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Do Guns in the Home Predict Gender and Relationship Attitudes? An Exploratory Study

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Abstract

This study explores the potential relationship of guns in students' homes with attitudes indicative of tolerance of violence, negative attitudes toward women and their roles, and attitudes suggestive of myths regarding sexual assault. Seniors in Kentucky high schools whose families possessed guns ($N=1749$) produced higher scores on scales measuring these variables as well as on scales of relationship dependency and religious involvement than seniors whose families did not own guns ($N=912$). Students whose families owned more than 10 guns tended to score highest on these measures compared with students whose families owned no or a few guns. Because of lower effect sizes, these significant associations require further investigation.

Keywords

gun ownership; attitudes; high school students; attitudes toward women; tolerance of violence

The major attitude variable historically assessed by researchers when surveying individuals possessing guns has been their perceptions regarding whether guns produce safer environments. Studies assessing the perceived effects of having a gun or guns in one's home have typically investigated whether gun possession is believed to promote safety and, in turn, whether these homes are actually safer (e.g., Azrael & Hemenway, 2000; Hemenway, Azrael, & Miller, 2000; Howard, Webster, & Vernick, 1999).

Next after attitudes toward safety, researchers have investigated whether attitudes toward aggression may be linked to gun ownership. This potential direct link between gun possession and attitudes toward using aggression has been assessed in a variety of ways. Specifically, attitudes toward aggression have been assessed through individuals' reasons for possessing a gun, the perceived function of a gun, the meaning of having a gun, and perceived situations in which a gun might be legitimately used. However, because guns have typically represented power and aggression in American culture (e.g., Stroud, 2012), indirect

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attitudes that might be related to gun possession could include need for dominance, tolerance of aggression, fearfulness, machismo, or a willingness to use other forms of aggression as well. Surprisingly, few studies have investigated associations between possessing guns with particular attitudes that may directly or indirectly relate to gun possession.

The lack of literature on gun ownership and associated attitudes may be the result of several factors. First, it is possible that the membership of the group owning guns may be so large, and therefore so diverse, that meaningful distinctions between them and individuals not owning guns may be rendered moot. Recent statistics suggest that 37–41% of American households had an adult who owned a gun (Desilver, 2013; Saad, 2011); thus attempting to determine characteristics in common for a large proportion of Americans may be similarly problematic as trying to find meaningful distinctions between large groups of people who are different on a particular type of life orientation (e.g., interested in watching sports) or who own particular objects (a television set).

Second, there are reasons to be concerned about whether researchers can accurately identify which persons own guns. Obtaining this information through federal or state records is problematic, due to the differences in legislation among states regarding sales and registration records (Koper, 2014.) In addition, regulation of sales for firearms, whether in primary markets (licensed dealers) or secondary markets (private sales), creates an even further gap in the ability to identify gun owners (Beck et al. 1993; Harlow, 2001; Koper, 2014; Koper, Woods, & Kubu, 2012; Sheley and Wright, 1993; Wright and Rossi, 1986). Furthermore, the national debate on regulations for gun ownership has made this a potentially sensitive topic when individuals are being asked to reveal whether they own guns for research purposes. Underreporting in telephone surveys has been found for a range of sensitive topics (e.g., Follingstad & Bush, 2014; Harrison, 1997; Wish, Hoffman, & Nemes, 1997), which calls into question whether gun ownership is reported accurately, much less whether attitudes or other factors potentially related to gun ownership are willingly or accurately stated. For example, Kellermann, Rivara, Banton, Reay & Fligner (1990) reported that about one-fourth of a sample identified through gun registration could not be located due to “inaccuracies” in the registration. This appears to call into question whether these individuals wanted their personal information and gun ownership to be part of official records, for example if they did not own the gun legitimately or wished to keep it secret from other family members. Of the group eventually contacted by these researchers, one-third would not consent to a general interview about gun ownership.

And, third, gun ownership studies have been severely criticized for research design issues. Criticisms include: use of secondary data sets not originally designed to study this question; survey respondents from households with guns answering the survey items may not have been involved in decisions about gun ownership; difficulty discerning reasons for gun ownership; and few multivariate studies ferreting out the most predictive factors (Cao, Cullen, & Link, 1997).

While information is lacking that might link *gun ownership* to an aggregate of political and/or personal attitudes, it appears even more difficult to predict attitudes or traits of youth

living in homes with guns. Socialization explanations would suggest that values children are raised with would generally be evident as adults (Cao, Cullen, & Link, 1997), so there may be no reason to believe that pro-gun attitudes or associated attitudes would be an exception. This hypothesis has been briefly explored, especially in the South and rural areas, where higher rates of gun ownership are perceived as promoting a “gun culture” with attendant attitudes expected to accompany that culture (e.g., DeFronzo, 1979; Marciniak & Loftin, 1991; Sheley, Brody, & Wright, 1994). This broad sweeping association may or may not be accurate and there is not enough data to solidly support this view. Polling information has determined that individuals in urban areas are half as likely to own a gun as rural dwellers, and households without guns are much more likely to claim allegiance with the Democratic Party (Pew Research Center, 2013). Although some researchers have found a relationship between owning a gun and having had parents who owned guns (Caetano, 1979; Deiner & Kerber, 1979; Lizotte et al., 1994), there is little data linking individuals’ socialization experiences as children regarding guns to their adult attitudes regarding guns (Cao, Cullen, & Link, 1997). Even if attitudes toward *owning* guns were demonstrated to be clearly passed on by parents to the next generation, whether those attitudes are part of a greater cluster of attitudes toward aggression would still need to be elucidated.

