EXPLORING THE ROLE OF FEAR OF CRIME AND GUN OWNERSHIP:

GENDER-SPECIFIC MODELS

By

Danielle M. Fenimore

A thesis submitted to the faculty of Radford University
in partial fulfillment of the requirements for the degree of
Master of Arts in the Department of Criminal Justice

Thesis Advisor: Nicole Hendrix, Ph. D.

May 2015

Dr. Nicole Hendrix
Thesis Advisor

4/9/2015
Date

Dr. Isaac Van Patten
Committee Member

9 April 2015
Date

Dr. Egan Green
Committee Member

4-9-2015
Date

Abstract

This study examines the relationship between fear of crime and gun ownership through the examination of data collected from an online survey. Previous research indicates that there is a significant difference between males' and females' fear of crime, and that females are more likely to engage in constrained behaviors, which decreases the likelihood of an individual becoming a victim of crime. Previous research also indicates that there is a reciprocal relationship between fear of crime and gun ownership, making it difficult to establish a causal relationship. The current study examines the hypothesis that differences in socialization of gender stereotypes identified in fear of crime research will similarly predict female protective ownership. Due to of issues identified with traditional fear of crime questions in previous research, each respondent was asked a series of questions to determine his or her level of fear. A factor analysis was conducted on these questions to create a new outcome variable to perform linear regression analyses to model significant predictors of fear. Six ordinary least squares analyses were performed to identify significant predictors of fear of crime and six logistic regression analyses were performed to determine whether there is a causal relationship between fear of crime and gun ownership.

Danielle M. Fenimore, M.A.
Department of Criminal Justice, 2015
Radford University

Dedications

I would like to dedicate this manuscript to the Fab Four. Without these guys, there is a high probability that grad school could have been a more stressful experience than what it ended up being. They made classes easier through just joking about the material in an odd way to learn it, and they were extremely supportive through the entire thesis process. Having gone through the thesis struggle with them has made us battle buddies. So to the Fab Four: Cheryl Johnson, Alisha Wilson, and Michael Logan. Thank you.

Also, Dr. Faye: thank you for lending your patio as a non-stressful place to analyze the outputs from all of my analyses during Spring Break. The canal is amazingly peaceful.

To my Starbucks crew: first, to our fearless leader, Kim Tribble, who did not even blink an eye when I told her that school would come first. Thank you for being the most awesome and understanding manager ever. Secondly, to Sabrina Hall, who is getting a special place in this dedication for beasting out two clopens in one week to make it possible for me to have my defense. And to every other partner at C-burg: You guys are awesome.

Bodie. You're so obnoxious but you're entertaining and you have loved me harder than any human could, and I can always count on you to be in my space when I need it the most. Thanks for choosing me.

Acknowledgements

First and foremost, I would like to acknowledge my thesis committee: Dr. Nicole Hendrix, Dr. Isaac Van Patten, and Dr. Egan Green. All three of these wonderful faculty members have mentored me and helped guide me through my graduate experience, each contributing to the academic I am today. Thank you for taking it in stride when I started my thesis over in December and helping me still make the spring semester deadlines.

I would like to especially acknowledge Dr. Hendrix for everything that she has done for me over the last seven years that I have known her. She has pushed me, helped me, poked me, motivated me, challenged me, and forced me to get past myself and to help me realize what I was actually capable of accomplishing, even with me resisting almost every step of the way. There isn't really anything I can say other than a simple, "Thank you."

Table of Contents

List of Tables

Page

Table of Figures

Page

Chapter 1: Introduction

Women are more likely to indicate that they fear crime, and are more likely to engage in self-protective behaviors, but less likely to own firearms overall (Gordon et al., 1980; Pew Research Center, 2013; Woolnough, 2009). Men are more likely to be victimized (Truman & Langton, 2014), less likely to fear crime, and are more likely own firearms. This creates an interesting conundrum when considering the relationship between fear of crime and gun ownership. Those who are more fearful are less likely to own, and those who are less fearful are more likely to own. Fear of crime and gun ownership has typically been defined by a reciprocal relationship (Bankston & Thompson, 1989; DeFronzo, 1979; Kleck, 1991; Kleck, 1997). Identifying a causal relationship has been difficult because of this, despite the fact that, logically, individuals whose fear of crime is higher may logically be more likely to engage in constrained behaviors. Constrained behaviors may be used to reduce the risk of victimization and includes engaging in protective behaviors, such as owning a gun for self-defense purposes. The current study serves to add to the existing literature of the relationship between fear of crime and gun ownership using gender specific models.

The existing literature describing the characteristics of gun owners indicates that the typical gun owner possesses a set of traits that are generally universal to most gun owners. These gun owners generally are male and own firearms for hunting or sport shooting. When examining the characteristics of gun owners who indicate the primary reason that they own a firearm is for protective purposes, a different set of characteristics is observed. Fear of crime is a socialized emotional response to individually perceived threats of potential victimization and past research has repeatedly found that women are

significantly more fearful than men (De Groof, 2008; Gordon et al., 1980; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006; Tomsich, Gover, & Jennings, 2011). Past research also indicates that fear of crime is likely to predict constrained behaviors. If women fear crime significantly more than men, then women should be more likely to engage in constrained behaviors. By looking at gender-specific models, this study examines the role that fear of crime has on gun ownership for men and women.

The current study examines the characteristics of gun owners, specifically women, and the role that fear of crime (argued below to be a socialized behavior) has in gun ownership. Past research has found that typical gun owners are often male, white, Southern, middle-aged or older, married, Protestant, higher income, are often employed in manual labor jobs, live in rural areas, and have conservative political views (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley, 2012; Hepburn et al., 2007; Kleck, 1995; Kleck, 1997; Lott, 2010; Sheley et al., 1994). Historically, the studies identified above indicated that gun owners reported owning firearms for sporting and hunting purposes. However, recent research conducted by the Pew Research Center indicates that more gun owners are reporting owning for protection. The focus of these studies has concentrated on the over-represented portion of the gun owning population in the United States. Since most gun owners are males who own for hunting or sporting purposes, females and individuals who own for protective purposes are not accurately represented by the typical gun owner model. The current study examines the role that fear of crime has on gun owners who own for protection and whether there is a significant difference between male and female gun owners.

Previous research indicates that the typical female owner generally mirrors this (Bugg & Yang, 2004; Fenimore & Hendrix, unpublished; Smith & Smith, 1995), indicating that female participation in the American gun culture is largely influenced by significant males in their lives, such as a father, brother, or husband (Blair & Hyatt, 1995). Gun owners who indicate they primarily own for protective purposes have been found to be divergent from the typical gun owner (Kleck & Gertz, 1995; 1998), but more recent research examining gun ownership shows indicates that this is less likely to be true (National Shooting Sports Foundation, 2012; Pew Research Center, 2013). Research has found that ethnic minorities and women from urban areas, who are often single or living alone, are more likely to own for protective purposes. This implies that their motivation for ownership may also be different from the motivation for ownership of the typical gun owner. Additionally, current research in fear of crime indicates that women are significantly more fearful than men in general, more likely to fear criminal victimization, perceive a higher victimization risk, and are more likely to partake in protective and defensive behaviors, including owning or carrying a gun for personal protection. This is likely the result of socialized gender stereotypes that indicate that women are more vulnerable and less likely to be able to defend themselves. Chapter 2 further explores the current research regarding the relationship between fear of crime and gun ownership.

Chapter 3 discusses the study methodology. Briefly, the researcher participated in the release of an online survey measuring gun ownership and attitudes about guns. While online surveys have their benefits, they also have their limitations, including potential issues with being able to generalize the results. Both benefits and limitations are explored in Chapters 3 and 5.

Descriptive and bivariate statistics were used to analyze all variables and the relationships between them. Factor analyses were conducted on the ten survey items measuring fear of crime to create a new outcome variable, Fear, which was used for the outcome of the ordinary least squares (OLS) regression models and as a predictor in the logistic regression models predicting gun ownership. The current study used OLS regression models to determine significant predictors of fear of crime and logistic regression models to test the relationship between fear of crime and gun ownership using the full sample and in gender-specific models.

The results of the current study are examined in detail in Chapter 4. The OLS regression analyses determined that age was a significant predictor regardless of what subsample was being tested. These results indicated that there was an inverse relationship between age and fear, indicating that younger respondents fear crime more. However, the constant was significant in all three models, indicating that an unaccounted for variable was missing that could potentially increase the explanatory power of the model.

Specifically of interest to the current study, the regression analyses indicated that fear was not a significant predictor of gun ownership. Interestingly, being raised in the South (traditionally a significant predictor of gun ownership) was also not a significant predictor of gun ownership. Being raised in a rural community was only significant for males and the total sample, and race was only significant when examining the full sample and females only. Similar findings for the fear of crime models are discussed in Chapter 4. Traditional predictors of fear of crime were either not significant or were significant with an inverse relationship that contradicts previous research. The implications of these findings are discussed in Chapter 5 with the conclusions and limitations of the study.

Chapter 2: Literature Review

This study examines the relationship between fear of crime and gun ownership. Fear of crime has been identified as a fear of victimization, and is significantly higher among women. Ferraro (1996) hypothesized that this was due to the "shadow hypothesis," which indicates that women's fear of becoming a victim of crime is because any criminal act has the potential to escalate to sexual assault. Not surprisingly, women are more likely to engage in constrained behaviors to minimize the chance that they will become victims, including carrying a weapon for protection (Felson & Pare, 2010). Conversely, men are more likely to be victimized, but are less likely to participate in constrained behaviors (Gordon et al., 1980). Men are also more likely to own firearms for hunting and sporting purposes (Kleck, 1991; Kleck, 1997), instead of for protection. The American gun culture is overly represented by the typical gun owner: Southern, white male, approximately middle aged, married, and conservative, who owns for hunting or sporting purposes (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley et al., 2012; Hepburn et al., 2007; Kleck, 1995; Kleck, 1997; Lott, 2010; Sheley et al., 1994). The current study examined the relationship between fear of crime and gun ownership using gender specific models in order to determine if fear of crime is a significant predictor for gun ownership for women.

Previous research regarding the role of fear of crime in gun ownership has found that there is a reciprocal relationship between these variables (Bankston & Thompson, 1989; DeFronzo, 1979; Kleck, 1991; Kleck, 1997). This simply indicates that previous studies have not been able to identify a causal relationship between them. Usually, this research has indicated that the primary issue revolves around the use of cross-sectional

data (Hauser & Kleck, 2013). Past research has taken care to analyze and criticize methodological issues with testing the relationship between fear and gun ownership. However, there are potential theoretical shortcomings that should be questioned as well. There is a fundamental difference in male and female socialization, and therefore, there is likely to be a difference as to why they would each own a firearm. Since socialization is important in understanding and predicting an individual's probability of owning a gun, it may be beneficial to examine males and females separately. While there are limitations to using cross-sectional data, the true limitation of previous research could potentially be theoretical, not methodological.

The gun culture is male-dominated (Blair & Hyatt, 1995; Bordua & Lizotte, 1979; Cooke & Puddifoot, 2000; Lizotte & Bordua, 1980). Males are generally more likely to be socialized into protective roles and taught that they should be tough (Branscombe & Owen, 1991; Pain, 2001), in turn making them less likely to indicate being fearful of crime. This is despite the fact that victimization surveys from the Bureau of Justice Statistics have shown that males are more likely to be victimized. While criminal victimization has decreased overall, males have been victimized more than females since, at least, 2004 (Truman & Langton, 2014). Previous research has identified a significant difference between males' and females' levels of fear of crime, with females being significantly more likely to indicate a fear of criminal victimization (DeGroof, 2008; LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010). This is the foundation of the fear of crime paradox, which indicates that even though women are more likely to be fearful of crime, they are less likely to be victimized (Ferraro, 1996; LaGrange & Ferraro, 1989).

Research has found that the traits of female gun owners generally mirror those of typical male gun owners, and this is likely to be a result from the role that socialization has in gun ownership. Since approximately the 1980s, media has indicated that female gun ownership has increased dramatically (Bigelow, 2013; Cytrynbaum, 1982; Johnson, 1989; Jones, Cantlon, & Slee, 1989; Marcus, 1981; Pulitzer, 1992; Thomas, 1994), but research indicates otherwise. The more recent trends have shown no significant change in ownership for males or females, and that the number of gun owners overall has been steadily decreasing since approximately the early to mid-1990s (Bugg & Yang, 2004; Legault, 2011).

Bordua and Lizotte (1979) found that female ownership for protection is affected by the crime rate in the area in which they live and that they are buying guns independent of the sporting culture. Historically, there was a time in which women were increasing their awareness and activity zones through the entry into the work force, thereby increasing their autonomy. This reduced the need for a male protector as the capable guardian, potentially increasing the likelihood of a criminal event. The protective use of firearms fills the void traditionally filled by a male protector with a surrogate capable guardian. It follows logically that fear of crime, which is often combatted with protective behaviors, would increase the likelihood of female gun ownership.

Gun Ownership

It is estimated that there are between 100 million and 270 million guns in civilian hands (Karp, 2007; Kleck, 1991; Kleck, 1997), but estimating this number accurately may be difficult (Kleck, 1991; Legault, 2011; Ludwig, Cook, & Smith, 1998). There are two possible ways to estimate this number. The first is a simple mathematical equation

using the number of imports, exports, and total guns manufactured since 1899, or the production-based estimate. The second method for estimating the civilian gun stock is the survey-based method, designed to use representative samples and questions regarding household ownership to make this estimate (Kleck, 1991). Due to issues with both of these estimates, the best estimate of the civilian gun stock remains unclear.

Using the production-based estimate, the size of the civilian gun stock is estimated to be well over 235 million firearms, 80 million of which are estimated to be handguns, indicating that long guns are more common (Kleck, 1997). Hepburn and colleagues (2007) found that 60% of firearms are long guns and the remaining 40% were handguns. This method is better used to measure trends in the gun stock rather than for getting the exact size of the civilian gun stock. (Karp, 2007; Kleck, 1991; Kleck, 1997). The second method to estimating the size of the civilian gun stock is through the use of survey responses. Gun ownership questions began appearing on surveys in 1959. This estimate is likely to be more representative, but is similarly riddled with deficiencies like the production-based estimate. Disparities in reporting, misunderstanding questions about ownership, or omitting, not knowing about, or forgetting about heirlooms, firearms owned by other members of the household, or guns kept elsewhere on the respondent's property (i.e. not in the house itself) challenges the reliability of these numbers. Also, the numbers reported by respondents were much lower than the production-based estimates for corresponding years (Kleck, 1991; Kleck, 1997).

These conflicting numbers emphasize the importance of developing unambiguous survey questions regarding gun ownership (Legault, 2011; Ludwig, Cook, & Smith, 1998). Legault (2011) and Ludwig, Cook, & Smith (1998) both examined General Social

Survey (GSS) data and found disparities in male and female responses to household gun ownership. The disparities observed were not explainable by other variables that commonly predict household gun ownership. These disparities create issues accurately assessing the percent of households that own firearms in the United States (Legault, 2011).

Ludwig, Cook, and Smith (1998) indicate that household gun ownership questions can be ambiguous and may be the cause of reporting disparities, but their study found that the largest gender gap was found in the survey with the least ambiguous question. This ambiguity is a result that ownership questions asked about firearms in the home specifically. Respondents often eliminate firearms kept elsewhere on their property, such as a car, garage, barn, or at their place of business. It is quite likely that by simply asking if the respondent personally owns a firearm (taken to mean that there is a firearm registered to them or they purchased the firearm themselves for their personal use), one can eliminate ambiguity in the question, but this implies that the disparities observed by the authors must have an alternate explanation. Legault (2011) and Ludwig, Cook, and Smith (1998) assert that disparities between male and female reporting rates are a result of face-to-face interviews. Women are less likely to answer truthfully and may consciously conceal their personal or household gun ownership due to social desirability biases (Kleck, 1991; Kleck, 1997; Legault, 2011; Ludwig, Cook, & Smith, 1998). The current study will potentially limit this effect. The survey was conducted using an online survey format. Legault (2011) and Ludwig, Cook, and Smith's (1998) studies indicate that the effect of the personal nature of firearm ownership and the social desirability bias

are magnified by face-to-face interviews due to the fact that respondents are inclined to believe that their responses can be traced back to them.

With women being less likely to answer truthfully about gun ownership, whether personal or household, this creates issues when trying to estimate household gun ownership and when trying to study female owners. The GSS has reported a lower number of household ownership repeatedly for the last several years. This lends to the disparities, not only detected in the GSS data by Legault (2011) and Ludwig, Cook, and Smith (1998), but also when trying to determine how large the civilian gun stock is. Additionally, when considering female personal ownership, this then becomes a somewhat insurmountable issue when the subject of a study does not answer truthfully. In the vein of the current study, this may mean that (a) estimations of the number of female gun owners are not reliable and (b) the characteristics of female gun owners and their rationale for ownership may become harder to identify.

These biases are a result of the socialization of stigmas about female gun owners. Branscombe and Owen (1991) found that guns are perceived as an aggressive cue and are generally associated with behaviors that are more likely to be expected from men. The results of their study indicate that women are more likely to be perceived as having masculine attributes when it is known that they own a gun. These perceptions could be relative and based on the culture of the region in which survey participants were raised. As Kleck (1991; 1997) indicated, cultural determinants of gun ownership are more difficult to overcome. Cultural determinants are rarely affected by a situation change (e.g., moving from the South to any other region) and are likely to have a stronger effect

on individual decisions to purchase or relinquish firearms when, or if, their situation changes.

This is not to imply that cultural determinants are insurmountable. Legault (2011) and Ludwig, Cook, and Smith (1998) indicated that individuals are influenced by how others perceive them and may often respond to survey questions with a socially desirable response, which is magnified in surveys that require the participant and the surveyor to be face-to-face. This indicates that local culture does have some role in individual behavior. Lizotte & Bordua (1980) found area of residence had a mild effect on gun ownership through cultural contact alone. This means that simply moving to an area with differing perceptions of firearms and firearm ownership may be enough to affect whether someone admits to owning a firearm.

These findings support the hypothesis that women are likely to be responding to a social desirability bias where they live. Evidence supporting the idea that a behavior, such as owning a gun, can be absorbed by simply inserting oneself into a different regional subculture implies that absorption of other behaviors is possible as well. This includes depictions of female gun owners, as discussed above, which will create falsities in reporting through social constructs such as the social desirability bias. In other words, by moving to an area where owning guns is socially acceptable (e.g. in the South), individuals are more likely to own and admit to owning a firearm. Conversely, if this individual then moved to an area where gun ownership is less socially acceptable (e.g. the Northeast), they may be inclined to get rid of their firearms or not openly admitting that they own.

Cultural contact could also affect socially expected emotional response to crime rates of the area or region, or even the inhabitants' level of fear. For example, Smith and Smith (1995) found that women living in fearful *places* were approximately 8% more likely to indicate having a handgun in the household than those who lived in less fearful places. Cultural contact could help define socially acceptable behavioral response to area crime rates, including the type of constrained behaviors an inhabitant relies on for protection against crime.

Reasons for owning. Without differentiating the type of gun, gun owners have reported owning firearms for two primary reasons – sport and protection (Diener & Kerber, 1979; Kleck, 1991; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981; van Kesteren, 2013). These reasons for owning are not mutually exclusive; owning for sport affects owning for protection and vice versa and there is a high likelihood that the owner was socialized into the culture for either reason (Lizotte, Bordua, & White, 1981). Kleck (1991; 1997) states that both situational and cultural determinants have a strong influence on personal gun ownership. Situational determinants are dynamic and change with the social environment where a gun owner may live. This includes relocating from an area with low crime rates to an area with high crime rates. Cultural determinants are more ingrained than situational; these can be seen as mechanisms of socialization. Cultural determinants are more persistent than situational determinants. For example, a gun owner living in an area where gun ownership is generally low may have grown up in the South where gun ownership is the norm (Glaeser & Glendon, 1998; Kaplan & Geling, 1998). Socialization has a significant role in owning firearms for sport (Diener & Kerber, 1979; Lizotte & Bordua, 1980). Lizotte and Bordua

(1980) found that when respondents in their survey owned for sport, it was likely due to early socialization into the gun culture. It was likely that their parents were gun owners and that they obtained their first firearm at a young age (Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981).

Typical gun owners. The typical gun owner is more likely to be male, Southern, older, married, of higher socioeconomic status, and approximately middle-aged. These individuals were likely to be raised in the South or in a small or rural town, and are more likely to still be living in this type of environment. Hunting and recreational use, such as target and sport shooting, are the primary reasons that these individuals own firearms (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley et al., 2012; Hepburn et al., 2007; Kleck, 1995; Kleck, 1997; Lott, 2010; Sheley et al., 1994). Ownership questions began appearing on surveys in the late 1950s. Despite the fact that the earliest surveys based the typical gun owner on responses to household ownership, this depiction of the typical gun owner has remained relatively unchanged since these questions first appeared in social surveys (Kleck, 1991; Kleck, 1997). This implies that less is known about gun owners who do not fit this profile. This may include minority and female owners.

