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Close Range: Adolescent Predictors of Adult Firearms Ownership in the United States

Michael A. Cretacci¹

SUNY-Buffalo State, United States of America / Jiangnan University Law School, China

Nicole Hendrix²

Radford University, United States of America

Abstract

The goal of this study was to assert that gun ownership in the United States is partially explained by the transmission of a “gun culture” from one generation to the next. Using longitudinal data from the highly-regarded National Longitudinal Study of Adolescent to Adult Health, we also make a contribution to the dated nature of the literature on the predictors of adult firearms ownership. This paper examines a model of adult gun ownership that includes measures of adolescent firearms access, the presence of adult males in the household, rural residency, age, race, and gender. Generally, adolescents who are African American, male, and living in rural areas were more likely to live in homes with firearms at Waves One and Two. Adolescents living in rural areas also demonstrated the likelihood of owning firearms as adults at Wave Three. As expected, access to firearms at Wave One increased the likelihood of access at Wave Two. Living with an adult male at Wave One had no effect on adolescent access to guns at Wave Two or Wave Three adult ownership. Adolescent access to guns at Waves One and Two increased the likelihood that they would own firearms as adults. Adolescent access to guns at Waves One and Two increased the likelihood that they would own firearms as adults at Wave Three. Findings suggest that cultural experiences surrounding gun ownership as adolescents increases the likelihood that firearms are owned as adults.

Keywords: Firearms, Gun Ownership, Guns, Gun Control, Firearms Policy.

Introduction

This investigation addresses the adolescent predictors of adult firearms ownership in the United States. In addition, we also document the process many previous studies have examined regarding gun ownership and theoretically expand upon those inquiries. Though not a new area of inquiry, this study is also relevant because it makes a number of important contributions to this body of literature. First, we present the notion that gun ownership in the U.S. is somewhat dependent upon the transmission of interests and involvement in firearms issues and activities from one generation to the next. This

¹ Associate Professor of Criminal Justice, SUNY-Buffalo State, Buffalo, NY, USA. E-mail: cretacma@buffalostate.edu. Special Guest Professor, Jiangnan University Law School, Wuhan, Hubei, China.

² Professor and Graduate Coordinator of Criminal Justice, Radford University, Radford, VA, USA. E-mail: pnhendrix@radford.edu.

participation in the gun culture may result in the passing of gun ownership from one generation to the next. Second, we utilized data collected by the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationwide sample of American high school students and their families. This particular contribution allows us to draw conclusions about the predictors of adult firearms ownership that apply to American society at large. Third, the study reviews the research on the predictors of adult gun ownership and because this area of inquiry is underdeveloped and dated, it serves as a call for renewed investigation. This is especially the case since a number of comprehensive data sets now exist that can be exploited to address the predictors of gun ownership. Finally, we believe this study to be a timely piece of research given the recent occurrences of mass gun violence in various locations in the United States and throughout the world. Within that context, gun violence can be understood more broadly by social science as a whole, if we can explain why individuals choose to own firearms in the first place.

Utilizing three-waves of longitudinal data obtained from the National Longitudinal Study of Adolescent to Adult Health (Add Health), we test a model that exploits the effect of having firearms in the home as an adolescent to predict the likelihood of owning firearms as an adult. Measures included here such as race, gender, age, rural residence, and the presence of an adult male in the household, are those that have been used previously in gun ownership research. We hypothesize that these experiences may increase the exposure of individuals to firearms at earlier ages and therefore, their perception of firearms as adults may be more positive. As a result, these types of individuals will be more likely to own firearms as adults (Bordua & Lizotte 1979; Cao, Cullen, & Link, 1997; Dixon & Lizotte, 1987; DuRant et al., 2007; Kleck 1997; Lizotte & Bordua, 1980; Lizotte, Bordua, & White, 1981; Smith & Uchida, 1988).

