The Effect of Gun Policy on Sexual Assault in U.S.

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Abstract. Existing studies show there is a relationship between guns and sexual violence against women: the inherently coercive nature of guns facilitate sexual assault and it is the weapon most frequently used in rape victimizations. Firearms are also prevalent in abusive relationships, situations that are also rife with sexual assault. Because gun policy impacts the access and presence of guns, this paper investigates and analyzes the relationship between the strength of gun policy and the rate of rape. Using data from Giffords Law Center and states' annual crime reports, a correlation and linear regression analysis was run on Microsoft Excel. The correlation shows a positive trend between a state's rate of rape and gun law rankings and gun law grades. This means the weaker a state's gun laws, the higher the rate of rape, and vice versa. The regression finds that a state's grade in gun laws has a statistically significant effect on the rate of rape. Additionally, a poor gun law grade is associated with a rape rate significantly higher than the national average. Although underlying causes are unknown, the results indicate that women would be safer in states with strong gun laws due to decreased risk of sexual assault.

Keywords: Rape; Gun Policy; Gender-based Violence; Sexual Assault; Firearms.

1. Introduction

On November 7th, 2023, the U.S. Supreme Court started hearing United States v. Rahimi. It is a case revolving around the Second Amendment that will decide whether federal law that prohibits those subjects to a domestic violence protection order from owning a gun is Constitutional or not—essentially, whether domestic abusers have the right to own a gun [1]. Advocates say the current law (as of the time this paper is being written) is a vital tool in protecting women, especially because of domestic abuse's high recidivism rate, and the impacts of this law being overturned would increase domestic gun violence and put women's lives at risk [1, 2]. While domestic abuse is rightfully at the center of this debate, a crucial issue that's closely tied to domestic abuse has not yet been considered on how it would be impacted by the potential overturn of the law: sexual assault [3]. Indeed, the link between guns, gun law and domestic abuse have been firmly established, and the direct role of firearms in sexual assault victimizations have been somewhat studied; however, insufficient attention has been paid to the issue of how gun policy affects sexual assault. Thus, the research question: what is the relationship between gun policy and sexual assault?

Existing literature on guns and violence against women paints a rather grim picture. Although most own a gun for the purposes of protecting themselves, very often it is used to harm women instead [4]. Due to a gun's dangerous and thus inherently coercive nature, firearms exacerbate power dynamics in abusive situations; millions of women have been threatened or shot at by a gun in cases of intimate partner violence [5]. The link between domestic violence and sexual assault is clear: of all women in abusive relationships, 40-45% will also be sexually assaulted during its course and nearly two thirds of IPV victims who experience firearms abuse reported that a partner tried to coerce them into sex [3, 6]. Like domestic abuse, sexual assault is a crime facilitated by the use or even mere presence of firearms: at 6-7% it is the most common weapon used in rape victimizations, and 14% of victims of firearm facilitated sexual assault reported or were documented as being hit/struck by a gun [7, 8, 9]. Furthermore, a study on firearm facilitated sexual assault (FFSA) found that sexual assaults made up 4.26% of nonfatal firearm injuries, which amounted to 11,849 victimizations, based on data pulled from the National Electronic Injury Surveillance System (NEISS) from 1993—2015 [9]. Pro-gun advocates argue that guns can be a way for women to protect themselves from sexual assault, but reality tells a different story: women never use guns to defend themselves against sexual assault [10].

In fact, the presence of guns on college campuses has actually been associated with increase reports of sexual assault [11]. As the intersection of guns and violence against women makes its way to the national limelight, it has sparked a need to understand how gun laws play a role in all types of gender-based violence.

2. Relationship between Gun Policy and Sexual Assault

2.1. Relationship Based on Existing Studies

Americans have grown increasingly concerned about gun violence, with 60% saying it is a "very big" national problem [12]. Despite—or perhaps because—the majority of Americans are concerned about gun violence; the topic of gun control and gun ownership remains one of the most hotly contested and emotional issues in America. Self defense is the most prevalent reason for gun ownership, with 72% of gun owners saying personal protection is a major reason for owning a gun [12]. However, epidemiological theory research warns that the defensive nature of hand guns is likely overestimated, and the claim that there are millions of annual self-defense gun usages is largely a myth [13]. Furthermore, rather than protect, guns are used much more often to frighten and intimidate others [14]. Firearm usage at home is also consistent with this finding, which is that guns in the home are similarly used more often to frighten intimates than to prevent crime. A majority of these at-home gun intimidations are perpetrated by males against female intimates [15].

In that same vein, women are uniquely vulnerable to gun violence. While it is true that most homicide victims are males, women are targeted for their sex. Domestic abuse and sexual assault are endemic, and although such crimes can occur to people of all genders, women make up the vast majority of victims. Domestic abuse/intimate partner violence (IPV) and sexual assault are crimes that are greatly facilitated by guns. When it comes to domestic abuse, a 2016 study found that 4.5 million women alive at the time were threatened with a firearm, and nearly 1 million were shot by an intimate partner [5]. In addition, women account for 80% of intimate partner firearm homicide victims, translating to about 70 women shot and killed by an intimate partner in the US every month. The number of female homicides committed by violent partners with firearms has accelerated in recent years. Intimate partner homicides against women increased by 6% in the decade between 2011 and 2020. The increase in IPV homicides with guns was even greater, at 15% [16]. To put this in an international context, 92% of all female firearm homicide victims in high income nations were from the U.S. Women are 28 times more likely to die by firearm homicide than women in similar nations, and domestic abuse is the main culprit for such shocking numbers. Furthermore, about forty percent of women firearm homicide victims were murdered by a current or past intimate partner. Pregnant and postpartum women are disproportionately impacted [16].