The depiction of the typical gun owner is unsurprising, considering that the American gun culture has been historically dominated by males and that much of the civilian gun stock is concentrated in the South (Blair & Hyatt, 1995; Bordua & Lizotte, 1979; Cooke & Puddifoot, 2000; Kleck, 1991; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981). Nor are these findings surprising when considering the results of Lizotte and Bordua's (1980) and Lizotte, Bordua, and White's (1981) studies

that indicate that a distinctive sporting subculture exists. According to the authors' criteria, there was no evidence of a protective ownership subculture, but when considering protective ownership as an extension of the sporting culture, socialization and cultural contact between members occurs through the subculture of sporting (Lizotte & Bordua, 1980). Significant predictors of protective ownership include age, gender, race, having friends who own for protection, and past victimization. However, despite the gun culture being overrepresented by males, women are more likely to own for protection (Lizotte, Bordua, & White, 1981), supporting the current hypothesis that when considering significant predictors of protective ownership, researchers should consider gender specific models.

Female gun owners. Despite the interest in American gun ownership, there is relatively little research on female gun ownership (Bugg & Yang, 2004; Smith & Smith, 1995). The number of female gun owners has been questioned in the past. Smith and Smith (1995) examined media and pro-gun group estimations and identified inconsistencies and misreported figures among sources such as the National Rifle Association (NRA) reported numbers and the data from a Smith and Wesson sponsored Gallup poll. These estimates were found to be based on unreliable sources, misinterpreted data, and ambiguous questions regarding personal ownership (Sheley et al., 1994; Smith & Smith, 1995). Between 1993 and 1994, the estimates of female gun owners ranged from 12% to 43%. The estimates greatly depended on the source of data (Smith & Smith, 1995) and challenge the ability to generalize the results of these surveys to female owners as a whole (Bugg & Yang, 2004). Despite these inconsistencies, each source claimed that

female gun ownership continually increased through the 1980s and 1990s (Bugg & Yang, 2004; Kleck, 1991; Kleck, 1997; Sheley et al., 1994; Smith & Smith, 1995).

National Rifle Association estimates may have been based on questionable sources and/or misinterpreted or misreported numbers. Additionally, the NRA made claims that the number of female members had increased significantly, but has been cited stating that they do not collect demographic information about their members. The Gallup poll data was often not available to other researchers outside of Smith and Wesson, and Gallup has repeatedly criticized Smith and Wesson for misusing the data collected in this study (Smith & Smith, 1995). Some studies have concluded that these statistics were promoted through the NRA "Refuse to Be A Victim" campaign and utilizing slogans such as "A Handgun is a Woman's Best Friend" to promote the purchase of guns and gun-related products to prevent future victimization in a market generally aimed at men (Blair & Hyatt, 1995; Sheley et al., 1994; Smith & Smith, 1995).

Smith and Smith (1995) identified three commonly reported figures representing the percentage of women who own firearms in the United States. The most commonly cited figures are 25%, 34%, and 43-43.5%, depending on the source. As mentioned above, these figures were found to be inconsistent from source to source and were often misinterpretations of different reported figures. The estimate of 25% was based on a combination of NRA and Smith and Wesson Gallop poll estimates. Ellen Hopkins claimed that 20 million females owned firearms and indicated that one in four women were likely to be armed (as cited in Smith & Smith, 1995, pp. 138-9). Smith and Smith (1995) argued that Hopkins insinuated that every one of these women were always

carrying a firearm with them and that they were ready to use these weapons for protection when the need arose.

Sources citing that 34% of women owned a gun were also found to be incorrect, but likely the most reliable reported figure. This estimate was based on a telephone survey of 1000 men and women using a question that specifically asks about personal ownership. However, the authors indicate that the question is still eliciting a response about guns in the home and not individual ownership. A similar issue was identified with the 43-43.5% estimation. Not only were these estimates reported using outdated numbers, but they were directly translating the number of female respondents who answered positively to questions about household ownership into the actual number of female gun owners (Smith & Smith, 1995). In their study described below, Bugg and Yang (2004) estimated that approximately 36% of women owned a gun, which is inconsistent with Smith and Smith's (1995) findings discussed below. Without developing a better measurement or identifying an approximate estimation of the percentage of American women who own firearms, recognizing trends becomes difficult and calls claims of significant increases in female ownership into question.

Other estimates of the number of female gun owners have come from General Social Survey (GSS) data. These may be the best because it provides data for a time-series analysis of gun ownership trends (Bugg & Yang, 2004; Legault, 2011; Sheley et al., 1994; Smith & Smith, 1995). There has been no indication of dramatic changes in ownership among men or women. If significant increases in female ownership had occurred, this would be observed in the GSS data. These estimates are much lower than those reported by the NRA and the Smith and Wesson Gallup poll, remaining steady at

approximately 12% from 1980 to 1994 for all female owners (Bugg & Yang, 2004; Sheley et al., 1994; Smith & Smith, 1995). Hepburn and colleagues (2007) found that approximately 11% of female respondents in the national firearms survey indicated that they owned at least one firearm. This indicates that the number of female gun owners has essentially remained steady over the past several years. During the same period of time, approximately 7.4% of females indicated that they owned only a handgun. This contradicts the media reports that females were increasingly purchasing handguns for protective purposes. GSS data also contradicts the media portrayal of female owners. Most often, female gun owners are presented as single and living in high crime, urban areas with distinctively high levels of fear of crime and prior victimization (Smith & Smith, 1995).

With the media focus on females living in urban areas, Sheley and colleagues (1994) conducted an analysis similar to Smith and Smith (1995) using GSS data, but using models that only examined characteristics of those respondents who indicated living in the 100 largest American metropolitan areas. Sheley and colleagues (1994) did not find a significant trend in female gun ownership, effectively disproving the media claims that dramatic increases in female protective ownership were occurring between the 1980s and 1990s. According to studies of the GSS, female gun owners are more likely to be older, married, living in the South or the West, living in rural areas, likely to live in a neighborhood with high levels of reported fear (which was distinguished from indicating that they were fearful of crime as individuals). Female gun owners are more likely to own if there are hunters in the home than if they indicated past victimization or fear of crime (Bugg & Yang, 2004; Smith & Smith, 1995). Of those women who were

unmarried, those who were more likely to indicate that they owned a firearm were more likely to identify that they were widows (Smith & Smith, 1995). Smith and Smith (1995) hypothesize that this is likely due to these women inheriting their deceased husbands' firearms.

When comparing this description to the typical male gun owner, it increases support for findings by Blair and Hyatt (1995) and Bordua and Lizotte (1979) that women are often socialized into the gun culture. To review, typical gun owners are older Southern males who are married, Protestant, conservative, and grew up in smaller, rural towns (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley, 2012; Hepburn et al., 2007; Kleck, 1991; Kleck; 1997; Lott, 2010; Sheley et al., 1994). This description closely resembles the findings of the typical female owner. While no specific reason for this has been directly discussed in the reviewed literature, this is likely due to the fact that women are likely to be socialized into the gun culture by male partners or family members (Blair & Hyatt, 1995), or may currently live or previously lived in areas where gun ownership is common (Lizotte, Bordua, & White, 1981). Bordua and Lizotte (1979) found that the relationship between male and female ownership is strong and positively related, independent of all other variables. This indicates that because it is a male-dominated culture, males play an important role in female gun ownership. Using the 2012 GSS data, it was determined that female respondents who were white were three and a half times more likely to report gun ownership. Female respondents who were married were three times more likely to report gun ownership (Fenimore and Hendrix, unpublished).

Using GSS data from 1971-2002, Bugg and Yang (2004) performed multivariate logistic regression analyses examining the trends in gun ownership over this time and compared these models between males and females. They hypothesized that they would find a decline in female gun ownership, but acknowledged that this was likely to be due to a number of unaccountable variables. Additionally, the GSS was not conducted during seven years of this period and gun ownership was not asked about for five years, leaving only 19 years for the authors to analyze. The authors found a decrease in gun ownership in both men and women between the 1990s and 2002, with the rate of female gun ownership ranging from 23.5% to 47%. However, this figure is based on household ownership, which may explain why Bugg and Yang's (2004) findings resembled the 34% figure discussed by Smith and Smith (1995).

Blair and Hyatt's (1995) study was designed to identify the effect of the gun industry attempt to market to women by measuring attitudes toward gun ownership. They specified several arguments that may support changes, particularly increases in female gun ownership. These include the ideas that it promotes the feeling of control and female empowerment, can potentially deter criminal acts against women, and provides a practical, equalizing tool to help women defend themselves against abusive partners. They also noted that bringing a firearm into the home or into women's personal possession increases the likelihood that it can be used against them.

The results of Blair and Hyatt's (1995) study showed that overall there is a significant difference between male and female pro-gun attitudes. When considering specific items on the survey, Blair and Hyatt (1995) found that women are more concerned with the potential risks when personally owning a firearm, specifically when

children were discussed. They were also more likely to feel less control and less safe with guns in the home, more hesitant to shoot someone in self-defense, more likely to be afraid of guns, and less likely to want to purchase a gun. Women were more confident in other women's abilities to handle firearms than men, but were less confident in their personal ability to handle firearms. The authors used an open-ended interview for further clarification and found that each of their interview subjects were socialized into the gun culture through either a significant other or male family members (Blair & Hyatt, 1995). This is not surprising considering that the gun culture is predominantly male (Blair & Hyatt, 1995; Bordua & Lizotte, 1979; Cooke & Puddifoot, 2000; Lizotte & Bordua, 1980).

When considering the research above, it can be argued that while a significant amount of research has been conducted in studying female gun ownership, there is still a significant amount of information that is unknown. Currently, the actual number of female owners and why they own firearms remains unclear. While it is known that the number of male owners is much higher, that many females are socialized into the gun culture, and that the characteristics of male and female gun owners are very similar, the current study examines another facet to gun ownership by investigating the role of fear of crime. When reviewing the literature for protective ownership, the research finds that the typical gun owner who has obtained a firearm for protection is likely to look different from the owners who primarily own for other reasons. Female gun owners are just as likely as, or perhaps even more likely than men to cite protection as their reason for gun ownership (Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981; Sheley & Wright, 1995).

Fear of Crime

Previous research measuring gender differences in fear of crime have found that women are significantly more fearful than men (DeGroof, 2008; Gordon, et al., 1980; LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006; Tomsich, Gover, & Jennings, 2011), despite the fact that men are more likely to be involved in crime and more likely to be victimized (Truman & Langton, 2014). This relationship appears to decrease as age increases (Liska, Sanchirico, & Reed, 1988). Ferraro (1996) indicated that the gender gap in fear of crime was likely related to the "shadow hypothesis," or the idea that any potential victimization could escalate to sexual assault. Additionally, women are socialized to believe they are less capable of defending themselves and to be more fearful of their environments, while men are socialized to be the protector and to not show their fear (Goodey, 1997), leading to the observed difference, increases for women, in self-reported fears.

Previous research indicates that males may be succumbing to the pressures of social expectations and answering fear of crime surveys according to their perception of the way others want them to respond. Sutton and Farrall (2005) suggest imbedding a lie scale within fear of crime surveys to ferret out a more truthful response from male respondents. While this is not included in the present study, this does open the opportunity for future research endeavors to conduct a similar survey as that used for the current study with an imbedded lie scale to see whether there is a significant difference between males and females when examining the relationship between fear of crime and protective gun ownership. When a lie scale was imbedded within their survey, Sutton and Farrall (2005) found that men are more likely to respond to questions about their

levels of fear with a socially desirable response, or a response that indicates that their actual fear is higher than what they report.

Two paradoxes exist in fear of crime research. The first is mentioned above; women express significantly higher levels of fear, but men are more likely to be victimized. The second is that women fear becoming victims of sexual assault in public places when these types of crime generally take place in private (Pain, 2001). This is likely a result of increased levels of fear of victimization by a complete stranger, or perhaps result from observed incivility (physical and social disorder in a neighborhood) that may provide visual cues that a neighborhood is bad (LaGrange, Ferraro, & Supancic, 1992). Additionally, women believe they are more likely to become victims of personal crime in the future. Women often perceive themselves at a greater risk of victimization than men because they believe they are unable to defend themselves, despite the fact that they are less likely to be victimized (Gordon et al., 1980; LaGrange & Ferraro, 1989). Gordon and colleagues (1980) found that women's perception of potential sexual victimization and their perceived physical vulnerability increases their fear resulting in an increased likelihood that women will partake in protective and constrained behaviors (Gordon et al., 1980; Pain, 2001).

Constrained and Avoidance Behaviors. Constrained and avoidance behaviors are those that individuals are likely to use to decrease their perceived risk of becoming a victim of crime. Constrained behaviors are meant to minimize an individual's risk of becoming a victim (Tomsich, Gover, & Jennings, 2011), including defensive behaviors such as purchasing a firearm, installing alarms, additional locks, window guards, or outdoor security lights. Avoidance behaviors are more interruptive in day-to-day

activities with the intention of avoiding potentially dangerous situations, such as avoiding areas with poor visibility at night or avoiding the use of public transportation. Liska, Sanchirico, and Reed (1988) hypothesize that there is a significant effect on social behaviors that result from increased fear of crime and that fear of crime and these changes in social behavior may have a reciprocal relationship. These behaviors manifest as constrained and avoidance behaviors. Similar to the relationship between fear of crime and gun ownership, previous research has been inconsistent in determining a causal relationship between fear and change in social behaviors (Liska, Sanchirico, & Reed, 1988). The results of their study indicate that not only is the relationship between fear and constrained behaviors reciprocal, but it is a perpetual, escalating loop. Fear increases constrained behaviors; partaking in constrained behaviors increases fear. The relationship between fear and constrained behaviors and the relationship between fear and gun ownership are equally complex.

Women indicated that they engage in self-protective behaviors more often than men (Gordon et al., 1980; Woolnough, 2009), but these behaviors are simple measures of protecting the individual. Gordon and colleagues (1980) found no significant difference between genders in protective behaviors that require a significant monetary investment and are designed for protecting a home or family rather than an individual, such as moving, installing alarms, or owning a dog.

The authors of this study utilized an ownership question that specifically measured non-hunting handgun ownership. While this question does not identify a specific use for these handguns, it can be logical to assume that if a gun is not being used for sporting, it is more likely than not being used for protection. Gun owners have

previously indicated that the two primary reasons for owning guns are hunting/sport and protection (Diener & Kerber, 1979; Kleck, 1991; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981, van Kesteren, 2013). Hill, Howell, and Driver (1985) ask specifically about atypical gun owners by eliminating those who own guns for hunting purposes. This supports the idea that there are significant predictors of protective gun ownership that are divergent from those that typically predict gun ownership.

Defensive gun use. Carrying firearms for protective uses decreases the likelihood of crimes being completed against would-be victims, prevents victim injury, and prevents loss of property (Kleck & Gertz, 1998; La Valle, 2013) and is likely to be more common than has generally been reported. Official reporting statistics are likely estimated much lower than the actual number of incidents reported. This can be due to non-reporting or measurement issues with previous self-report surveys, such as the National Crime Victimization Survey (NCVS). When compared to survey responses in a study by Kleck and Gertz (1995; 1998), the number of defensive gun use incidents that have been reported in national self-report surveys often fell short of the numbers reported in their study.

Kleck and Gertz (1995) conducted a nationwide telephone survey to better understand the use of firearms for defensive purposes. The results of this survey indicated that defensive gun uses (DGUs) were more likely to occur in defense against burglary, assault, or robbery. Defenders were more likely to carry a gun for self-protection, more likely to have been the victim of a burglary or assault within the previous year, and more likely to have been the victim of assault since becoming an adult. These individuals were also less likely to convey the belief that offenders should receive harsh punishment for

their crimes (Kleck & Gertz, 1995). They were less likely to agree with the use of capital punishment and did not believe that courts should punish criminals harshly (Copes et al., 2014; Kleck & Gertz, 1995).

Forty-six percent of the respondents were female, which the authors found surprising due to the fact that women are less likely to be victimized or own a firearm (Kleck & Gertz, 1995). They speculated that this could be a reporting issue, in which men are less likely to report out of fear of receiving punishment than were women. The sample was disproportionately minority (African American and Hispanic), more likely to live in urban areas, more likely to be single, and less likely to be poor (Kleck & Gertz, 1995; 1998). These findings are interesting when considering that one of the limitations the authors mention was that their survey excludes the 5% of Americans without access to a telephone. These individuals were more likely to be of a lower socioeconomic status or live in rural areas. Those who live in rural areas are more likely to own a firearm, but low income individuals, who often live in urban areas, are more likely to be victims of crime and were found to be disproportionately involved in DGU incidents.

This disparity may be a result of the challenges made to Kleck and Gertz's (1995) study by Hemenway (1997). Beyond issues with reliability and validity within this survey, Hemenway (1997) indicated that self-report telephone surveys often provide the respondent with the ability to answer any question in a way that is more socially desirable. In the case of defensive gun use, respondents are able to take on hero characteristics. The results of Kleck and Gertz's (1995) survey indicated that there were nearly half a million instances of crime prevention through defensive gun use. Hemenway (1997) indicated that this was improbable, due to the fact that three years

before the survey was conducted, most people did not own firearms and there were not nearly enough homicides to support this figure.

When considering what this sample looks like compared to the typical gun owner, there is a distinct difference that can be observed. As stated before, the typical gun owner is likely to be a white Southern male who lives in a small towns or rural area and has Republican ideologies (Azrael, Miller, & Hemenway, 2000; Hepburn et al., 2007; Kleck, 1991; Kleck, 1997; Lott, 2010; Sheley et al., 1994). Because women are more likely to partake in defensive behaviors (Lizotte & Bordua, 1980), they may be more likely to own firearms for protection or out of fear of becoming a crime victim than men (Azrael, Miller, & Hemenway, 2000; Bordua & Lizotte, 1979). While it appears that most defensive gun owners have been victimized at least once in their lives, the study by Kleck and Gertz (1995) does not include the role that fear of crime may play in defensive gun use. The study found that defenders were more likely to carry a gun for self-protection, which simply implies that these individuals have a fear of becoming the victim of crimes.

It is unclear from the results of this study (Kleck & Gertz, 1995) whether these individuals simply purchased their firearm for protection, or whether they simply carry a firearm while away from their home, specifically for self-protective purposes. This may support the findings that indicate that a small fraction of carriers are not personal gun owners, leading to speculation that many carriers are possibly carrying firearms that belong to other people, such as a parent or spouse (Kleck & Gertz, 1998). It may be that these individuals perceive that they have an increased risk of becoming a victim. Conversely, this may also indicate that personal gun owners perceive that those around

them are at an increased risk of becoming a victim and provide carriers with a firearm to take with them when they are away from their home.

In a second study by Kleck and Gertz (1998), the authors found that females are disproportionately represented among carriers. They found that a disproportionate number of DGUs (46%) are reported by females. In their univariate analysis, the authors found that those who carry are more likely to have previously been a victim of burglary, robbery, or assault. Carriers are more likely to feel that they must rely on themselves, rather than law enforcement, for protection, even when compared to gun owners in general (Kleck & Gertz, 1998). Additionally, gun owners in general are more likely to promote more punitive views, but carriers are more likely to feel that courts are not harsh enough on offenders. Similar to previous findings, respondents who carry for protection were more likely to personally own a firearm, be male, Black, younger, wealthier, separated, be from bigger cities, and be from the Southern or Western regions (Kleck & Gertz, 1998).

Theoretical Model

The current study tests the relationship between fear of crime and gun ownership, examining how gender socialization affects this relationship using two theoretical models. The first model tested for significant predictors for fear of crime related to socialization. These include being from the South, race, gender, age, being from a rural area, income, parents' ownership behaviors, and prior victimization. The second model examined how these socialization variables interact with fear of crime to determine whether fear of crime is a significant predictor of gun ownership.

Socialization. Socialization has been found to have an important role in both gun ownership (Blair & Hyatt, 1995; Bordua & Lizotte, 1979; Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981) and fear of crime and perceived risk (De Groof, 2007; Goodey, 1997; Gordon, et al., 1980); it would logically follow that one will impact the other in some way. Due to the reciprocal nature of the fear of crime and gun ownership relationship (Bankston & Thompson, 1989; Kleck, 1991; Kleck, 1997), the order of events is likely to be questioned. When considering that fear of crime and protective behaviors have a repeatedly reinforcing relationship (Liska, Sanchirico, & Reed, 1988), one has to precede the other to begin this relationship.

Gender. Fear in women is likely to be related to one type of crime. Research has shown that female fear of crime is equated to fear of rape or sexual assault (Dobbs, Waid, & Shelley, 2009; Fisher & Sloan, 2003). Males were found to be afraid of more varied types of crimes, with property crimes being the primary crime type (Dobbs, Waid, & Shelley, 2009; Fisher & Sloan, 2003; Schafer, Huebner, & Bynum, 2006). However, fear of crime should be conceptualized as an ambiguous and future event, based on gender stereotype socialization. Because males and females are socialized to different stereotypes, they are likely to perceive potential victimization, threats, and crime according to those gender stereotypes. This will in turn help determine what kind of constrained behaviors they will partake in, including protective gun ownership.

Region. Being from the South is a significant predictor of gun ownership, but little research has explored the effect of being Southern on fear of crime. The South is culturally characterized by a Southern culture of honor (Cohen & Nisbett, 1994; Cohen et al., 1996). Participants that were from the South in Cohen and Nisbett's (1994) study and

Cohen and his colleagues' (1996) studies were shown to react to insult differently than the study participants who were from the Northeast.