The small amount of literature investigating whether youth in homes with ownership of firearms possess different attitudes from those growing up in homes with no guns appears contradictory. For example, in a sample of students attending three public high schools in New York City, 20% of them reported guns in their home. Forty-three percent of this sample approved of the idea of gun ownership even though 57% of this subsample reported a gun injury occurring to themselves or a relative (Kahn, Kazimi, & Mulvihill, 2001). This New York City sample obviously had high exposure to gun violence which may have influenced their rate of gun endorsement as a means of protection rather than family attitudes toward or actual possession of a gun. Sampling a different group of urban teenagers, Bergstein, Hemenway, Kennedy, Quaday, & Ander (1996) determined that those admitting to handling guns without adult permission or supervision were more likely to have a gun in their own home, suggesting that handling guns may be more normative for them. But, a national survey of high school students regarding firearm policies (Vittes, Sorenson, & Gilbert, 2003) reported that most high school students (and especially females) were in favor of *more* restrictive firearm policies, although students living in homes where guns were present were less likely to support restrictive policies. This subgroup of students appears to have attitudes toward gun ownership that likely parallel those of the adults in their homes.

Beyond attitudes toward gun ownership, the more important question becomes whether “attitudes” or “traits” regarding aggression might be linked with gun ownership that might then be passed on to children of those possessing the guns? Some qualitative or anecdotal reports have suggested the following attitudes or traits with possessing guns: identification with dominant masculinity (Stroud, 2012); an association with freedom and independence (Cooke & Puddifoot, 2000); and general acceptance of violence-prone attitudes (Shapiro, Dorman, Welker, & Clough, 1998). Shapiro et al. (1998) reported that youth for whom guns are part of their daily lives are more likely to promulgate violence-prone attitudes than youth without this experience. Shapiro, Dorman, Burkey, Welker, and Clough (1997) developed a measure of youth attitudes toward guns and violence and were able to identify four factors

which were all more predominant in students owning guns – Excitement, Power Safety, Comfort with Aggression, and Aggressive Response to Shame. And, Downey, Zun, Burke, and Jefferson (2013) found the distinguishing characteristics between emergency room cases of youth experiencing gun-related injuries versus youth with non-violence related medical problems were greater endorsement of gun possession and behavioral instances of aggression.

Thus, it is surprising that more research has not attempted to determine whether potentially related attitude patterns might be evident for youth living in environments with guns. Are these youth likely to demonstrate attitudes that are tolerant of aggression in general? Would they likely display more distal attitudes found in adult populations that have been linked to aggressive attitudes? For example, Forbes, Adams-Curtis, and White (2004), in their investigation of whether various attitude measures appeared related to dating violence and sexual coercion, concluded that “relationships between attitude measures and aggressive behavior appeared to be based primarily on generalized hostility toward women” (p. 236). This research team (Forbes, Adams-Curtis, Pakalka, & White, 2006) also demonstrated that college men who had participated in sports in high school that encourage aggression significantly differed in their attitudes than college men who had not. Specifically, those participating in aggressive sports “were more accepting of violence, had more sexist attitudes and hostility toward women, were more accepting of rape myths,” (p. 441) and reported more instances of physical aggression or sexual coercion toward their dating partners. A meta-analytic review of individual differences predicting attitudes toward rape (Anderson, Cooper, & Okamura, 1997) provided evidence that predictive attitudes included “traditional gender role beliefs, adversarial sexual beliefs, needs for power and dominance, aggressiveness and anger, and conservative political beliefs” (p. 295). Conversely, religiosity has been believed to be an inhibitor of aggression (Leach, Berman, & Eubanks, 2008), yet more nuanced investigations of this relationship have challenged the automatic assumption that higher religiosity is inversely related to aggression. For example, the college students in Watkins’ (2003) study who scored high on “religious conflict” also reported higher scores on physical aggression, and Landau, Björkqvist, Lagerspetz, Österman, and Gideon (2002) reported that the effects of religiosity on aggression were more significant for female youth than male youth. While Koch and Ramirez (2010) stated that general religiosity (i.e., belief in God, strength of religious faith) was not associated with aggressive attitudes or behaviors, college students who scored high on Christian fundamentalism were more likely to approve of relationship violence and have engaged in acts of intimate partner violence. Because many of these attitudes may share a basic and common belief system, it is important to investigate whether this range of attitudes appears linked to attitudes toward aggression in general that may be fostered by environments with guns in particular.

