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Statistical Analysis Research Paper

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EXECUTIVE SUMMARY

The topic chosen for this research paper is perhaps one of the most controversial and divisive topics in our country today. How you view this topic can depend on many variables, from where you live, to the political affiliation you have. This research paper is about handgun control and whether or not there should be more restrictions on handguns in our society. The research question “there should be more restriction on handguns in our society” is used as the dependent variable in this study. The question is part of a survey conducted by the National Opinion Research Center. The complete survey, including the question used in this study, can be found in the General Social Surveys Cumulative Code Book.

A linear regression, using this dependent variable, was run using Statistical Package for the Social Sciences (SPSS) software. Five independent variables were used with the findings analyzed for the following outcomes: P-values, beta scores, R^2 , mean, and standard deviation.

Finally, data from the Uniform Crime Report and Bureau of Statistics was used to supplement the linear regression results. This paper will be structured as follows: background, theoretical framework, data collection methods, research methodology and analysis, potential limitations of the study, use of research findings, and conclusion.

BACKGROUND

Handgun control has been a controversial topic for many years. There are potential valid arguments on both sides of the topic. No matter your opinion it is obvious there are many who have become victims of crime involving the use of a firearm. Generally speaking a handgun is the weapon of choice when a firearm is used in the commission of a crime.

According to the Federal Bureau of Investigations (FBI), Uniform Crime Report, in 2009 there were a total of 13,636 murder victims in the United States, of which 6,452 were killed by handguns. Further data shows there were a total of 806,843 aggravated assaults in 2009, of which 146,773 resulted from the use of a firearm. It is difficult to determine how many of these firearms are handguns since the category of firearms listed in the FBI statistics for aggravated assaults include all types of firearms combined together.

Some of the data not included in these statistics is the hundreds of thousands of family members and friends who are also second hand victims because of their victimized loved one. Also not included in these statistics are how many of the suspected shooters were legally armed, according to their state law, and how many were committing another crime at the time their victim was injured or killed. So it is easy to see how many different independent variables could be considered when asking the question, “there should be more restriction on handguns in our society”.

In this research study instead of using independent variables like respondent has a family member who is a murder victim or how many suspects were committing other crimes at the time of the murder or assault; I decided to find how people responded based on their sex, race, age, political party affiliation, and income.

THEORETICAL FRAMEWORK

The right to own and carry a handgun has been a contentious argument for many years. There are many different variables to consider when discussing this topic. One must take into consideration the demographics of each area, the right of each state to determine what is best for the citizens of that state, the rights given to each of us as citizens of the United States by the

Constitution, and the impact on crime depending on whether there is more or less restrictions on handguns -- just to mention a few.

The scope of this project will only allow us to scratch the surface when it comes to this debate; therefore I will try to answer the research question “There should be more restriction on handguns in our society”. In answering this question I will consider the following five independent variables: respondent’s sex, race of the respondent, age of the respondent, political party affiliation, and respondents income.

Finally I will not try to answer all the possible questions which may come from researching this topic since as previously mentioned there are many variables that affect this topic. I will stick to answering the research question and how the independent variables affect the question.

DATA COLLECTION METHODS

The data used in this research comes from the General Social Surveys Codebook (GSSC) for the years 1972-2008. This codebook contains hundreds of research questions covering a variety of topics. The information used in my research question is derived by using a survey where the respondents were interviewed and asked about a wide range of topics including handgun control. The items appearing on the survey are one of three types: permanent questions that occur on each survey, rotating questions that appear on two out of every three surveys (1973, 1974, and 1976, or 1973, 1975, and 1976), and a few occasional questions such as; split ballot experiments that occur in a single survey (p. vii).

From 1972 through 2004 an independently selected sample of English speaking adults was used for the survey. Beginning in 2006 Spanish speaking adults were added to the survey population.

Finally, data from the FBI Uniform Crime Reporting (UCR) database along with the Bureau of Justice Statistics was used to supplement the GSSC findings. It is important to note the UCR information is compiled by the FBI from data that is reported to them by local and state law enforcement agencies. The reporting of information to the UCR is not mandatory except in limited situations such as the agency has been awarded Federal grant money or reporting is required by state law.

Once the data is reported the FBI will issue a yearly report on crime in the United States. The following UCR categories are used to collect crime data: murder, rape, robbery, assault, burglary, theft, auto theft, and arson. Within these categories there is additional data collected on the victim's age, gender, race, and the type of weapon used in the commission of the crime. This information is used to create various reports that reflect crime in America.