Literature Review

1. Culture and Transmission of Adult Firearms Ownership in the United States

As individuals in other countries relinquish their guns, Americans grasp them tightly. As policy makers respond to tragic events, perhaps understanding the culture of gun ownership will help to explain the occurrence of those same events, perhaps without reducing access to firearms for law abiding adults. The United States ranks first among civilian ownership with 88.8 firearms per 100,000 citizens (Small Arms Survey, 2007). In recent years, reports of reductions in gun ownership (Klein, 2012; Lauter, 2012) nationwide have circulated in contrast to indicators that gun sales have skyrocketed (Holmes, 2013; Matheny, 2013). The General Social Survey (2010) found that about one-third of Americans had a gun in their homes. For the following year, the 2011 Gallup Poll (2012) found that 43 percent of Americans indicated gun ownership. These seemingly confusing and conflicting findings result from the challenging nature of studying gun ownership. While the ideas presented here are not new, their articulation in a theoretically complete manner is needed. Researchers often ask individuals about their personal firearms ownership patterns and then also identify the likelihood that households contain firearms. For many in our society, these outcomes lead to questions about the path that motivates individuals to own firearms. Understanding the cultural characteristics that precede adult gun ownership and the differences in adolescent access to firearms, may help us understand the implications of firearms related policies. We recognize that many individuals lawfully own firearms and therefore, we wish to make it clear that this paper is

not intended as an indictment of such ownership. We simply desire to more clearly explain the manner in which gun ownership, like many other human behaviors, is passed from one generation to the next.

Firearms ownership is part tradition and part situation in the United States. Many Americans own firearms to participate in related sports and hunting, while others own for protection. Research on legal ownership has often relied on self-report data from gun owners using surveys and interviews and these studies have found the characteristics of gun owners to be consistent. Three of their most important traits are gender, residential location, and income level. For example, males are more likely to own firearms. Relatedly, investigators have also pointed out that households comprised only of males are more likely to report owning guns (Bordua & Lizotte, 1979; Cao et al., 1997; Cook & Smith, 1998; Dixon & Lizotte, 1987; DuRant et al., 2007; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Ludwig, Cook, & Smith, 1998; Ruback, Shaffer, & Clark, 2011; Smith & Uchida, 1988; Wright, Rossi, & Daly, 1983). Further, rural households and those with higher incomes are also more likely to have firearms than are urban or lower income households (Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua 1980; Lizotte et al., 1981; Ludwig et al., 1998; Smith & Uchida 1988; Wiktor et al., 1994; Wright et al., 1983).

Additionally, race, class, and age also appear to have significant impacts on the cultural transmission of firearms ownership. Specifically, Whites are more likely to own than minorities, as are the upper middle to upper class (Bordua & Lizotte, 1979; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Ruback et al., 2011; Smith & Uchida, 1988; Wiktor et al. 1994; Wright et al., 1983). Also, middle aged and older individuals are more likely to own firearms than are younger adults (Bordua & Lizotte, 1979; Cao et al., 1997; Kleck, 1997; Dixon & Lizotte, 1987; Lizotte & Bordua, 1980; Lizotte et al., 1981; Wright et al., 1983). While these traits are important for this cultural model of gun ownership, one of the most influential relationships in the gun ownership literature is that between adolescent exposure to firearms and their ownership of firearms as adults.

In fact, research consistently reports that adolescents who grew up in gun households are far more likely to own firearms than those who do not (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Ruback et al., 2011; Smith & Uchida, 1988; Wright et al., 1983). It is our position that stable findings regarding this characteristic of gun ownership indicate the “cultural transmission” of gun ownership to future generations. In other words, these findings suggest that adults that teach children about guns influence the future ownership patterns of those that they teach. One way of explaining this is that family members may share gun hobbies, views, and responsibilities with one another. Parents may also take children hunting or target shooting and introduce them to guns in a way that creates a positive experience within the family, which encourages the continuation of the hobby or lifestyle (Kleck, 1997; Reed, 1986). In part, the familiarity that individuals gain from these experiences may increase their positive definitions about firearms and increase the likelihood that they will own guns as adults. Growing up in a gun household may also involve teaching and training about firearms. Such an environment may also expose children and adolescents to guns in a way that shows them how to think and behave around firearms. This training socializes children about guns in ways that many non-gun owners would see as foreign and which serves to entrench children in the gun culture.

The stability of findings with regard to other characteristics associated with gun ownership also suggests that gun exposure occurs in predictable patterns across generations. Historically, the research is consistent about who own guns and the type of guns that are owned. Part of that assertion flows from Kleck's (1997) analysis of Wright, Rossi and Daly's *Under the Gun* (1983), which examined surveys of gun ownership from 1973 through 1987. Kleck (1997) further argued that none of the associations between the variables changed over time and that those patterns were constant. We assert that this stability and consistency across the demographic characteristics of those most likely to own guns over such long periods of time, indicates the transmission of gun hobbies, views, and behaviors across generations (p. 71).