The purpose of this study was to explore the potential relationship of growing up with guns in one’s home and possessing a cluster of attitudes indicative of greater tolerance of violence, more negative attitudes toward women and their roles, and more attitudes suggestive of double standards and rape myths regarding sexuality. In addition to simply dichotomizing households as possessing or not possessing a gun for classifying participants, this study also explored whether greater exposure to guns was related to greater endorsement

of the hypothesized attitudes. Thus, “dosage” was used as an independent variable, defined by increasing numbers of guns in the home.

Method

Participants

High school seniors from 25 high schools in Kentucky were recruited to participate in a research project entitled “Life’s Snapshot.” Seniors attending high school the day of data collection were eligible to participate; enrollment and attendance records provided by the schools indicated the researchers had access to 72% of seniors in these schools. Completed surveys were obtained from 3,547 seniors with only 267 refusing to participate (N=3814), indicating a response rate of 93%, with 80% of the schools having greater than 90% response rate. Students who completed the surveys were mailed \$10 checks for their participation. For the analyses in this manuscript, the analyzable dataset consisted of 2,661 high school seniors. Seniors were excluded if they were missing demographic information or did not answer enough items within each attitude scale to allow for imputation of missing data (n=372), or if they did not provide a response to the item asking the number of guns in their home (n=514).

Procedure

Prior to this project, a 5-year randomized intervention trial to evaluate the effectiveness of a bystanding program was conducted in 26 high schools in Kentucky; half of the schools were randomized to the intervention and the other half were randomized to the control condition. In the intervention condition, students had been exposed to speeches regarding the Green Dot bystanding program, a proportion of the students had been trained more specifically in bystanding techniques, and students had been encouraged to engage in school projects on this topic. These schools were distributed geographically across the state, representing urban, suburban, and rural schools. Schools involved in this evaluation study were approached regarding solicitation of their senior students for a follow-up study that would extend into their young adulthood for 3–4 years. Twenty-five of the twenty-six schools gave permission for the researchers to administer paper-pencil surveys on site during the Fall semester and signed a Memorandum of Understanding with investigators at the University of Kentucky for this project. In addition, the researchers received a Certificate of Confidentiality from NIH for this project (NIH5R01HD075783-02).

The initial survey was finalized, approved by the University of Kentucky’s IRB, and pilot tested for readability and length of administration. At the time of administration in the schools, students were given verbal informed consent information, they were presented with a written informed consent page at the front of the survey, and they were requested to check a box stating that they did or did not wish to participate in the study. The contact information students provided to the researchers for mailing checks and to contact them with subsequent surveys was separated from participants’ responses and a unique code was assigned to each survey. Data were entered into a REDCap database, where contact information was entered as a separate database; all participant responses were de-identified in analysis datasets.

Measurement

Due to the range of scales and items covering various attitudes and traits, psychometric analyses were conducted with the selected pre-existing scales, standardized scales from which a portion of the items were utilized, and devised scales/items. Most items comprising scales in the study were selected from existing standardized scales. All scales and items, whether originating from standardized scales or devised, were subjected to psychometric assessment, including internal consistency, a determination whether an item contributed to a scale's reliability, inter-item correlations, and factor analyses to determine whether items loaded on a scale's primary factor. By subjecting standardized scales, reduced standardized scales, or scales combining standardized items and newly devised items to these psychometric tests, the quality of scales and items was enhanced through elimination of items that were redundant or not loading on a scale's primary factor. To assess construct validity, scales were correlated with scales with similar constructs.

Guns in the home—A single question was asked to assess whether a student lived in a home where guns were present. Students were asked to provide the number of guns in their home with no parameters or categories specified. For these analyses, two dummy variables were established. First, a dichotomous variable classified students as either living in a home with no gun versus living in a home with one or more guns and second, a variable was developed with categories specifying the number of guns in the household (1=*0 guns*; 2=*1–2 guns*; 3=*3–10 guns*; 4=*more than 10 guns*).

Social Belonging—Four items from the Collective Self-esteem Scale (CSE; Luhtanen & Crocker, 2013) were used to measure social or collective identity based on membership in social groups. Internal consistency for the overall scale was .85–.88, and concurrent validity was demonstrated with high correlations with other self-esteem and ego task scales.

Personal Tolerance and Personal Reporting of IPV—Four items were developed to assess the degree to which an individual would experience being the recipient of physical force (like hitting) from a partner before they would: 1) think it was wrong; 2) think it was a problem; 3) tell someone in authority (but not police); and 4) tell the police. Response options were 1=*once*; 2=*rarely*; 3=*occasionally*; 4=*fairly often*; 5=*often*; 6=*would not think it was a problem or tell anyone no matter how often*. The first two items were summed to create a threshold item for personal tolerance for IPV and the second two were summed to create a scale for reporting the IPV to authority figures.

Relationship Dependency—Seven items were adapted from the Spouse-Specific Dependence Scale (Rathus & O'Leary, 1997) to be suitable for assessing relationship dependency for both males and females in a high school dating population. Items were selected from all three subscales of Anxious Attachment, Exclusive Dependency, and Emotional Dependency. Cronbach alphas for the original subscales ranged from .84–.89, and the alpha for the total scale was .93. For the current sample, the Cronbach alpha was .70.