Being from the South will likely have an inverse relationship with fear of crime. This may be due to an inflated projection of oneself, and may be subject to similar problems as gender. In gender differences of fear of crime, the study by Sutton and Farrall (2005) indicated that imbedding a lie scale in surveys resulted in finding that men's fear of crime is likely to be higher than previously indicated. The authors hypothesized that this is likely due to the fact that males are responding to societal depictions of males being less fearful than females. There may be a similar effect with people indicating that they are from the South. These individuals are likely reacting to the cultural expectations of the Southern culture of honor. However, despite being Southern having an inverse relationship with fear of crime, this variable will likely still have a positive relationship with gun ownership. This is primarily due to a standing tradition in the South regarding enculturation that is positive towards firearms and that gun ownership is most often predicted by being Southern.

Race. Throughout the existing literature, being white is a significant predictor of firearm ownership (Azrael, Miller, & Hemenway, 2000; Hepburn et al., 2007; Kleck, 1991; Kleck; 1997; Lott, 2010; Sheley et al., 1994). Previous research has also indicated that whites are generally more fearful than minorities (Gainey, Alper, & Chappell, 2011; Ortega & Myles, 1987). Using the theoretical models, the results will likely indicate that race is correlated with fear and gun ownership. Previous research has indicated that whites are more likely to own firearms and race is often a significant predictor of firearms. Additionally, the results of the regression analyses will likely indicate that being

white is a significant predictor of both fear of crime and gun ownership. The explanation of the relationship between race and fear is likely cultural and beyond the scope of the current study.

Conversely, Callanan (2012) found that blacks are more likely to be victimized, lending to the creation of another potential paradox when discussing fear of crime. Previous research has indicated that whites are generally more fearful; this study contradicts these findings and found that blacks and Latinos were more likely to indicate fear of crime Callanan (2012) also indicated that blacks were more likely to be victimized. The results of Callanan's (2012) study indicate this is due to crime-related media consumption as well as elevated perceptions of neighborhood crime risk.

Income. Those in low income areas are more likely to be living in higher crime areas, such as urban, inner city neighborhoods, and more likely to fear becoming a victim of crime. Respondents who indicate having a low income are likely to be minorities living in urban areas. Callanan (2012) found that there was an inverse relationship between income and fear, indicating that fear increases in areas with lower income.

Age. Older individuals are more likely both to own firearms and to be fearful of crime. Ortega and Myles (1987) found that as individuals grow older, their fear increases as well, but this is highly dependent on race. The authors used a regression analysis to model fear using age, sex, and race; young black males (aged 25) were the least fearful, while older black females (aged 65) indicate having the most fear. The opposite effect was seen in white respondents. As these individuals aged, their level of fear showed a marginal decrease. It is possible that there is a similar effect found with age as is found with gender. Older individuals grow weaker as they age and are less likely to be able to

defend themselves from an attack. This logically would result in higher levels of fear. However, Callanan (2012) found results that opposed these findings, once again, reporting an inverse relationship between age and fear.

Size of area/urbanity. Similarly to income and race, size of area, or urbanity, is likely to significantly predict fear of crime. Individuals who live in the inner city are more likely to be subjected to higher rates of crime, and are more likely to indicate fear of future victimization. Additionally, there is likely to be a cultural explanation as to why size of area may be a significant predictor of fear of crime.

Ceslinka (2007) examined the attitudes of gun owners, identifying that individualists, those who are more likely to possess traits associated with the typical gun owner, are more likely to be self-dependent. These individuals are likely to oppose and distrust the government. Additionally, respondents who live in rural areas and small towns are more likely to be far removed from local law enforcement and may be more likely to have to rely on themselves to defend property or themselves because it may take the police a while to reach their residence. However, being socialized to defend themselves and property, similarly to the region variable, may make individuals less afraid of crime. This is likely due to the fact that they have had to take matters into their hands and are less afraid of becoming a victim of crime.

Conclusion

The overarching research question in the current study inquires about the characteristics of female gun owners. However, more specifically, the current study inquires about the relationship between fear of crime and gun ownership, and whether this relationship varies when examining it with gender specific models. The preceding

review of the existing literature has described the relationship between fear of crime and gun ownership. The key finding in the literature is that protective gun owners should not be analyzed in the context of the American gun culture as a whole. Often, those who indicate they are fearful of crime in their neighborhood share characteristics with those who indicate owning a firearm for protection. This often means that these same gun owners do not share characteristics with typical gun owners. Additionally, male and female gun owners have different perceptions and opinions about gun owning and are likely to own for different reasons. Male and female gun owners should similarly be analyzed separately. The primary hypothesis of the current study indicates that significant differences will exist between male and female gun owners when testing the relationship between fear of crime and gun ownership. Females are more likely to indicate being fearful of criminal victimization and are also more likely to engage in constrained behaviors. These constrained behaviors are simply meant to prevent future victimization.

The differences in fear of crime are likely related to differences in gender socialization. The current study considered this when measuring the effect of socialization on fear of crime when testing the theoretical fear of crime model. This model is intended to identify significant predictors of gender socialization on fear of crime. The second theoretical model tested the combined effect of fear of crime and socialization on gun ownership, with the intention of identifying fear of crime as a significant predictor of fear of crime.

Chapter 3: Methodology

Fear of crime and gun ownership have repeatedly been found to have a reciprocal relationship, making previous attempts to identify fear of crime as a significant predictor of gun ownership extremely difficult (Bankston & Thompson, 1989; DeFronzo, 1979; Kleck, 1991; Kleck, 1997). However, previous research has not tested this relationship considering the role that gender socialization may have. The current study utilized a cross-sectional design to test two general models; the first is a fear of crime model and the second is a gun ownership model. The data was collected from an online survey administered through Amazon's Mechanical Turk. The fear of crime model tests gender differences in fear of crime, using a model that considers the effects of socialization for each gender on the reported fear of crime. Previous research indicates that age, race, income, urbanity, and prior victimization may have different effects on fear of crime based on gender (Callanan, 2012; De Groof, 2007; Dobbs, Waid, & Shelley, 2009; Fisher & Sloan, 2003; Gainey, Alper, & Chappell, 2011; Goodey, 1997; Gordon et al., 1980; Ortega & Myles, 1987).For this reason, each base model and theoretical model was tested three times using the total population and then gender-specific models to identify any significant differences between men and women. Once this was completed, a second model tested whether socialization and fear of crime can predict gun ownership.

Data Collection

The current study examined the role of fear of crime in gun ownership. The research question that was examined tests how this relationship varies between males and females. All data was collected using Amazon's Mechanical Turk (MTurk). MTurk is an online marketplace in which individuals can register as requesters (those who post tasks

to be completed) or workers (those who complete tasks). Workers can be enlisted to complete tasks and are compensated small amounts (often between five and ten cents) upon successful completion of each task (Buhrmester, Kwang, & Gosling, 2011). A review of the tasks published on the site indicates that compensation ranges from 10 cents to two dollars.

Amazon's Mechanical Turk (MTurk). Online data collection has advantages and disadvantages (Wright, 2005). Conducting surveys online provides researchers with access to unique populations. Groups that only exist in cyberspace, with specific interests, and those respondents who are hesitant to meet with researchers face-to-face, such as those with certain medical conditions, are more accessible online. The Internet enhances the ability to reach these groups through blogs and online special interest groups. Additionally, online surveys take less time to connect with a greater number of people, are relatively inexpensive despite the cost to use the software, and reduce biases that are often found using traditional sampling methods (Buhrmester, Kwang, & Gosling, 2011; Rouse, 2015; Wright, 2005). Despite this, Rouse (2015) has suggested that additional research be conducted regarding the quality of MTurk data.

Most disadvantages of online data collection are related to sampling issues. Online data collection generally results in inaccurate demographic information, inaccurate estimations of the total sample size, and problems with producing a randomly selected sample due to multiple email addresses belonging to one member of an online group, multiple responses from one respondent, and invalid or inactive email addresses. These disadvantages are likely due to poor record management on the part of the

administrators on online groups or to privacy issues with contact and demographic information (Wright, 2005).

Because workers on the MTurk marketplace are paid to participate in the study, as per the nature of the MTurk system, this could potentially create a limitation with the data itself. Participants who are rewarded or compensated by participating in the study may often respond to survey questions simply to receive compensation, further compromising the reliability of the data. However, Buhrmester, Kwang, and Gosling (2011) found that workers were willing to complete simple tasks through MTurk for little to no compensation. This indicates that there is no financially-driven motivation to complete the tasks on MTurk and that data quality should not be affected. The compensation amount generally will only affect the rate at which data is collected.

Ethical considerations have been made in regards to conducting an online survey with human subjects and according to the Institutional Review Board (IRB) requirements. The researcher has successfully passed the required training through the Collaborative Institutional Training Initiative (CITI) at Radford University and the IRB approved the study to be released. A cover letter describing the purpose of the study was provided to each respondent and the option to not participate in the study or decline to answer any question is provided. MTurk collects IP addresses; however, none were recorded for the current study. Participants in this study can only be tracked by identification numbers assigned to each respondent.

Variables. The use of cross-sectional data to determine the causal relationship between fear of crime and gun ownership has often resulted in observations of a reciprocal relationship between ownership and fear. The OLS and logistic regression

models were designed to overcome this limitation by using additional predictor variables to measure fear of crime. Each respondent was asked a set of questions meant to improve previous measurements of fear of crime, taking into account prior victimization, as well as demographic variables known to be affected by socialization and to have an effect on rates of fear of crime and gun ownership. These include gender, age, race, income, size of area where the respondent resides (rural vs. urban), prior victimization, parents' gun owning behaviors, and personal identification as being Southern. Each of these represent socialization into the American gun culture as well as socialization into gendered stereotypes and levels of fear.

Survey respondents were asked to respond to several items that were used to measure socialization, fear of crime, and gun ownership. The first model measures the relationship between gender socialization and fear of crime. These variables include gender, race, age, being Southern, urbanity, income, prior victimization (see Table 1), and a series of ten questions measuring fear of crime (see Table 1). Respondents were asked to identify their gender by answering male or female. Race was identified from a list of possible options including American Indian/Alaskan Native, Asian/Asian American, Black/African American, Hispanic/Latino, Hawaiian/Other Pacific Islander, White/Non-Hispanic, Multiple races, or Other. Both age and income allowed respondents to enter specific values for these variables.

Urbanity was measured by having respondents identify the size of the community they lived in, selecting from urban, suburban, large rural, small rural, and geographically isolated. There is currently no universally agreed upon definition of rural and the definition varies depending on who is asking. Ruralness can be defined by population

density of an area, which is generally asked by demographers; the dominant economic activity; or a complex measurement of beliefs, values, and feelings of those living in that community. This is generally a composite measure used by sociologists and is often compared to a similar measurement of urbanness to understand the differences between individuals and ideologies of these two types of regions. Psychologists often measure the state of mind of those living in that community, and this measurement is based on an individual perception of the area in which an individual lives. Finally, ruralness can be measured using cultural concepts, which often contrast the culture of rural communities with that of urban ones (Small, 2001). The definition of rural is not only relative to the individual being asked, but also shows a degree of overlap. The demographic, economic, and social definitions exhibit a degree of overlap. Each of these definitions considers household income as one of the primary identifiers of rural communities. This indicates that there is currently no perfect, universal measurement of the concept of rural communities, but rather that it depends on what the researcher is attempting to measure.

The measurement of ruralness in this study is consistent with the psychological definition of the concept of ruralness. In this survey, each respondent was asked to indicate the type of area they lived in, in both the state they were born in and the state that they currently live in. Each respondent was asked to identify from the following list: urban, suburban, large rural, small rural, or geographically isolated. In this definition, the size of the area is defined as a relative term, with each respondent self-identifying as a member of a rural community. The psychological definition is dependent on the state of mind of the respondent, and relies on attitudes developed from interactions with others in the community.

Because Southern is being measured as a mechanism of socialization, respondents were asked to indicate what state they were born in and how long they lived in this state. Respondents were asked to indicate which state that they were born in. Descriptive statistics of the sample indicate that respondents indicated that they had lived an approximate average of 25 years in the state that they were born in. Gastil's (1971) Southern Index was used to identify which states would be categorized as Southern. This index was developed based on the results of multiple correlation analyses, examining the relationships between variables measuring Southern culture, including the percent of racial minorities, homicide rates, and the shared historical background of people in specific states. An ordinal scale was developed to determine how Southern all states were, with 5 being the least Southern, and 30 being completely Southern. Gastil's analyses indicated that states that border these states scored highly because of Southern migration patterns and by being in contact with states that scored as completely Southern. These states were West Virginia, Virginia, Kentucky, Tennessee, North Carolina, Arkansas, Mississippi, Alabama, Georgia, South Carolina, and Louisiana. These states were coded as Southern for the current study; all other responses were coded as Not Southern.

The data was collected using Amazon's Mechanical Turk (MTurk). While online sampling is found to eliminate data collection bias, the MTurk population may create a limitation within the current study due to the fact that the MTurk, as well as other online populations, have been found to be slightly more ethnically more diverse than traditional samples and samples taken from American universities (Buhrmester, Kwang, & Gosling, 2011). This may present reliability issues due to the fact that the MTurk population has

been found to be have more ethnic minorities than are generally found in the American gun owning population, but demographic studies of the MTurk worker population indicates that it is as representative of the American population as a traditional sample pool (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010).

Data

The data collected from the MTurk survey includes demographic data, questions regarding gun ownership, and questions meant to assess perspectives on fear of crime. The survey was created in Qualtrics and uploaded to Amazon's MTurk marketplace. As discussed previously, MTurk is an online marketplace where workers can complete tasks for a small payment determined by the requester. Each respondent in the survey was compensated twenty-five cents to complete a 58-item survey. The average length of time each respondent took to complete the survey was approximately 10 minutes. Five hundred forty-one respondents completed the survey.

Analytical Techniques

Visual data analysis. Visual data analysis was conducted to determine whether the distribution of the data is approximately normal or diverges significantly from a normal distribution, through the creation and analysis of histograms. Through a visual examination of the data, the researcher is able to determine what type of analysis is appropriate for testing the relationship between fear of crime and gun ownership. Histograms are best suited to examine the distribution of a continuous variable. Histograms are most effective in the examination of a continuous variable, versus in the examination of a dichotomous variable, such as the variable measuring gun ownership. A

dichotomous variable is a nominal variable with only two possible categories, such as gender.

Univariate analysis. A univariate analysis of the data was conducted to describe the sample and identify patterns within the data. Because univariate analyses only examine one variable, it does not test correlations or relationships between variables. In essence, the univariate analysis is the numerical representation of the visual data analysis, providing the results of statistical tests that indicate whether the outcome variable is approximately normally distributed and to provide a preliminary analysis of the fit of the model, generally the median or the mean, to the data. This analysis will examine the distribution of the dependent variable and frequencies. The current study examined two dependent variables: one for the fear of crime model discussed below, and one for the gun ownership model discussed below. The fear of crime variable was analyzed to determine whether it is approximately normally distributed.

Bivariate analysis. The current study will utilize a bivariate correlational analysis to test the strength and direction of the relationship between the independent and dependent variables. This analysis will also help identify whether there are any potential issues with collinearity between variables. It is important to understand that a significant correlation does not equate to a causal relationship, but rather measures how much and in what direction two variables vary. A positive relationship indicates that both variables are increasing together, while a negative relationship indicates that as one variable increases, the other decreases. These relationships are measured by the Pearson product-moment correlation coefficient, or Pearson's *r*. This value will always be between -1.0 and 1.0. A -1.0 is a completely negative correlation, a 1.0 is a completely positive correlation, and a

0 indicates that there is no correlation between the two variables. These relationships can be displayed graphically in a scatterplot to show the linear relationship between two variables. The closer the observed values are to this line, the stronger the relationship between the two variables.

Pearson's *r* will remain the same regardless of which variable is identified as the independent variable, and which variable is identified as the dependent variable. This value is related to the R-squared value discussed in more detail below in the regression analysis. By squaring the correlation coefficient *r*, the resulting value indicates how much of the variation in the dependent variable can be accounted for by the variation in the independent variable. In the current study, there are two dependent variables, fear of crime and gun ownership. The independent variables are experience with prior victimization, parental gun ownership, and demographic variables, such as gender, race, region, etc.

Factor analysis. The MTurk survey will include a set of questions developed from previous studies (LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010) to assess each respondent's level of fear of crime, as opposed to using the traditional General Social Survey or National Crime Survey single item assessment of fear of crime. This single question generally asks about each respondent's fear of walking in his or her neighborhood, or areas near where he or she lives, alone at night. In their evaluation of this question, LaGrange and Ferraro (1989) have identified four flaws with this question: 1) this question does not directly reference crime or the potential of becoming a victim; 2) the use of a single question to measure a theoretical construct, such as fear of crime, increases the chance of error; 3) the question does not measure fear of different types of

crime; 4) the wording of this question introduces the ominous scenario of walking alone at night, potentially evoking an exaggerated level of fear. This scenario violates the premises of routine activities theory, in that most demographic groups are not likely to have this behavior in their routine behaviors repertoire.

For the purposes of the current study, this implies that the measurement of fear of crime must consist of a multi-item inquiry that specifically addresses the fear of crime without evoking an exaggerated level of fear and be specific to crime in which the respondent may use a gun for protective purposes. Table 1 contains a set of questions that combines questions used in previous surveys to measure fear of crime (LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010). These questions were included in the MTurk survey and were analyzed using a factor analysis to measure the underlying construct of fear of crime and to create a new outcome variable to use for the linear regression analysis. In order to create this new variable, a factor analysis was performed using questions 1 through 10 in Table 1.

Factor analysis is a method of reducing a complex set of variables to measure one concept. In the current study, ten questions are used to measure fear of crime. Performing the factor analysis on these questions will help identify patterns within the data to measure the underlying concept of fear of crime and will reduce these ten variables to one new fear of crime variable. The analysis of these variables will indicate which variables are most closely related to fear and assign weights to each variable relative to its contribution to fear. Weighting each variable ensures that the variables most correlated with fear, or making the largest contribution to the underlying concept being measured, were most represented when creating the new outcome variable.

The process to calculate the contribution of each variable to the explanation of the underlying concept is known as the principle components method. This process extracts variables one by one, starting with the variable that explains the most variance in the underlying concept, and repeats this process over and over until the contribution of each variable has been calculated. The number of variables that are extracted to create the new variable measuring the underlying concept can be limited by the researcher. This means that in the current study, all ten variables can be included in the factor analysis to develop a predictor, but the researcher could hypothetically choose to only include the five variables that explain the most variance in the underlying concept of fear of crime to create a new outcome variable to use in the regression analysis. Two factor analyses were conducted on the ten variables measuring fear of crime from the online survey. The first factor analysis indicated that these survey items were measuring two different concepts. The seven items with factors loadings greater than 0.500 were then analyzed a second time to ensure that there were no underlying concepts being measured when these questions were considered independently. This factor analysis indicated that these items were only measuring one underlying concept and all items loaded highly on this factor.

Measuring fear of crime. Previous research indicates that the General Social Survey (GSS) question regarding fear of crime is ambiguous and elicits an exaggerated perception of fear (LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010). Fear of crime questions should specifically imply that crime is what is to be feared, unlike the GSS question, identifies specific crimes, and does not elicit an exaggerated feeling of fear when the respondent is being surveyed. The items "It is not safe to be out at night," and "It is not safe to be out alone," do not fit these criteria, but it is arguable that they are

similar enough to the GSS question to serve as a control to use for comparison of the results of the current study to previous research. Table 1 shows that, with the exception of the two questions discussed above, each of the questions that are used to measure fear of crime meet the necessary three criteria to better measure each respondent's fear of crime. Finally, the socialization model indicates that prior victimization will predict fear of crime. Questions 11 and 12 below both measure prior victimization. Respondents were asked to identify to which degree they agree or disagree with questions 1 through 9 using a 5-point Likert scale, ranging from strongly disagree to strongly agree. Questions 11 and 12 were answered either "Yes," or "No."

Table 1. Questions measuring fear of crime.

	Questions	Crime/ personal victimization	Identifies Specific Crime	Does Not Exaggerate Fear
1	I am afraid someone will break into my home while I am there.	X	X	X
2	I am afraid someone will break into my home while I am not there.	X	X	X
3	I am afraid of being sexually assaulted.	X	X	X
4	I am afraid of being attacked by someone with a weapon (knife, club, gun, or other weapon).	X	X	X
5	It is not safe to be out at night.			
6	It is not safe to be out alone.			
7	I am afraid to walk alone at night where I live.			
8	I am afraid of being murdered.	X	X	X
9	I am afraid of being robbed.	X	X	X
10	I am afraid that someone I know will become a victim of crime.	X	X	
11	Have you ever been the victim of a property crime?	Measures prior victimization		
12	Have you ever been the victim of a violent crime?	Measures prior victimization		

Regression analyses. In quantitative analysis, regression analyses are used to test, and ultimately determine, whether a causal relationship exists between two or more variables. The simplest form of regression, which includes the use of one predictor, or independent, variable and one outcome, or dependent, variable, is known as simple regression and is used to predict the values of one variable from another. Regression differs from correlations in two primary and important ways. First, correlation measures how much variables vary together. In a bivariate analysis, the resulting values indicate the strength and direction in which two variables vary together. Second, it was previously mentioned that correlations do not equate to a causal relationship. Bivariate analyses are not designed to measure a causal relationship. A regression analysis is designed to

identify a causal relationship between two or more variables. Generally, a regression model consists of one outcome variable and one or more predictor variables.

