**Associations between gun storage practices and parenting practices: A Pennsylvania study**

**Abstract**

This study examines how parenting practices might relate to home gun storage practices, even after accounting for sociodemographic correlates found in past research. First, parenting practices of personal gun owners, household gun owners, and non-owners are compared. Second, the study identifies associations among parenting practices, household gun storage, and juvenile access to household firearms. Data were obtained in October 2019 through an online survey of 525 Pennsylvania parents of youth ages 12 to 17. Respondents were selected to mirror Pennsylvania demographics. Results indicated no differences in parenting practices based on household gun ownership. Yet, personal gun ownership was associated with more inconsistency in discipline and poor monitoring and supervision. Poor supervision and monitoring were not associated with firearm storage practices. Parents who reported poorer supervision and monitoring were more likely to allow their child gun access. There was no link between parental involvement and household firearm practices. Parents who used inconsistent discipline also had inconsistent firearm storage practices. Positive discipline and communication were associated with storing guns locked.

***Keywords:*** youth, firearm access, injury prevention, parenting, family functioning

**Introduction**

 Exposure to firearms is extremely common in the U.S. In 2017, nearly a third of adults personally owned a firearm and another 11% lived in a household where someone else owned a gun (Parker et al. 2017). Most adults have friends who own firearms, and almost three-quarters have fired a gun in their lifetime (Gramlich and Schaeffer 2019). While protection remains the topmost reason for gun ownership in the U.S. (Parker et al. 2017), activities like hunting and sport shooting are common as hobbies and social activities for many gun owners, especially in rural areas (U.S. Fish and Wildlife Service 2017). Past research found evidence of a social gun culture; many gun owners participate in gun-related social activities, feel that gun ownership is tied to their personal identity, and share positive views of guns with their peers (Kalesan et al. 2015; Parker et al. 2017).

Introduction to this subculture often starts in childhood. Almost half of all adults grow up in a home with at least one firearm (Gramlich and Schaeffer 2019). For many, the experience is positive. In 2016, for example, an estimated 3.84 million juveniles ages 6 to 15 participated in target shooting activities (U.S. Fish and Wildlife Service 2017) and a similar number hunted with a firearm (Mueller 2016). Since juveniles cannot legally own or carry firearms in most circumstances, these activities are generally safe, adult-supervised social experiences involving family members, friends, and others. For these juveniles, gun ownership and gun exposure constitute positive experiences. Not all youth interact with firearms in this way. Past literature has well-documented that unsupervised access to firearms by juveniles is a significant risk factor for suicide (Choi et al. 2017), violent offending and violent victimization (Ruback et al. 2011), as well as unintentional injury and death (Fowler et al. 2017). In 2017, the Centers for Disease Control and Prevention estimated that 4.8% of high school youth carried a gun in the past year, excluding hunting and sport (2018). On average, between 2000 and 2014, firearms accounted for 1,300 deaths and nearly 6,000 nonfatal injuries among children each year (Fowler et al. 2017).

This study explores parenting practices among Pennsylvania parents as possible correlates of gun storage practices and youth firearm access. Two research questions are considered. First, how are parenting practices associated with gun ownership status? Second, what are the associations among parenting practices, household gun storage, and juvenile access to household firearms? This study specifically focuses on parental involvement, supervision and monitoring, use of positive discipline techniques and communication, and inconsistency in the use of discipline. This investigation builds on prior work by identifying how parenting practices might relate to juvenile firearm access, even after accounting for the sociodemographic correlates found in past research. The pages to follow review the existing body of research in this area.

**Baumrind’s Typology of Parenting Styles**

 The term parenting style refers to broad approaches and patterns in parenting. In the late 1960s, Baumrind developed a typology of three parenting styles: authoritative, authoritarian, and permissive (Baumrind 2005; Robinson et al. 1995). Authoritative parents are warm and caring and engage in frequent and open communication with their children. Household and behavioral rules are clear, and the child may even have input into developing the rules. These parents set high but achievable goals for their children. This parenting style has been extensively identified as ideal for positive child behavioral and psychological outcomes (Schroeder and Mowen 2014). Authoritarian parents are less nurturing and impose strict rules and punishments with little or no input from the child. Communication is one-sided, if it occurs at all. Permissive parents are warm and nurturing and have open communication with their children. However, there are few rules and these may not be enforced. There are low or few expectations for children to meet, and children are largely responsible for addressing their own needs and problems. Later, a fourth style of parenting was added to these three: uninvolved (Darling 1999). With uninvolved parents there is little caring or nurturing, limited if any communication, no or few rules, and little use of discipline. This typology remains one of the more common ways to differentiate parenting styles (Power 2013).