Religious Involvement—Six items from the Religious Commitment Inventory (RSI-10; Worthington et al., 2003) and eight items from the Religious Self-Regulation Questionnaire

(RSQ; Ryan, Rigby, & King, 1993) were used to assess religious investment. While the RCI-10 taps into the degree of investment in religion as significant for one's life, the RSQ determines whether a person engages in religious activity to avoid negative outcomes (e.g., because God would disapprove) or for reasons suggesting the person identifies with the religious activity (e.g., enjoy spending time praying or attending church). Response options were 1=*not at all*; 2=*a little*; 3=*some*; 4=*quite a bit*. The RCI-10 demonstrated a full scale alpha of .93 and a test-retest reliability of .87. Construct validity was determined through high correlations with similar scales of religiosity and criterion-related validity was determined through high correlations with frequency of religious activities. For the current sample, the Cronbach alphas were .96 for the RCI-10 items, .87. for the RSQ items, and .94 for the combined items. Positive religious motivation items had a Cronbach alpha of .94 while the negative religious motivation items had an alpha of .87.

Negative attitudes toward women—Thirteen items were adapted from several scales of sexism (e.g., Benson & Vincent, 1980; Glick & Fiske, 1996) that represented three themes: 1) Women are succeeding at men's expense; 2) Girls/women acting or dressing sexy want sex; and 3) Women are too harsh on men. Response options were 1=*strongly disagree*; 2=*disagree*; 3=*agree*; 4=*strongly agree*. A high score indicates a more negative attitude toward women. For the current sample, the Cronbach alpha was .72.

Traditional attitudes toward women's roles—Six items were adapted from the Attitudes toward Women Scale (AWS; Spence, Helmreich, & Stapp, 1973) to assess attitudes toward women's role in society. Response options were 1=*strongly disagree*; 2=*disagree*; 3=*agree*; 4=*strongly agree*. A high score indicates a more traditional view of women's roles as opposed to a more egalitarian view. For the current sample, the Cronbach alpha was .81.

Sexual attitudes items—Items tapping into rape myths adapted from several scales (e.g., Lonsway & Fitzgerald, 1995) were included in this study. The attitudes covered "owing" sex to a dating partner, "owing" sex to a date who spends money, blame being assigned to someone who is sexually assaulted while they were drunk, and blame being assigned to a sexual assault victim for not being clear in their refusal to have sex. Parallel items were established for these attitudes that pertained to either guys or girls. Items unique to the genders were: sexual assault charges are often a way to get back at guys; many girls lead a guy on and later claim sexual assault; and guys cannot be sexually assaulted. Response options were 1=*strongly disagree*; 2=*disagree*; 3=*agree*; 4=*strongly agree*. A high score indicates stronger rape myth attitudes, more blaming of the victim, and more belief that sex is "owed" to a dating partner. Three scores were formed from the items for this sample: 1) a total score (alpha=.76); 2) attitudes toward females in sexual situations (alpha=.84); and 3) attitudes toward males in sexual situations (alpha=.76).

Use of physical force in intimate relationships—Five items were developed to assess the students' view that physical fights are inevitable in intimate relationships (1 item), that physical force can be prevented in romantic relationships (2 items), and physical force occurring in intimate relationships is harmful and problematic when it occurs (2 items).

Response options were 1=*strongly disagree*; 2=*disagree*; 3=*agree*; 4=*strongly agree*. A high score indicates that a student was less accepting of physical force in intimate relationships. For the current sample, the Cronbach alpha was .75.

Statistical Analysis

Descriptive statistics (counts and percentages) on demographic variables were calculated for 1) students providing data for the item asking the number of guns in their household; 2) students who did not provide information on guns in their household; and 3) students providing data about guns but who were excluded because of missing demographics or scale items (see Table 1). Chi square tests were performed to determine whether excluded students differed from students who provided the information required for these analyses. Using .01 as the threshold for significance, only race and grades in school distinguished these groups. Higher percentages of non-white students and students with poorer grades were excluded from analyses based on missing data, but the effect size of this comparison was very small. In addition, descriptive information was provided on students who reported the presence of guns in their homes as well as on students reporting no guns at home (see Table 1). Chi-square tests were performed to compare demographic characteristics for these two groups which constituted the main groups for comparison in this study. Again using .01 as the threshold for significance, analyses indicated that a significantly greater number of white students and female students lived in homes with guns compared with non-white students and male students, respectively, students with guns in their households were more likely to be living in suburban or rural areas, and students with guns in their household were more likely to be in a relationship in the past 12 months, be exclusively heterosexual, and have higher grades. A further descriptive breakdown of demographics of those participants who reported one or more guns in their homes was provided using categories of 1) 1–2 guns at home, 2) 3–10 guns at home, and 3) more than 10 guns at their residence (see Table 1).