When testing a regression model, not only is causality determined, but the analysis will also determine how much of the variation within the outcome variable can be predicted by the model being tested. This is known as the R-squared value, or the coefficient of determination, which is a value between 0 and 1.0. As model fit increases, the R-squared value will increase. Models that best explain the variation in the outcome variable will have an R-squared value closer to 1.0.

Regression models rely on several key assumptions. The first is that the residuals (the difference between observed and predicted values) are independent, or uncorrelated with each other. Variables that are strongly correlated with each other may exhibit a high degree of collinearity. This was assessed by identifying the variance inflation factor. The resulting statistic, or the variance inflation factor, was a value between 0 and 4. The closer that this value gets to 4, the more likely that there is a problem with collinearity. The square root of this value is the number of times that the standard error is inflated when there is a high degree of correlation between predictor variables.

The second assumption of regression models is that the residuals are normally distributed. This can be determined through both visual data analysis and univariate analysis. If the dependent variable is normally distributed, the residuals are normally distributed. Certain regression analyses can still be conducted if this assumption is violated, such as in the case of count data that often results in a Poisson distribution. Poisson regression analysis utilizes the logarithm of the expected values and transforms

the data to produce a more linear relationship, therefore compensating for the issues that are caused by non-normally distributed variance.

The next assumption of regression models is that the variance is homoscedastic. This simply means that residuals have similar variance, though not a high degree. This is due to the fact that regression models also assume there is non-zero variance, or that some variance exists in the residuals of the predictor variables. Regression models also assume that residuals are uncorrelated. Finally, regression models assume that the relationship between the predictors and the outcome variable is linear.

Logistic regression models violate one of these assumptions. Because the outcome variable is dichotomous, establishing a linear relationship is difficult. To overcome this violated assumption, logistic regression models use the natural log of the outcome variable. Logistic regression also assumes low levels of collinearity between predictor variables and independence of errors, similar to ordinary regression models.

Fear of crime model. The factor analysis conducted on the fear of crime questions to create a new outcome variable will likely result in a continuous variable. In regression analyses in which the outcome variable is continuous, it is appropriate to use an ordinary least squares (OLS), or multiple, regression analysis to test the model (Figure 1). An OLS regression analysis utilizes two or more predictor variables. In the case of the fear of crime model, these predictors are gender, race, age, urbanity, income, region, and prior victimization. The analysis will determine which of the variables were significant predictors of fear of crime. The ordinary least squares analysis not only examine the effect of the model as a whole, but also assessed the effect of each individual predictor on fear of crime as well.

Gun ownership model. Because the gun ownership variable is dichotomous, it is appropriate to use a logistic regression analysis when testing this model (Figure 2). OLS regression and logistic regression differ solely based on the premise that a linear relationship cannot be established in a logistic regression. This is because the outcome is dichotomous and inherently will not have a linear relationship with the predictor variables. Forcing a linear regression on data with a dichotomous outcome variable will result in a model that does not fit the data properly. These dichotomous variables violate the assumption that the residuals of the outcome variable are normally distributed. In order to test the fit of the model to the data, logistic regression analyses rely on the use of the chi-square value. In null-hypothesis testing, the chi-square test measures the likelihood that the observed values in a dataset occurred by chance.

Conclusion

The current study tests the relationship between fear of crime and gun ownership by creating four separate regression models. There are two primary models, one to test the relationship between socialization and fear of crime, and one to test the relationship between fear of crime and gun ownership. In the first, socialization. Socialization is measured by including race, gender, age, urbanity, income, Southern socialization, and prior victimization. This model was tested using an ordinary least squares regression analysis. The second model tested the relationship between fear of crime and gun ownership, to determine if fear of crime is a significant predictor of gun ownership. The second model measured the effect that socialization and fear of crime have on gun ownership, and included the same socialization variables as the first model. These models can be seen in Figures 1 and 2. These models were then broken down into three separate

models, testing these relationships with the total sample and then using the gender-specific subpopulations. The analysis included a visual analysis of the outcome variable measuring fear of crime. The outcome variable for fear of crime was created using a factor analysis on the ten questions from Table 1 that measuring fear. The analysis also included a univariate analysis to describe the sample and bivariate analysis to test the strength and direction of the relationships between the independent and dependent variables. Finally, OLS and logistic regression analyses were conducted to ultimately test the relationship between fear and gun ownership.

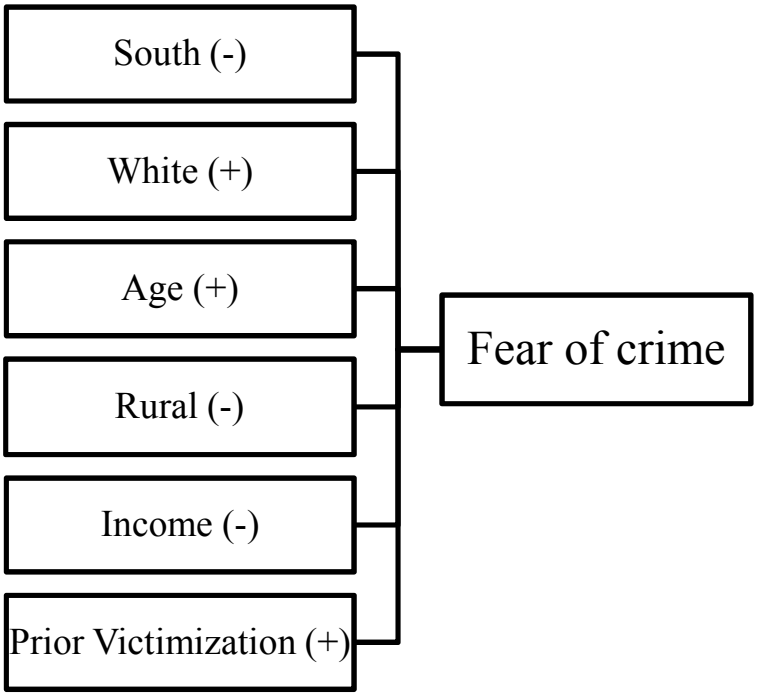

Figure 1. Fear of crime theoretical model

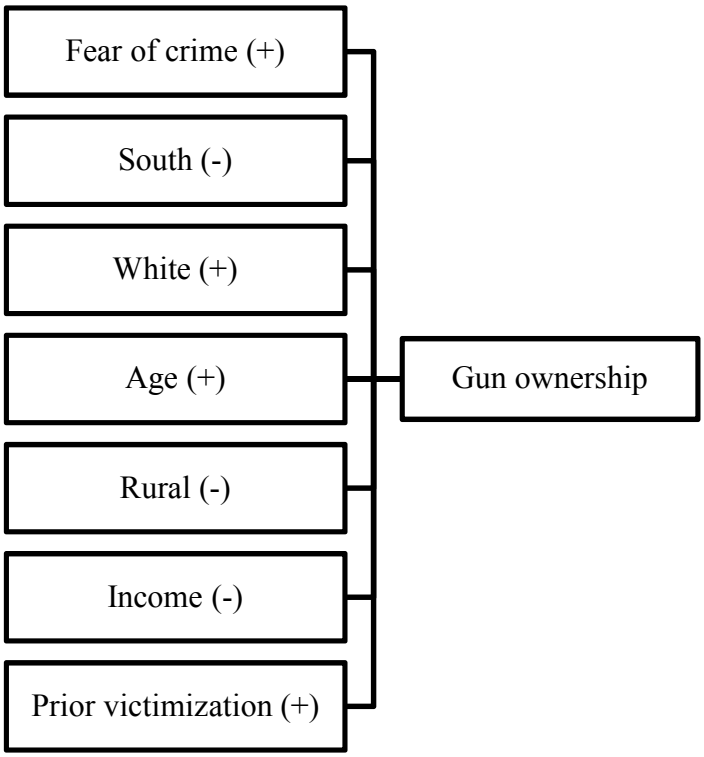

Figure 2. Gun ownership theoretical model

Chapter 4: Analytical Results

The purpose of the current study is to examine the differences in theoretical predictors of male and female gun ownership. It has previously been found that the relationship between fear of crime and gun ownership is reciprocal, creating issues with establishing causality (Bankston & Thompson, 1989; DeFronzo, 1979; Kleck, 1991; Kleck, 1997). These analyses are generally conducted without analyzing this using gender-specific models. Males and females react differently to fear of crime. In general, females are significantly more likely to be fearful and are significantly more likely to partake in protective behaviors (De Groof, 2008; Felson & Pare, 2010; Gordon et al., 1980; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006; Tomsich, Gover, & Jennings, 2011). However, the American gun culture is traditionally dominated by males and gun owners who own for sporting purposes, and may possibly mask the role that fear plays in female gun ownership. Logically, theoretical models predicting gun ownership using gender-specific models are likely to identify different significant predictors, including those that are generally non-significant when examining gun owners as a whole. The current study tests this hypothesis using gender-specific models that test the relationship between fear and gun ownership.

The data for this study was collected from an online survey through Amazon's Mechanical Turk (MTurk) system. MTurk is an online job market place where individuals can post tasks for MTurk workers to complete, including participation in online surveys. Five hundred forty-one respondents completed a 51 item survey regarding gun ownership and the perceptions and attitudes toward guns. MTurk is a crowdsourcing

website where workers can receive compensation for completing tasks posted by requesters. MTurk allows for an expedited data collection process.

Two types of regression analyses were conducted to determine whether fear of crime is a significant predictor of household gun ownership. An ordinary least-squares (OLS) regression model was used to identify significant predictors of fear of crime. A base model was created for comparison purposes. This model measures a number of variables including age, income, regional socializations, rural socialization, and race. The models in which the total sample observations were analyzed included gender as a predictor. The gender variable was removed from the model when testing gender-specific models. When conducting the regression analyses, the gender-specific models were designed to select male respondents only, and then female respondents only to control for the effect that gender has on the theoretical models. The theoretical model tested included predictor variables measuring Southern socialization (South), rural socialization (Urbanity), income, age, race, and prior victimization. Prior victimization was measured using two variables that asked respondents whether he or she had been a victim of property or violent crime at any point in their lives. The dependent variable for the OLS models was created from a factor analysis of 10 items measuring fear of crime.

In total, twelve models were tested. Six were tested using an OLS regression analysis predicting fear of crime and six were tested using a logistic regression analysis to predict gun ownership. These models were based on two general models, a base and a theoretical model, that were tested three times each for each type of analysis, first using the total sample, and then using the male and female subsamples. The base model consisted of gender, race, south, urbanity, age, and income as predictors. Gender was

removed as a predictor for the gender-specific models. This model was used in both the OLS and logistic regression analyses. Property crime victimization and violent crime victimization were added in the theoretical models predicting fear. Fear and previous victimization were added in the theoretical models predicting gun ownership. A logistic regression model was then used to determine whether fear of crime is a significant predictor of household gun ownership. The predictor variables were the same as the OLS models, but included the new fear of crime variable discussed above as a predictor instead of as the outcome. Six models were tested using a logistic regression analysis. Two models, the base model and the theoretical model, used the total sample, two models used the male-only subsample, and two models used the female-only sample. These gender-specific models also included a base model and a theoretical model for each subsample. The base model was the same as those used in the OLS regression analysis models. The theoretical model included the variables that measure victimization and fear. Both the OLS regression models and the logistic regression models are displayed in Tables 11 through 16. Goodness-of-fit and model comparison statistics were also computed, including F-statistics, Akaike Information Criterion, Bayesian Information Criterion, changes in R^2, and Chi-squared analysis.

Univariate Analyses

Table 2 displays the results of the univariate analyses. A univariate analysis is simply used to describe the sample. These analyses are often called descriptive statistics for this reason. A univariate analysis was completed for the total sample, and then again for both the male and the female subsample. The term univariate is used when only one variable is analyzed at a time. In univariate analyses, the simplest model, or

representation, of the data can be determined, often as one of the measures of central tendency. These measures are the mean, median, or the mode. The mean is determined by adding all the values reported in a variable, and then dividing by the number of cases (*N)* of a variable. The mean is also called the average. The median is the middle value within those reported, and the mode is the value that occurs most often.

Table 1. Descriptive statistics—demographics and prior victimization

	Total Sample				Males Only				Females Only			
Variable	N	%	Mean	SD	N	%	Mean	SD	N	%	Mean	SD
Sex												
Male	253	47.9										
Female	275	52.1										
Age			36.47	13.28			35.08	13.43			37.75	13.04
Race												
White	419	79.4			201	79.4			218	79.3		
Other	109	20.6			52	20.6			57	20.7		
R's Income			54479.36	46192.90			57378.50	47195.55			51422.66	45037.62
Region												
South	77	14.9			39	15.7			38	14.1		
Not South	441	85.1			209	84.3			232	85.9		
Urbanity												
Rural	132	25.0			56	22.1			76	27.7		
Not rural	395	75.0			197	77.9			198	72.3		
Property crime victimization												
Yes	240	45.5			119	47.0			121	44.2		
No	287	54.5			134	53.0			153	55.8		
Violent crime victimization												
Yes	95	18.1			40	15.8			55	20.3		
No	429	81.9			213	84.2			216	79.7		
Have gun in home												
Yes	167	31.6			96	37.9			71	25.8		
No	361	68.4			157	62.1			204	74.2		

Table 2 indicates that 47.9% of the respondents were male and 52.1% of the respondents were female. The average age of the sample as a whole was 36.47 (SD=13.28), while the average age of males was 35.08 (SD=13.43) and the average age of females was 37.75 (SD=13.04). Four hundred nineteen respondents, or 79.4%, identified as White. Similar rates were found in both males (79.4%) and females (79.3%).

The aggregate average income was approximately $55,500 (SD=6637.32), while men indicated an average income of approximately $57,000 (SD=47195.55) and women indicated an average income of approximately $51,400 (SD= 45037.62). Approximately 15% of men and women indicated that they were raised in the South. More women indicated being raised in a rural community (27.7%), whereas 22.1% of men indicated being raised in a rural community. Finally, approximately 47.0% of male respondents indicated having been a victim of property crime at some point in their lives, and 15.8% of males indicated that they had been a victim of violent crime. Similarly, 44.2% of women indicated that they had been a victim of property crime, while 20.3% indicated that they had been a victim of violent crime.

In total, 167 respondents indicated that they have a gun in their home. This is approximately 31.6% of the sample. Nearly thirty-eight percent of males indicated that there was a gun in the home, while only 25.8% of female respondents indicated that there was a gun in the home. All respondents answered the question regarding household gun ownership, but these rates should be much closer to the aggregate household gun ownership rates. According to Legault's (2011) research, married women are 34% less likely to report household gun ownership. The implications of this finding will be discussed in Chapter 5. The descriptive statistics of the outcome variable Fear is discussed below when it is assessed for normality. The statistics for this variable can be found in Tables 5, 6, and 7.

Factor Analysis

Generally, the validity of the General Social Survey question measuring fear of crime has been questioned and criticized. LaGrange and Ferraro (1989) discussed four

primary criticisms of the survey item "It is not safe to walk alone in my neighborhood at night." The authors determined that the question does not specifically reference crime, nor does it measure different types of crime. The question is also criticized for oversimplifying the theoretical construct of fear of crime. One question alone cannot measure a complete theoretical construct as complex as fear of crime. Finally, the single item relies on an ominous scenario and is likely to evoke exaggerated levels of fear. The authors support this criticism with the fact that the scenario suggested is likely to be outside of a respondent's routine activities.

The current study utilized questions developed from previous studies (LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010) that have attempted to reduce the ambiguity in the GSS fear of crime measurements and to address the criticisms made above. The survey implemented via MTurk included a multi-item inquiry to measure fear of crime. The ten items included in the current study are meant to eliminate this problem by addressing each of the four criticisms identified by LaGrange and Ferraro (1989). The first criticism is that the GSS question evokes an exaggerated level of fear for the respondent. The GSS item measuring fear of crime asks respondents to rate his or her agreement with the statement, "Is there any area around [your home or neighborhood] where you would be afraid to walk alone at night?" By creating a situation that is likely to be outside of their routine behaviors, this increases the respondent's discomfort and anxiety with the situation, in turn increasing their fear. Respondents are not likely to be walking through their neighborhood alone at night (LaGrange & Ferraro, 1989).

This item has also been criticized for not identifying specific types of crime of which the respondent is fearful (LaGrange & Ferraro, 1989). Of the ten items included in

the MTurk survey, seven ask respondents to indicate his or her agreement with statements of fear of a specific type of crime, e.g., one of the items asks respondents to indicate his or her agreement (using a five-point Likert scale) with the statement, "I am afraid of being robbed." Additional crime types include sexual assault, burglary of the home when the respondent is there and when the respondent is not there, being attacked with a weapon, and being killed. This not only indicates that respondents should be thinking about his or her fear response to crime, but also to different types of criminal acts.

The GSS question is also criticized for attempting to measure a whole theoretical concept with one question. LaGrange and Ferraro (1989) indicate that this is likely to increase the chance of Type I errors. These types of errors are described more below. In summary, Type I errors are characterized by rejecting the null hypothesis (that no relationship between variables exists) when the null is actually true. This is also known as a false positive. Three items measuring fear of crime that were similar to the GSS question were included in the survey. These questions asked respondents to indicate his or her level of agreement with the statements, "It is not safe to be out at night," "It is not safe to be out alone," and "I am afraid to walk alone at night where I live." These three questions fail to overcome the criticisms of the GSS questions discussed above, but were included in the survey to determine if they were measuring a different concept than the questions that named specific crimes. The results of the factor analysis discussed below determined that these questions were measuring something different from the questions that were developed from previous research. This indicates that there may be something that is unaccounted for in the ambiguous questions that can equally determine fear, but

may perhaps testing a different emotional response than the questions that look at specific crimes.

A new variable was created from the ten questions used to measure fear of crime (Table 1) through a factor analysis. The factor analysis identified the underlying concept these ten items were measuring and created a new variable measuring a single concept. The primary function of a factor analysis is to condense a given number of observations or variables into a smaller number of underlying constructs. For example, the current study used ten questions to measure fear of crime. Potentially, these questions could measure up to ten different concepts, or these ten questions could contribute to the measurement of one underlying concept. In short, a factor analysis takes a complex multi-item measurement and identifies underlying concepts, or factors, reducing it to a simpler, single scale variable measurement of this concept. This is why factor analysis is often called a data reduction technique.

There are two types of factor analyses that can be used. The first is exploratory. In an exploratory factor analysis, the researcher simply examines a group of variables to determine whether a factor exists. The current study utilizes a confirmatory factor analysis. A confirmatory factor analysis tests hypotheses made *a priori* that a group of variables measures a specific concept. In the current study, it is hypothesized that the items asking about each respondents' fear of specific situations is measuring their overall fear of crime.

The analysis for this study was conducted using SPSS statistical analysis software. Factors are extracted during the analysis using one of several methods. The most common is the principle components method. This is the method that SPSS defaults

to and is the method that is used in the current study. Principle components method (PCM) operates similarly to a backward stepwise regression analysis, in which all variables are included in the analysis and then systematically removed to identify which combination of variables explains the most variance in the new outcome variable. PCM calculates (*n)* factors from the complete set of variables that explains the most variance. This extraction method continues to calculate factors in a similar way with the maximum number of factors calculated restricted by the researcher or restricted by the number of variables included in the analysis.

Variables are rotated within the analysis to load onto factors, and to ensure that the most variance is explained by the fewest factors. In rotations that result in factors that are completely independent of each other, the rotation is called orthogonal. Orthogonal rotations are likely to result in fewer factors because these rotations force variables to load highly earlier in the analysis, leaving less unexplained variance to be explained after the first factor is calculated. This study utilizes a varimax orthogonal rotation method to extract variables, which maximizes the contribution that each variable makes to the variance within the factor.

Factor analysis output contains a number of components that help the researcher determine the number of underlying concepts in a given group of variables. First, the correlation matrix displays the direction and strength of the relationships among all the variables being included in the factor analysis. This is the same as the correlation matrices in Tables 8, 9, and 10 in the section describing the bivariate analysis more in depth below, but is looking specifically at the items measuring fear of crime.

The next component of the factor analysis are the communality statistics for each variable. The communality statistics are the proportion of variance in each variable explained by all extracted factors and is determined by calculating the sum of squared factor loadings for each variable. For example, in the case of the current analysis, the first factor identified in Table 3 accounts for approximately 80% of the variation in the first item ("I am afraid that someone will break into my home while I am there."). This results in two statistics: the initial communality statistic and the extraction communality statistic. The initial communality statistic is always equal to 1 because the initial number of factors is always equal to the number of variables included in the analysis. The extraction communality statistic is a decimal value between 0 and 1. These are reported with the factor loadings in Table 3.