The current research also examines the availability of firearms in the household early in the individual's life as a predictor of ownership later in adulthood. We believe that such a relationship may be indicative of a passing of culture from parent to child and implies the cultural connection to firearms noted by Kleck (1997). Culture socializes individuals about how to behave, think, feel and converse in the world around them. This process often occurs in intimate settings, such as within families, and between peers. At the heart of this research are questions about the socialization of gun owners. Understanding the functioning of these relationships may aid in the crafting of policy to reduce firearms violence and death and improve the understanding of the role of gun ownership within the culture of America. However, doing so requires a broader examination of culture and how it is transmitted generally to future generations.

2. Culture and Household Transmission of Adult Firearms Ownership

According to Tylor (1871), culture is "that complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired...as a member of society" (p. 1). Culture has also been more broadly defined by Kroeber and Kluckhohn (1952) as the "patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts" (p. 181). Generally speaking, Hofstede (1984) suggests that culture is the "collective programming of the mind which distinguishes the members of one category of people from another" (p. 51). Culture defines groups and helps to identify the boundaries of behavior and expectations between groups. In many ways, culture gives identity and solidarity to those within groups.

These definitions of culture can logically impact how the ownership of firearms might be passed from one generation to the next and many of the same concepts have been found in the literature predicting gun ownership (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Smith & Uchida, 1988; Wright et al., 1983). These references to culture are typically connected to family groups and the nature of areas where individuals become adults (Cunningham et al., 2000). It is these experiences that we believe result in the transmission of generational "gun culture" regarding firearms ownership. Researchers have identified several variables which serve as indicators of the cultural theory: gender, race, living in a rural area, and the presence of others who can transmit the culture to others. Most often the research has looked at the presence of firearm owning parents (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; DuRant et al., 2007; Ludwig et

al., 1998; Kleck, 1997; Lizotte & Bordua 1980; Lizotte et al., 1981; Smith & Uchida, 1988).

The first concept that we hypothesize to influence owning a gun as an adult is the availability of firearms in the home when individuals are adolescents. Growing up in a house where firearms are present or available may increase the likelihood that individuals come into contact with firearms, participate in gun related activities, and should increase positive perspectives associated with guns. These experiences should all result in a higher likelihood that such an individual will own guns later in life since research has demonstrated that those who indicate parental ownership or growing up in homes with guns are more likely to own firearms (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Smith & Uchida, 1988; Wright et al., 1983).

3. Adult Firearms Ownership and Rural Culture

Secondly, we examine the effect of living in rural areas on future gun ownership. Since gun hobbies and activities are more common in rural areas, it is also posited that individuals living in, or who grew up in these areas, may have attitudes and behaviors about firearms that are different from more urban areas of the United States. At a minimum, living in a rural location that has historically been “firearm friendly” will make firearm behaviors and activities more acceptable, available, and accessible. This social acceptance of firearms means that individuals living in rural areas may be likely to own guns generally (Kim et al., 2011; Bordua & Lizotte, 1979; Caetano, 1979; DeFronzo, 1979; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Sheley et al., 1994; Smith & Uchida, 1988; Wiktor et al., 1994; Wright & Marston, 1975).

A further example of this phenomenon is Kohn (2004)’s ethnographic study of “gun enthusiasts.” She used a participant observation method and immersed herself in gun sports primarily in the San Francisco Bay area of northern California. She engaged in shooting activities, made friends with members of a shooting club, spent time at gun ranges, shops, and attended shooting competitions. The in-depth interviews she conducted of thirty-seven male and female gun enthusiasts provide interesting insight into individuals who participate in a lifestyle that involves guns as a hobby or who own guns as part of sport and defense purposes, rather than gun owners in general.

However, while her research offers an analysis into what gun owners look like, it is limited by the fact that she interviewed only gun enthusiasts and only those in the San Francisco Bay area. She investigated how gun owning and participation in gun activities shed light on larger issues related to what has long been thought of as a gun culture. In addition, all of the gun enthusiasts in Kohn (2004)’s study shared some basic characteristics which include, “a love of guns, both handguns and long guns, a love of the gear associated with guns, and an enjoyment of the activity of shooting; either competitively, outdoors at random targets, or for recreational target shooting” (p. 7). She also noted that these individuals support private gun ownership and held strong opinions about what guns mean for America and what being a gun owner means in general (Kohn, 2004). This supports the idea that cultural involvement in firearms activities may reflect larger adherence to the culture that encourages firearms ownership.