Comparison of those with and without guns in the home on attitude scales was conducted using MANOVA. Wilks' Lambda was the statistic used to determine overall significance, and only if the overall MANOVA was significant were subsequent univariate comparisons performed. A similar MANOVA was conducted for comparing groups based on the number of guns in the home (0, 1–2, 3–4, more than 4); post hoc Tukey HSD analyses were conducted for significant omnibus tests to determine which of the four groups were different from each other. MANOVAs were conducted to protect against Type 1 error. Participants who had guns in their home did not vary significantly from those who did not on two measures of response style – i.e., scores on a measure of social desirability (i.e., Balanced Inventory of Desirable Responding with Impression Management and Self-deception subscales, Paulhus, 1983) and on a measure of overreporting (Overreporting Scale with four subscales, Follingstad, 2010). Also, the goal of these analyses was to characterize the attitudes of students with guns in their homes as a group. Therefore, no covariates were included in the multivariate analyses. All analyses were conducted using SAS 9.3; a two-sided significance level of 0.05 was used for all statistical tests.

Results

Analyses

A MANOVA was conducted using the dichotomous variable of guns in the home versus no guns as the fixed factor and the following attitude scales as dependent variables: Social Belonging, Tolerance Level for Physical Violence from Dating Partner, Level of Reporting Physical Violence from Dating Partner, Relationship Dependency, Religious Involvement, Negative Attitudes toward Women, Traditional Attitudes toward Women, Sexual Assault Attitudes, and Acceptance of Physical Violence in Intimate Relationships. The overall MANOVA was significant ($F=10.53$, $df(9, 2651)$, $p<.0001$) using the Wilk's Lambda statistical test for multivariate analyses. Subsequent univariate tests indicated that the following attitude variables were significantly different for students with guns in the home compared with students with no guns: Relationship Dependency ($F=7.03$, $df(1, 2659)$, $p=.008$), Religious Involvement ($F=20.03$, $df(1, 2659)$, $p<.0001$), Negative Attitudes toward Women ($F=49.24$, $df(1, 2659)$, $p<.0001$), Traditional Attitudes toward Women ($F=18.96$, $df(1, 2659)$, $p<.0001$), Sexual Assault Attitudes ($F=10.41$, $df(1, 2659)$, $p<.001$), and Acceptance of Physical Violence in Intimate Relationships ($F=9.60$, $df(1, 2659)$, $p<.002$). Students with guns in their homes reported higher involvement in religious activities, more negative attitudes toward women, more traditional attitudes toward women, greater acceptance of sexual assault myths, and greater acceptance of physical IPV than students with no guns. See Table 2 for the mean and standard error of the attitude scales for students with guns in the home versus no gun in the home factor.

For scales with subscales whose univariate tests were significant at the .05 level, individual MANOVAs were conducted on scales that had subscales, i.e., three religious involvement subscales (Religious Investment, Positive Relationship to Religion, and Negative Relationship to Religion), two sexual assault subscales (Sexual Assault Myths about Females and Sexual Assault Myths about Males), and four subscales regarding negative attitudes toward women (Women Not Appreciating Men, Women Overreacting to Men's Behavior, Women Succeeding at Men's Expense, and Women Asking for Sex through Dress or Behavior). The Wilks Lambda test was significant for the religious subscales ($F=8.09$, $df(3, 2656)$, $p<.0001$), but only two of the subscales (Positive Religious Motives (No Guns Mean=9.26; Guns Mean=10.28; $F=21.22$, $df(1, 2658)$, $p<.0001$) and Religious Investment (No Guns Mean=12.15; Guns Mean=13.60; $F=23.57$, $df(1, 2658)$, $p<.0001$)) differentiated students with and without guns in their homes. The Wilks Lambda test was significant for the Negative Attitudes toward Women subscales ($F=13.31$, $df(4, 2637)$, $p<.0001$), with all four subscales differentiating students with and without guns in their homes: Women Succeed at Men's Expense (No Guns Mean=8.28; Guns Mean=8.78; $F=33.72$, $df(1, 2640)$, $p<.0001$); Women Not Appreciating Men (No Guns Mean=5.21; Guns Mean=5.38; $F=13.71$, $df(1, 2640)$, $p=.0002$); Women Overreacting to Men's Behavior (No Guns Mean=2.39; Guns Mean=2.49; $F=11.20$, $df(1, 2640)$, $p=.0008$); Women Asking for Sex through Dress or Behavior (No Guns Mean=15.16; Guns Mean=15.82; $F=35.41$, $df(1, 2640)$, $p<.0001$). Across the four subscales, students with guns in their homes showed higher levels of negative attitudes toward women than students with no guns in their homes. The final analysis of subscales of a significant univariate scale (Sexual Assault Myths) also

demonstrated a significant Wilks' Lambda statistic ($F=13.41$, $df(2, 2655)$, $p<.0001$), with both subscales' univariate analyses being significant (Sexual Assault Myths about Females - No Guns Mean=7.79; Guns Mean=8.37; $F=26.83$, $df(1, 2656)$, $p<.0001$; Sexual Assault Myths about Males - No Guns Mean=13.10; Guns Mean=12.74; $F=11.78$, $df(1, 2656)$, $p=.0006$). Students with guns in their homes demonstrated greater acceptance of sexual assault myths regarding females, but lower levels regarding males than students with no guns in their homes.