According to a 2021 report on guns and domestic violence, simply the presence of a gun in an abusive relationship intensifies the patterns of control and coercion and increases violence aimed toward the victim [17]. A 2017 study on guns in intimate partner violence discovered that guns are the weapon of choice for domestic abusers: one-third of all weapons used against an intimate partner were firearms. The vast bulk of such incidents were male-on-female and the gun was typically used to threaten—not to shoot—the intimate partner. In such cases injuries were uncommon, but a victim's fear was three times greater if threatened with a gun rather than another type of weapon due to the immediate fatal dangers of a firearm [18]. A presence of a gun establishes an "intense, reality--based fear" for women in abusive relationships—because if he pulls the trigger, she will die. Just the fear of that threat is significantly associated with PTSD. In fact, the study authors even assert that that link is stronger than the one between abuse and PTSD [19]. A firearm is a powerful facilitator of domestic abuse, without a single shot fired.

On the subject of rape and sexual assault, females (1.3 per 1,000) are significantly more likely than males (0.1 per 1,000) to be the victims—13 times more likely, in fact [8]. The intersection of sexual assault and gun policy has made its way on college campuses as well. Proponents of "carry on campus" (the concealed carry of guns on college and university campuses) argue that it may reduce the number

of sexual assault and rape occurrences. After all, rape and sexual assault victimizations is extremely common on college campuses, with rape making up 22.2% of all campus crime [20]. However, 85-90% of sexual assaults reported by college women were perpetrated by someone already known to the victim—a friend, acquaintance, or intimate partner—and about half occur on a date [21]. Given this context, it's extremely difficult for women to utilize a gun in such situations. In fact, according to the National Crime Victimization Surveys, women never use guns to protect themselves against sexual assault [10]. What's more is carry-on-campus has actually been shown to increase reports of sexual assault. A general linear model analysis by Youngstown State University discovered that the frequency of reported sexual assaults were consistently higher in concealed carry universities, after universities implemented concealed carry policies. This trend was observed across three states including data from 54 colleges and universities. The data indicates there is a significant increase in reported sexual assault crimes once carry on campus laws are passed [11].

The presence of a gun can threaten, intimidate, psychologically abuse, and coerce compliance on a victim, which increases the likelihood of sexual assault. Guns are the most frequent weapon used in sexual assault and rape incidents, accounting for 6%-7% in all such victimizations against women from 2005-2010. To put this in numbers, 12,630 reported rapes involved the presence of a gun [7, 8]. Furthermore, a study on firearm facilitated sexual assault (FFSA) found that sexual assaults made up 4.26% of nonfatal firearm injuries, which amounted to 11,849 victimizations, based on data pulled from the National Electronic Injury Surveillance System (NEISS) from 1993—2015. FFSA is defined as an incident where the patient stated a firearm was used to coerce or facilitate the sexual assault, and the victim's (91% female) chief injury was sexual assault. Of the FFSA patients that presented to the NEISS participating hospitals, 91% were female and 48% were ages 15—24. A worrying number of victims—14 percent—reported or were recorded as being hit/struck by a gun [9].

2.2. Gun Policy Strength and Rape Rate

This subsection explores the relationship between the strength of gun policy and rape rate, by state. Using data from Giffords Law Center, each of the 50 states were given a "grade" on the strength and quality of their gun laws. Within Excel, the grade was assigned a numerical value (A = 1, A- = 2, B+ = 3, B = 4, B- =5, C+ = 6, C = 7, C- = 8, D+ = 9, F = 10). Each state was also ranked 1–50, with the one ranked first having the strongest gun laws. The rape rate per state was calculated by dividing the total number of reported offenses with the total population, then multiplying that by 100,000. In cases where the data given was only representative of a certain percentage of the population, the population was multiplied by the percent. The rape statistics came from the most recent available data, with most coming from 2019, 2021, and 2022. Data came from publicly released annual reports on crime and the FBI. Population data for each of the states came from the US Census Bureau from the years 2020 and 2022, depending on what year the rape statistics came from for that particular state. In total, this research contains 150 data points. Fifty came from each state's gun law rankings, 50 from each state's gun law grade, and 50 from each state's rape rate. This data can be found in Appendix 1.

It would be pertinent to clarify that sex crimes are often disaggregated into various categories such as fondling, sodomy, statutory rape, forcible rape, rape, incest, sexual assault with an object, etc. Only categories containing the word "rape" was used. For example, if a state's data on sex crimes were separated into rape, sodomy, and fondling, then only the count index from rape was used. If it was separated into rape, statutory rape, sexual assault with an object, and fondling, then only the data from rape and statutory rape was used.

On Excel, a correlation was run on the gun law grade (GLG) and rape rate (RR) as well as the gun law rankings (GLR) and rape rate. A linear regression analysis was run on the GLG and RR. This was done with and without the outlier, which was Alaska with a 151.126 rape rate. (While there's many reasons that go into why, Alaska's high rape rate is typically attributed to its rural nature—in such places, women simply cannot rely on police to protect them) [22].