RESEARCH METHODOLOGY AND ANALYSIS

During the period of 1972 – 2008 a sample population of 53,053 people participated in the GSSC survey. In 2004 the question “there should be more legal restrictions on handguns in our society” was presented to 2,785 participants. The following choices were offered to those surveyed: agree, disagree, and don't know. The participants could also chose not applicable or simply just not answer the question. The results are shown below in Table 1.1.

TABLE 1.1

996. Please tell me whether you agree or disagree with the following statement: "There should be more legal restrictions on handguns in our society."														
[VAR: HGUNLAW]														
<u>RESPONSE</u>	<u>PUNCH</u>	<u>YEAR</u>												
		<u>1972-82</u>	<u>1982B</u>	<u>1983-87</u>	<u>1987B</u>	<u>1988-91</u>	<u>1993-96</u>	<u>1998</u>	<u>2000</u>	<u>2002</u>	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>ALL</u>
Agree	1	0	0	0	0	0	0	0	0	0	924	0	0	924
Disagree	2	0	0	0	0	0	0	0	0	0	384	0	0	384
Don't know (Skip to next section)	8	0	0	0	0	0	0	0	0	0	27	0	0	27
No answer (Skip to next section)	9	0	0	0	0	0	0	0	0	0	5	0	0	5
Not applicable	BK	13626	354	7542	353	5907	7502	2832	2817	2765	1472	4510	2023	51703

A linear regression was done using the dependent variable “there should be more legal restrictions on handguns in our society”. The independent variables consisted of the following: respondent’s sex, race of respondent, age of respondent, political party affiliation, and respondents income.

By doing this regression I am looking at several indicators. First, I will look at the P-values to determine the significance of the independent variable to the dependent variable. If I receive a .01 level of significance then this will indicate I can be 99% confident that the results are not due to chance, whereas a .05 level of significance will indicate I can be 95% confident that the results are not due to chance. Anything above .05 is statistically insignificant. Second, I want to know the beta score which indicates the strength of the relationship between the dependent and independent variable. Anything under a .2--.3 is weak, between a .3--.5 is moderate, and anything above a .5 is considered a strong association. Third, I will look at R^2 which shows how much of the variance is explained by the independent variable. The finding

should be above .40 for the score to be robust. In other words the variance describes how far the values lie from the mean. Finally, I will look at the mean and standard deviation graphically.

After running the linear regression using the above mentioned variables I found the following results:

P-Values

The P-values indicate a .01 level of significance in the independent variables; respondent's sex, race, and political party affiliation. This means we can be 99% confident that the results from using these independent variables are not due to chance. I am somewhat shocked by some of these findings since according to a special report by the Bureau of Justice Statistics statistician Craig Perkins (1997), victims of violent crimes are much more likely to be men who are black or Hispanic. While those who agreed with the question tended to be white males. The variable "sex" is also interesting since those who were surveyed and answered the question as "I agree" were nearly three times more likely to be men than women. I would tend to think women would be more likely to agree with stricter hand gun control – so this also surprised me. Once again these results may be able to be explained since according to UCR, men are over three times more likely to be victims of violent crime like murder.

Several other things could help explain these results. First of all the data used in this survey comes from 2004. According to the GSSC (2009) it was not until 2006 that Spanish speaking adults were included in the survey, which may explain there were a low number of Hispanic respondents. Moreover, I have no way to know the sex or race of the 1,477 who either did not answer or marked non-applicable as their answer.

Furthermore, in a journal by Jody Lipford (1995) she lists the following findings when it comes to those senators who are likely to vote for or against gun control: (1) senators from states with high rates of violent crime were not differentially likely to vote for the Brady Bill and, if anything, were more likely to vote *against* the Brady Bill; (2) senators from states where hunters form a strong interest group were more likely to vote *against* the Brady Bill; (3) senators receiving relatively large campaign contributions from the National Rifle Association (NRA) were more likely to vote *against* the Brady Bill; and (4) democrats and politically “liberal” senators were more likely to vote *for* the Brady Bill (p. 1). Interestingly the independent variable political party affiliation is part of that list at number four. I am not surprised that there is a .01% level of significances with the independent variable of party affiliation since those who answered “I agree” were nearly three times more likely to be Democrat.

Somewhat higher but still at the .05 level of significances is the age of respondent. I am not shocked at the fact age is shown to have significances, however what I don't know from looking at the data is how those surveyed responded to the question according to their age.

The last independent variable is respondent's income which was statistically insignificant. It is my reasoning that not enough people answered this question based on their income level to make this statistically significant. I could find no research information that compared the income of the victims of a violent crime with handgun related offenses.