A MANOVA was conducted to compare students with different levels of number of guns in the home (0, 1–2, 3–10, greater than 10) on the following attitude scales as dependent variables: Social Belonging, Tolerating Physical Violence in Relationships, Level of Reporting Physical Violence in Relationships, Relationship Dependency, Religious Involvement, Negative Attitudes toward Women, Traditional Attitudes toward Women, Sexual Assault Attitudes, and Acceptance of Physical Violence in Intimate Relationships (Table 3). The resulting Wilk's Lambda ($F=6.43$, $df(27, 7737)$, $p<.0001$) was statistically significant, and subsequent univariate tests indicated that the following attitude variables were significantly different for students with varying numbers of guns in the home: Tolerance Level for Physical Violence from Dating Partner ($F=6.14$, $df(1, 2657)$, $p<.0001$), Level of Reporting Physical Violence from Dating Partner ($F=7.14$, $df(1, 2657)$, $p<.0001$), Religious Involvement ($F=7.20$, $df(1, 2657)$, $p<.0001$), Negative Attitudes toward Women ($F=25.70$, $df(1, 2657)$, $p<.0001$), Traditional Attitudes toward Women ($F=24.13$, $df(1, 2657)$, $p<.0001$), Sexual Assault Myths ($F=6.05$, $df(1, 2657)$, $p<.0001$), and Acceptance of Physical Violence in Intimate Relationships ($F=4.74$, $df(1, 2657)$, $p<.003$). Post hoc Tukey tests were performed to determine which of the four levels of family gun ownership were statistically different from each other. In general, the group of students with 10+ guns in their homes was distinguished from the other three groups by producing the highest scores on the scales (See Table 3.) Students with no guns in their homes typically produced the lowest scores.

Discussion

In this exploratory study, significant and consistent attitudinal differences were found between high school seniors who reported guns in their homes compared with seniors with no guns at home using multivariate analyses to control for collinearity. Overall significance was required before univariate tests of individual attitude scales (and subscales) were considered. Because of the expectation that homes with guns may be more likely to hold conservative or traditional values, finding these attitudes to be generally more prevalent in youth whose families have guns suggests that these values may be part of a larger complex of beliefs and attitudes. It is important to remember that these results combine male and female responses because of the lack of interaction between gender and family gun ownership for these attitude variables.

Specifically, the cluster of negative attitudes toward women, traditional attitudes toward women's roles, sexual assault myths, and greater tolerance of physical aggression in intimate relationships were all more likely to be endorsed by students with guns in their homes along with greater acknowledgement of relationship dependency and religious involvement. The

significance of reported relationship dependency along with the other scales in this cluster of attitudes continues to lend support to previously hypothesized theories that relationship-aggressive individuals demonstrate greater need for these intimate connections which they may attempt to maintain through control and intimidation rather than possessing desirable relationship skills (Kane, Staiger, & Ricciardelli, 2000; Rathus & O'Leary, 1997). Religious involvement, on the other hand, has been viewed as both a buffer to prevent relationship aggression as well as a stated rationale for maintaining traditional roles (Brinkerhoff, Grandin, and Lupri, 1992; Ellison and Anderson, 2001). Future research may elucidate more specific beliefs within religiously involved individuals which are better predictors of relationship aggression, rather than the gross assessment of religious "involvement" (e.g., Ryan, Rigby, and King, 1993).

Nonsignificant results for types of attitudes included in this study are of interest. Social belonging was not related to families possessing or not possessing guns. Thus, reports of how attached students felt to groups that defined them or whether they believed that their social groups were significant for their lives were equally distributed across students and not associated with whether or not their families possessed guns. In addition, when they would label physical force as a problem if it were used against them in a dating relationship and how much violence would have to occur before they would be willing to report it, was not different based on family gun ownership.

When "dose" of exposure to guns was considered, students whose homes have 10 or more guns consistently demonstrated the highest scores, at times even distinguished from students with homes possessing 1–2 guns or even 3–10 guns. Thus, more conservative, traditional, and religious attitudes were reported by students growing up with the most exposure to guns. Families with many guns may possess them for different reasons than families who possess few guns, e.g., families with one gun may possess it for the purpose of protecting themselves from crime that they fear will happen. Thus, families with many guns may be more likely to have an ethos about gun possession that incorporates a broader range of attitudes.

It is important to note at this point that these findings, while often significant at the $<.0001$ level, had low effect sizes. The large sample size likely influenced the ability to find significance, but the low amounts of variability that can be predicted from these factors suggests that this exploratory study needs to be followed by more targeted studies. For example, are there subgroups within the students living in homes with guns for which these factors are highly predictive compared with other subgroups of these students? Do particular demographic factors or other attitudes serve as mediators of family gun ownership and youths' attitudes?