Further, when describing the responsibility of owning firearms, her subjects spoke of independence, individualism, and freedom. Many of those that she interacted with, understood owning guns as a basic right to protect themselves or their families and saw

themselves as free, independent persons. Kohn (2004) compares them to the early colonists and according to her, early responsible, adult citizens of the republic “had a right and an obligation to arm themselves to protect their nation” (p. 81). The shooters and gun enthusiasts Kohn (2004) interviewed, identified with the notion that to own guns is to be a “responsible, full-status adult in American society” (p. 81). Kohn (2004)’s respondents also pointed out perceptions of unequal access to guns and see gun ownership as a way to ensure their own autonomy and self-determination. (p. 82). These ideals further the notion that gun ownership is at least partially explained by culture. The implications of gun ownership in terms of their symbolic and cultural meanings are important, particularly when related to the way in which gun beliefs and behaviors are transmitted across generations. Many of Kohn’s (2004) subjects learned about shooting from family and significant others, giving further support to the ideas about transmission of gun perspectives across generations.

4. Relationships, Gun Type, and Transmission of Adult Firearms Ownership

An additional point of the model asserts that the communication of values about guns occur in close relationships. As described above, participation in shooting sports encourages individuals to view guns as non-threatening. Lizotte and Bordua (1980) note that experiences, such as hunting with family, may expose individuals to guns in a positive way and will transmit gun culture through generations and across social groups. This exposure to guns at early ages or with significant others, will lay a positive foundation in terms of seeing guns as a feasible recreational behavior or response to fear of victimization.

In an attempt to address that concept, the current study examines the presence of adult males in the adolescent’s household. This, combined with the measure of gun availability during adolescence, provides a measure of the potential cultural transmission of firearms ownership given that males are more likely to own guns. In a gun owning household, the research is clear that males are more likely to indicate household and personal ownership and use of the firearm (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Ludwig et al., 1998; Smith & Uchida 1988; Wright et al., 1983) than females.

While scholarship has supported the notion that males in the home are related to gun ownership, investigators have also argued that the type of firearm owned is also an important key. Specifically, studies indicate that the utility of the weapon is often related to the types of guns owned by the adolescent later in life. Findings from previous studies demonstrate that gun owners who have indicated ownership primarily for recreational purposes have been found to own long guns for hunting or sports (Bordua & Lizotte, 1979; Davis & Smith, 1994; Dixon & Lizotte, 1987; Kleck, 1997; Lizotte & Bordua, 1980; Smith & Uchida, 1988; Wright et al., 1983). However, some also own home defense firearms but they are less likely to carry their weapons on their person or in their car (Bankston et al., 1990; Bankston & Thompson, 1989; Kleck, 1997; Kleck & Gertz, 1998). These firearms owners are also more likely to be white, male, live in the Southern or Western states, earn higher incomes, be married, espouse conservative political views, and live in rural areas (Bordua & Lizotte, 1979; Caetano, 1979; DeFronzo, 1979; Kleck, 1997; Lizotte & Bordua, 1980; Lizotte et al., 1981; Sheley et al., 1994; Smith & Uchida, 1988; Wiktor et al., 1994; Wright & Marston, 1975). For these owners, guns appear to be part of their lives and most likely have been since they were young. Many of

these individuals also learned to shoot at early ages and received their first personal gun as a child or young adolescent (Bordua & Lizotte, 1979; Cao et al., 1997; Dixon & Lizotte, 1987; Kleck, 1997, Lizotte & Bordua, 1980; Lizotte et al., 1981; Wright et al., 1983; Young, 1986).

Gun culture introduces most gun owning individuals to firearms and gives them positive interactions with guns that increase the likelihood that they will own firearms. In contrast, individuals who have no experience with firearms are unlikely to feel at ease with handling them. Being a sport owner may be indicative of lifelong involvement with firearms and the recreational activities involved with them. Therefore, ownership impacts why individuals procure firearms and the particular type that they purchase. This culture and ownership related activity has been found to be more common, most likely due to simple opportunity for it to continue, in the rural areas of certain regions of our country.