**Parenting Styles, Parenting Practices, and Delinquency**

 Parenting styles can impact adolescent involvement in delinquent behavior. Past research determined that both male and female adolescents had higher rates of delinquency in households with permissive parenting. However, having even one authoritative parent in the household was linked to lower levels of delinquency (Hoeve et al. 2009). Research by Mowen and Schroeder (2018) determined that authoritarian parenting was the least effective of the four parenting styles in preventing delinquent behavior. Yet, there were marked differences by race and ethnicity across other parenting styles. White youth with uninvolved mothers had higher rates of delinquency, but this trend was not found for Black or Hispanic youth. Black youth, specifically those from disadvantaged communities, seemed to have lower rates of delinquency in households characterized by authoritarian parenting. This was not the case for other racial or ethnic groups. In other research, shifts from parenting styles high in responsiveness (authoritative) to those low in responsiveness (authoritarian, uninvolved) were associated with increased offending in adolescents (Schroeder and Mowen 2014). Together, these results suggest that both harsh (high discipline, low communication, low warmth) and lax (few rules, low communication) parenting can have a negative impact on adolescent behavior.

 Yet, a distinction must be made between broad parenting styles like these and specific parenting behaviors, referred to as parenting practices. Parenting practices can differ from parent to parent, even among those with a similar parenting style. This study focuses on parental involvement, supervision and monitoring, use of positive discipline techniques and communication, and inconsistency in the use of discipline. Authoritative parents are more likely to engage in practices like encouraging dialog with their child, explaining the underlying reasons behind rules, consistently adhering to rules and apologizing when making a parenting mistake (Robinson et al. 1995). Authoritarian parents are more likely to use punishment or threat of punishment as a tool, more likely to use one-side directives rather than true dialog, and engage in strict monitoring. Permissive parents might state rules but not follow through, discipline at some times but not others, as well as monitor inconsistently or infrequently (Robinson et al. 1995). This study identifies how practices like these may relate to household gun storage and juvenile firearm access.

**Parenting Practices and Weapon Access**

Unsupervised access to a firearm often occurs at home or at the home of a peer (Choi et al. 2017; Fowler et al. 2017). A nationwide study in 2017 found that gun owners with children were much more likely to store their guns unloaded in a locked place in the home than gun owners without children (Brown 2017). Even so, 47% of gun owning parents reported that some guns in their home were stored loaded, and 44% stated that at least one gun was kept loaded and readily accessible most or all of the time (Brown 2017). Easy juvenile access to guns is more common among males, Whites, those from two-parent families, conservative Protestants, those living in the South or Midwest, those of higher socioeconomic status, and those living in rural areas (Ruback et al. 2011; Stroope and Tom 2017). To date, however, it is unclear how parents’ choices about firearm storage and juvenile firearm access align with other parenting practices. Feigelman and colleagues (2019) noted that youth with easy access to firearms had closer relationships to their mothers and fathers than other youth. Yet, they also engaged in risky and delinquent behavior at higher rates.

Unsupervised access to firearms is a significant risk factor for delinquency, both for violent offending and violent victimization (Ruback et al. 2011). Extant research has not fully explored how parenting practices might be associated with firearm access. Gun owners and non-owners feel differently about taking steps to ensure child safety around guns. While nearly all gun owners and non-owners believe it is important to talk to children about guns, non-owners are substantially more likely to believe it is essential for gun owners to keep guns unloaded and locked (Parker et al. 2017). Among non-owners, women and Whites are more likely to talk to children about gun safety than males and non-Whites (Brown 2017). Parental beliefs about children and guns also differ (Farah et al. 1999). In one study, 46% of gun-owning parents believed that children could tell the difference between a real gun and a toy gun by age 6; only 10% of non-owners had the same perception (Webster et al. 1992). Gun owners and those from rural areas were more comfortable trusting children with loaded guns and teaching them how to shoot at younger ages than non-owners. They also differ in other parenting practices. Martin-Story et al (2015) found that gun owners were more likely to spank children than non-owners. They also found some evidence of better family functioning (less parenting stress, more responsive parenting) in homes with guns than in homes without guns. However, the study was limited to parents of very young children; trends among families with adolescents remain unknown.

Parenting practices may impact gun storage and access patterns among gun owners. Feigelman, Rosen, and Cerel (2019) identified trust as a key concern. Male adolescents with close, warm relationships with parents reported easy access to guns. The authors argued that high levels of trust likely facilitated gun access. Poor monitoring and supervision could also play a role. Past work found that children injured by firearms were more likely to come from disadvantaged families (Hardy 2002; Leventhal et al. 2014). Poor supervision was common in these families. Further, mothers of injured children were found to be less involved with their children, emotionally fatigued, as well as less assertive with discipline and communication (Hardy 2002). In other research, unsafe firearm storage was more common among parents struggling with problems like stress, depression, or alcoholism (Martin-Storey et al. 2015; Morgan et al. 2019; Morrissey 2016). Martin-Story et al (2015) also observed that unsafe firearm storage was more common in homes where parents permitted other risky behaviors, like riding a bike without a helmet.

 This study focuses on two areas where relevant research is quite limited. First, how are parenting practices associated with gun ownership status? Although Martin-Story et al (2015) explored this issue to some degree, this study examines both personal gun owners and household gun owners as a more refined indicator of gun ownership status. No a priori hypotheses are proposed for this research question given so little existing research as a starting point. This study also investigates possible associations among parenting practices, household gun storage, and juvenile access to household firearms. The following hypotheses are tested.

