```
. tab abstonly repstatecontrol, col nokey chi2
```

abstonly	repstatecontrol			Total
	0	1	9	
0	23 79.31	7 35.00	1 100.00	31 62.00
1	6 20.69	13 65.00	0 0.00	19 38.00
Total	29 100.00	20 100.00	1 100.00	50 100.00

Pearson chi2(2) = 10.4897 Pr = 0.005

Figure 3

*Regression of Religious and Republican State Control*

. reg abstonly religdum repstatecontrol

Source	SS	df	MS	Number of obs	=	50
Model	.375428638	2	.187714319	F(2, 47)	=	0.77
Residual	11.4045714	47	.242650455	Prob > F	=	0.4671
				R-squared	=	0.0319
				Adj R-squared	=	-0.0093
Total	11.78	49	.240408163	Root MSE	=	.4926

  

abstonly	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
religdum	.1643699	.1411918	1.16	0.250	-.1196713 .4484111
repstatecontrol	.0219199	.0537067	0.41	0.685	-.0861241 .1299639
_cons	.2982511	.0961523	3.10	0.003	.1048176 .4916846

Figure 4

*Chi-Square Analysis of GDP Dependent Variable*

. tab sexedreq gdpdum, col nokey chi2

sexedreq	RECODE of stateGDP (stateGDP)		Total
	Low GDP	High GDP	
0	11 39.29	10 45.45	21 42.00
1	17 60.71	12 54.55	29 58.00
Total	28 100.00	22 100.00	50 100.00

Pearson chi2 (1) = 0.1925 Pr = 0.661

**Figure 5**

**Chi-Square Analysis of Rural Population Dependent Variable**

tab sexedreq ruraldum, col nokey chi2

sexedreq	RECODE of rural (rural)		Total
	Low Rural	High Rura	
0	9 36.00	12 48.00	21 42.00
1	16 64.00	13 52.00	29 58.00
Total	25 100.00	25 100.00	50 100.00

Pearson chi2(1) = 0.7389 Pr = 0.390

**Figure 6**

**Regression of Rural Population and GDP**

. reg sexedreq rural stateGDP

Source	SS	df	MS	Number of obs	=	50
Model	.28011076	2	.14005538	F(2, 47)	=	0.55
Residual	11.8998892	47	.253189133	Prob > F	=	0.5788
Total	12.18	49	.248571429	R-squared	=	0.0230
				Adj R-squared	=	-0.0186
				Root MSE	=	.50318

sexedreq	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rural	-.0002334	.0055732	-0.04	0.967	-.0114453	.0109785
stateGDP	-8.80e-06	9.26e-06	-0.95	0.347	-.0000274	9.83e-06
_cons	1.012053	.5375451	1.88	0.066	-.0693479	2.093455