Historically, individuals living in rural areas have been found to be much more likely to own firearms (Wright & Marston, 1975) and lower population densities tend to characterize these areas. Hunting and shooting sports have also been hobbies indicative of rural lifestyles. In the past, hunting provided much needed food for families living in rural areas and it is now a tradition and bonding ritual passed down from parents to child. Many individuals who hunt learned this hobby from their parents or significant other and may not see guns, particularly those involved in shooting sports, as dangerous, as many of these individuals have owned their firearm since adolescence (Cunningham et al., 2000; Miller et al., 2007). These cultural issues may also explain the role of gender in predicting both access to and ownership of firearms.

Existing research on firearms has long noted lower rates of ownership by women. In fact, the same characteristics, which have long predicted male ownership, seem to do the same for females (Johnson et al., 2004) and the reasons why females own guns are remarkably similar to males. Primarily, female gun owners have been found more likely to live in rural areas, generally in the South (Ludwig et al., 1998; Sheley et al., 1994; Rennan et al., 1990; Whitehead & Langworthy, 1989; Wright et al., 1983; Young, 1986). Despite these similarities, women continue to own far fewer firearms than men, even in rural areas, and are less likely than males to carry firearms. These differences in male and female gun ownership beg the question of how cultural experiences might impact the transmission of gun ownership over the life-course for males and females.

Given the lack of inclusion in firearm traditions, women may be less likely to turn to firearms for protection. This point could also be tied to the socio-historical role of men as protector and provider. Warr's (1992) findings on male altruistic fear indicate the possibility that men may be more willing to consider themselves responsible for their family's well-being and to purchase firearms for their safety. A lack of gun ownership by women in rural areas may be indicative of their adherence to traditional gender roles, particularly as they relate to males protecting females. Women may be more likely to see the role of protector fulfilled by the men with whom they share a home than taking on that role themselves. If ownership in females were a response to similar male cultural experiences favorable to firearms, then one would expect a model of gun behaviors to predict similarly for groups divided on gender.

The cultural impact of adolescents growing up with firearms has not been fully examined. Individuals who grow up in homes where guns are more available and in rural areas should be more likely to own guns. The cultural transmission of firearms values across generations should encourage those that have grown up around firearms to be more

likely to own them. Due to the nature of gun ownership in rural regions, rural residency will be included in the models. In order to fully investigate the impact socialization has on adult gun ownership, measures of accessibility to firearms as an adolescent will be also be included. This research also explores the impact of growing up in a family that owned firearms and the age at which individuals received their first personally owned firearm. Individuals who grow up with firearms in the home and who personally own guns earlier in life would be expected to own guns as adults.

Methodology

a. Sampling Method. The National Longitudinal Study of Adolescent to Adult Health, (Add Health) is a nationally representative sample of adolescents as they aged from Wave One in 1994 to Wave 4, in 2008. Schools used in the initial data collection for the Add Health study were selected from 26,666 high schools and their feeders and stratified by common demographic variables to more completely represent high schools in the United States. The desire to compile a nationally representative dataset from which one could make general conclusions about adolescent behavior was reflected in the decision by the researchers to include adolescents from various economic, social, geographic, and educational backgrounds (Tourangeau & Shin, 1999). In an attempt to correct for sampling and non-response error, the Add Health team implemented an extensive weighting procedure for each wave of data collection. Data utilized for this research extended to Wave Three, with roughly ages 11–25 represented in the sample.

The initial sample for the Add Health study consisted of 80 high schools and their 52 feeders and all students in grades 7–12 were asked to complete the In-school Questionnaire (Tourangeau & Shin, 1999). Eligible high schools for the database were defined as any school that included an 11th grade and had an enrollment of more than 30 students. Tourangeau and Shin (1999) also point out that 80 schools were selected and that they were sorted by size (125 students or fewer, 126 to 350, 351 to 775, 776 or more), school type (public, parochial, private), region (Northeast, Midwest, South, West), urbanity (urban, suburban, rural), and percent white (0, 1 to 66, 67 to 93, 94 to 100) (p.2). Once a high school had been recruited, it was asked to provide the names of each feeder school with one feeder being selected for each high school.