1. Poor supervision and monitoring will be associated with unsafe firearm practices (storing guns loaded, unlocked, and permitting unsupervised access to firearms) (Hardy 2002; Morrissey 2016).
2. Greater involvement with children will be associated with unsafe firearm practices (Feigelman et al. 2019).
3. Inconsistent discipline will be associated with unsafe firearm practices (Hardy 2002).
4. Greater use of positive discipline / communication will be associated with unsafe firearm practices (Feigelman et al. 2019).

**Methods**

**Data**

Data were obtained through an online survey administered in October 2019. The survey consisted of approximately 80 items. Topics addressed by the survey included parenting practices in the home, household rules, child problem behaviors, and gun ownership. Aside from demographics, most items were derived from an existing survey (sources noted in Measures) such as the Alabama Parenting Questionnaire (Frick 1991) for parenting practices and surveys used by Azrael et al (2018) to assess firearm storage practices. Some sections of the survey asked respondents to report information about each of their children, thereby increasing the length of the survey. Respondents completed the survey in 23 minutes, on average. All respondents were shown and agreed to the terms of an informed consent page at the start of the survey. Respondents were free to discontinue participation at any time.

The survey was administered by the Qualtrics survey research company. Qualtrics regularly administers surveys to a market research panel of more than six million individuals across the U.S. who complete online surveys in exchange for small incentives like sky miles or points that can later be redeemed for gift cards. The target sample size for this study was 500. Eligible respondents were Pennsylvania residents with the following characteristics: age 18 or older, English-speaking, non-institutionalized, parent or legal guardian of a child ages 12 to 17 and reside at least part-time with their child ages 12 to 17. This study focused on teens since teens are at higher risk than younger children for firearm injury, homicide, and suicide (Solnick and Hemenway 2019). Qualtrics sent 1,362 potential respondents an email invitation to participate in the study. Potential respondents were first asked a set of demographic questions. Quotas ensured the final sample would be representative of Pennsylvania demographics, based on U.S. Census figures, for race and ethnicity, rural residence, education, and income. Once a given demographic category was represented in proportion to the Pennsylvania population (college educated respondents, for example), no more respondents from that demographic category were permitted to participate in the study. Qualtrics targeted an equal number of males and females.

Of the initial 1,362 potential respondents, 21 were underage, 247 had no children in the desired age range, 200 were not currently living in Pennsylvania, and 31 did not agree to the terms of the informed consent document. Others were excluded from the final sample because they failed attention checks in the survey, took the survey too quickly (<1/3 the median response time) to suggest they were reading each question, or because quotas matching their demographic characteristics were already full. The final sample consisted of 525 respondents.

**Measures**

***Gun Ownership***

To distinguish gun owners from non-owners,respondents were asked if there was a gun in their household (yes/ no). A follow-up question asked if the respondent personally owned a gun or if all guns in the household belonged to another family member. This question was used to create a dichotomous control variable (1 = yes, 0 = no) for personal gun ownership. Past research found that household and personal gun owner reports of gun storage practices differed among members of the same household (Azrael et al. 2000).

***Gun Storage and Youth Access***

Gun storage and youth gun access are dependent variables. Two items addressed gun storage practices in the home. The first asked “Are the firearms in your home stored unloaded?” with response options of yes, no, some of them, and unsure. The second item asked, “Are the firearms in your home stored in a locked cabinet or case?” with the same response options. A final item asked each respondent “Does your child (or children) age 12 to 17 have access to the firearms in your home?” Response options were “yes, they can access a firearm on their own,” “yes, but only with adult permission/ supervision,” and no. Unsure responses were coded as missing. These items were based on research by Azrael and colleagues (2018), who asked their own respondents to report whether guns were stored loaded and unlocked, loaded and locked, unloaded and unlocked, or unloaded and locked.

***Parenting***

Parenting practices are the primary independent variables. These were measured using the Alabama Parenting Questionnaire (APQ), a survey instrument designed for parents of children ages 6 to 18. Respondents were given a list of 42 statements and asked to indicate how often each typically occurred in their home. Response options were never (0), almost never (1), sometimes (2), often (3), and always (4). The APQ measures five dimensions of parenting: positive involvement with children (10 items, alpha = 0.72), poor supervision and monitoring (10 items, alpha = 0.83), use of positive discipline techniques and communication (6 items, alpha = 0.54), inconsistency in the use of discipline (6 items, alpha = 0.58), and corporal punishment (3 items, alpha = 0.28). Each subscale was calculated as an additive score. Scores on each subscale were treated as separate predictors. The remaining items in the APQ are not part of any particular scale but measure specific parenting practices. These items were not used in the present study. The corporal punishment subscale was also omitted from this study, as is standard practice when examining parents of adolescents (Zlomke et al. 2014). Additional details about the APQ have been described elsewhere (Frick 1991).