Table 2. Rotated factor loadings and communality statistics for Factor Analysis 1

Survey Item	Loadings		
	Factor 1	Factor 2	Communalities
I am afraid someone will break into my home while I am there.	**.785**	.296	.705
I am afraid someone will break into my home while I am not there.	**.797**	.117	.648
I am afraid of being sexually assaulted.	**.517**	.468	.487
I am afraid of being attacked by someone with a weapon.	**.821**	.346	.793
I am afraid of being murdered.	**.755**	.368	.706
I am afraid of being robbed.	**.807**	.359	.779
I am afraid that someone I know will become a victim of crime.	**.716**	.286	.595
I am afraid to walk alone at night where I live.	.292	**.810**	.742
It is not safe to be out at night.	.236	**.888**	.844
It is not safe to be out alone.	.324	**.833**	.799
Bolded values are loadings >0.500.			

The next important component of factor analysis are the eigenvalues for each factor. Eigenvalues indicate the amount of variance underlying all variables associated

with one factor. When each eigenvalue is divided by the total number of variables included in the factor analysis, this results in a measurement of the proportion of variance explained by each factor. For example, in the first factor analysis done for this study, Factor 1 has an eigenvalue of 4.172. When this value is divided by 10 (the number of variables included in the factor analysis), the resulting value is 0.4172. This value indicates that 41.72% of the total variance is explained by Factor 1.

The next component is the factor loadings for each variable. Factor loadings are the correlation of a variable with a factor and tell the researcher which variables make the largest contribution to each factor. Table 3 displays the factor loadings for Factor 1 and Factor 2 from the first factor analysis conducted for this study. This table shows that the first seven variables included in the factor analysis contribute the most to Factor 1 and the last three variables contribute the most to Factor 2. For this reason, a second factor analysis was conducted with only these seven variables to ensure that they were only measuring one underlying concept.

The variable FAC1_2 (Factor 1 of analysis 2), renamed as "Fear" for the analysis, was selected as the outcome variable in the current study. This is due to the fact that each survey item loaded higher on this factor and the analysis returned only one underlying concept. Table 4 below shows the factor loadings for comparison with those from the first factor analysis.

Table 3. Rotated factor loadings and communality statistics for Factor Analysis 2

Survey Item	Loadings	
	Factor 1	Communalities
I am afraid someone will break into my home while I am there.	**.830**	.689
I am afraid someone will break into my home while I am not there.	**.752**	.566
I am afraid of being sexually assaulted.	**.693**	.481
I am afraid of being attacked by someone with a weapon.	**.895**	.802
I am afraid of being murdered.	**.851**	.725
I am afraid of being robbed.	**.882**	.778
I am afraid that someone I know will become a victim of crime.	**.767**	.588
Bolded values are loadings >0.500.		

Visual Data Analysis

As previously stated, regression analyses operate on several assumptions, including a normally distributed outcome variable, homogeneity of variance, interval-level or ratio-level data, and independence. Normality of the outcome variable can be identified by a cursory analysis of the data through descriptive statistics and visual data analysis. The outcome variable for the OLS regression analyses, Fear, was evaluated for normality through visual data analysis and univariate analysis. The results of these analyses are displayed in Tables 5, 6, and 7 and Figures 3, 4, and 5 below. Because logistic regression is used for regression analyses with dichotomous, categorical outcome variables, gun ownership was not evaluated for normality.

When a variable displays a non-normal distribution, the likelihood of Type I errors increases. In null-hypothesis statistical significance testing, researchers recognize that there are two possible outcomes to any analysis: there is a relationship between two variables, or there is no relationship between two variables. The null hypothesis simply assumes that there is no relationship between two variables. Researchers use confidence

intervals to indicate how confident they are in the results of their analysis, generally in the form of p=0.05, p=0.01, or p=0.001. In the case of a p-value of 0.05, there is a 5% chance that an analysis would yield the same results if no relationship actually existed between variables. This also indicates that there is a 5% chance that no relationship exists even when one was identified. This is a Type I error. Type I errors are also known as false positives, or a rejection of the null hypothesis when the null is actually true.

Non-normal distributions can be transformed to attempt to remedy issues with normality and to reduce the likelihood of Type I errors. It should be mentioned that even though the values change in a transformed variable, the relationship between them remains unchanged because the same mathematical equation is performed on every value in that variable. Transformations are not the same as creating a new variable. The most common transformations used on data are log, reciprocal, square root, and cube root transformations.

If a transformation does not work, extreme outliers may be causing undue influence on the mean and may be the cause of a significantly non-normal distribution. In cases such as these, it may be necessary to trim the mean. For example in a 5% trimmed mean, 5% of the highest and 5% of the lowest values are completely removed from the data to remove the effect that those outliers may be having on the mean. Despite significant results of the Shapiro-Wilk tests (Tables 5-7) for non-normal distributions, the distributions do not warrant any transformation to the data, nor does it require trimming the mean. Figures 3, 4, and 5 below show the distribution of the errors and indicate that there should be no problems using the untransformed variables in the model.

One case in the current data set had an unusual answer for the age variable. Participants were required to be at least 18 years old to complete the survey, but there was one case that been answered with a number lower than this required age (3). This case was replaced with the mean. Missing or erroneous data may also have an effect on the generalizability of the data. By replacing this case with the mean, it allows all cases to be included in the analysis and reduces the effect of an error outlier. The use of imputation allows the research to correct for missing or inaccurate data due to the fact that some respondents skipped certain questions, opted out of certain questions, or came to a certain question and stopped the survey altogether (Walker & Maddan, 2009). Like the current case, often researchers will replace this data with another value, specifically the mean as was done here to prevent non-normal distributions due to error values.

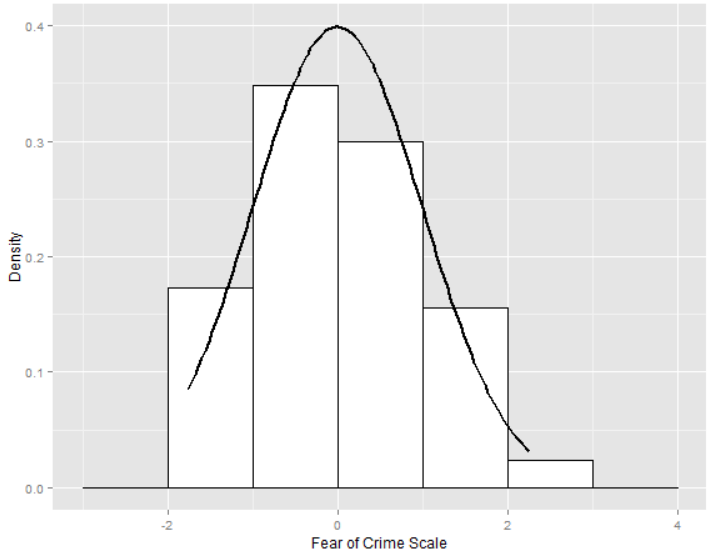

Figure 3. Histogram and density plot for Fear (total sample)

Table 4. Descriptive statistics for Fear (total sample)

	Mean	**SD**	**Skew**	**Skew.2SE**	**Kurtosis**	**Kurtosis.2SE**	**Shapiro-Wilk**	***p*-value**
Fear	0.00	1.00	0.155	0.722	-0.747	-1.746	0.9796	<0.001

Histograms, density curves, descriptive statistics, and the Shapiro-Wilk test are all specifically used to determine whether a variable is normally distributed. The results of the Shapiro-Wilk test and the descriptive statistics for the total sample are displayed in Table 5. Figure 3 shows that Fear is positively skewed and has a leptokurtic density curve, which means the density curve is taller and narrower than that of a normally distributed variable, but otherwise appears normally distributed. The results of the Shapiro-Wilk test indicate that the distribution of Fear for the total sample is significantly different from a normal distribution (W=0.9796, p<0.001). When the p-value in a Shapiro-Wilk test is less than 0.05 ($p < 0.05$), this indicates that the distribution is significantly different from a normal distribution.

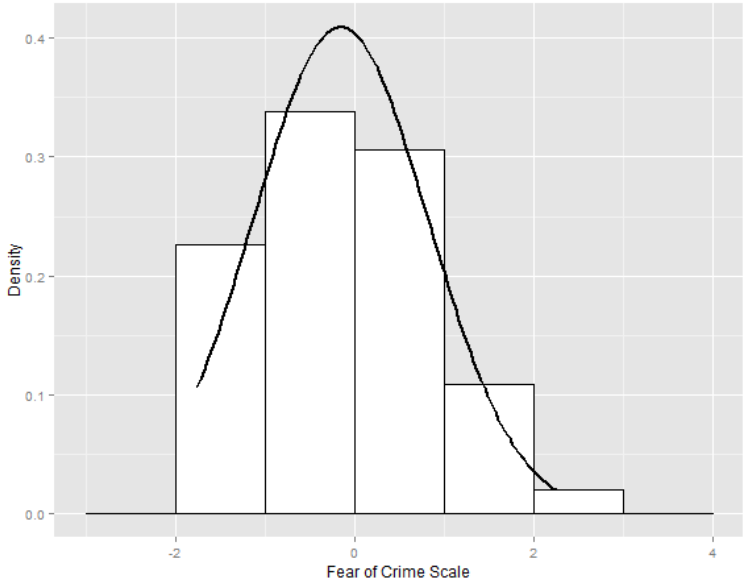

Figure 4. Histogram and density plot for Fear (males only)

Table 5. Descriptive statistics for Fear for males only

	Mean	**SD**	**Skew**	**Skew.2SE**	**Kurtosis**	**Kurtosis.2SE**	**Shapiro-Wilk**	***p*-value**
Fear	-0.152	0.975	0.297	0.960	-0.561	-0.911	0.976	<0.001

Figure 4 shows a similarly leptokurtic and positively skewed distribution for Fear when examining males only. The statistics in Table 6 show that the data are significant for a non-normal distribution (W=0.976, p<0.001). However, despite being non-normal, the results of this analysis do not indicate that this data needs to be transformed.

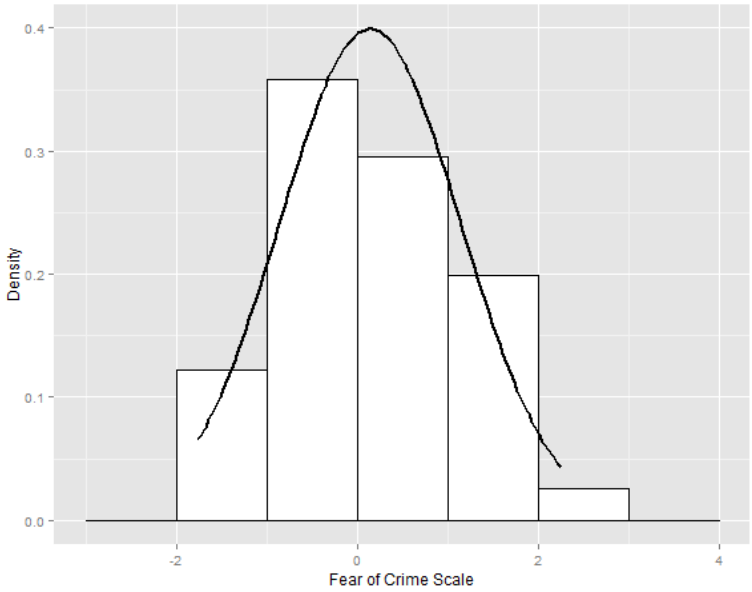

Figure 5. Histogram and density plot for Fear (females only)

Table **6**. Descriptive statistics for fear for females only

	Mean	**SD**	**Skew**	**Skew.2SE**	**Kurtosis**	**Kurtosis.2SE**	**Shapiro-Wilk**	***p*-value**
Fear	0.145	0.999	0.026	0.087	-0.832	-1.411	0.9768	<0.001

Figure 5 displays the histogram and density curve for Fear when examining females only. The statistics in Table 7 indicate that the distribution is leptokurtic, but when visually examining the data, the distribution looks to be more platykurtic. The distribution also appears to almost be bimodal. These characteristics are likely to be the reason that the Shapiro-Wilk test resulted in a significantly non-normal distribution (W=0.9768, p<0.001). However, these results do not warrant any transformations to the

data despite the fact that the Shapiro-Wilk tests indicated that the outcome variable was not normally distributed. The Shapiro-Wilk test is extremely sensitive to any departure from a normal distribution in large samples, which is likely the reason that the test returned significant statistics. Figures 6, 7, and 8 below show that the residuals are normally distributed.

Bivariate Analyses

Bivariate analyses are used to measure the magnitude and direction of relationships between two variables. Magnitude is the strength of the relationship and is reported with an absolute value between 0 and 1, with 0 indicating that there is no relationship between two variables and 1 indicating that there is a perfect relationship between both variables. The direction of a relationship is denoted by a positive or negative value. These values are known as correlation coefficients, or as a Pearson product-moment correlation (*r*). Positive relationships occur when both variables change in the same direction. For example, to have a positive relationship, the values of one variable will increase as the values of the other variable increase. Negative relationships occur when the variables are changing in opposite directions. As the independent variable increases, the dependent variable decreases, or vice versa. A perfectly positive relationship is identified by a correlation coefficient of 1.0, and a perfectly negative relationship is identified by a correlation coefficient of -1.0.

These relationships are a measurement of the variable correlations, which simply indicates how much one variable changes when the other changes. The primary rule when conducting bivariate analyses is that researchers should take care not to make causal inferences from bivariate correlations. Correlations do not implicate a causal relationship

between two variables, but correlations do serve as the first step to identifying and proving causal relationships. This is due to the fact that significant correlations help identify potential predictors for later regression analyses. Causality is determined using multivariate analyses, which are explained below.

Table 8 displays the results of the bivariate analysis for the total sample. Tables 9 and 10 display the results of the bivariate analyses for males only and females only, respectively. Fear and household gun ownership are positively and very weakly correlated, but was not significant ($r = 0.051$, $p = 0.246$). This correlation is similar regardless of what sub-sample is being examined. Similarly, when examining males and females only, the correlation of fear and gun ownership was weakly and positively correlated ($r = 0.096$, $p = 0.132$, and $r = 0.051$, $p = 0.407$, respectively).

Table 7. Results of bivariate correlation analysis for total sample

	1	2	3	4	5	6	7	8	9	10
1. Fear	----									
2. Household gun ownership	.051	----								
3. Age	-.200**	-.015	----							
4. Income	-.190**	-.023	.081	----						
5. Gender	-.149**	.130**	-.101*	.065	----					
6. Race	-.089*	.126**	.103*	-.023	.002	----				
7. South	.027	.040	-.007	-.039	.023	-.003	----			
8. Rural	-.045	.199*	.064	-.040	-.065	.133*	.110*	----		
9. Property crime victimization	.040	.139*	.207**	.047	.029	.091*	-.047	.048	----	
10. Violent crime victimization	.088*	-.035	.060	-.106*	-.058	-.027	-.057	.002	.227**	----

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

When examining the total sample correlations between the base model variables and fear, fear was negatively and significantly correlated with age, income gender, and race, but these correlations were very weak to moderately weak. Briefly, being younger,

having a lower income, being female, and identifying as a racial minority are all significantly correlated with higher reported levels of fear. Fear and age had the strongest correlation ($r = -0.200$, $p < 0.01$). This correlation is inconsistent with previous research. It indicates that as age increases within the total sample, fear decreases. Previous research has cited an opposite relationship (Ortega & Myles, 1987), in which older individuals indicated higher levels of fear than younger individuals, likely as a result of their decreased ability to defend themselves.

Fear and income had the next strongest correlation ($r = -0.190$, $p < 0.01$). This correlation is consistent with previous research and the existing knowledge of low income areas (Callanan, 2012). As income decreases, fear of crime increases; this is likely due to the fact that areas characterized by low income are often more likely to experience higher rates of crime.

The next strongest correlation was between fear and gender ($r = -0.149$, $p < 0.01$), which indicates that being female is significantly correlated with higher levels of fear. This is consistent with previous research in which females were found to be significantly more fearful than males (De Groof, 2008; Gordon et al., 1980; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006; Tomsich, Gover, & Jennings, 2011). The last significant correlation was between fear and race ($r = -0.089$, $p < 0.05$). This correlation indicates that respondents that identify as racial minorities have higher levels of fear, and is also consistent with previous research.

These same variables were similarly examined with household gun ownership. Previous research indicates that those respondents who indicated that they owned a gun were raised in the South in rural communities, identify as white, are male, older, and have

higher income (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley, 2012; Hepburn et al., 2007; Kleck, 1995; Kleck, 1997; Lott, 2010; Sheley et al., 1994). In the current sample, being white, male, and socialized in a rural community were positively and significantly, albeit weakly, correlated with gun ownership ($r = 0.126$, $p = 0.01$; $r = 0.130$, $p = 0.01$; $r = -0.199$, $p = 0.05$, respectively). Age, income, and being raised in the South were not found to be significantly correlated with household gun ownership.

Finally, the correlations between the victimization variables and fear, and victimization and household gun ownership were examined. Violent crime victimization was found to be positively and significantly correlated with fear of crime ($r = 0.088$, $p < 0.05$). Respondents who indicated having been a victim of violent crime at any point in their lives was correlated with higher levels of fear of crime. When examining victimization and gun ownership, violent crime was no longer significantly correlated. In fact, the relationship changed; those that had been a victim of violent crime were *less* likely to own. While the reasons for this are not explored in the current study, there are potential theoretical implications that can be made about this relationship and will be discussed in Chapter 5 below. Property crime was positively and significantly correlated with household gun ownership ($r = 0.139$, $p = 0.05$). Respondents who have been victims of property crime also indicated higher levels of household gun ownership.

Table 8. Results of bivariate correlation analysis for males only

	1	2	3	4	5	6	7	8	9
1. Fear	----								
2. Household gun ownership	.096	----							
3. Age	-.202**	-.068	----						
4. Income	-.120	.064	.064	----					
5. Race	-.211**	.075	.056	.020	----				
6. South	.012	.024	.028	-.073	.024	----			
7. Rural	-.084	.231**	.125*	.035	.106	.196**	----		
8. Property crime victimization	.056	.161*	.235**	.020	.009	-.075	.089	----	
9. Violent crime victimization	.163*	.085	.121	-.088	-.128*	-.099	.004	.351**	----

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Bivariate analyses were conducted similarly for both the male and female subsamples. The socialization variables included in the base models were analyzed with fear and then with gun ownership. Prior victimization was then examined with fear and gun ownership. When examining males only, income was no longer significantly correlated with fear. Only age and race were found to be significantly correlated with fear. Both were inversely and weakly correlated with fear ($r = -0.202$, $p < 0.01$; $r = -0.211$, $p < 0.01$). Males who were younger and males who identified as a racial minority had higher levels of fear.

When examining the socialization variables with household gun ownership, only having been raised in a rural community was positively and significantly correlated with household gun ownership ($r = 0.231$, $p < 0.01$). Similar to the bivariate analysis of the aggregate sample, violent crime victimization was significantly and positively correlated with fear ($r = 0.163$, $p < 0.05$) and property crime victimization was significantly and positively correlated with household gun ownership ($r = 0.161$, $p < 0.05$).

Table 9. Results of bivariate correlation analysis for females only

Table 10. Results of bivariate correlation analysis for females only

	1	2	3	4	5	6	7	8	9
1. Fear	----								
2. Household gun ownership	.051	----							
3. Age	-.232**	.067	----						
4. Income	-.251**	.008	.107	----					
5. Race	.019	.179**	.150*	-.074	----				
6. South	.046	.052	-.037	-.002	-.029	----			
7. Rural	-.030	.192**	-.002	-.118	.157**	.037	----		
8. Property crime victimization	.036	.111	.189**	.070	.166**	-.020	.017	----	
9. Violent crime victimization	.013	-.134*	-.004	-.120	.058	-.017	-.006	.127*	----

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

When examining females only, age and income remained significantly and negatively correlated with fear ($r = -0.232$, $p < 0.01$; $r = -0.251$, $p < 0.01$, respectively). Race was no longer significantly correlated with fear. The correlation between age and fear identified above indicates that older respondents indicated lower fear. The correlation between income and fear is consistent with previous findings (Ortega & Myles, 1987). Again, similarly to the aggregate bivariate analysis, race and growing up in a rural community was positively and significantly correlated with household gun ownership ($r = 0.179$, $p < 0.01$; $r = 0.192$, $p < 0.01$, respectively).

Prior victimization and fear were not significantly correlated. Interestingly, when examining the correlations between prior victimization and household gun ownership, property crime victimization was not significantly correlated with household gun ownership as was the case with the aggregate sample and the male subsample bivariate analyses, but violent crime victimization was negatively and significantly correlated with household gun ownership ($r = -0.134$, $p < 0.05$).

To reiterate, correlations do not indicate a causal relationship. The findings of the bivariate analysis simply indicate that certain responses to certain questions coincided with certain responses to other questions, and are helpful in determining what variables are likely to predict fear of crime and household gun ownership.

Multivariate Analyses

Two types of multivariate analyses were conducted for the current study. Ordinary least-squares (OLS) regression models were used to identify significant predictors of fear of crime. Four gender-specific OLS models were tested to determine these predictors. Two models were tested using the full sample. The new variable created using the factor analysis was used as the outcome variables for the OLS models. Similarly, four logistic regression models were tested similarly using gender-specific models and the Fear variable created from the factor analysis to determine significant predictors of household gun ownership. Two models included the full sample.