About 90,000 students completed the in-school questionnaire and deemed eligible for the core in-home sample (Kelley & Peterson, 1997). For the Wave One in-home data collection, 27,559 students were selected from the original 90,000 that completed the In-School Questionnaire (Tourangeau & Shin, 1999), which included a core sample of about 20,000 (Tourangeau & Shin, 1999, p. 8). Wave One (with a response rate of 78.9 percent) was conducted from September 1994 through December 1995, and Wave Two (with a response rate of 88.2 percent) was conducted about one year later (Kelley & Peterson, 1997). The core sample is important because it is the main sample that was drawn from the original 90,000 adolescents. Overall, 7,885 males and 8,159 females were selected for the core sample. Wave Three was conducted with the original respondents in 2002 and was completed with those respondents and their partners. The public-use data file for this project includes the Wave One In-Home Interview, the In-school Questionnaire, the Parent Questionnaire, the Wave Two In-Home Interview (Kelley & Peterson, 1997) and the Wave Three In-Home Interview with the original respondents and their partners. The public-use data utilized for this project is nationally representative and therefore allows for

conclusions based on a sample that is based on adolescent behavior throughout the United States.

Add Health serves as a good source of data for this project for a number of reasons. First, the data provide information about the relationships that participants have with their caregivers. This is important because the theoretical argument that we use rests on the assertion that cultural beliefs regarding firearms ownership translate into actual ownership in adulthood for those exposed to firearms culture. In addition, the data also provide information on local residential area. Again, part of our theory rests upon the notion that respondents living in rural communities are more likely influenced by cultural values regarding ownership later in life. Finally, using multiple waves of data, it is possible to examine whether cultural issues and family ties at adolescence translate into future firearms ownership. To pinpoint these connections, our models and theory stipulate that we must employ family relationships, presence of male role models in the home, residential location, gender, age, and racial components as independent predictors. As a result, we find the Add Health study fertile ground for this type of research.

b. Dependent Variables. There are two dependent variables for this research. We look at the correlates of gun access at Wave One and also use that item as a predictor for gun access at Wave Two and gun ownership at Wave Three. As a result, two separate, dichotomous items are used to measure these concepts. First, access to guns as an adolescent is operationalized by simply utilizing the item, “Do you have easy access to a gun in your home?” Similarly, the item used to indicate adult ownership is, “Do you own a gun that is not part of your job?” Both items are coded (0 = No, 1 = Yes).

c. Independent Variables. We have incorporated several items that act as predictors for the cultural transmission models. As previously mentioned, access to firearms in the home as an adolescent is one construct. Further, to test for the possibility that males tend to transmit the desire to own firearms over time to their adolescent children, we also utilize a dichotomous item that asks whether or not an adult male is present in the home and as with the prior dichotomies, the coding is: (0 = No, 1 = Yes). An additional part of the model proposed that residential location is an important predictor as well and we utilize a measure that incorporates whether or not the adolescent respondent lives in a rural or urban setting at either Wave One or Two. As before, the coding reflects that of traditional dichotomous items (0 = No, 1 = Yes). To further supplement our hypothesis that the cultural transmission of adult firearms ownership takes place over time, we also utilize an age variable. This item simply asks the respondent to identify his or her age at the time he or she was interviewed. We have included age at Wave One. In keeping with the previous assertion that firearms ownership is primarily a male phenomenon, we also include a dichotomy for the gender of the respondent with it being coded as: (0 = Female, 1 = Male). A dichotomous item for race, coded (0 = Not African American, 1 = African American) was also included.

Due to the dichotomous nature of the dependent variables, we employed bivariate logistic regression. The limitations of predicting these types of measures require a methodology that allows for a nonlinear relationship. This technique predicts the likelihood of an event occurring, which in this case is gun access or handgun ownership by the respondent at three different waves of data collection. Findings from the bivariate logistic regression analyses are consistent with prior research and are presented in Table 3. In the interest of being as transparent as possible, we include both the change in odds and

the exp (B) in the text for all three waves, with the exp (B) coefficient in parentheses throughout.

Results

Table 1 presents the results of the descriptive analysis of these data. The sample used for this study is about 48 percent male and 25 percent African American. Nearly 25 percent of the respondents indicate living in a home with access to firearms at Wave One. By Wave Two, slightly more than 18 percent have access to a firearm in the home. For Wave Three, 9 percent of the sample indicates owning a gun. Finally, nearly 28 percent indicate living in a rural area at Wave Three.