First, with the correlation. With the outlier, the relationships between GLG and RR as well as GLR and RR yielded extremely similar results within 1.3 percentage points of each other. For the former,

the correlation coefficient was 47.3%. The latter's correlation coefficient was 48.6%. Without the outlier, the correlation coefficient increased by a significant amount. The correlation coefficient for GLG and RR was 56.3%. The correlation coefficient for GLR and RR was 54.6%. This shows a solid positive relationship GLG, GLR, and RR, but in practical terms it means that gun policy and the rate of rape has an inverse relationship: the weaker the gun laws, the higher the rate of rate; the stronger the gun laws, the lower the rate of rape.

This positive trend can be illustrated by a graphical depiction of the data. Figure 1 and Figure 2 are with the outlier. Figure 3 and Figure 4 are without. The regression line formula for each of the graphs is on the upper left hand corner in a blue box.

Figure 1 shows the relationship between GLR and RR. The scatter plot shows a positive trend, where the 'worse' (closer to 50) the ranking, the higher the rape rate.

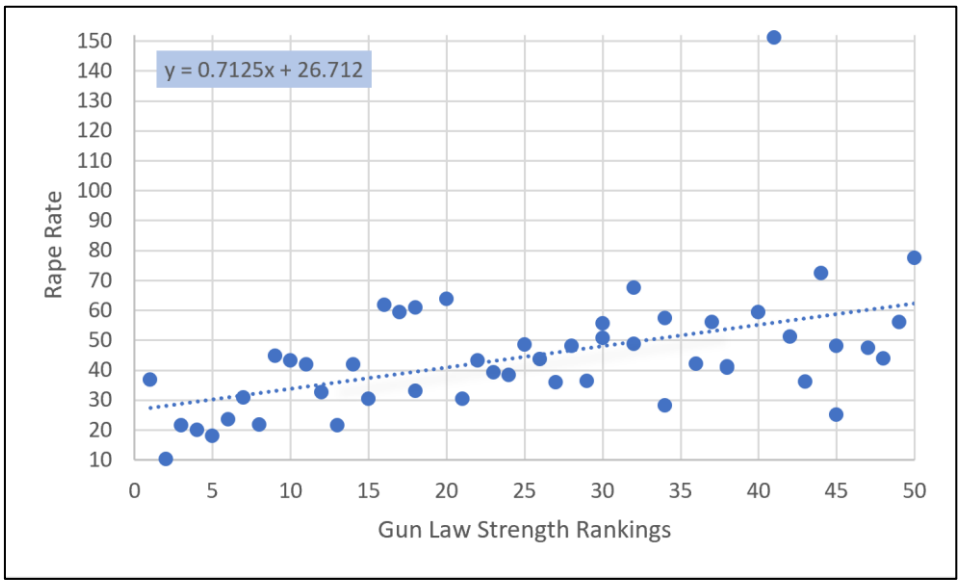

Figure 1. The relationship between gun law rankings and rape rate, including the outlier near the upper right hand corner. Source: Appendix 1.

Figure 2, shown below, displays the relationship between GLG and RR. Like Figure 1, the scatter plot also shows a positive trend. The higher the numerical value of the grade (i.e., the worse the grade is), the higher the rape rate is as well.

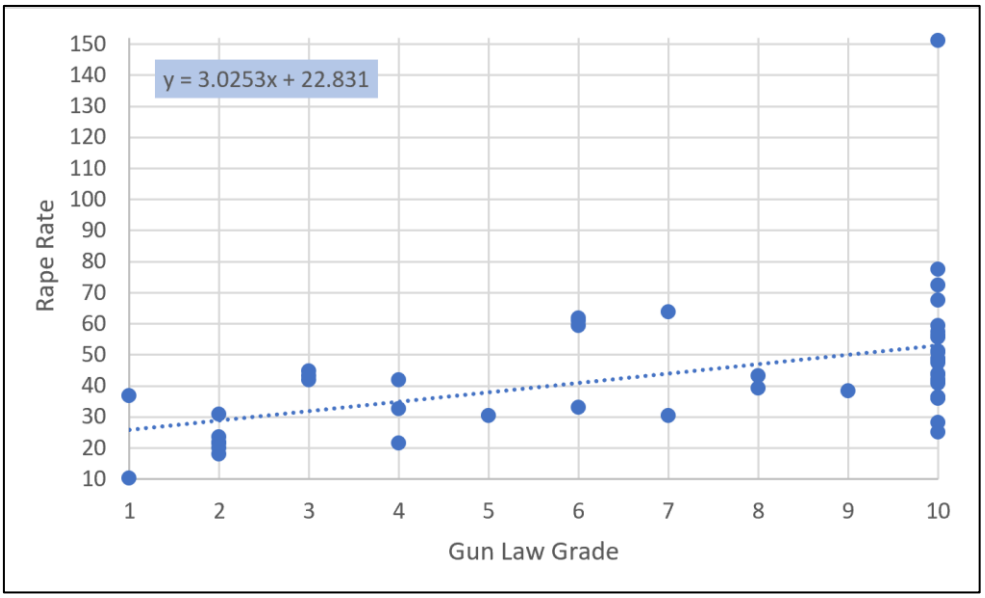

Figure 2. The relationship between gun law grades and rape rate, including the outlier at the upper right hand corner. Source: Appendix 1.