In general, regression analyses are meant to determine a causal relationship. The standard output of any regression analysis will indicate which of the predictor variables significantly predict the outcome variable. Typically, regression analyses are summarized by a linear relationship. This can best be described by explaining a simple regression analysis, which only includes one predictor, or independent variable, and the outcome, or dependent variable.

Field, Miles, and Field (2013) indicate that any data can be predicted using the following equation: $\text{outcome}_i = (\text{model}) + \text{error}_i$. This equation is a modified linear equation, in which the outcome is what is being predicted and the model is the group of predictor variables selected to define the linear model. Error is the difference between the

predicted values and those actually observed in the data. In determining a linear relationship, the traditional equation for a line (y= mx + b) consists of three primary components: the y-intercept (b), or the value of the dependent variable if the independent variable is equal to zero; the slope of the line (m), which is the change in y-values over the change in x-values; and finally, the value of the independent variable (x) is included to determine the value for the dependent variable. The traditional equation of a line is the simplest predictive model, but assumes that the relationship between x and y is constant. In a regression analysis, it is understood that this relationship is not constant, and that the relationship between the independent and dependent variable can only be approximated with a line. This is why error is included in the equation for regression and is simply meant to account for the random variation in the data.

The line that is meant to represent the data is also meant to decrease the distance from each data point to the line as much as possible. In doing this, the model will account for the overall degree of variation within the data. The distances between the actual, observed data points and the predicted points in the linear model are known as deviations, and can be both negative and positive values (observed values can fall above or below the line and will therefore be lower or higher than the predicted values). The best linear model will be the one that has the lowest total squared error. This is calculated by squaring each deviation and then finding the total sum of all squared deviations. This results in a predictive linear model that is based on the lowest, or least-squared, error, which is why multivariate regression analysis is often referred to ordinary least-squares (OLS) regression.

OLS regression models.

Ordinary least-squares regression, or multiple regression, utilizes the same underlying concepts of simple regression, but complicates the equation by adding in additional independent variables to accurately predict the dependent variable. In simple regression, the single predictor explains the variation in the outcome. In multiple regression, multiple predictors contribute to the explanation of the variation in the outcome. The model equation then changes from the simple regression equation, which only considers two variables, to: $Y = a + b_1X_1 + b_2X_2 + \ldots b_nX_n + e$, where *a* is the value of the dependent variable if all independent variables are zero; b_n is the slope defining the relationship between X_n and the dependent variable, controlling for the effects of all other independent variables; and *e* is the error. This equation accounts for each variable included in the model.

Linear regression models, such as OLS, operate on the assumption that the data will behave and look a certain way to accurately predict the values of the dependent variable. First, the outcome variable must be a quantitative, continuous variable, measured at the interval-, or ratio-level. Second, predictors should exhibit non-zero variance, meaning that the predictors have to vary somewhat. Next, the variance should be constant, or homoscedastistic. If the variances are extremely unequal, the variance is heteroscedastistic. Next, no predictors should exhibit a perfect linear relationship with another predictor. If variables correlate too strongly, this presents potential issues with multicollinearity. If there is a high degree of collinearity within the predictors, assessing the individual contribution of each predictor to the model becomes difficult. Also, no spurious relationships should exist between predictors and external variables. The error terms should be both independent and normally distributed. If errors are not independent,

this introduces issues with autocorrelation. The Durbin-Watson test is used to test the assumption of independent errors. Regression analyses assume that errors are random and normally distributed, with a mean of zero. The last assumption of regression analyses is that there is in fact a linear relationship between the predictors and the outcome.

There are several test statistics that are important to consider when conducting an OLS regression analysis. First, the R-squared value, which is related to the Pearson product-moment correlation value, indicates how much of the variation in the outcome can be accounted for by the present model. When conducting a bivariate analysis, Pearson's *r* is reported to indicate the magnitude and direction of a correlation. When this number is squared, this "squared *r*" value, or the R-squared statistic, is interpreted as the percent of variation in the dependent variable that is accounted for by the independent variable. The only difference between the bivariate R-squared value and the regression R-squared value is that the complete model, not just one independent variable, explains a percent of the variation in the outcome variable.

When examining multiple models to determine which model best explains the outcome variable, there are a number of statistical tests that can compare models. OLS models can be compared using an analysis of variance (ANOVA) test in R, or can be tested for a change in R-squared in SPSS. Significant results of the ANOVA test indicate that one model was a significant improvement over the other. Another way to compare models is to compare the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values for each model. Generally, a decrease in these test statistics from one model to the next indicates that the model with lower AIC and BIC values is a better fit for the data.

Table 11 displays the results of the OLS regression analysis for the total sample. Tables 12 and 13 display the results of the same analyses conducted using gender-specific models. The OLS regression analyses were conducted to test the effects of socialization on fear of crime. The base model, which was run first, consisted of the variables South, Rural, White, Gender, Age, and Income as predictors. Each of these variables has shown to provide an explanation of the socialization effects on fear of crime. The second model, the theoretical model, included the same variables as the base model, but tested how prior victimization also contributed to the explanation of respondents' fear of crime.

Table 10. Multiple regression fear of crime models for total sample

	R^2	B	$SE\ B$	β
Base	0.112**			
Constant		1.015**	0.187	
South		-0.006	0.138	-0.002
Rural		-0.112	0.117	-0.049
White		-0.115	0.125	-0.046
Gender		-0.323**	0.100	-0.162
Age		-0.017**	0.004	-0.214
Income		-0.00000338**	0.000	-0.159
	AIC	1011.84	BIC	1043.09
Theoretical	0.139**			
Constant		0.928**	0.186	
South		0.016	0.137	0.006
Rural		-0.125	0.116	-0.054
White		-0.117	0.124	-0.047
Gender		-0.338**	0.099	-0.170
Age		-0.019**	0.004	-0.240
Income		-0.00000335*	0.000	-0.157
Property Crime Victimization		0.297**	0.102	0.149
Violent Crime Victimization		0.125	0.132	0.049
	AIC	994.40	BIC	1033.37
Model Comparison (Base vs. Theoretical): F=5.536, p<0.01				

*. p<0.05; **. p<0.01

The results of the analysis of the base model indicate that this model was a good fit for the data and was able to account for approximately 11% of the variation in respondent fear of crime. The statistics indicate that the model is significant ($R^2 = 0.112$, $F=5.536$ $p <0.001$). In this model, age, gender, and income were significant predictors of fear of crime. Female respondents, younger respondents, and those with lower income are more likely to fear crime.

The theoretical model has more explanatory power than the base model. While it does not account for a large amount of variation in fear, it accounts for approximately 14% of the variation in the outcome variable, and is a significant improvement over the base model ($R^2 = 0.139$, $F=5.536$, $p<0.01$). This can also be observed when looking at the AIC and BIC of each model. The theoretical model produced lower AIC and BIC values than those produced for the base model, indicating that the theoretical model is an improvement over the base model.

In the theoretical model, gender, age, and income remained significant predictors. Property crime victimization was added to the model and was found to be a significant predictor of fear of crime. Similar to the base model, females, younger respondents, and those with a lower income were more likely to be fearful. In the theoretical model, those who had ever experienced property crime were more likely to have higher levels of fear.

In summary, gender, age, income, and property crime victimization were significant predictors of fear of crime. Younger respondents, those with lower income, females, and those who had been the victim of property crime had higher levels of fear. Race and violent crime victimization did not make a significant difference.

Model diagnostics—full sample. Figure 6 indicates that the standardized residuals are approximately normally distributed. This can be determined visually by the fact that the residuals fall along the regression line. This indicates that the model was a good fit for the data and that there are no cases exerting undue influence on the model. Additionally, the variance inflation factor (VIF), which tests the predictors for multicollinearity, indicates that there is no issue with multicollinearity in this model. Each variable had a VIF of less than 2, including the victimization variables. Multicollinearity only becomes an issue when the VIF test returns a value over 4. Finally, the Durbin-Watson test, which tests for autocorrelation, was non-significant (DW= 1.972, p=0.744), indicating that there were no issues with autocorrelation in the data.

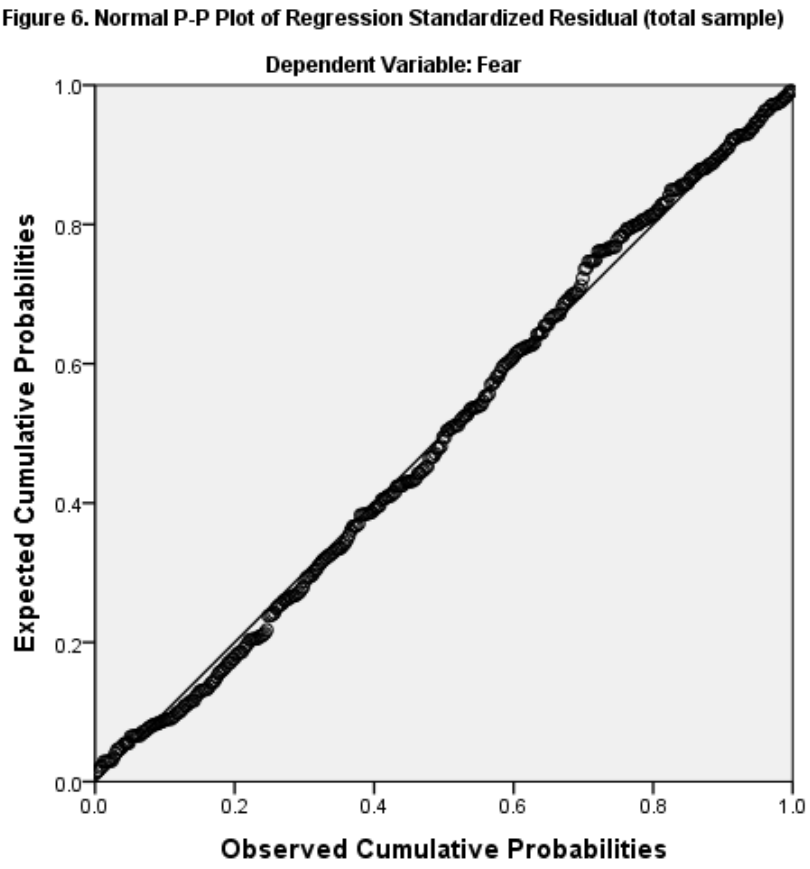

Figure 6. Quantile comparison plot of standardized residuals for total sample

Table 12 displays the results of the OLS regression analysis when the base and theoretical models only consisted of male respondents. As with the full sample, the base model included South, Rural, White, Age, and Income as predictors. Gender was removed. Property crime and violent crime victimization were added to the theoretical model. The results of the analysis are discussed below.

Table 11. Multiple regression fear of crime models for males only

	R^2	*B*	*SE B*	*β*
Base	0.083**			
Constant		0.770**	0.258	
South		-0.068	0.201	-0.025
Rural		-0.035	0.169	-0.015
White		-0.325	0.187	-0.123
Age		-0.016**	0.005	-0.221
Income		-0.00000219	0.000	-0.105
AIC	529.83	BIC	552.52	
Theoretical	0.140**			
Constant		0.573*	0.259	
South		0.019	0.197	0.007
Rural		-0.077	0.165	-0.033
White		-0.203	0.186	-0.077
Age		-0.020**	0.005	-0.270
Income		-0.00000177	0.000	-0.085
Property Crime Victimization		0.226	0.147	0.114
Violent Crime Victimization		0.499*	0.202	0.187
AIC	521.68	BIC	550.86	
Model Comparison (Base vs. Theoretical): F=6.006, p<0.01				

*. p<0.05; **. p<0.01

In the base model specifically examining males, only age was a significant predictor of fear. In this model, younger males were more fearful of crime. The base model is significant, but only explains approximately 8% of the variation within the outcome variable ($R^2 = 0.083$, $F = 6.006$, $p<0.01$).

The theoretical model accounts for approximately 14% of the variation in the outcome variable and was a significant improvement over the base model ($F=6.006$, $p<0.01$). Age remained a significant predictor in the theoretical model. When the victimization variables were introduced, only violent crime was a significant predictor.

In summary, younger males and those who had been victims of violent crime were more fearful. Interestingly, race was not significant and income were no longer significant.

Model diagnostics—males only. The results of the VIF test, the Durbin-Watson test, and the assessment of the distribution of residuals were similar to those for the total sample. There were no issues with multicollinearity. All VIF statistics were less than 2. There were no issues with autocorrelation (DW=2.043, p=0.754). Finally, Figure 7 shows that the residuals were normally distributed and that no cases were exerting undue influence on the model.

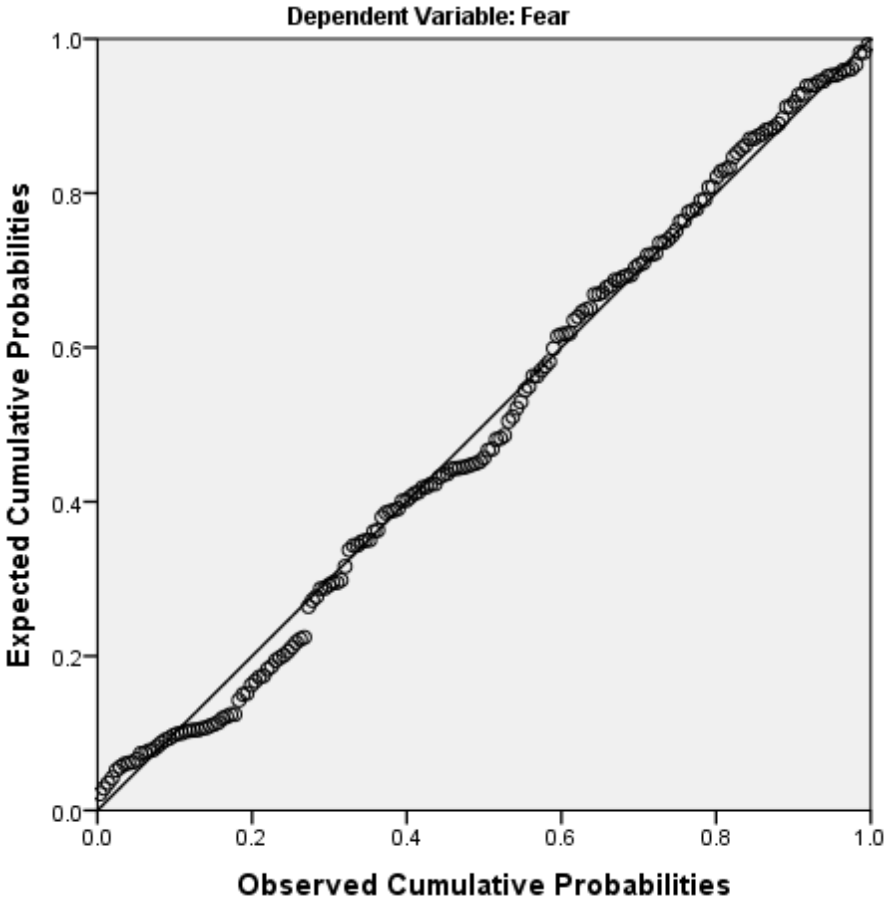

Figure 7. Quantile comparison plot of standardized residuals for males only

Table 13 displays the results of the OLS regression analysis when the base and theoretical models only consisted of female respondents. As with the analyses with the full sample and males only, the base model included South, Rural, White, Age, and Income as predictors. Property crime and violent crime victimization were added to the theoretical model. The results of the analysis are discussed below.

Table 12. Multiple regression fear of crime models for females only

	R^2	B	$SE\ B$	β
Base	0.113**			
Constant		0.995**	0.262	
South		0.057	0.193	0.021
Rural		-0.219	0.165	-0.098
White		0.063	0.169	0.027
Age		-0.017**	0.006	-0.213
Income		0.00000480**	0.000	-0.227
AIC	488.66		BIC	510.98
Theoretical	0.140**			
Constant		1.025**	0.264	
South		0.059	0.191	0.022
Rural		-0.245	0.164	-0.110
White		0.024	0.169	-0.011
Age		-0.019**	0.006	-0.232
Income		-0.00000525**	0.000	-0.248
Property Crime Victimization		0.289*	0.144	0.148
Violent Crime Victimization		-0.227	0.177	-0.094
AIC	477.47		BIC	505.95
Model Comparison (Base vs. Theoretical): F=2.623, p=0.076				

*. p<0.05; **. p<0.01

The results of the analysis indicated that both the base and the theoretical models were a good fit for the data, but the theoretical model was not an improvement over the base model when examining the female subsample (R^2 = 0.140, F=2.263, p= 0.076). The base model accounted for approximately 11% of the variation in fear. Age and income are both significant predictors, similar to the results of the analysis using the total sample.

The theoretical model account for approximately 14.5% of the variation in the outcome variable. Age and income remained as significant predictors. Property crime victimization was a significant predictor once the victimization variables were added to the model.

In summary, a small amount of fear of crime can be accounted for by the theoretical model. Younger females, having a lower income, and having been a victim of property crime increases fear of crime. Again, race and property crime were not significant predictors.

Model diagnostics—females only. Similar to both the analyses with the total sample and the males only, the VIF test, Durbin-Watson test, and the assessment of the distribution of the residuals indicated that no assumptions about regression were violated. There were no issues with multicollinearity or autocorrelation. Figure 8 shows that the residuals were normally distributed and that no cases were exerting undue influence on the model.

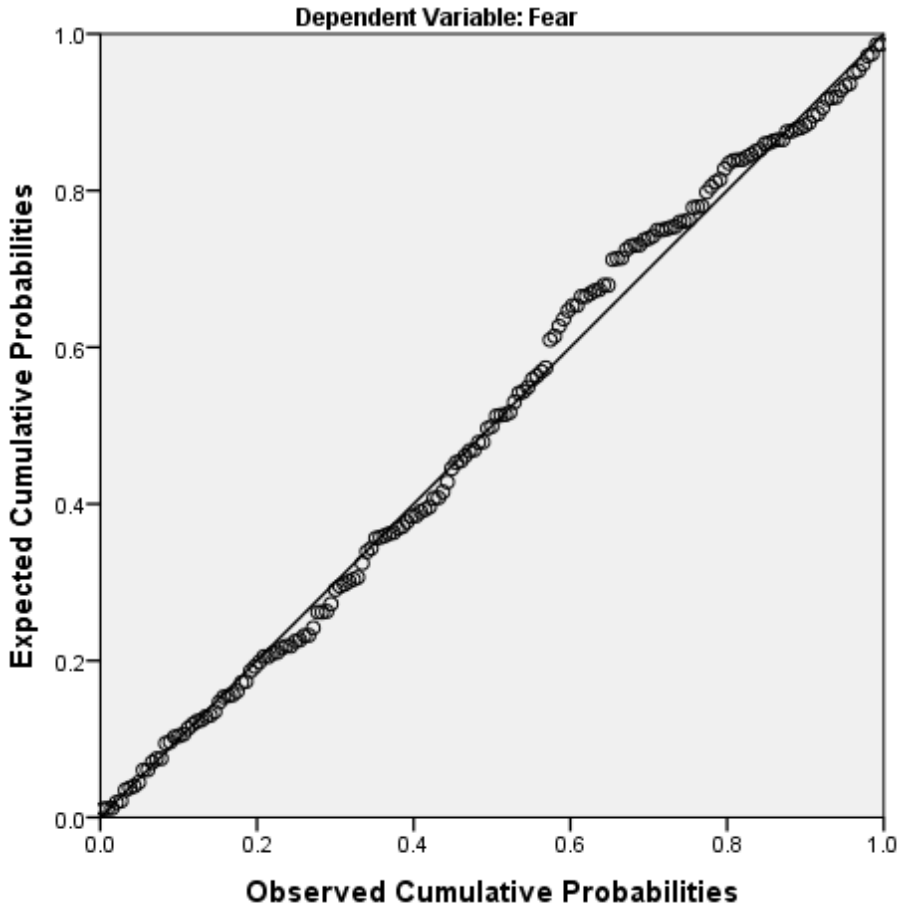

Figure 8. Quantile comparison plot of standardized residuals for females only

Significant constants. The constant remained significant in all of the OLS models. When the constant is significant in a regression analysis, it indicates that there is a variable not included in the model that could potentially explain the variation in the outcome. In both the total sample and the male sample models, the coefficients of the constant decrease in value with the introduction of victimization. This indicates that it contributes to the explanation of fear, but that the model is still missing a variable that would help explain the variation in the outcome. This can also be seen when comparing the models. Adding the variables measuring victimization resulted in an increase in the R-squared value.

However, when looking at the models testing the female subsample, the coefficient of the constant increases with the addition of the variables measuring victimization. Even though the theoretical model was an improvement over the base model, it was not significant. Adding the victimization variables increased the model explanatory power, which can be seen with the R-squared value, but the fact that the coefficient of the constant increased is likely the reason why the theoretical model was not a significant improvement over the base model.