***Demographics***

Demographic controls included parent gender (male, female), number of children, age in years, race (White, non-White), marital status (currently married or cohabiting, not currently married or cohabiting), household income (under $20K, $20K-$29,999, $30K- $39,999, …, $100K+), whether respondent lives in a rural area (yes/ no), and highest level of education (less than high school, high school, some college, 2-year degree, 4-year degree, graduate degree). While ethnicity (Hispanic, not Hispanic) was measured by the survey, gun ownership among Hispanics was too rare in the sample to include ethnicity as a control variable. Similarly, gun ownership among non-Whites was extremely rare in the sample, necessitating a dichotomous indicator for race.

**Plan of Analysis**

 Ordinary Least Squares (OLS) regression was first used to examine the association between gun ownership (both household and personal) and parenting practices, with parenting practices as outcome measures. Bivariate correlations indicated small to moderate associations between personal gun ownership and parenting practices (r = 0.07 for involvement, 0.13 for poor supervision and monitoring, 0.02 for positive parenting, and 0.11 for inconsistent discipline). The correlations with poor supervision and monitoring and inconsistent discipline were significant at the 0.05 level. For the second research question, all three dependent variables (gun storage and youth gun access) in the core analysis are nominal with more than two levels. Multinomial logistic regression was used to examine associations between respondent parenting practices, household gun storage, and youth firearm access. “No” is used as the baseline category for all models (no guns locked, no guns unloaded, no gun access). Early examination of the data revealed significant differences (P < 0.05) in gun storage practices by parenting practices, suggesting a more nuanced investigation using multinomial logistic regression was needed. Of the 525 respondents, 478 (<9%) had missing data; all models were calculated using complete case analysis. Robust standard errors were used for all estimation. All control variables were included in each model.

**Results**

**Sample Characteristics**

As shown in Table 1, half of the respondents were male and half were female—equal representation was built into study design. Consistent with 2019 U.S. Census population estimates for Pennsylvania, 83% of respondents were White. Respondent age range (27 to 69) was consistent with a sampling design that targeted parents of 12 to 17-year-old children. The sample was, however, better educated and had higher income, on average, than is typical in Pennsylvania. In 2019, 31% of Pennsylvania residents had a Bachelor’s degree or higher (U.S. Census Bureau 2019). That figure was 56% among study respondents. About a third of respondents reported a gun in their household; 22% reported that they personally owned one or more of the guns in their homes. These figures differ from national estimates that place household gun ownership at around 42 % and personal gun ownership at 30% (Parker et al. 2017). Regarding behavior, more than 83% of gun owners reported that all guns in the household were locked and unloaded, respectively. About 70% reported that their child ages 12 to 17 could not access the household firearms under any circumstances. Wide ranges on each of the parenting subscales from the Alabama Parenting Questionnaire (APQ) indicated substantial variation in parenting practices within the sample.

**Parenting Differences**

Ordinary Least Squares (OLS) regression models assessing associations between parenting practices and household gun ownership were tested, but there was no association between household gun ownership and any of the APQ subscales. Table 2 shows comparable models but with a control for personal gun ownership instead. Results indicated that personal gun ownership was associated with more inconsistency in discipline and poorer monitoring and supervision. Differences in parenting practices were linked to respondent demographics. Older respondents reported significantly less frequent use of positive discipline and less positive involvement with their child than younger respondents, but also reported less inconsistent discipline and fewer problems with supervision and monitoring. Compared to females, male respondents indicated better supervision and monitoring practices and had marginally lower scores for inconsistent discipline. Each additional child in the home was associated with significantly better monitoring and supervision, but also with less use of positive discipline. More parental involvement and more use of positive discipline were associated with higher levels of education. Higher levels of education were also negatively associated with inconsistent discipline and poor monitoring. Being White and a rural resident were both significantly associated with better monitoring and supervision.

**Gun Storage and Youth Access**

 All remaining regression analyses utilized the control for personal gun ownership given associations noted in Table 2. Multinomial logistic regression models testing associations between gun storage and youth access among gun owners are shown in Table 3. Baseline categories for each model are no guns unlocked, no guns loaded, and no youth gun access, respectively. Relative risk ratios (RRR) for each predictor are displayed. A relative risk ratio is the ratio of the probability of an outcome in a group with a certain characteristic (i.e. the predictor) to the probability of an outcome in a group without that trait (or with a lower value on that trait). Personal gun ownership did not distinguish parents who kept guns locked or unloaded from parents who did not. Nor did personal gun ownership differentiate between parents who permitted youth access to guns from those who did not.

Parents who reported poorer supervision and monitoring were significantly more likely to indicate that their child could access guns under any circumstances, whether supervised or otherwise. Relative risk ratios were 1.4 for unsupervised access and 1.2 for supervised access. Parents who reported greater use of positive discipline and communication were more likely to say some (RRR = 1.7) or all (RRR = 1.5) of the guns in their home were stored locked. These parents were also marginally less likely to allow their child access to firearms under adult supervision as opposed to never allowing youth access. This parenting practice did not distinguish those who reported guns in their home were stored unloaded versus loaded. Parents with higher scores on the inconsistent discipline subscale were marginally more likely to say that some of their guns were stored loaded (rather than none of them). Parental involvement was not a distinguishing factor for any gun storage practices.