Figure 3 shows the relationship between GLR and RR, this time without the outlier. The coefficient of the regression line decreased without the outlier "pulling" it up.

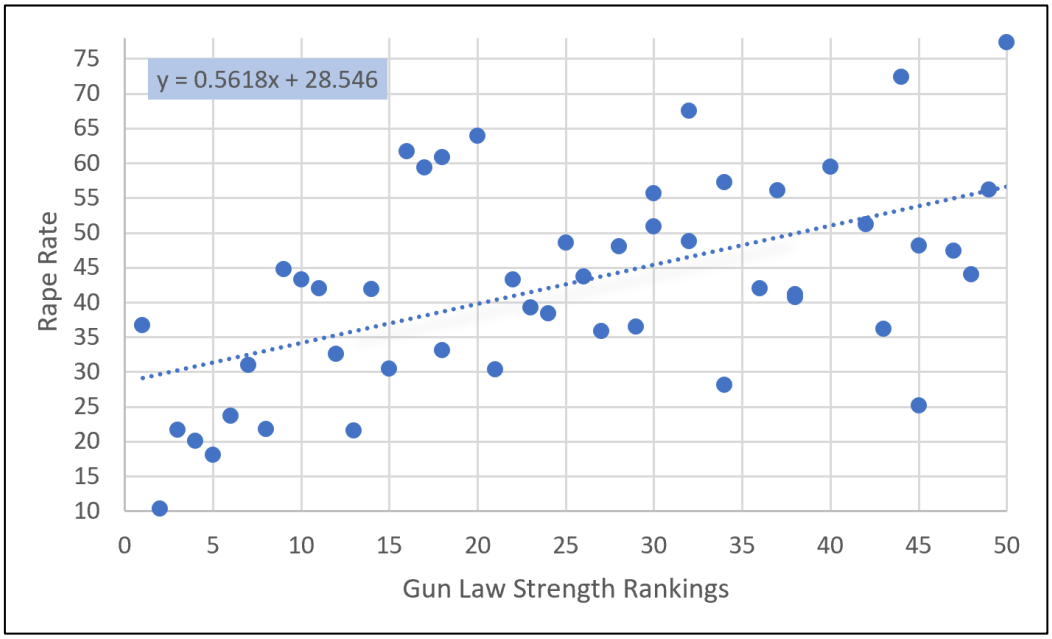

Figure 3. The relationship between gun law rankings and rape rate, without the outlier. Source: Appendix 1.

Figure 4 shows the relationship between GLG and RR, this time without the outlier. As with Figure 3, the coefficient of the regression line decreased without Alaska's outlier "pulling" it up.

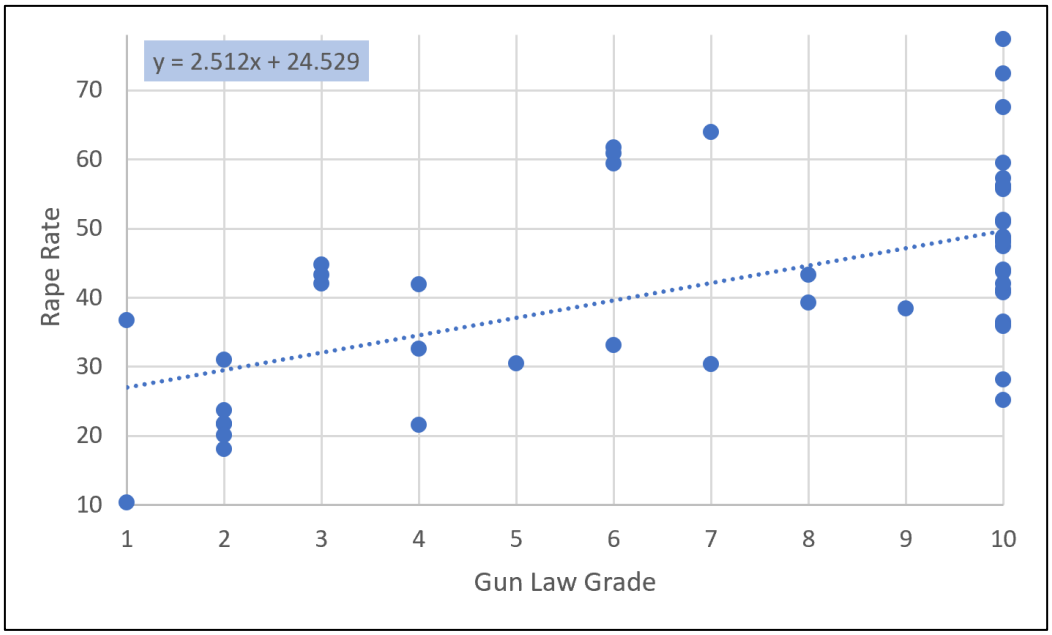

Figure 4. The relationship between gun law grades and rape rate, without the outlier. Source: Appendix 1.

Table 1. A table of the results from the linear regression analysis, run with the outlier. Source: Appendix 1.