Logistic regression models

Logistic regression models, in essence, are the same analysis as an OLS regression analysis, but is distinguished through the use of a dichotomous outcome variable. This means that there are two possible outcomes that the model is trying to predict. The logistic regression analysis determines the probability that one of these outcomes occurs over the other. In order to do this, logistic regression still follows the general equation discussed above in which $\text{outcome}_i = (\text{model}) + \text{error}_i$, but is altered to accommodate for the fact that there are only two possible outcomes and becomes:

$$P(Y) = 1/ (1+e^{-(\text{model})})$$

P(Y) is simply the probability that Y is likely to occur. When a number is raised to a negative exponent, this results in a decimal. Adding 1 to this means that the denominator will always be bigger than 1, even if only by a very small amount, and ensures that P(Y) will always be a decimal, or a probability. This can then be interpreted as how likely it is that Y will occur based on the model created by the researcher.

Logistic regression inherently violates some of the assumptions about regression analysis discussed above. First, a dichotomous variable cannot be normally distributed.

This dichotomous variable offers only two outcomes. In the current study, gun ownership was coded 1 (Yes) or 0 (No). All respondents in the study either own a gun or they do not. Victimization was coded similarly. All respondents had been victimized, or they had not. Similarly, the variables measuring South, urbanity, race, and gender were coded into dichotomous variables. These variables were not originally dichotomous and had to be recoded into dummy variables.

Dummy variables allows the researcher to create a dichotomous variable that will select for a desired outcome determined *a priori*. A dummy variable allows the researcher to collapse the number of categories in a nominal-level variable from *N* to two. For example, in its original form, the item that collected information about Southern socialization asked each respondent to indicate in which state or American territory he or she was born and how long he or she had lived there, resulting in approximately 54 categories. Because the current study was interested in the effect of being socialized in the South, these responses were recoded to 1 (Southern) or 0 (Not Southern), with Southern states being identified by Gastil's (1971) Southern index.

The effect size of a model cannot be perfectly measured in a logistic regression. This is due to the fact that R^2 values are based on correlations, and correlations are premised on a linear relationship between a predictor and outcome. This violates another assumption of regression analysis because linearity between the predictor and a dichotomous outcome does not exist. When testing the correlations between a predictor and a dichotomous outcome, there is no way to measure how much the outcome varies because there are only two, discrete possibilities. The current study includes Cox &

Snell's R^2 and Nagelkerke's R^2 as approximate analogs that can be interpreted the same as an R^2 measurement in an OLS model.

When interpreting a logistic regression, it is necessary to ensure that the model fits the data properly, similar to OLS regression. This is generally referred to as assessing the goodness-of-fit. Goodness-of-fit can be tested many ways, but the current study uses the model Chi-square to assess fit. Chi-square measures the difference between the null-hypothesis model (that there is no relationship) and the model being tested. If the model Chi-square is significant, the model is a good fit for the data.

Table 13. Logistic regression models

	Model A: Base				Model B: Theoretical			
	Fear of crime and household gun ownership for total sample				Fear of crime and household gun ownership for total sample			
Independent variable	*B*	SE (*B*)	Wald	Exp (*B*)	*B*	SE (*B*)	Wald	Exp (*B*)
Constant	-1.923**	0.483	15.827	0.146	-2.305**	0.528	19.062	0.100
Age	-0.002	0.009	0.046	0.998	-0.003	0.010	0.076	0.997
Income	0.000	0.000	0.137	1.000	0.000	0.000	0.094	1.000
Gender	0.645**	0.242	7.077	1.906	0.695**	0.253	7.573	2.004
South	0.264	0.319	0.681	1.302	0.292	0.328	0.791	1.339
Rural	0.769**	0.264	8.478	2.158	0.775**	0.271	8.164	2.170
Race	0.693*	0.339	4.182	1.906	0.703*	0.349	4.050	2.019
Property crime victimization					0.823**	0.257	10.242	2.278
Violent crime victimization					-0.407	0.340	1.436	0.666
Fear					0.207	0.129	2.579	1.230
X^2	23.63				38.67			
df	6				9			
p	<0.01				<0.01			
Cox & Snell R^2 (Nagelkerke R^2)	0.063 (0.089)				0.101 (0.143)			

*. $p<0.05$; **. $p<0.01$

When comparing models for logistic regression to determine overall goodness-of-fit, there are several methods through which this can be done. The current study uses a X^2 model comparison to determine whether one model is a better fit than another. This can

be done by visually assessing the statistics for this test. The model with a higher X^2 value and a lower *p*-value is generally a better fit for the data. The theoretical model was a significant improvement over the base model (X^2=38.67, df=9, p<0.01) when examining the total sample. The base model was able to account for approximately 6.3% to 8.9% of the variation in the outcome, while the theoretical model was able to account for approximately 10.1% to 14.3% of the variation in the outcome variable. In both models, gender, being raised in a rural community, and race are significant predictors of gun ownership. When victimization variables were included in the theoretical model, property crime victimization was also a significant predictor of gun ownership. However, the constant is significant in both the base and theoretical models, similar to the OLS models. Adding victimization and fear further confounds the model, despite adding to the explanation of the outcome.

The odds ratio is calculated by raising *e* (the natural log) to the coefficient of each variable. Negative relationships, or decreased odds of an event occurring, are identified by an odds ratio of less than one. Positive relationships are identified by an odds ratio of greater than one. If the odds ratio is equal to 1, no relationship exists. In the base model, the odds of a male respondent being a gun owner is 1.906 times greater than female respondents. Respondents are 2.158 times more likely to own a gun if they were raised in a rural community and white respondents are 1.906 times more likely to own a gun than a respondent that identifies as a racial minority.

In the theoretical model, the odds ratios are similar to those in the base model. The odds that a male respondent owns a firearm are 2.004 times greater than female respondents. Respondents raised in a rural community and white respondents are

approximately 2 times more likely to own a firearm than those raised in a suburban or urban community (Exp(B)=2.170) or minority respondents (Exp(B)=2.019), respectively. Property crime victimization became a significant predictor in the theoretical model. Respondents who had ever been victims of property crime were 2.278 times more likely to own a firearm than those who had not been victims of property crime. The odds of a respondent owning a firearm are 1.230 times greater if the respondent indicated that he or she feared crime, but this is not a significant relationship. In both models, income and being raised in the South had no effect on the likelihood that a respondent owned a firearm.

Table 14. Logistic regression models males only

	Model A: Base				Model B: Theoretical			
	Fear of crime and gun ownership in males				Fear of crime and gun ownership in males			
Independent variable	*B*	SE (*B*)	Wald	Exp (*B*)	*B*	SE (*B*)	Wald	Exp (*B*)
Constant	-0.409	0.583	0.492	0.664	-0.866	0.631	1.884	0.420
Age	-0.013	0.012	1.193	0.987	-0.017	0.013	1.627	0.984
Income	0.000	0.000	0.675	1.000	0.000	0.000	0.575	1.000
South	-0.036	0.440	0.007	0.965	0.035	0.457	0.006	1.035
Rural	1.076**	0.365	8.699	2.933	1.062**	0.375	8.006	2.891
Race	0.216	0.428	0.255	1.242	0.372	0.452	0.679	1.451
Property crime victimization					0.871*	0.349	6.237	2.390
Violent crime victimization					-0.041	0.465	0.008	0.960
Fear					0.162	0.172	0.882	1.176
X^2	10.880				19.633			
df	5				8			
p	0.054				<0.05			
Cox & Snell R^2 (Nagelkerke R^2)	0.056 (0.077)				0.099 (0.135)			

*. $p<0.05$; **. $p<0.01$

When examining males only, the base model was able to account for approximately 5.6% to 7.7% of the variation in the outcome variable. The theoretical

model was able to account for approximately 9.9% to 13.5% of the variation in the outcome variable. In both models, rural socialization was a significant predictor of gun ownership. Similar to the aggregate sample models, property crime victimization became a significant predictor in the theoretical models. The results of the X^2 comparison test indicate that the theoretical model again was a better fit for the data (X^2=19.633, df=8, $p<0.05$).

In the base model, the odds of a male respondent being a gun owner are 2.933 times greater if he was raised in a rural community. These odds decreased slightly in the theoretical model. The odds of a male respondent being a gun owner increased by 2.891 if he was raised in a rural community. The odds of a male respondent being a gun owner are 2.390 times greater if he had ever been a victim of property crime. Again, income had no effect on gun ownership. While it was not significant, the odds of a male respondent being a gun owner are only 1.035 times greater if he was raised in the South. Being from the South has traditionally been a significant predictor of gun ownership and should contribute significantly to the explanation of gun ownership. The implications of this finding will be discussed in Chapter 5. The odds of being a gun owner increase nearly 2 times if the respondent indicated being afraid of crime, but fear was not a significant predictor of gun ownership.

Table 15. Logistic regression models females only

	Model A: Base				Model B: Theoretical			
	Fear of crime and gun ownership in females				Fear of crime and gun ownership in females			
Independent variable	*B*	SE (*B*)	Wald	Exp (*B*)	*B*	SE (*B*)	Wald	Exp (*B*)
Constant	-3.407**	0.867	15.448	0.033	-3.471**	0.915	14.388	0.031
Age	0.017	0.015	1.158	1.017	0.017	0.017	0.969	1.017
Income	0.000	0.000	0.058	1.000	0.000	0.000	0.014	1.000
South	0.638	0.475	1.800	1.892	0.630	0.492	1.635	1.877
Rural	0.497	0.407	1.488	1.643	0.482	0.423	1.300	1.620
Race	1.500*	0.639	5.512	4.482	1.407*	0.646	4.743	4.082
Property crime victimization					0.606	0.398	2.325	1.833
Violent crime victimization					-0.995	0.587	2.877	0.370
Fear					0.203	0.208	0.948	1.225
X^2	13.101				20.372			
df	5				8			
p	<0.05				<0.01			
Cox & Snell R^2 (Nagelkerke R^2)	0.072 (0.109)				0.110 (0.167)			

*. $p<0.05$; **. $p<0.01$

The base model in Table 16 accounted for approximately 7.2% to 10.9% of the variation in female gun ownership. The theoretical model was able to account for approximately 11.0% to 16.7% of the variation in female gun ownership. In both models, race was the only significant predictor of female gun ownership. In the X^2 comparison test, the theoretical model was a significant improvement over the base model (X^2=20.372, df=8, p<0.01).

When examining the base model, the odds of a female respondent owning a gun are 4.482 times greater for white female respondents. Similar to both the full sample models and the male-only models, income and being raised in the South had no effect on gun ownership in either the base model or the theoretical model. Additionally, rural socialization was no longer significant. When examining the theoretical model, the odds of a female respondent owning a gun are 4.089 times greater for white female

respondents. Property crime victimization was no longer a significant predictor of gun ownership, nor were being raised in a rural community, being raised in the South, or fear significant predictors of gun ownership for females. Being the victim of violent crime decreased the odds of females owning guns by nearly one-third, but violent crime victimization was not a significant predictor of female gun ownership. Fear, again, was not significant. Finally, the constant was significant again in the logistic regression models using the female subsample. The implications of these findings will be discussed in Chapter 5.

Chapter 5: Conclusions, Implications, and Future Research

Since the late 1950s, research has indicated that predictors of American gun ownership have remained generally unchanged (Azrael, Miller, & Hemenway, 2000; Ceslinka, 2007; Coyne-Beasley, 2012; Hepburn et al., 2007; Kleck, 1995; Kleck, 1997; Lott, 2010; Sheley et al., 1994). Typical gun owners are white, married, Southern males, who were raised in a rural community and socialized into the American gun culture by those around them. Most often gun owners will own for sporting purposes, such as hunting and target shooting, than for other purposes. These reasons are only seconded by owning a gun for protection. Previous research indicates that female gun ownership is often predicted similarly (Bugg & Yang, 2004; Smith & Smith, 1995). This research has found that female gun owners are often married, white, and Southern. They are similarly socialized into the American gun culture by males in their lives, including brothers, fathers, and significant others.

Fear of crime has been argued to be the result of gender-specific socialization (Goodey, 1997; Pain, 2001). Women are generally taught that they are weaker and less able to defend themselves. Women generally feel that they should be weary of strangers (despite studies that indicate that most victims are victimized by people that they know) (Pain, 2001) and that every encounter has the potential to escalate to sexual assault (Ferraro, 1996). Conversely, men are taught that they should be tough and are meant to serve in a protective role. Men are also more likely to be involved in crime as both the victim and the perpetrator (Truman & Langton, 2014).

Fear of crime and gun ownership are both sensitive to the social desirability bias. This means that respondents are more likely to indicate higher levels of fear or admit to

owning a firearm if it is socially acceptable for them to do so. Females are significantly more likely to have higher levels of fear, while males are significantly more likely to own firearms. Females or males violating these social norms are considered to be failing members of either gender. Women who own and shoot firearms are considered less feminine. Men are considered less masculine if they indicate that they are fearful of crime. More likely than not, it is these societal expectations that best explain the social desirability bias theory that drives reporting disparities in household gun ownership, and led to the creation of the lie scale to ensure that males are not understating their actual level of fear (Sutton & Farrall, 2005).

This study was meant to test the effect of gender-specific socializations on gun ownership through the interaction between fear of crime and gun ownership. Based on previous research that indicates the General Social Survey (GSS) question measuring fear of crime does not fully measure this concept, ten items measuring fear of crime were added to a survey in which the researcher participated. These ten items were then reduced to a single concept using a factor analysis.

The findings of the current study may indicate that reasons for gun ownership are changing (Pew Research Center, 2013; National Shooting Sports Foundation, 2012) and that not all gun owners conform to the traditional depiction of gun owners. With more gun owners indicating that they are owning firearms for protection (Pew Research Center, 2013), research should explore from what gun owners are protecting themselves. Currently, it is understood that the relationship between fear and gun ownership is reciprocal. Additionally, studies investigating this relationship are often criticized for methodological flaws. The current study argues that it may not be the methodologies that

are flawed, but rather the underlying theories of the studies. Because females are more likely to indicate that they are fearful of crime and are more likely to engage in protective behaviors, it would logically follow that fear would be a significant predictor of gun ownership for females. The current study explores the relationship between fear and gun ownership using gender-specific models that examine this relationship for males and females independently of each other to see if this relationship behaves differently in either gender. The following chapter includes a discussion of the major findings, implications of the results, limitations of the current study, and future research opportunities.

Discussion

The primary research question of the current study asked whether there was a difference in significant predictors between male and female gun ownership. Specifically, the researcher was investigating the role that fear of crime has when examining male and female gun owners with different models. The results of the logistic regression analysis indicate that there is a difference in significant predictors. Only rural socialization was a significant predictor for males, and only race was a significant predictor for females. Being raised in a rural area increased the odds of male gun ownership by nearly three times, while being a white female increased the odds of gun ownership by approximately four times. Fear of crime and victimization were not significant predictors of gun ownership. The constant was significant in both the gun ownership logistic regression models testing the total sample and the female subsample, indicating that some other unmeasured variable was contributing significantly to the explanation of gun ownership.

When examining the univariate statistics, the data support disparities identified in previous research (Legault, 2011; Ludwig, Cook, & Smith, 1998) between reported rates of gun ownership between men and women. When examining males, approximately 38% of households reported owning a firearm, while only approximately 26% of women admitted to household ownership. While the reason for this was not explored in the current study, this disparity still bears mentioning for its theoretical implications.

Much of the results of the preceding analysis were contradictory to previous research. In the bivariate analysis age was negatively correlated with fear of crime in all three analyses (total sample, male subsample, and female subsample). This contradicts previous research that indicates that as people age, they fear crime more, due to their decreased physical ability to defend themselves (Ortega & Myles, 1987). Variables that are traditionally strongly correlated with gun ownership, such as growing up in the South, growing up in a rural community, and race are generally weakly correlated with gun ownership. Growing up in a rural community is the only variable that is significantly and positively correlated with gun ownership.

Correlations can help determine which variables may be significant predictors of an outcome. This was true in the case of the victimization variables. Property crime was significantly and positively correlated with gun ownership in the bivariate analysis, and remained a significant predictor of gun ownership in the total sample theoretical model and the male subsample theoretical model. However, despite being significantly and positively correlated with gun ownership in the bivariate analysis, violent crime victimization was not a significant predictor of gun ownership.

Age was a significant predictor of fear of crime in each OLS model, in both the base and theoretical models for each of the three samples used in this study. In each model an inverse relationship was observed. Ortega and Myles (1987) found that older individuals were more likely to fear crime. While the reason for this is not explicitly stated, the theory that as individuals age, they are less physically able to defend themselves is a logical conclusion. The implication of this finding is discussed below. Gender was also found to be a significant predictor of fear in the total sample. This supports previous research that has found females to be significantly more likely to fear crime (De Groof, 2008; Gordon et al., 1980; LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006; Tomsich, Gover, & Jennings, 2011).

Finally, gender was a significant predictor of gun ownership in the model that used the total sample. This result was expected due to the male-domination of the American gun culture. Race and rural socialization were also significant predictors in the total sample. Race was not significant in the model using the male subsample. The results of the logistic regression analysis indicated that the odds that a male gun owner was white was approximately 1.5 times greater than a male gun owner who identified with a racial minority, but these results were not significant. Race has traditionally been found to be a significant predictor of gun ownership. It remains a significant predictor of female gun ownership. This is likely due to the fact that white males are more likely to own guns and are more likely to socialize females in their lives into the culture. Having been a victim of property crime increases the odds that a respondent will own a gun more than all other predictors in the total sample. In the models using the male subsample, being

raised in a rural community increased the odds of owning a firearm the most, but property crime was the only other significant predictor of gun ownership.

Implications

The results of the current study suggest that measuring the relationship between fear of crime and gun ownership may be more muddied than was originally believed. First, using the GSS question to measure fear of crime has been criticized by previous research as being ambiguous and an invalid measurement of a more complex theoretical concept (LaGrange & Ferraro, 1989). The survey items used in the current study were developed by LaGrange and Ferraro (1989) and May, Rader, and Goodrum (2010) to overcome the criticisms of the GSS questions and to better measure the full concept of fear of crime. By using a factor analysis, the researcher was able to determine that the survey items that were similarly ambiguous to the GSS question ("I am afraid to walk [in my neighborhood] alone at night," "It is not safe to walk alone," and "It is not safe to walk at night") and the questions that asked about specific victimization situations ("I am afraid of being murdered," or "I am afraid of being robbed," etc.) were clearly measuring two different concepts.

The three questions that are subject to the criticisms of the GSS questions are essentially asking the respondents about the same situation, but it does not capture the reason why the respondent indicates being more fearful. With so much left unexplained by using these survey items, it is logical to utilize the survey items that offer a better explanation of why the respondent is fearful. The survey items that present specific victimization situations indicate that respondents are clearly weary of becoming victimized during the commission of a crime. As was expected, gender significantly

predicted how fearful a respondent was. However, the constant was significant in all six OLS models, indicating that socialization and prior victimization do not fully explain why respondents are fearful of becoming the victim of a crime. While prior victimization reduced the coefficient of the constant in the total sample and male subsample OLS models, it further confounded the model for the female subsample. This implies that the explanation fear of crime may be more complex, or simply just fundamentally different, for women than it is for men. Previous research (LaGrange & Ferraro, 1989; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006) has suggested measuring fear using multiple components is the best way to fully measure the concept of fear of crime. These components include fear of victimization, perceived safety, perceptions of major crime, perceptions of neighborhood order, media exposure, defensive behaviors (beyond gun ownership), satisfaction with law enforcement, and asking respondents to indicate if the United States has a crime problem. It may be that variation within the response of the GSS question can be explained by these factors, but to test the relationship between fear and gun ownership, it may be beneficial to include variables measuring these components of fear in the theoretical model to help further explain fear and to fully measure why respondents indicate being fearful of criminal victimization.

Policy implications of fear of crime can lead to suggestions for reducing this fear (Warr, 2000). In the current study, fear has been found to have no effect on gun ownership, but that does not imply that the opposite is true. The mutually reinforcing relationship between fear and protective behaviors indicates that as fear increases, individuals are more likely to partake in protective behaviors. As they partake in protective behaviors, their fear will continue to increase in an endless cycle (Liska, et al.,

1988). The results of the study by Liska and colleagues (1988) indicate that encouraging individuals to partake in protective behaviors is actually counterproductive to controlling and reducing fear within a population. If partaking in protective behaviors adds to the fear experienced by an individual, encouraging participation in protective behaviors may not solve the fear of crime issue.

In the current study, fear is measured with items asking about specific crime types. A simple univariate analysis of each fear of crime item in the survey will allow policy makers to understand which crimes cause the most anxiety. This will get to the root cause of the fear and will help identify which criminal elements should be targeted to help reduce fear. When considering that the factor analysis completed for this study identified two underlying concepts, one of which was driven by the ambiguous questions about walking alone, walking at night, and walking alone at night, it appears that perhaps the underlying component is the fact that the questions are ominous, fear evoking, and ambiguous. However, it is implied that respondents should be considering how they would feel about walking alone at night in their own neighborhoods. This indicates that they do not feel safe within their neighborhoods. It may not necessarily be other neighbors who cause this anxiety, but the idea that a stranger could be lurking nearby (the concept of "stranger danger"). Policy makers should acknowledge that this may related to the physical characteristics of the neighborhood itself that are fear inducing, not just to crime rates themselves. Using elements of environmental design theories, identifying the elements of the environment that are the most fear invoking, policies could address the environmental design issues and seek to improve them, thus reducing fear of crime.