Table 2 shows the results of the bivariate correlation analysis conducted to ascertain the relationships among the variables in the models. Significant positive relationships were found between gun access at Wave One and male gender, age, living in a rural location as an adolescent, and living with an adult male at Wave One. Males and older respondents were more likely to indicate living in a home with gun access at Wave One. Respondents who indicate living with an adult male were also more likely to indicate gun access at Wave One. Regarding access to firearms at Wave Two, male and older respondents were more likely to indicate access to firearms. Respondents who indicate living in rural areas were also more likely to indicate access to guns. At Wave Three, the relationships were similar to those found in previous waves. Male and older respondents were more likely to indicate owning a gun. Those who grew up in rural areas and who lived in homes with gun access were also more likely to indicate owning a gun at Wave Three.

Table 3 shows that males (1.93) were significantly more likely to indicate living in homes with access to firearms in Wave One and Two and this result is synonymous with an almost doubling of the odds that gun ownership would occur. African American (-.64) respondents were 36 percent less likely to indicate living in homes where they had access to firearms at Wave One. However, those living in rural areas (2.86) were far more than twice as likely to live in homes with firearms and those with adult males living in the home (1.24) were about 24 percent more likely to live in homes with access to firearms. For Wave One, the strongest predictor was the variable measuring whether or not the respondent was living in a rural area. The Nagelkerke R square value indicates that about 11 percent of the variance in access to firearms at Wave One is explained by our cultural transmission model.

Similarly, for models predicting access to firearms in the home at Wave Two, males (1.37), were about 37 percent more likely to indicate living in homes with access to firearms. African American (-.56) respondents were 44 percent less likely to indicate living in homes where they had access to firearms at Wave Two. However, those living in rural areas (1.63) were about 63 percent more likely to live in homes with firearms. For Wave Two, the strongest predictor was the prior variable measuring access to firearms at Wave One (16.265). By Wave Two, living in the home with an adult male is no longer a significant predictor of access to guns in the home, particularly once we control for access at Wave One. The model's Nagelkerke R square value indicates that about 40 percent of the variance in access to firearms at Wave Two is explained by the cultural transmission model. However, a significant proportion of that is due to the prior control for Wave One access.

Table 1. Distribution of Model Measures

Variable	Metric
Age	
Mean Age Wave 1	15.49
Mean Age Wave 2	16.02
Mean Age Wave 3	21.82
Gender	
Male	48.4%
Female	51.6%
Ethnicity	
African American	25.0%
Non- African American	75.0%
Living in rural area (W3)	27.6%
Adult male in the home (W1)	35.6%
Firearms access and ownership	
Firearms access in the home (W1)	24.3%
Firearms access in the home (W2)	18.4%
Adult firearms ownership (W3)	9.0%

When examining the likelihood of owning handguns at Wave Three, males (2.92) were significantly and far more likely to both own guns and report gun ownership. As the most powerful effect in the equation, being male increased the odds of gun ownership at Wave Three by almost 300 percent, while living with an adult male at Wave One had no significant effect on the likelihood of gun ownership at Wave Three. However, what was quite interesting and consistent with prior findings and the current model, was that living in a home with gun access (2.20) at Wave One also greatly and significantly increased the odds that respondents owned firearms at the later wave of data collection. More specifically, the contribution of this variable resulted in well-over a 200 percent change in the likelihood of future handgun ownership. Similarly, access to firearms at Wave Two (1.54), was also a significant contribution to the model, increasing the odds that the respondent would own handguns at Wave Three by an additional 54 percent. Further, those living in rural areas (1.96) were almost twice as likely to own handguns at Wave Three. The model's Nagelkerke R square indicates that nearly 13 percent of the variance predicting adult gun ownership is explained by the cultural transmission model.

Table 2. Pearson Correlations Among the Cultural Transmission Model Measures

Variables		Male	African American	W1 Age	W1 Rural	W1 Adult male	W1 Easy access	W2 Easy access
Male	N	1.00 6504						
African American	N	-.008 6485						
Wave 1 Age	N	.041** 6493	.002 6477					
Wave 1 Rural	N	-.006 6503	-.098** 6485	-.010 6493				
Wave 1 Adult male	N	.097** 6477	-.112** 6461	.028* 6469	.026* 6477			
Wave 1 Easy access	N	.144** 6443	-.120** 6427	.085** 6435	.235** 6443	.085** 6427		
Wave 2 Easy access	N	.122** 4805	-.116** 4793	.048** 4796	.201** 4805	.056** 4792	.537** 4773	
Wave 3 Handgun Ownership	N	.167** 4837	-.010 4824	.037** 4831	.124** 4837	.021 4825	.184** 4806	156** 3799