Regression Statistics								
Multiple R	0.472749116							
R Square	0.223491727							
Adjusted R Square	0.207314471							
Standard Error	18.94276427							
Observations	50							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	4957.278405	4957.278405	13.81518168	0.000526791			
Residual	48	17223.75927	358.828318					
Total	49	22181.03767						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	22.83132558	6.488131052	3.518937178	0.000959415	9.786064004	35.87658715	9.786064004	35.87658715
Grade (#)	3.025340829	0.813946778	3.716877948	0.000526791	1.388791176	4.661890483	1.388791176	4.661890483

Table 2. A table of the results from the linear regression analysis, run without the outlier. Source: Appendix 1.

Regression Statistics								
Multiple R	0.562620553							
R Square	0.316541887							
Adjusted R Square	0.302000225							
Standard Error	12.44116653							
Observations	49							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	3369.297411	3369.297411	21.76793047	2.58019E-05			
Residual	47	7274.783359	154.7826247					
Total	48	10644.08077						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	24.52879896	4.266510132	5.749148181	6.43873E-07	15.94568782	33.1119101	15.94568782	33.1119101
Grade (#)	2.511976915	0.538402507	4.665611478	2.58019E-05	1.428850798	3.595103032	1.428850798	3.595103032

Next, the linear regression. The data refers to Table 1 and 2 above. The coefficient is 3.03 and 2.51 for the outlier and no outlier respectively, meaning for each unit increase of GLG then the RR is expected to increase by 2.51 units. (The regression line formula can be found in Figures 1, 2, 3 and 4 below). The p value is 0.000523 and 0.0000258 for the outlier and no outlier respectively. Because it is much lower than alpha (0.05), and neither of the upper and lower 95% contain 0, it means the coefficients are statistically significant and there is sufficient evident to reject the null hypothesis (H0 = 0). Thus, GLG is likely to have a significant effect on the RR.

The r square is 0.2235 and 0.3167 for the outlier and no outlier respectively, which indicates that 22.35% and 31.67% of the variance in RR is explained by GLG. It suggests that GLG has a statistically significant positive effect on RR. The model only explains about 31.67%, which leaves a significant amount of unexplained variance. However, because gun policy isn't even directly linked to sexual assault, 31.67% can be considered quite high in the context of this research.

The standard error throws a bit of a wrench in the conclusions that can be draw about the data; the standard error is 18.94 and 12.44 for the outlier and no outlier, respectively. Because the ratio of the standard error to the coefficient is 4.96, it means the standard error is relatively high compared to the coefficient. This indicates variability within the data. It suggests there is not enough information to reliably estimate the effect of that specific independent variable on the dependent variable.

However, the GLG t-stat is high as well at 3.72 and 4.67 for the outlier and no outlier respectively, which is interesting considering the high standard error. A high t-stat would indicate that GLG has a statistically significant impact on the rape rate, but the high standard error means that there is some

uncertainty associated with this impact. The other "paradoxical" aspect is the significance F: it's 0.000523 and 0.0000258 for the outlier and no outlier respectively. It's much lower than the rejection range of > 0.05, which typically indicates that the overall regression model is highly significant. However, with the standard error in mind, it can be concluded that GLG does have a statistically significant effect on RR, but there is variability within this data set and there is some uncertainly associated with the relationship. Ultimately, the high standard error isn't surprising due to the complex nature of what drives sexual assault.

To offer a more practical breakdown of the relationship between gun policy and sexual assault, the average rape rate of the country is 42.6 (calculated without the outlier). Based on this, there are 25 states below the average rape rate and 25 states above the average rape rate. Of the 25 with above average rape rates, 18 were graded with F's and 19 were among the bottom 25 states out of the national ranking in terms of gun control. In contrast, the 25 states with below average rape rates possessed all the A's and B's and 17 of them were among the top 25 states out of the national ranking. Additionally, the average RR of states graded an F is 14.36% higher than the national average, and 112.72% higher than the average RR of states graded an A or A-. In contrast, the average RR of states graded an A or A- is 46.24% lower than the national average, and 52.99% lower than the average RR of states graded an F. It's important to emphasize that this regression model cannot determine whether poor gun policy *causes* high rates of rape, but based on the results from the correlation and linear regression, one can conclude that GLG does have an effect on the RR.

2.3. Results

The correlation results of this study indicate that there is a strong inverse relationship among the strength of gun policies and rape rate. This means that the stronger the gun laws of a state, the lower the rate of rape. Conversely, the weaker the gun laws of a state, the higher the rate of rape. According to the regression, results indicate the overall regression model is statistically significant. Additionally, the GLG has a statistically significant effect on the RR and about a third of the variance in the RR can be explained by the GLG. The high standard error indicates quite a bit of variability in the data and uncertainty surrounding this relationship, but is ultimately not surprising given the variety of complex factors that go into high rates of sexual assault. In a more practical breakdown, having weak gun policies is associated with a rape rate nearly 15% higher than the national average. On the other hand, having strong gun policies is associated with a rape rate that's 46% lower than the national average. Ultimately, one concludes that gun policy does impact rates of sexual assault. These findings suggest that women would be safer residing in states with strong gun laws because there is a decreased risk of sexual violence. The results of this study corroborate other literature that explores the role of firearms in violence against women: that its usage and presence intensify abusive dynamics, coerces rape, is associated with an increase of reported sexual assault, and kills domestic abuse victims. While previous studies on guns and violence against women mostly examines the direct role of firearms in such situations, this research contributes a clearer understanding of how gun *policy* plays a role in sexual assault victimizations.