 Remaining associations in Table 3 were linked to demographics. Older respondents were significantly less likely to allow their child unsupervised gun access, and also less likely to say the some of the household guns were kept loaded. Compared to females, males were substantially more likely to permit unsupervised youth gun access instead of no access and to say that only some of the household guns were unloaded. Those with more children in the home were significantly more likely to say that at least some of the household guns were kept unlocked and loaded. Respondents with higher levels of education were more likely to say some of their guns were stored unloaded. Whites were significantly more likely than non-Whites to say that only some of their guns were locked and unloaded and were marginally more likely to say that their child had supervised access to firearms.

**Discussion**

Results indicated no differences in parenting practices based on household gun ownership. Yet, results indicated that personal gun ownership was associated with more inconsistency in discipline and poorer monitoring and supervision. In prior research, Martin-Story et al (2015) found some evidence of better family functioning in homes with guns than in homes without guns. However, the study was limited to parents of very young children and the results were not statistically significant in the presence of other controls. The current study focused on families with adolescent children. In line with expectations, poor supervision and monitoring were associated with greater youth firearm access. There was no link between parental involvement and household firearm practices, as predicted in the second hypothesis. The third hypothesis was somewhat supported; parents who used inconsistent discipline also had inconsistent firearm storage practices. They were marginally more likely to say that some of their guns were stored loaded (rather than none of them). The fourth hypothesis was also supported. Positive discipline and communication were associated with storing guns locked.

While this study accounted for key demographic traits like gender, income, education, and rurality, differences in parenting between gun owners and non-owners may still be entwined with cultural differences between the two groups. Rates of gun ownership are higher among political conservatives and among religious subgroups like Evangelical Protestants (Merino 2018). In one study, conservative Protestant adolescents reported higher access to guns in the home than those from other religious groups (Stroope and Tom 2017). Past research found that those with conservative religious beliefs were more often encouraged by church leaders to engage in positive discipline techniques than those from less conservative religious groups (Wilcox 1998). Further work found that conservative Protestants placed a high value on child obedience and that the importance of child obedience to this subgroup has increased over time (Starks and Robinson 2005). Religion and conservativism aside, Kalesan (2015) and others (Parker et al. 2017) noted that gun owners are often embedded in a social life involving other gun owners and participation in gun-related activities. These interactions contribute to a social gun culture that may promote or uphold specific values related to parenting. That differences in parenting practices in the current study emerged specifically between personal gun owners and non-owners may simply be a byproduct of more frequent or direct exposure to such a subculture.

The finding that poor supervision and monitoring were associated with greater likelihood of child gun access was consistent with past work. Existing research found that children injured by firearms often originated from disadvantaged families where poor supervision was more common (Hardy 2002; Leventhal et al. 2014). Other studies found unsafe firearm storage among parents battling stress, depression, or alcoholism (Martin-Storey et al. 2015; Morgan et al. 2019; Morrissey 2016). Parents struggling with personal problems like these might have less ability to effectively monitor children. Martin-Story et al (2015) observed unsafe firearm storage in homes where parents permitted other risky behaviors, like riding a bike without a helmet. Yet, it remains possible that allowing risky behaviors and failing to supervise or monitor children are distinct. A parent, for example, might make the conscious choice that allowing a risky behavior is acceptable while still taking the time to supervise and monitor child behavior. It is also possible that parents who engaged in less supervision and monitoring compensated by denying child firearm access. For a parent with limited time or resources for supervision, denying child gun access altogether may be considered the best option to ensure child safety. One study, for example, found that parents supervised their firstborn children more than later children (Averett et al. 2011). Yet, this pattern did not fully account for the link between having an older sibling and engaging in risky behavior.

It was surprising that there was no link between parental involvement and household firearm practices. Highly responsive parenting, a key trait of authoritative parenting (Baumrind 2005), is characterized by frequent two way-communication between parent and child, warmth, and support. In the Alabama Parenting Questionnaire, items measuring involvement include how often “you have a friendly talk with your child,” “you volunteer to help with special activities your child is involved in,” and “your child helps plan family activities” (Frick 1991). Feigelman, Rosen, and Cerel (2019) found that teens with close, warm relationships with parents reported easy access to guns. The authors posited that close relationships with parents engender parent-child trust, which may make parents either more inclined to allow child gun access or less likely to take steps to actively prevent child gun access. It may be the case that this study’s measure of positive discipline is more consistent with measures used by Feigelman et al (2019) than this study’s measure of involvement. In the present study, use of positive discipline (rewards, praise, etc.) was positively associated with permitting children supervised gun access.

Yet, Feigelman et al (2019) found that the association between parent-child relationships and firearm access only applied to male adolescents, not females. The present study examined household practices as opposed to practices specific to a particular child or child gender. Gun ownership and gun use remain strongly gendered; most gun owners and gun users are male (Parker et al. 2017). Hunting and shooting sports are generally passed on from male family members to male children (Stedman and Heberlein 2001). It is conceivable that parental involvement might be associated with gun storage in the household for male children specifically, a trend that might be masked because this study did not account for child gender. Examination of child safety campaigns from 1997 to 2016 in one study indicated a strong gender bias (Bauer et al. 2019). The advertising focused on stereotypically male sports and sports equipment for boys and stereotypically female sports for girls. In doing so, these campaigns communicated a gendered conception of risk to families. Influences like these could contribute to different parenting practices for male and female children, including different rules about household firearms or firearm storage practices in the home. Further research is needed to explore this possibility.