Beta Scores

The beta scores for all of the independent variables is weak with the respondent's sex, and political party affiliation being the strongest -- falling between .2--.3. The lowest score is respondent's income at .009.

This indicates the strength of the relationship between the dependent and independent variables is weak. A graphical representation of the results for the P-values and Beta scores are shown in Table 1.2.

TABLE 1.2

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.510	.100		15.060	.000
	RESPONDENTS SEX	-.195	.030	-.209	-6.385	.000
	RACE OF RESPONDENT	-.085	.026	-.110	-3.338	.001
	AGE OF RESPONDENT	.001	.001	.028	.850	.395
	POLITICAL PARTY AFFILIATION	.060	.007	.272	8.240	.000
	RESPONDENTS INCOME	-.001	.005	-.009	-.280	.780

a. Dependent Variable: SHOULD BE MORE RESTRICTIONS ON HANDGUN

R²

The R^2 results show that only about .15 of the variance is explained by the independent variable. These findings are weak since at least a .40 is needed to have a robust score. So when determining how far the values fall from the mean, in this study, only about .15 can be explained by the independent variables that were used. A graphical representation of these findings is listed in Table 1.3.

TABLE 1.3

Model Summary ^b						
Model	Change Statistics					Durbin-Watson
	R Square Change	F Change	df1	df2	Sig. F Change	
1	.156	30.336	5	821	.000	1.943

a. Predictors: (Constant), RESPONDENTS INCOME, POLITICAL PARTY AFFILIATION, RACE OF RESPONDENT, RESPONDENTS SEX, AGE OF RESPONDENT

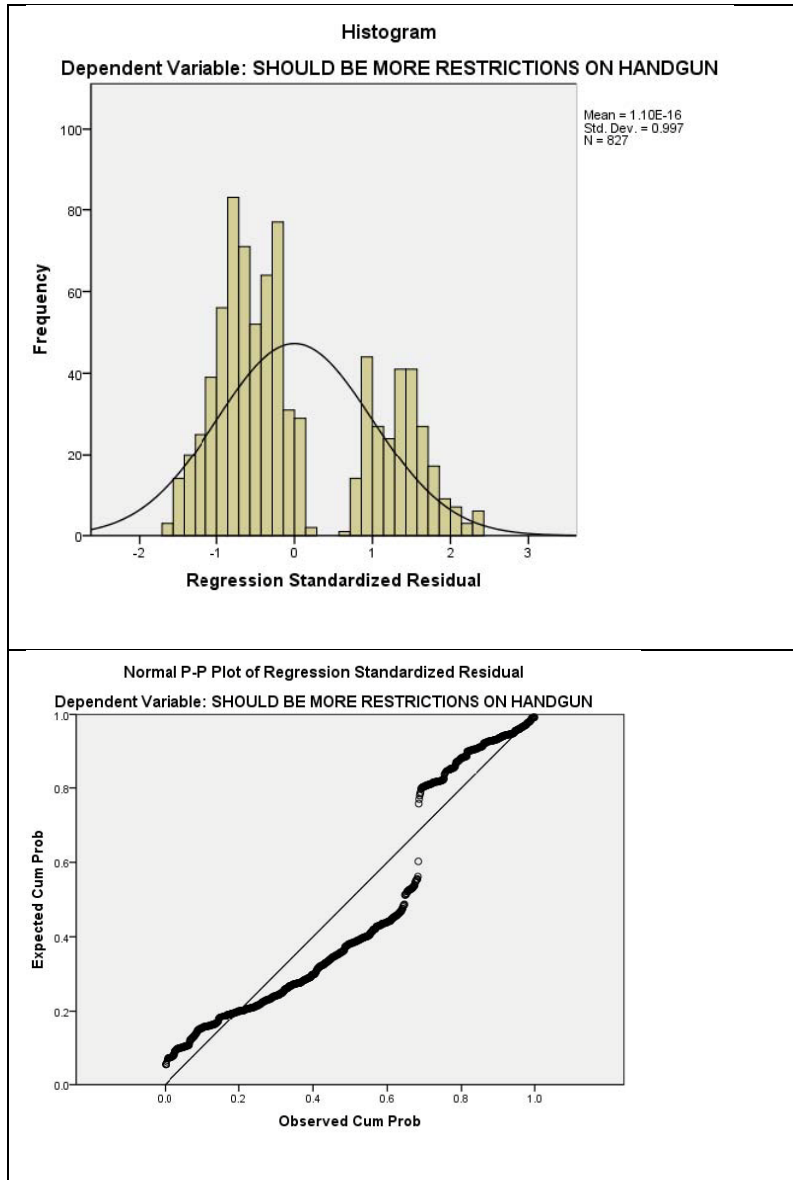
b. Dependent Variable: SHOULD BE MORE RESTRICTIONS ON HANDGUN

Mean and Standard Deviation

According to Earl Babbie (2010) the mean is an average computed by summing the values of the observations and dividing by the number of observations, whereas the standard deviation is the measure of dispersion around the mean (p. 431). The bell curve is used to graphically represent the findings in my linear regression. It is important to note a perfect bell curve is represented by a mean that equals one and a standard deviation that equals one. The higher the standard deviation, the farther the values are dispersed away from the mean.