3. Discussion

3.1. Suggestions

The findings of this research indicate that having weak gun laws is associated with high rates of rape, and that the strength (or lack thereof) of gun policy has a statistically significant effect on rape. On this basis, there are several policy recommendations for lawmakers—especially of states with weak gun policies—to reduce sexual violence against women.

In terms of prevention, handguns should be more strongly regulated. Handguns are the most common type of gun in the homes of battered women, especially compared to the general population [23]. Of the victims of robbery, aggravated assault, sexual assault and rape, 25% had been attacked with an offender carrying a firearm (specific data on handguns and sexual assault was not available)

[24]. Therefore, state lawmakers might consider making it harder to attain a handgun in order to make the weapon less accessible to those who might commit violence against women, which may decrease the likelihood of such crimes from occurring.

States should work to disarm sex offenders by permanently prohibiting any and all rapists from owning a gun. Rape has a high recidivism rate at 23-82% after only five years, and as established in Literature, firearms are found to coerce sexual assaults and 6-7% of rape involved the presence of a firearm [25]. According to the Violence Policy Center, while current federal policy outlaws the possession of firearms by a person convicted of a felony sex offense, it is legal for those convicted of misdemeanor sex crimes to buy, sell, and possess firearms [26]. Thus, state laws ought to have prohibitions analogous to federal laws in order to empower states and local prosecutors to properly prosecute sex offenders that violate the law, and apply the law to those convicted of misdemeanor sex crimes as well.

Additionally, state lawmakers must disarm domestic abusers. After all, intimate partner violence and sexual assault are deeply intertwined; 40-45% of women in violent relationships will be sexually assaulted during the relationship, and nearly two-thirds of IPV victims who had nonfatal weapons abuse reported that an intimate partner attempted to force them to have sex [3, 6]. Thus, its recommended that lawmakers completely close the "boyfriend loophole" by permanently disarming any and all domestic abusers. Federal law used to prohibit those convicted of domestic abuse from possessing firearms, but it only encompassed those who were married to, residing with, or had a child with the victim. This means that ex-boyfriends, abusers found guilty of misdemeanor charges pertaining to domestic abuse, as well as stalkers with prior convictions or restraining orders were still permitted to possess firearms. It is critical that the "boyfriend loophole" is closed because half of intimate partner homicide are committed by an unmarried partner [27]. The Bipartisan Safer Communities Act partially closed this loophole, but still doesn't apply to abusers with only restraining orders and no convictions. It's also not a permanent denial of access: gun owning rights can be restored if abusers have a clean record for five years. Thus, states must work to completely close those loopholes. Multiple studies show that policies that prevent abusers from firearms reduce gun violence and IPV [28, 29, 30]. Furthermore, domestic abuse shows high rates of recidivism, bolstering the argument for removing any chance of future gun ownership for such offenders [2].

3.2. Limitations

The reliability of this data is impacted by how different states define and categorize their sexual assault data. While one state may just count "rape", other states will differentiate "rape" from "sexual assault with an object". For this research, only categories containing the word "rape" was used. As such, all other sexual assault data was not accounted for in the calculations. Furthermore, rape and sexual assault is severely underreported. According to a Justice Department analysis of violent crime in 2016, 77% of all rapes and sexual assaults go unreported [31]. This means the true significance of the relationship between gun policy and rape is likely understated. Most significantly is the simultaneous high standard error and high F statistic from the regression analysis, which might be an issue of multicollinearity. Finally, it's important to distinguish how an independent variable *causes* a dependent variable versus an independent variable *affecting* a dependent variable; in this research, which simply provides a descriptive explanation for the relationship between gun policy and sexual assault, it's the latter.

4. Conclusion

As gun violence remains a focal point of American society, it is crucial to understand how its policies intersect with women's safety. This research investigated the relationship between the strength of gun policy and the rate of rape per state. It's found that there is a strong relationship between the two variables. The data, run with and without the outlier, yielded a strong correlation coefficient and showed a positive trend, where the worse the GLR and GLG (closer to 50 and 10

respectively) was, the higher the rate of rape was as well. The regression analysis found that GLG had a statistically significant effect on RR and the overall regression model was significant as well, but the high standard error suggests caution in interpreting the model's results. It was also found that the average rape rate of states graded poorly on gun policy was much higher than the national average and significantly higher than the average RR of states with a "good" grade. Future research may investigate potential multicollinearity; this paper only focused on gun policy, which due to its deeply political nature, is probably indicative of how states are likely to approach other issues as well—such as sexual assault. Undoubtedly, many more variables play a role in America's endemic rape victimizations, and it would be pertinent to understand such underlying causes . Additionally, future research might also examine the efficacy of laws aimed at disarming domestic abusers—such as federal law that prohibits anyone subject to a domestic violence protection order from purchasing or possessing firearms—in reducing sexual assaults, due to the strong links between domestic violence and sexual assault. Finally, while data from this research was attained from cut-and-dry crime reports, in-depth survey research with sexual assault survivors is required to have a more nuanced and complete picture of how guns play a role in sexual assault victimizations. Such information would be important for lawmakers to consider when gun regulation is drafted; policies informed by evidence and research have the best chance of keeping women safe.