Remaining results were largely aligned with expectations. Parents who used inconsistent discipline, for instance, were more likely than others to report that only some of their firearms were stored unloaded. Inconsistent discipline is a common practice among both permissive parents and uninvolved parents in Baumrind’s (2005) typology. Both parenting styles are low on demandingness meaning rules are lax (if present at all) and may or may not have consequences if broken (Darling 1999). The results of this study indicate that inconsistencies in firearm safety may be part of a larger pattern of inconsistent parenting (Hardy 2002). This finding has been observed for other parenting practices. Jinnah and Stoneman (2016), for instance, examined child injury on farms as it related to permissive parenting. The authors found that permissive parenting contributed to child farm injuries not only through limited rules and supervision, but also through modeling unsafe behaviors. Fathers’ modeling of unsafe behaviors was particularly influential.

**Limitations and Directions for Further Study**

 Several limitations of this study must be kept in mind. First, the sample was obtained exclusively from Pennsylvania. Inferences for other states or regions cannot be drawn. Second, the sample originated with a market research panel. Although Qualtrics used quotas and targeted recruiting to align sample demographics with those for the state as a whole, individuals who choose to take surveys for points or other incentives may differ from residents more broadly. These individuals also have access to broadband internet, which is more limited in low income and rural communities (Powell et al. 2010). Gun ownership, particularly for sport and hunting as opposed to protection, is more common in these communities (Parker et al. 2017). Aside from sampling, there are also some limitations related to the study’s scope and design. As a cross-sectional study, it was not possible to assess how parenting practices might have changed over time for a given family. This study also relied on parent reports. Previous research found that parents and children can have different perspectives on parental monitoring practices (Gentile et al. 2012). A topic such as gun storage is also prone to social desirability bias. Parents may report safe firearm storage in an effort to give the most socially appropriate response instead of an accurate response (Azrael et al. 2000). Additional research incorporating child reports of gun accessibility may help to assess this possibility.

 Due to a small sample of gun owners, this study was precluded from addressing reasons for household gun ownership. While protection is the most common motivation, hunting and sport are a close second (Parker et al. 2017). The types of guns used for protection and sport frequently differ; handguns are common for protection while long guns are more common for sport shooting. Additionally, most gun-owning households have more than one firearm (Parker et al. 2017). Owners may have different purposes for each firearm in the household, which may partially explain why some respondents would store certain household guns differently than others. Motivation for gun ownership may also relate to youth gun access. A gun owner, for example, may permit supervised access to a home’s long guns for hunting while limiting the child’s access to handguns. Further research is needed to identify how households store different types of firearms and how child access may be regulated differently based on firearm type and purpose.

Lastly, this study did not examine use of firearms by children, only parents’ reports of youth firearm access and gun storage practices that could lead to youth firearm use or exposure. Firearm violence of several forms continues to be a pressing issue in the U.S. Unsupervised access to firearms by juveniles is a significant risk factor for suicide (Choi et al. 2017), violent offending and violent victimization (Ruback et al. 2011), as well as unintentional injury and death (Fowler et al. 2017). In 2017, almost 5% of high school youth reported that they carried a gun in the past year, excluding hunting and sport (Centers for Disease Control and Prevention 2018). Additional study is needed to incorporate not only measures of parenting practices, but also child-reported gun access. Parent and child reports of gun accessibility in the home may differ.

**Conclusion**

 The results of this study have practical implications for gun violence and gun injury prevention. Pediatricians are frequently encouraged to discuss gun safety with caregivers. Research from the 1990s found fairly low compliance with this recommendation. In one study, only about a quarter of pediatricians discussed gun safety with parents (Grossman 1995). Compliance was somewhat more likely among pediatricians who themselves owned guns, perhaps indicating more comfort with the topic (Becher et al. 2000). A more recent review of physician practices found that gun safety counseling continued to be a rare or low-occurrence practice even two decades later (Roszko et al. 2016). Yet, gun safety counseling can effectively improve gun storage practices, parents are generally open to these discussions, and training for pediatricians can make gun safety counseling all the more effective (Roszko et al. 2016). Good training, however, should be based on empirical research. The results of this study may help physicians and other practitioners in youth services identify practices in the home that are associated with higher-risk firearm storage or youth gun access. Parenting questionnaires may help identify higher-risk families, even without questions directly assessing gun storage.

 This study builds on the extant literature by examining parenting practices where previous studies focused much more on the sociodemographics of youth gun access and firearm storage. Even after accounting for well-known factors like race, socioeconomic status, and rurality, this study found that parenting practices differed between gun owners and non-owners. Among gun owners, differences in parenting were related to whether or not household firearms were stored locked or unloaded and whether or not teens in the home were permitted supervised or unsupervised access to guns. These results indicate that parental choices about firearms should not be considered an isolated practice. Rather, these choices are ingrained in a broader web of parenting practices and family dynamics. Additional research is needed to explore how these links might relate to the type or number of guns in the home, the gender of the child, or the purpose of gun ownership for adults in the household.