Although this study was able to gather information from a wide range of high school students across Kentucky, this study must also be replicated with a pool of high school students representing a broader racial and ethnic range. Kentucky also is a state that ranks higher (11th) among U.S. states in gun ownership (48%) (Timmons, 2015), suggesting that it would be important to have these findings replicated in states with lower gun ownership. The percentage of people in Kentucky who claim to affiliate with a religion is 51.6% which is fairly similar to the overall percentage in the United States who claim a religious affiliation

(48.8%; Sperling, 2015), but racial representation in Kentucky is fairly different from the rest of the nation. The high percentage of white students in the participant pool is not a function of which students volunteered (i.e., 93% of students present participated in the study), but rather represents the racial breakdown of Kentucky residents.

The findings of this study should be considered exploratory although intriguing. The consistency of significant results across a cluster of factors that have been associated with violence in interpersonal relationships suggests this may be an important line of research for further investigation.

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Table 1

Demographic variables.

	All Students (N = 3547)		Excluded for Not Reporting Gun Data (N=514)		Excluded for Missing Scales/ Demog- raphics (N = 372)		Eligible Students (N =2661)		Students with Any Guns (N=1749)		Students with No Guns (N= 912)		Students with 1-2 Guns (N= 507)		Students with 3-10 Guns (N= 826)		Students with more than 10 Guns (N=416)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender^c																		
Female	1828	51.8	258	51.1	171	47.0	1399	52.6	885	50.6	514	56.4	301	59.4	438	53.0	146	35.1
Male	1702	48.2	247	48.9	193	53.0	1262	47.4	864	49.4	398	43.6	206	40.6	388	47.0	270	64.9
Race^{ad}																		
Asian or Asian American	49	1.4	6	1.2	4	1.1	39	1.5	9	0.5	30	3.3	3	0.6	6	0.7	0	0.0
Black or African American	348	9.9	58	11.6	52	14.9	238	8.9	67	3.8	171	18.8	45	8.9	14	1.7	8	1.9
Hispanic or Latino/Latina	104	3.0	11	2.2	15	4.3	78	2.9	29	1.7	49	5.4	14	2.8	10	1.2	5	1.2
White	2888	82.3	405	81.0	262	74.9	2221	83.5	1604	91.7	617	67.7	426	84.0	784	94.9	394	94.7
Other	122	3.5	20	4.0	17	4.9	85	3.2	40	2.3	45	4.9	19	3.7	12	1.5	9	2.2
RUCC Group^e																		
Urban	1753	49.4	260	50.6	210	56.5	1283	48.2	689	39.4	594	65.1	254	50.1	296	35.8	139	33.4
Suburban	1374	38.7	202	39.3	118	31.7	1054	39.6	804	46.0	250	27.4	197	38.9	398	48.2	209	50.2
Rural	420	11.8	52	10.1	44	11.8	324	12.2	256	14.6	68	7.5	56	11.0	132	16.0	68	16.3
Relationship in the Past 12 Months^f																		
No	972	27.6	143	28.7	111	30.6	718	27.0	418	23.9	300	3.9	145	28.6	202	24.5	71	17.1
Yes	2551	72.4	356	71.3	252	69.4	1943	73.0	1331	76.1	612	67.1	362	71.4	624	75.5	345	82.9
Relationship Status																		
Casual dating, not exclusive relationship	520	21.6	90	27.4	49	21.2	381	20.7	251	19.8	130	22.5	68	19.7	116	19.6	67	20.4
Sexual with someone (like hooking up), but not exclusive relationship	167	6.9	23	7.0	13	5.6	131	7.1	92	7.3	39	6.7	19	5.5	40	6.8	33	10.1
Committed relationship, but not living together	1461	60.8	178	54.3	134	58.0	1149	62.3	805	63.6	344	59.4	223	64.5	383	64.7	199	60.7
Living with boyfriend/ girlfriend	103	4.3	16	4.9	12	5.2	75	4.1	47	3.7	28	4.8	13	3.8	22	3.7	12	3.7

	All Students (N= 3547)		Excluded for Not Reporting Gun Data (N=514)		Excluded for Missing Scales/ Demogra- phics (N = 372)		Eligible Students (N =2661)		Students with Any Guns (N=1749)		Students with No Guns (N= 912)		Students with 1-2 Guns (N= 507)		Students with 3-10 Guns (N= 826)		Students with more than 10 Guns (N=416)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Married	23	1.0	5	1.5	3	1.3	15	0.8	9	0.7	6	1.0	2	0.6	4	0.7	3	0.9
Other	130	5.4	16	4.9	20	8.7	94	5.1	62	4.9	32	5.5	21	6.1	27	4.6	14	4.3
Sexual Attraction^g																		
Exclusively Heterosexual	3024	86.4	411	82.7	310	86.6	2303	87.1	1550	89.0	753	83.4	436	86.2	736	89.5	378	91.5
Not Exclusively Heterosexual	475	13.6	86	17.3	48	13.4	341	12.9	191	11.0	150	16.6	70	13.8	86	10.5	35	8.5
Grades in School^{bh}																		
Mostly As	1475	42.4	178	36.3	121	36.6	1176	44.2	807	46.1	369	40.5	227	44.8	400	48.4	180	43.3
Mostly Bs	1419	40.8	210	42.9	128	38.7	1081	40.6	712	40.7	369	40.5	210	41.4	332	40.2	170	40.9
Mostly Cs	517	14.8	88	18.0	70	21.1	359	13.5	200	11.4	159	17.4	60	11.8	82	9.9	58	13.9
Mostly Ds	58	1.7	9	1.8	11	3.3	38	1.4	25	1.4	13	1.4	9	1.8	10	1.2	6	1.4
Mostly Fs	13	0.4	5	1.8	1	0.3	7	0.3	5	0.3	2	0.2	1	0.2	2	0.2	2	0.5
Planning to Attend College																		
No	230	6.5	45	9.0	24	6.7	161	6.1	117	6.7	44	4.8	28	5.5	46	5.6	43	10.3
Yes	3289	93.5	456	91.0	333	93.3	2500	93.9	1632	93.3	868	95.2	479	94.5	780	94.4	373	89.7