* $p < .05$, ** $p < .01$

Table 3. Binary Logistic Regression Effects of the Cultural Transmission Model on Adult Firearms Ownership

Variable	Wave 1: GunAccess	Wave 2: Gun Access	Wave 3: Gun Ownership
Age	1.115**	.998	.997
Gender (Male)	1.929**	1.371**	2.917**
African American	.639**	.555**	1.272
Rural	2.857**	1.632**	1.960**
Male in Home	1.243**	.953	.998
W1-Access to Gun		16.248**	2.195**
W2-Access to Gun		16.265**	1.542**
N	3806	3790	3768
Model Chi-Square	278.157***	1081.664***	219.305***
Nagelkerke R-Square	.105	.399	.128

* $p < .05$, ** $p < .01$

Discussion and Conclusion

Generally, there is some evidence of cultural transmission of firearms culture across generations. The findings suggest that growing up in a house with firearms may have a lasting effect on the likelihood of owning firearms as an adult in the United States. However, that effect does not seem to be dependent on the presence of an adult male in the home. The experiences of growing up around guns seem to increase the likelihood that firearms are owned by adults in America. Males and those living in rural areas in the United States were more likely to indicate living in homes with gun access in Waves One and Two. African Americans were less likely to indicate growing up in these homes, however, the effect of race on the handgun ownership measure was not significant. It may also be that ownership within urban areas is more likely to be hidden because respondents in those areas may be less likely to admit that a gun is in the home or that they own guns later in life. This may affect African American respondents more significantly, particularly if their firearms ownership is occurring within urban communities. With such a large sample size and a parsimonious model, it may be that additional measures and additional future research could help tease out the complexity of this relationship.

While the present study is a significant contribution to the literature that addresses how and why Americans own firearms, we also recognize a number of important shortcomings that should be addressed in future investigations. First, the current study employs a measure of access to any kind of guns for the participants at Waves One and Two but the final tested model predicts handgun ownership in adulthood. The participants at Waves One and Two are adolescents and so while they are asked about access to firearms at these times, it is also the case that they are likely not allowed to legally own firearms at those points in time. So, while it is true that asking these respondents about access to firearms is not exactly asking them if they themselves own guns, asking

about access serves the dual function of determining if the respondent resides in a home that has firearms and at the same time allows for the determination of whether or not having guns in the home at the time that they are asked has any bearing on later ownership. In the future, a model predicting general gun ownership at various ages, instead of access to guns while an adolescent, might be a clearer test of the theory tested here.

Relatedly, the average age of respondents at Wave Three is just barely over 21. More than a quarter (27.5 percent) of the sample is under the legal age for handgun purchases. This may limit the willingness of participants to admit handgun ownership or limit the likelihood that those individuals actually own handguns. In other words, handgun ownership may actually be higher than what is reported here. In an attempt to address this matter, respondents aged 19 and 20 at Wave Three were excluded to see if the fact that some respondents were below the age to legally purchase a firearm would impact the results. We found that the results were essentially unchanged from the test that kept these respondents in the sample. Future studies of gun ownership that includes long guns; such as rifles and shot guns, may be better measures. Investigators will also need to manage this issue surrounding the age of potential respondents.

We also acknowledge that others might object to the use of the easy access item used at Waves One and Two because a respondent could essentially say “no” to whether they have “easy access” to a firearm if it is kept under lock and key. This might be confusing to some because a respondent could answer the question negatively but there still could be a gun present in the home. A better measure for future investigations might directly ask if a gun is present in the home.

Additionally, the question regarding handgun ownership at Wave Three comes with a caveat: the question asks if the respondent owns a handgun that is not related to his or her job. While it is difficult to say to what extent this question had on the amount of handgun ownership under study here, it does create the thought that ownership could be underreported. More specifically, a question that excludes other types of firearms such as long guns and also guns that might be related to one’s profession in security or law enforcement, could serve to create a climate where the activity under study (gun ownership) is not clearly understood and perhaps understated. Future researchers would need to ask the ownership question more broadly so that the clearest understanding about what types of guns are owned under what circumstances, can be explained and commented upon.

The findings from this study offer insight about the role of adolescent cultural experiences on adult handgun ownership. It is hoped that documenting this relationship will assist future studies and support future work in this area of research and controversy. Through additional work examining these issues, we can continue to improve our understanding about firearm related issues.

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