References

[1] Bloomberg School of Public Health staff report. "Do Guns Belong in the Hands of Domestic Abusers?" John Hopkin University - the Hub, 7 Oct. 2023, hub.jhu.edu/2023/10/24/supreme-court-gun-rights-roskam-qa/#: ~:text=On%20Nov.%207%2C%20the, a%20protection%20order%20or%20restraining.

[2] McCormick, Amanda V., et al. "Reducing Recidivism in Domestic Violence Cases." University of the Fraser Valley, June 2011.

[3] Tjaden, Patricia, et al. "Extent, Nature, and Consequences of Intimate Partner Violence." National Institute of Justice, Center for Disease Control and Prevention, July 2000.

[4] Nadeem, Reem. "For Most U.S. Gun Owners, Protection Is the Main Reason They Own a Gun | Pew Research Center." Pew Research Center - U.S. Politics & Policy, 30 Aug. 2023, www.pewresearch.org/politics/2023/08/16/for-most-u-s-gun-owners-protection-is-the-main-reason-they-own-a-gun.

[5] Sorenson, Susan B., and Rebecca A. Schut. "Nonfatal Gun Use in Intimate Partner Violence: A Systematic Review of the Literature." Trauma, Violence, & Abuse, vol. 19, no. 4, SAGE Publishing, Sept. 2016, pp. 431–42. https://doi.org/10.1177/1524838016668589.

[6] Adhia, Avanti, et al. "Nonfatal Use of Firearms in Intimate Partner Violence: Results of a National Survey." Preventive Medicine, vol. 147, Elsevier BV, June 2021, p. 106500. https://doi.org/10.1016/j.ypmed.2021.106500.

[7] Planty, Michael, Ph. D., et al. "Female Victims of Sexual Violence, 1994-2010." U.S. Department of Justice, Mar. 2013.

[8] Truman, Jennifer L., Ph. D. "Criminal Victimization, 2010." National Crime Victimization Survey, Sept. 2011.

[9] Hudak, Lauren A., et al. "Firearm-Facilitated Sexual Assault: Using Emergency Department Data to Provide a Novel Perspective of the Problem." Violence and Gender, Mary Ann Liebert, Inc., Mar. 2020, https://doi.org/10.1089/vio.2019.0030.

[10] Hemenway, David, and Sara J. Solnick. "The Epidemiology of Self-defense Gun Use: Evidence from the National Crime Victimization Surveys 2007–2011." Preventive Medicine, vol. 79, Elsevier BV, Oct. 2015, pp. 22–27. https://doi.org/10.1016/j.ypmed.2015.03.029.

[11] Biastro, Leslie A. Arming the Academy: How Carry-on-Campus Impact Incidence of Reported Sexual Assault Crimes. eric.ed.gov/?id=EJ1148907.

[12] Pew Research Center. "Key Facts About Americans and Guns | Pew Research Center." Pew Research Center, 13 Sept. 2023, www.pewresearch.org/short-reads/2023/09/13/key-facts-about-americans-and-guns.

[13] Hemenway, D. The Myth of Millions of Annual Self-Defense Gun Uses: A Case Study of Survey Overestimates of Rare Events. 1997, www.semanticscholar.org/paper/The-Myth-of-Millions-of-Annual-Self-Defense-Gun-A-Hemenway/b7ac37ea395efaaf471c5e8989788de87e8ba02f.

[14] Relative Frequency of Offensive and Defensive Gun Uses: Results from a National Survey | Office of Justice Programs. www.ojp.gov/ncjrs/virtual-library/abstracts/relative-frequency-offensive-and-defensive-gun-uses-results.

[15] Azrael, Deborah, and David Hemenway. "'In the Safety of Your Own Home': Results from a National Survey on Gun Use at Home." Social Science & Medicine, vol. 50, no. 2, Elsevier BV, Jan. 2000, pp. 285–91. https://doi.org/10.1016/s0277-9536(99)00283-x.

[16] ---. "Guns and Violence Against Women: America's Uniquely Lethal Intimate Partner Violence Problem." Everytown Research & Policy, 2 Oct. 2023, everytownresearch.org/report/guns-and-violence-against-women-americas-uniquely-lethal-intimate-partner-violence-problem.

[17] "BEYOND BULLET WOUNDS: GUNS IN THE HANDS OF DOMESTIC ABUSERS." BRADY: United Against Gun Violence, brady-static.s3.amazonaws.com/Guns-Domestic-Violence.pdf.

[18] Sorenson, Susan B. "Guns in Intimate Partner Violence: Comparing Incidents by Type of Weapon." JOURNAL OF WOMEN'S HEALTH, vol. 26, no. 3, Nov. 2017, https://doi.org/10.1089/jwh.2016.5832.

[19] Mascia, Jennifer. "No Shots Fired." The Trace, 23 Sept. 2020, www.thetrace.org/2018/09/guns-domestic-violence-coercive-control.

[20] 2015 National Crime Victims' Rights Week (NCVRW) Resource Guide | Office of Justice Programs. www.ojp.gov/ncjrs/virtual-library/abstracts/2015-national-crime-victims-rights-week-ncvrw-resource-guide.

[21] "Most Victims Know Their Attacker | National Institute of Justice." National Institute of Justice, nij.ojp.gov/topics/articles/most-victims-know-their-attacker.

[22] Fuchs, Erin. "Why Rape Is Much More Common in Alaska." Business Insider, 29 Sept. 2013, www.businessinsider.com/why-does-alaska-have-such-a-high-rate-rape-2013-9.