When examining gun ownership and fear of crime, legal gun ownership potentially has a deterring effect on crime, which could, in turn, reduce levels of fear. Using Kennesaw, Georgia as a case study example, a 1982 town ordinance requires each household to own and maintain a firearm. The town saw a significant drop in crime rates, specifically burglary, which is attributed to this ordinance (McDowall, Lizotte, & Wiersema, 1991). The problem with implementing a similar policy in other communities is subject to the same cultural influences that create the social desirability bias. Communities that are less receptive to guns are likely to argue against such policies. An increased number of guns could potentially result in an increase of violent crimes.

Limitations

There are several limitations that should be mentioned to further explain the results of the preceding analyses. First, in Chapter 3, it was explained that previous research indicates that the MTurk worker sample is a representative sample of the population. However, the univariate statistics in Tables 2, 3, and 4, indicate that the sample is not representative. According to the most recent Census (2010) data, whites are over-represented in the survey sample. Additionally, this sample is slightly older and has an over-represented subsample of females. This reduces the ability to generalize the results of the study and may be the reason that traditional predictors of gun ownership were not significant in the logistic regression models.

Measuring fear of crime and gun ownership is inherently subject to reliability issues. As discussed above, the GSS question measuring fear of crime has been labeled as ambiguous and has been criticized for evoking an exaggerated fear response. It has also been criticized for attempting to measure an entire theoretical concept with one question.

Fear is also subject to a conditioned response based on the face-to-face interview format of the GSS. This response, the social desirability bias, is discussed in Chapter 2. Briefly, the social desirability bias indicates that respondents are likely to answer survey questions based on what is socially acceptable, not what is actually true. This means that males are more likely to understate their level of fear. By asking multiple questions that address the entire concept of fear of crime, researchers are able to better measure this concept. The current study addresses fear as it relates to crime and the fear of becoming a victim, but previous research indicates that fear of crime is more complex than just the fear of victimization. Fear of crime can also be measured using questions regarding protective behaviors and socialization as it relates to gender stereotypes and media exposure. While the survey format for the current study was not a face-to-face interview, previous research indicates that surveys that are not face-to-face are also subject to a similar bias (Sutton & Farrall, 2005).

Gun ownership is subject to the same bias as fear of crime. Legault (2011) and Ludwig, Cook, and Smith (1998) found disparities between male and female respondents in the reported numbers of households that own guns. The results of their studies indicated that women were likely to underreport household gun ownership and attributed this to the social desirability bias. The univariate statistics in the current study indicate that there is a small disparity in household gun ownership when each variable was examined for males and females separately. This creates a similar limitation that previous studies have encountered due to the effects of the social desirability bias. In a meta-analysis of studies comparing traditional survey methods with computer-based survey methods, Dodou and de Winter (2014) indicated that previous meta-analyses found,

historically, computer-based surveys resulted in lower levels of an observed social desirability bias. In their own meta-analysis, they found that in computer-based surveys that included sensitive questions, e.g. household gun ownership questions, respondents were significantly more likely to answer with socially desirable answers than respondents who were taking a paper-based survey. Modern computer users are likely to be more aware of the ability researchers have to track them through IP addresses and may answer according to what is socially acceptable in the community in which they live. Social desirability creates issues when attempting to reliably measure sensitive subjects such as gun ownership because it causes respondents to answer according to what they believe is the socially accepted response. In the current study, respondents indicated that approximately 32% of households had guns, but when looking specifically at males, this statistics increased to nearly 38%, while women indicated that approximately 26% of households owned at least one firearm.

Finally, the survey utilized cross-sectional data. While regression analyses are used to determine the probability that one variable can predict another, they are less effective when research is attempting to identify a causal relationship. One of the primary criticisms of most research measuring the relationship between fear and gun ownership is that it utilizes cross-sectional data rather than longitudinal data, which is better at explaining causal relationships.

Future Research

The future research opportunities described here are meant to improve upon the limitations listed above, including issues with measurement, sampling, and methods. Because previous research, including the current study, has been unable to identify a

causal relationship between fear of crime and gun ownership, future research would benefit from the use of longitudinal data. Many studies attempting to identify a causal relationship between fear and gun ownership often use cross-sectional data to attempt to do so (Hemenway, Solnik, & Azrael, 1995; Hill, Howell, & Driver, 1985; Marciniak & Loftin, 1991; Young, McDowall, & Loftin, 1987). Longitudinal studies are more beneficial in determining causality because they show the change from one point in time to the next (Bachman & Schutt, 2014). In using longitudinal data, researchers are better able to identify whether fear precedes gun ownership or vice versa.

Fear of crime research may also benefit from the continued use of multiple survey items measuring fear of crime. Multiple survey items allow researchers to better measure a theoretical concept, such as fear of crime. Using analyses such as a factor analysis allow researchers to reduce these multiple items to a single item by creating a scale to measure theoretical concepts. When conducting the factor analysis for the current study, the ten items clearly measured two distinct concepts (Table 5). However, when these two variables were included in a bivariate analysis, they were significantly and very strongly correlated. This indicates that it may be the language of the question that does in fact guide how a respondent responds to questions about fear of crime. Seven of the ten items included in the fear of crime questions asked about specific fears and eliminated some of the ambiguous language for which the GSS fear of crime question is criticized. The last three items were more ambiguous, implicated that the respondent was alone and defenseless, places the respondent in a situation they are not likely to routinely be in, and is likely to evoke an exaggerated level of fear. These are likely to elicit different types of emotional responses from the respondent. Future research could identify which elements

best predict fear of crime, and in turn best measure the full concept of fear. Future research could also identify questions that may help understand and explain fear of crime as a theoretical concept in addition to those used in the current study, including questions regarding protective behaviors and questions measuring the effect that socialization has on fear of crime.

The current study uses a measurement of household gun ownership to measure respondent's gun ownership. Previous research and the current study show that there is a marked disparity in the reported numbers of household gun ownership between male and female survey respondents. Legault (2011) determined that males are more likely to be truthful, while females are likely to improperly underreport firearms in the household. This then results in improperly measured rates of household gun ownership. Additionally, when asking survey participants about household gun ownership, there is a possibility that the firearms they are reporting are not the respondents' personal firearms. This can create issues connecting personal reasons for firearms ownership to household firearms ownership.

Household ownership measures firearms ownership by household and is a different measurement than personal gun ownership. The survey participant may not personally own a firearm. Since fear of crime may be an individual, emotional response to the participant's surroundings or environment, researchers compare this individual-level measurement with a broader case-level measurement. If the personal gun owner is not asked about their individual fear of crime, it will become difficult to understand why they own firearms. It can be derived from ownership studies by the Pew Research Center (2013) and the National Shooting Sports Foundation (2012) that indicate more gun

owners are owning for protection than what was previously reported, that this is driven from fear of personal harm. Without asking individual gun owners themselves about why they own a firearm, the relationship could potentially remain obfuscated by how previous studies have measured both of these concepts. In other words, a survey respondent may indicate that he or she is fearful of crime and that someone (other than the respondent) owns a firearm. The respondent's level of fear may have no effect on the other individual's reason for owning a firearm.

It is not necessary to do away with the question of household gun ownership (this will still allow for the measurement of the number of households that have firearms), but future research could focus more on personal ownership. This would solve some issues with using household gun ownership as a measurement of gun ownership when attempting to identify fear as a significant predictor of personal gun ownership. Disparities would still exist. This is due to the fact that some gun owners may still refuse to answer questions about gun ownership, but this would solve some issues with understanding gun ownership and identifying significant predictors of gun ownership that may not have been previously identified. To overcome issues with the social desirability bias, researchers could employ lie scales (Sutton & Farrall, 2005) in their surveys to measure household gun ownership more accurately.

Future research could measure the same relationship between gun ownership and fear, but using gun ownership as a predictor of fear. While a study such as this may result in similar, non-significant results, it would further support the need to utilize different methods of identifying a causal relationship between fear and gun ownership.

Finally, the current study only examines legal gun ownership. It does not consider illegal gun ownership. While measuring illegal gun ownership is subject to potentially more issues than measuring legal gun ownership, illegal gun ownership is likely to contribute to the understanding of the relationship between fear and gun ownership as well. Kennedy (2011) indicated that young black males owned firearms in urban areas more often to prevent themselves from becoming a victim. Future research could focus on identifying significant predictors of gun ownership in urban areas.

Conclusions

The current study has determined that traditional predictors of fear of crime and gun ownership may not be significant predictors of these behaviors, or that the relationship between these predictors and outcomes are opposite of what previous research has identified. This may be a result of the population from which the sample was derived. While MTurk has been found to be a representative sample, the average level of education of the sample was higher than the national average. The current study has identified that fear of crime is not a significant predictor of gun ownership and emphasizes that the traditionally significant predictors of gun ownership may be evolving.

References

Azrael, D., Miller, M., & Hemenway, D. (2000). Are household firearms stored safely?: It depends on who you ask. *Pediatrics, 106*(3), e31-e31.

Bachman, R., & Schutt, R.K. (2014). *The practice of research in criminology and criminal justice, 5th ed.* Thousand Oaks, CA: SAGE Publications, Inc.

Bankston, W.B., & Thompson, C.Y. (1989). Carrying firearms for protection: A causal model. *Social Inquiry, 59*(1), 75-87.

Bigelow, C. (2013). Why female gun ownership is up 77% since 2005. Retrieved January 23, 2015, from http://townhall.com/columnists/celiabigelow/2013/02/27/why-female-gun-ownership-is-up-77-since-2005-n1521739/page/full

Blair, M.E., & Hyatt, E.M. (1995). The marketing of guns to women: Factors influencing gun-related attitudes and gun ownership by women. *Journal of Public Policy & Marketing, 14*(1), 117-127.

Bordua, D.J., & Lizotte, A.J. (1979). Patterns of legal firearms ownership: A cultural and situational analysis of Illinois counties. *Law & Policy Quarterly, 1*(2), 147-175.

Branscombe, N.R., & Owen, S. (1991). Influence of gun ownership on social inferences about women and men. *Journal of Applied Social Psychology, 21*(19), 1567-1589.

Bugg, D., & Yang, P.Q. (2004). Trends in women's gun ownership, 1973 – 2002. *International Journal of Comparative and Applied Criminal Justice, 28*(2), 169-188.

Buhrmester, M., Kwang, T., & Gosling, S.D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on Psychological Science, 6*(1), 3-5.

Callanan, V.J. (2012). Media consumption, perceptions of crime risk and fear of crime: Examining race/ethnic differences. *Sociological Perspectives, 55*(1), 93-115.

Ceslinka, K. (2007). Individualism and collectivism in America: The case of gun ownership and attitudes toward gun control. *Sociological Perspectives, 50*(2), 229-247.

Cohen, D., & Nisbett, R.E. (1994). Self-protection and the culture of honor: Explaining southern violence. *Personality and Social Psychology Bulletin, 20*(5), 551-567-.

Cohen, D., Nisbett, R.E., Bowdle, B.F., & Schwarz, N. (1996). Insult, aggression, and the southern culture of honor: An "experimental ethnography". *Journal of Personality and Social Psychology, 70*(5), 945-960.

Cooke, C.A., & Puddifoot, J.E. (2000). Gun culture and symbolism among United Kingdom and United States women. *The Journal of Social Psychology, 140*(4), 423-433.

Copes, H., et al. (2014). The lost cause?: Examining the Southern Culture of Honor through defensive gun use. *Crime & Delinquency, 60*(3), 356-378.

Coyne-Beasley, T., et al. (2012). Disparities in firearms ownership and storage practices in North Carolina. *Southern Medial Journal, 105*(4), 225-230.

Cytrynbaum, P. (1982). What's new in gun manufacturing?: A drive to woo women – And invigorate sales. *The New York Times.*

DeFronzo, J. (1979). Fear of crime and handgun ownership. *Criminology, 17*(3), 331-339.

De Groof, S. (2008). And my mama said: The (relative) parental influence on fear of crime among adolescent girls and boys. *Youth Society, 39*(3), 267-293.

Diener, E., & Kerber, K.W. (1979). Personality characteristics of American gun-owners. *The Journal of Social Psychology, 107*, 227-238.

Dobbs, R.R., Waid, C.A., & Shelley, T.O. (2009). Explaining fear of crime as fear of rape among college females: An examination of multiple campuses in the United States. *International Journal of Social Inquiry, 2*(2), 105-122.

Dodou, D., & de Winter, J.C.F. (2014). Social desirability is the same in offline, online, and paper surveys: A meta-analysis. *Computers in Human Behavior, 36,* 487-495.

Felson, R.B., & Pare, P.P. (2010). Gun cultures or honor cultures?: Explaining regional and race differences in weapon carrying. *Social Forces, 88*(3), 1357-1378.

Fenimore, D., & Hendrix, N. (unpublished). Examining the Role of Fear of Crime and Gun Ownership with Gender Specific Models.

Ferraro, K.F. (1996). Women's fear of victimization: Shadow of Sexual Assault?. *Social Forces, 75*(2), 667-690.

Fisher, B.S., & Sloan, J.J. (2003). Unraveling the fear of victimization among college women: Is the "shadow of sexual assault hypothesis" supported?. *Justice Quarterly, 20*(3), 633-659.

Gainey, R., Alper, M., & Chappell, A.T. (2011). Fear of crime revisited: Examining the direct and indirect effects of disorder, risk perception, and social capital. *American Journal of Criminal Justice, 36*(2), 120-137.

Gastil, R.D. (1971). Homicide and a regional culture of violence. *American Sociological Review, 36*(3), 412-427.

Glaeser, E.L., & Glendon, S. (1998). Who owns guns?: Criminals, victims, and the Culture of Violence. *The American Economic Review, 88*(2), 458-462.

Goodey, J. (1997). Boys don't cry. *British Journal of Criminology, 37*(3), 401-418.

Gordon, M.T., et al. (1980). Crime, women, and the quality of urban life. *Signs, 5*(3), S143-S160.

Hauser, W., & Kleck, G. (2013). Guns and fear: A one-way street?. *Crime & Delinquency, 59*(2), 271-291.

Hemenway, D. (1997). Survey research and self-defense gun use: An explanation of extreme overestimates. *Journal of Criminal Law & Criminology, 87*(4), 1430-1445.

Hepburn, L., Miller, M., Azrael, D., & Hemenway, D. (2007). The US gun stock: Results from the 2004 national firearms survey. *Injury Prevention, 13*, 15-19.

Hill, G.D., Howell, F.M., & Driver, E.T. (1985). Gender, fear, and protective handgun ownership. *Criminology, 23*(3), 541-552.

IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.

Johnson, P. (1989). Women are buying guns; 'Biggest reason is fear of crime'; 'I feel more secure having a fun around'. *USA Today.*

Jones, C., Cantlon, G., & Slee, A. (1989). Gun makers target women in new sales drive; Women's role. *The Sun Herald.*

Kaplan, M.S., & Geling, O. (1998). Firearm suicides and homicides in the United States: Regional variation and patterns of gun ownership. *Social Science & Medicine, 46*(9), 1227-1233.

Karp, A. (2007). *Completing the count: Civilian firearms*. Geneva: Small Arms Survey 2007: Guns and the City.

Kennedy, D.M. (2011). *Don't shoot: One man, a street fellowship, and the end of violence in inner-city America.* New York, NY: Bloomsbury, USA.

Kleck, G. (1991). *Point blank: Guns and violence in America*. New York, NY: Aldine de Gruyter.

Kleck, G. (1997). *Targeting guns: Firearms and their control.* New York, NY: Aldine de Gruyter.

Kleck, G., & Gertz, M. (1995). Armed resistance to crime: The prevalence and nature of self-defense with a gun. *Journal of Criminal Law and Criminology, 86*(1), 150-187.

Kleck, G., & Gertz, M. (1998). Carrying guns for protection: Results from the National Self-Defense Survey. *Journal of Research in Crime and Delinquency, 35*(2), 193-224.

LaGrange, R.L., & Ferraro, K.F. (1989). Assessing age and gender differences in perceived risk and fear of crime. *Criminology, 27*(4), 697-719.

LaGrange, R.L., Ferraro, K.F., & Supancic, M. (1989). Perceived risk and fear of crime: Role of social and physical incivilities. *Journal of Research in Crime and Delinquency, 29*(3), 311-334.

La Valle, J.M. (2013). "Gun control" vs. "Self-protection": A case against the ideological divide. *Justice Policy Journal, 10*(1), 1-26.

Legault, R.L. (2011). Reporting error in household gun ownership in the 2000 General Social Survey. *Crime & Delinquency, 59*(6), 811-836.

Liska, A.E., Sanchirico, A., & Reed, M.D. (1988). Fear of crime and constrained behavior specifying and estimating a reciprocal effects model. *Social Forces, 66*(3), 827-837.

Lizotte, A.J., & Bordua, D.J. (1980). Firearms ownership for sport and protection: Two divergent models. *American Sociological Review, 45*(2), 229-244.

Lizotte, A.J., Bordua, D.J, & White, C.S. (1981). Firearms ownership for sport and protection: Two not so divergent models. *American Sociological Review, 46*(4), 499-503.

Lott, J.R. (2010). *More guns, less crime: Understanding crime and gun control laws,* 3rd ed. Chicago, IL: The University of Chicago Press.

Ludwig, J., Cook, P.J., & Smith, T.W. (1998). The gender gap in reporting household gun ownership. *American Journal of Public Health, 88*(11), 1715-1718.

Marciniak, L., & Loftin, C. (1991). Measuring protective handgun ownership. *Criminology, 29*(3), 531-540.

Marcus, F.F. (1981). Spurred by fear, more and more women learn how to use guns. *The New York Times.*

May, D.C., Rader, N.E., & Goodrum, S. (2010). A gendered assessment of the threat of victimization: Examining gender differences in fear of crime, perceived risk, avoidance, and defensive behaviors. *Criminal Justice Review, 35*(2), 159-182.

McDowall, D., Lizotte, A.J., & Wiersema, B. (1991). General deterrence through civilian gun ownership: An evaluation of the quasi-experimental evidence. *Criminology, 29*(4), 541-559.

National Shooting Sports Foundation, Inc. (2012). Consumer handgun ownership report 2011

Ortega, S.T., & Myles, J.L. (1987). Race and gender effects on fear of crime: An interactive model with age. *Criminology, 25*(1), 133-152.

Pain, R. (2001). Gender, race, age and fear in the city. *Urban Studies, 38*(5-6), 899-913.

Paolacci, G., Chandler, J., & Ipeirotis, P.G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making, 5*(5), 411-419.

Pew Research Center. (2013). Why own a gun? Protection is now the top reason.

Pulitzer, L.B. (1992). Women bearing firearms increasing. *The New York Times.*

R Core Team. (2015). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.com.

RStudio Team. (2012). RStudio: Integrated Development for R. RStudio, Inc., Boston, MA. http://www.rstudio.com.

Schafer, J.A., Huebner, B.M., & Bynum, T.S. (2006). Fear of crime and criminal victimization: Gender-based contrasts. *Journal of Criminal Justice, 34*, 285-301.

Sheley, J.F, Brody, C.J., Wright, J.D., & Williams, M.A. (1994). Women and handguns: Evidence from national surveys, 1973-1991. *Social Science Research, 23*, 219-235.

Small, M. (2001). “Rural life today: Defining “Rural.”.

Smith, T.W., & Smith, R.J. (1995). Changes in firearms ownership among women, 1980-1994. *Journal of Criminal Law and Criminology, 86*(1), 133-149.

Sutton, R.M., & Farrall, S. (2005). Gender, socially desirable responding and the fear of crime: Are women really more anxious about crime?. *British Journal of Criminology, 45*, 212-224.

Thomas, P. (1994). Fear impels more women to buy guns; Opponents say NRA seeks to capitalize. *The Washington Post.*

Tomsich, E.A., Gover, A.R., & Jennings, W.G. (2011). Examining the role of gender in the prevalence of campus victimization, perceptions of fear and risk of crime, and the use of constrained behaviors among college students attending a large urban university. *Journal of Criminal Justice Education, 22*(2), 181-202.

Truman, J.L., & Langton, L. (2014). Criminal Victimization, 2013. Bureau of Justice Statistics.

van Kesteren, J.N. (2013). Revisiting the gun ownership and violence link: A multilevel analysis of victimization survey data. *British Journal of Criminology,* atz052.

Walker, J.T., & Madden, S. (2009). *Statistics in criminology and criminal justice: Analysis and interpretation,* 3rd ed. Sudbury, MA: Jones & Bartlett Publishers, LLC.

Warr, M. (2001). Fear of crime in the United States: Avenues for research and policy. *Criminal Justice, 4*(4), 451-489.

Woolnough, A.D. (2009). Fear of crime on campus: Gender differences in use of self-protective behaviors at an urban university. *Security Journal, 22*(1), 40-55.

Wright, K.B. (2005). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software

packages, and web survey services. *Journal of Computer-Mediated Communications, 10*(3), 00.

Young, R.L., McDowall, D., & Loftin, C. (1987). Collective security and the ownership of firearms for protection. *Criminology, 25*(1). 47-62.