The mean for this study is 1.1 and the standard deviation is 0.9. Neither is perfect, and the bell curve is skewed somewhat to the right; however, nearly 95% of the values lie within plus or minus two standard deviations. Finally, the results depicted on the scatter plot suggest a positive correlation between the dependent and independent variables. A graphic representation of the findings is shown in Table 1.4.

TABLE 1.4



POTENTIAL LIMITATIONS OF THE STUDY

There are possibly many limitations to this study. As mentioned before there are many variables that could affect and change the results. As an example the demographics could play a large part in how a person answers the question. In his journal Jody Lipford (2005) speaks about

some characteristics which may indicate a person will either be pro-handgun control or anti-handgun control. He states “specifically, an older male, with a high income and an interest in hunting, raised in the rural South with a Protestant background is most likely to be a gun owner” (p. 1). Therefore demographics can play a part when you consider individuals raised in the rural South outside of large cities are more likely to be anti-handgun control.

Another limitation could be whether or not the person has been a victim of a violent crime where a handgun was used. Professor Lipford further states a senator from a state with higher rates of violent crime may be less likely to vote for stricter handgun control, a surprise to most people I would think.

Additionally, the data retrieved from the UCR and Bureau of Justice Statistics has its limitations in that most law enforcement agencies are not required to report crime statistics to the Federal government. Although a majority of the larger departments do, a high rate of the smaller departments does not; this may give somewhat a less accurate picture of crime in the United States.

Finally, this topic is extremely controversial with many people unlikely to change their point of view because of the outcome of this study.

USE OF RESEARCH FINDINGS

The findings from this research are very interesting and in some cases different than what I expected. I do not believe the findings in this study will convince most people to change their mind on this topic. However, I do believe the findings can be a small piece of the puzzle when it comes to better educating us on the variables that affect this question. Therefore, I believe the

best use of this information is for education and perhaps as a beginning to allow for more in depth research of this topic.

CONCLUSION

As is the case with most questions there are many variables that affect the answer. This study is no different. I chose my dependent variable by looking at the possible questions in the General Social Surveys Codebook. I then picked the independent variables after running more than 40 different linear regressions in SPSS until I was able to find those independent variables that showed an accepted level of significances between the dependent and independent variables. While not all the independent variables were statistically significant, four of the five showed levels of significances at .05 or higher giving me confidence that those results were not by chance. I believe there is a positive correlation between the independent variables I chose and the dependent variable.

Likewise as it was mentioned at the beginning of this paper, handgun control is a controversial topic that is unlikely to be solved anytime soon. There are way too many variables to say across the board it works or does not work. Information must continue to be gathered on the effect handgun control has on preventing crime, or in some cases increasing the chances an innocent citizen will be left unable to protect himself/herself against a criminal, who could care less about a handgun law. This research information should be used along with the hundreds of other studies that have been done on this topic to better understand the pros and cons of handgun control.

REFERENCES

- Babbie, E. (2010). *The Practice of Social Research*. Belmont, CA: Wadsworth.
- Lipford . J (1995). The Political Economy of Gun Control: An Analysis of Senatorial Votes on the 1993 Brady Bill Department of Economics and Business Administration, Presbyterian College, Clinton, S.C. Retrieved from <http://www.saf.org/journal/12/Lipford.htm>
- National Opinion Research Center University of Chicago . (2009). *General Social Surveys Cumulative Code Book*.
- U.S. Bureau of Justices Statistics. (1997). *Age Patterns of Victims of Serious Violent Crimes*: Bureau of Justice Statistics Special Report. Craig Perkins: Author. Retrieved from <http://bjs.ojp.usdoj.gov/content/pub/pdf/apvsvc.pdf>
- U. S. Federal Bureau of Investigations. (2009). *Uniform Crime Reports: Violent Crime*. Washington, DC: Author. Retrieved from <http://www.fbi.gov/about-us/cjis/ucr/ucr>