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**Table 1:**

***Sample characteristics (n = 525)***

|  |  |  |  |
| --- | --- | --- | --- |
| **Ordinal/ Continuous Measures** | **N** | **Mean (SD)** | **Range** |
| Age | 478 | 43.80 (8.37) | (27, 69) |
| Number of children | 525 | 2.47 (1.24) | (1, 7) |
| APQ: Positive involvement | 525 | 26.36 (4.90) | (7, 40)) |
| APQ: Poor supervision & monitoring | 525 | 14.38 (6.37) | (2, 40) |
| APQ: Positive discipline & communication | 525 | 14.72 (3.09) | (4, 24) |
| APQ: Inconsistent discipline | 525 | 10.95 (3.82) | (0, 24) |
| **Categorical Measures** | **N** | **Proportion** | **95% CI** |
| Male | 260 | 49.71% | (0.45, 0.54) |
| White | 436 | 83.05% | (0.80, 0.86) |
| Married or cohabiting | 404 | 76.95% | (0.73, 0.80) |
| Rural resident | 124 | 23.62% | (0.20, 0.27) |
| Household gun owner | 177 | 33.71% | (0.30, 0.38) |
| Personal gun owner | 113 | 21.52% | (0.18, 0.25) |
| *Firearms unloaded:*  All of them | 148 | 85.55% | (0.79, 0.90) |
| Some of them | 14 | 8.09% | (0.05, 0.13) |
| No | 11 | 6.36% | (0.04, 0.11) |
| *Firearms locked:*  All of them | 145 | 83.33% | (0.77, 0.88) |
| Some of them | 14 | 8.05% | (0.05, 0.13) |
| No | 15 | 8.62% | (0.05, 0.14) |
| *Youth access:*  Unsupervised | 20 | 11.30% | (0.07, 0.17) |
| Supervised | 32 | 18.08% | (0.13, 0.24) |
| No | 125 | 70.62% | (0.63, 0.77) |
| *Income*: < $20K | 33 | 6.37% | (0.05, 0.09) |
| $20K - $29,999 | 31 | 5.98% | (0.04, 0.08) |
| $30K - $39,999 | 38 | 7.34% | (0.05, 0.10) |
| $40K - $49,999 | 26 | 5.02% | (0.03, 0.07) |
| $50K - $59,999 | 29 | 5.60% | (0.04, 0.08) |
| $60K - $69,999 | 27 | 5.21% | (0.04, 0.08) |
| $70K - $79,999 | 45 | 8.69% | (0.07, 0.11) |
| $80K - $89,999 | 40 | 7.72% | (0.06, 0.10) |
| $90K - $99,999 | 48 | 9.27% | (0.07, 0.12) |
| $100K + | 201 | 38.80% | (0.35, 0.43) |
| *Education*: < High school | 12 | 2.29% | (0.01, 0.04) |
| High school | 97 | 18.48% | (0.15, 0.22) |
| Some college, no degree | 85 | 16.19% | (0.13, 0.20) |
| 2-year degree | 47 | 8.95% | (0.07, 0.12) |
| 4-year degree | 173 | 32.95% | (0.29, 0.37) |
| Graduate degree | 111 | 21.14% | (0.18, 0.25) |

*Note:* SD refers to standard deviation. CI refers to confidence interval. N refers to the count for a particular response category for categorical measures and for total number of responses for ordinal and continuous measures.

**Table 2:**

***Ordinary Least Squares (OLS) regression models with parenting practices as outcome (n = 470)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **Positive involvement** | **Poor supervision & monitoring** | **Positive discipline & communication** | **Inconsistent discipline** |
|  | **b** |  | **(SD)** | **b** |  | **(SD)** | **b** |  | **(SD)** | **b** |  | **(SD)** |
| Age | -0.14 | \*\* | (0.03) | -0.19 | \*\* | (0.04) | -0.09 | \*\* | (0.02) | -0.11 | \*\* | (0.02) |
| Male | -0.01 |  | (0.46) | 2.27 | \*\* | (0.58) | 0.43 |  | (0.29) | 0.49 |  | (0.37) |
| Number of children | 0.04 |  | (0.18) | -0.50 | \*\* | (0.20) | -0.25 | \* | (0.11) | -0.23 | + | (0.14) |
| Income | -0.04 |  | (0.10) | 0.15 |  | (0.11) | -0.05 |  | (0.06) | -0.01 |  | (0.07) |
| Education | 0.51 | \*\* | (0.19) | 0.52 | \* | (0.232) | 0.20 | + | (0.11) | 0.52 | \*\* | (0.14) |
| White | 0.88 |  | (0.69) | -2.18 | \*\* | (0.74) | 0.11 |  | (0.38) | -0.46 |  | (0.50) |
| Married | 0.45 |  | (0.54) | -0.14 |  | (0.66) | 0.13 |  | (0.34) | 0.59 |  | (0.46) |
| Rural resident | -0.26 |  | (0.47) | -1.81 | \*\* | (0.61) | -0.36 |  | (0.32) | -0.60 |  | (0.41) |
| Personal gun owner | 0.34 |  | (0.54) | 1.66 | \* | (0.76) | 0.01 |  | (0.35) | 0.83 | + | (0.42) |
| Constant | 29.56 | \*\* | (1.44) | 21.57 | \*\* | (1.76) | 18.66 | \*\* | (0.87) | 13.73 | \*\* | (1.11) |
| R-Squared | 0.08 |  |  | 0.16 |  |  | 0.09 |  |  | 0.12 |  |  |