^a indicates a significant Chi Square ($p < .01$) when comparing students excluded for missing gun data, students excluded for missing demographics and attitude items, and students with gun data

^b indicates a significant Chi Square ($p < .01$) when comparing students excluded for missing gun data, students excluded for missing demographics and attitude items, and students with gun data

^c indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

^d indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

^e indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

^f indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

^g indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

^h indicates a significant Chi Square ($p < .01$) when comparing students with any gun in their home with students with no guns in their home

Table 2

Attitude Scales for High School Seniors with Any Guns in their Household versus Seniors with No Guns in their Household.

	No Guns (N=912)		Any Guns (N=1749)	
	Mean	(SE)	Mean	(SE)
Social belonging	12.09	(0.06)	12.15	(0.04)
Relationship dependency *	19.18	(0.11)	19.51	(0.08)
Personal tolerance	3.60	(0.10)	3.46	(0.07)
Personal reporting	5.13	(0.11)	5.21	(0.08)
Religious involvement ***	30.69	(0.49)	33.38	(0.35)
Negative attitudes towards women ***	31.02	(0.16)	32.46	(0.11)
Traditional attitudes towards women ***	11.62	(0.12)	12.40	(0.09)
Sexual Assault attitudes **	23.85	(0.07)	24.18	(0.05)
Physical Aggression attitudes *	8.89	(0.10)	8.56	(0.07)

Overall MANOVA (Wilks Lambda) significant at $F=10.53$, $df(9,2651)$, $p<.0001$.

* p significance $>.01$;

** p significance $>.001$;

*** p significance $>.0001$

Table 3Attitude Scales for High School Seniors for Categories of Number of Guns in their Household.[#]

	Gun Category*	Mean	Standard Error
Social belonging	0 guns _a	12.90	(0.06)
	1–2 guns _a	12.10	(0.08)
	3–10 guns _a	12.16	(0.06)
	11+ guns _a	12.19	(0.09)
Relationship dependency	0 guns _a	19.18	(0.11)
	1–2 guns _a	19.57	(0.15)
	3–10 guns _a	19.43	(0.12)
	11+ guns _a	19.61	(0.16)
Personal tolerance of dating violence	0 guns _{ab}	3.60	(0.09)
	1–2 guns _a	3.36	(0.13)
	3–10 guns _a	3.27	(0.10)
	11+ guns _b	3.94	(0.14)
Personal reporting of dating violence	0 guns _a	5.13	(0.11)
	1–2 guns _{ab}	5.27	(0.15)
	3–10 guns _a	4.88	(0.11)
	11+ guns _b	5.77	(0.16)
Religious involvement	0 guns _a	30.69	(0.49)
	1–2 guns _{ab}	32.35	(0.66)
	3–10 guns _b	33.49	(0.51)
	11+ guns _b	33.28	(0.72)
Negative attitudes towards women	0 guns _a	31.02	(0.16)
	1–2 guns _b	31.79	(0.21)
	3–10 guns _b	32.46	(0.17)
	11+ guns _c	33.28	(0.23)
Traditional attitudes towards women	0 guns _a	11.62	(0.12)
	1–2 guns _a	11.62	(0.16)
	3–10 guns _b	12.46	(0.12)
	11+ guns _c	13.21	(0.18)
Sexual Assault attitudes	0 guns _a	23.85	(0.07)
	1–2 guns _{ab}	24.08	(0.10)
	3–10 guns _{ab}	24.12	(0.08)
	11+ guns _b	24.44	(0.11)
Physical Aggression attitudes	0 guns _a	8.89	(0.10)

Gun Category*	Mean	Standard Error
1–2 guns _{ab}	8.62	(0.14)
3–10 guns _b	8.38	(0.11)
11+ guns _a	8.84	(0.15)

Analyses adjusted for school attended

Overall MANOVA (Wilks Lambda) significant at $F=6.43$, $df=(27,7737)$, $p<.0001$

Different subscripts represent categories that are significantly different from each other. Categories with the same subscript are not statistically different from each other.