[23] Sorenson, Susan B., and Douglas J. Wiebe. "Weapons in the Lives of Battered Women." American Journal of Public Health, vol. 94, no. 8, American Public Health Association, Aug. 2004, pp. 1412–17. https://doi.org/10.2105/ajph.94.8.1412.

[24] Zawitz, Marianne W. "Guns Used in Crime." U.S. Department of Justice, July 1995.

[25] Scurich, Nicholas, and Richard S. John. "The Dark Figure of Sexual Recidivism." Behavioral Sciences & the Law, vol. 37, no. 2, pp. 158–75. https://doi.org/10.1002/bsl.2400.

[26] Violence Policy Center. "Sex Offender Registry Bill Scheduled to Be Considered by House Today Will Allow Misdemeanor Sex Offenders Continued Access to Guns Despite Ban Passed by House on Voice Vote on Similar Bill Last Year." vpc.org, 8 Mar. 2006, vpc.org/press/press-release-archive/sex-offender-registry-bill-scheduled-to-be-considered-by-house-today-will-allow-misdemeanor-sex-offenders-continued-access-to-guns-despite-ban-passed-by-house-on-voice-vote-on-similar-bill-last-year.

[27] Sorenson, Susan B., and Devan Spear. "New Data on Intimate Partner Violence and Intimate Relationships: Implications for Gun Laws and Federal Data Collection." Preventive Medicine, vol. 107, Elsevier BV, Feb. 2018, pp. 103–08. https://doi.org/10.1016/j.ypmed.2018.01.005.

[28] Zeoli, April M., and Daniel Webster. "Effects of Domestic Violence Policies, Alcohol Taxes and Police Staffing Levels on Intimate Partner Homicide in Large US Cities." Injury Prevention, vol. 16, no. 2, BMJ, Apr. 2010, pp. 90–95. https://doi.org/10.1136/ip.2009.024620.

[29] Diez, Carolina Soto, et al. "State Intimate Partner Violence–Related Firearm Laws and Intimate Partner Homicide Rates in the United States, 1991 to 2015." Annals of Internal Medicine, vol. 167, no. 8, American College of Physicians, Sept. 2017, p. 536. https://doi.org/10.7326/m16-2849.

[30] Zeoli, April M., et al. "Analysis of the Strength of Legal Firearms Restrictions for Perpetrators of Domestic Violence and Their Associations with Intimate Partner Homicide." American Journal of Epidemiology, vol. 187, no. 11, Oxford UP, Nov. 2018, pp. 2365–71. https://doi.org/10.1093/aje/kwy174.

[31] Morgan, Rachel E., Ph. D., and Grace Kena Ph. D. "Criminal Victimization, 2016: Revised." U.S. Department of Justice, Oct. 2018, bjs.ojp.gov/content/pub/pdf/cv16.pdf.

Appendix 1.

Category	Source
Crime in Alabama, Arizona, Arkansas, Florida, Idaho, Indiana, Kansas, Louisiana, Maryland, Mississippi, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming	Tracking Crime by State - 24/7 Wall St. (247wallst.com)
Crime in Illinois, Kentucky, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina,	CDE (cjis.gov)
Crime in Alaska	https://dps.alaska.gov/getmedia/7bd9d7e2-1620-40cd-a24d-4c2371cf5458/Crime-in-Alaska-2021
Crime in California	https://data-openjustice.doj.ca.gov/sites/default/files/2023-06/Crime%20In%20CA%202022f.pdf
Crime in Colorado	https://coloradocrimestats.state.co.us/tops/report/violent-crimes/colorado/2022
Crime in Connecticut	https://portal.ct.gov/-/media/DESPP/CSP/Crimes-Analysis/2021/Crime-in-Connectiut-Report-2021.pdf
Crime in Delaware	https://sac.delaware.gov/wp-content/uploads/sites/64/2022/12/CiD-17-21-Main-Report-Final.pdf
Crime in Georgia	file:///C:/Users/ningh/Downloads/2021%20Crime%20Statistics%20Summary.pdf
Crime in Hawaii	https://www.honolulupd.org/wp-content/uploads/2023/05/HPD2022annualreport.pdf
Crime in Iowa	https://icrime.dps.state.ia.us/CrimeInIowa/Home/Index
Crime in Maine	https://www.maine.gov/dps/msp/taxonomy/term/1141
Crime in Massachusetts	https://ma.beyond2020.com/ma_tops/report/violent-crimes/massachusetts/2022
Crime in Michigan	https://www.michigan.gov/msp/-/media/Project/Websites/msp/micr-assets/2022/MICR-Annual-Report-2022.pdf?rev=3e67b9fb366a4a069c12cfb79b1e8c24&hash=DB2B1230DFBE9EF88CA3CDAA96FFE15B
Crime in Minnesota	https://dps.mn.gov/divisions/bca/bca-divisions/mnjis/Documents/2022-Minnesota-Uniform-Crime-Report.pdf
Crime in Missouri	https://showmecrime.mo.gov/CrimeReporting/CrimeReportingTOPS.html
Crime in Pennsylvania	https://www.ucr.pa.gov/PAUCRSPUBLIC/Home/Index
Gun law grade and rankings	https://giffords.org/lawcenter/resources/scorecard/
State population	https://www.census.gov/quickfacts/fact/table/MT/PST045222