*Note:* \*\* p< 0.01. \* p< 0.05. + p<0.10.

**Table 3:**

***Multinomial logistic regression models with gun storage and youth gun access among gun owners as outcomes (n = 163)***

|  |  |  |  |
| --- | --- | --- | --- |
| **Predictor** | **Guns locked** | **Guns unloaded** | **Youth access** |
|  | **RRR** |  | **(SD)** | **RRR** |  | **(SD)** | **RRR** |  | **(SD)** |
| *All of them/ Unsupervised:* Age | 1.00 |  | (0.05) | 0.98 |  | (0.04) | 0.82 | \* | (0.07) |
| Male | 1.08 |  | (1.04) | 1.13 |  | (0.94) | 25.40 | \* | (34.14) |
| Number of children | 1.06 |  | (0.27) | 1.69 | \* | (0.39) | 0.71 |  | (0.26) |
| Income | 1.20 |  | (0.14) | 0.91 |  | (0.11) | 1.06 |  | (0.15) |
| Education | 0.67 |  | (0.17) | 1.08 |  | (0.27) | 1.55 |  | (0.68) |
| White | 1.25 |  | (1.13) | 0.77 |  | (0.84) | 1.67 |  | (1.57) |
| Married | 0.49 |  | (0.51) | 2.45 |  | (1.89) | 0.14 |  | (0.22) |
| Rural resident | 1.44 |  | (0.97) | 0.83 |  | (0.52) | 5.11 |  | (7.00) |
| Personal gun owner | 0.66 |  | (0.64) | 1.09 |  | (0.90) | 0.27 |  | (0.68) |
| APQ: Positive involvement | 1.03 |  | (0.09) | 0.98 |  | (0.10) | 0.92 |  | (0.09) |
| APQ: Poor supervision & monitoring | 0.85 |  | (0.10) | 0.99 |  | (0.07) | 1.40 | \* | (0.20) |
| APQ: Positive disc. & communication | 1.47 | \* | (0.23) | 1.04 |  | (0.18) | 0.83 |  | (0.12) |
| APQ: Inconsistent discipline | 1.08 |  | (0.21) | 0.99 |  | (0.14) | 1.10 |  | (0.30) |
| Constant | 0.26 |  | (0.82) | 7.35 |  | (22.16) | 3.75 |  | (19.95) |
| *Some of them/ Supervised:* Age | 0.96 |  | (0.05) | 0.87 | \* | (0.06) | 1.02 |  | (0.03) |
| Male | 5.40 |  | (6.31) | 12.42 | \* | (15.79) | 0.66 |  | (0.36) |
| Number of children | 1.76 | + | (0.56) | 2.69 | \*\* | (1.00) | 1.03 |  | (0.18) |
| Income | 1.11 |  | (0.14) | 0.72 |  | (0.15) | 0.91 |  | (0.09) |
| Education | 0.98 |  | (0.33) | 2.78 | \* | (1.33) | 1.06 |  | (0.19) |
| White | 0.48 |  | (0.48) | 0.13 |  | (0.17) | 6.36 | + | (7.05) |
| Married | 0.58 |  | (0.80) | 4.85 |  | (5.64) | 2.91 |  | (2.56) |
| Rural resident | 1.13 |  | (0.99) | 0.74 |  | (0.72) | 1.57 |  | (0.71) |
| Personal gun owner | 2.30 |  | (3.16) | 0.40 |  | (0.53) | 1.95 |  | (1.11) |
| APQ: Positive involvement | 0.90 |  | (0.12) | 0.78 |  | (0.12) | 1.16 |  | (0.10) |
| APQ: Poor supervision & monitoring | 0.91 |  | (0.14) | 1.21 |  | (0.18) | 1.17 | \*\* | (0.07) |
| APQ: Positive disc. & communication | 1.68 | \* | (0.36) | 1.01 |  | (0.22) | 0.79 | + | (0.11) |
| APQ: Inconsistent discipline | 0.81 |  | (0.19) | 0.66 | + | (0.15) | 0.88 |  | (0.08) |
| Constant | 0.47 |  | (0.64) | 0.00 |  | (0.00) | 0.00 | + | (0.01) |
| Pseudo R-squared | 0.19 |  |  | 0.17 |  |  | 0.35 |  |  |

*Note:* \*\* p< 0.01. \* p< 0.05. + p<0.10.