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Associations between active shooter incidents and gun ownership and storage among families with young children in the United States

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ABSTRACT

The presence of firearms and their unsafe storage in the home can increase risk of firearm-related death and injury, but public opinion suggests that firearm ownership is a protective factor against gun violence. This study examined the effects of a recent nearby active shooter incident on gun ownership and storage practices among families with young children. A series of regression models, with data from the nationally representative Early Childhood Longitudinal Study-Birth Cohort merged with the FBI's Active Shooter Incidents data collected in 2003–2006, were used to examine whether household gun ownership and storage practices differed in the months prior to and following an active shooter incident that occurred anywhere in the United States or within the same state. Approximately one-fifth of young children lived in households with one or more guns; of these children, only two-thirds lived in homes that stored all guns in locked cabinets. Results suggest that the experience of a recent active shooter incident was associated with an increased likelihood of storing all guns locked, with the magnitude dependent on the temporal and geographic proximity of the incident. The severity of the incident, defined as the number of fatalities, predicted an increase in storing guns locked. Findings suggest that public shootings change behaviors related to firearm storage among families with young children.

1. Introduction

High-profile active shooter incidents such as the elementary school shooting in Newtown, Connecticut, in 2012, and the 2016 night club shooting in Orlando, Florida, increased public attention to firearm ownership and storage. A 2013 report from the Federal Bureau of Investigation (FBI, 2013) found that between 2000 and 2007, an average of 6.4 incidents occurred annually, whereas between 2008 and 2013, an average of 16.4 incidents occurred each year. Of the 160 active shooter incidents between 2000 and 2013, 64 (40%) are considered "mass killings", defined as three or more fatalities in a single incident, and the average number of fatalities per incident also increased over time (FBI, 2013).

Although active shooter incidents represent a small proportion of gun violence, they have outsized psychological impacts (North et al., 1997; Bjelopera et al., 2013). The recent experience of an active shooter incident, particularly one that occurs geographically close by, may induce some parents to purchase a firearm out of concern for their children's safety. Indeed, a 2014 Pew Research poll found that nearly three-fifths (57%) of Americans said that gun ownership does more to protect people from becoming victims of crime (Pew, 2014), and gun sales have increased in recent years. Since the mid-1990s, the increase in guns outpaced the increase in population by more than double (Follman, 2012). The United States has 4.4% of the world's population, but contains 42% of all of the world's civilian-owned guns (Lopez, 2015). Polls show little change in public opinion regarding gun control after the mass shootings in Newtown or Aurora, Colorado, in 2012, Tucson, Arizona in 2011, or at Virginia Tech in 2007 (Pew, 2014).

Among households that own guns, a recent active shooter incident may lead families to store guns ready for use in the event of an unexpected attack – such as storing them in unsecure locations or loaded with ammunition. In the 1990s, about one-third (35%) of American households (Phillips, 2013; Schuster et al., 2000) reported owning at least one firearm; among these households, 43% had at least one unlocked firearm (i.e., stored in an unlocked place and not locked with a trigger lock) (Schuster et al., 2000).

Alternatively, the recent experience of an active shooter incident may decrease families' rates of gun ownership and increase safe storage practices among those who are concerned about firearm accidents, suicides, and their children's access to guns. Unintentional injuries due to firearms are more likely to occur when firearms are stored loaded or in an unlocked manner (Grossman et al., 2005). In 2010, >600 people died as a result of an unintentional discharge of a firearm, 10% of whom were children under age 15 (Hoyert et al., 2012). That same year, nonfatal injuries resulting from firearm discharge, both intentional

Abbreviations: ECLS-B, Early Childhood Longitudinal Study-Birth Cohort; FBI, Federal Bureau of Investigation.

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and unintentional, affected nearly 24 of every 100,000 individuals in the U.S. (Centers for Disease Control and Prevention, 2013) Empirical research shows that countries and states with more guns have more firearm-related homicides and suicides (Monuteaux et al., 2015; Miller et al., 2002a; Miller et al., 2002b). In 2013, former President Obama released a plan to reduce gun violence that included encouraging the safe storage of firearms (The White House, 2013).

However, in the 2014 Pew poll, a minority (38%) of Americans indicated that gun ownership does more to endanger than enhance personal safety (Pew, 2014). In 2000, an estimated 1.69 million children under age 18 in the U.S. were living with loaded and unlocked firearms (Okoro et al., 2005), although ownership and storage practices vary geographically (Phillips, 2013; Okoro et al., 2005; Prickett et al., 2014). Further, research finds that parents' perceptions of their children's access to household guns are inaccurate, even among those who discussed gun safety with their children and practice safe storage methods (Baxley and Miller, 2006).

To date, the short-term effects of a recent active shooter incident on firearm ownership and storage practices among families with young children have not been investigated. Active shooter incidents may change parents' behavior by highlighting the dangers of firearms, inducing them to more safely store their guns or to not own guns at all. Alternatively, active shooter incidents may encourage parents to purchase firearms and have them readily accessible in the case of an intruder, given public perceptions of guns as a means of protection. The gun ownership and storage practices may be more susceptible to change among those who experienced a recent incident that occurred geographically nearby or that was more severe in terms of fatalities, due to greater media attention as well as a greater perceived threat. Using data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), this study investigates how a recent active shooter incident affects families' likelihood of owning a gun, and among gun owners, whether guns in the home are stored locked.

2. Methods

2.1. Data

This study uses two data sources. First, the ECLS-B is a comprehensive, longitudinal study collected by the National Center for Education Statistics (NCES). The baseline sample of approximately 10,700 children is nationally representative of children born in the United States in 2001.[1] Data were collected through parent interviews that occurred in 5 waves from 2001 to 2008. This study primarily uses information collected in waves 2 and 3, and the first wave for background information. In wave 2 (when children were 2 years old), interviews were conducted between January 2003 and March 2004 (between 3% and 11% in each month). In wave 3 (when children were 4 years old), interviews were conducted from August 2005 to June 2006, with nearly three-quarters (74%) occurring in the fall of 2005 (September, October, November).

Second, information on active shooter incidents from was obtained from a 2013 FBI report[2] on active shooter incidents in the United States from 2000 to 2013. Active shooter incidents are defined as "an individual actively engaged in killing or attempting to kill people in a confined and populated area." These incidents do not include the accidental discharge of firearms or suicides that occurred in public areas. These incidents may originate as domestic disturbances, but occur in public areas and thus potentially endanger others. The FBI gathered in the list using FBI records, official police records, and open sources. Between January 2003 and December 2006, there were 34 active shooter incidents. The month, year, and state of shooting were used in conjunction with the month, year, and state of interview to code whether the respondent had recently experienced an active shooter incident. This research received exemption from the American University Institutional Review Board.

2.2. Measures

At waves 2 and 3, respondents were asked whether they had a gun in the home ($1 = yes$, $0 = no$).[3] If they replied yes, respondents were asked if all guns were kept in a locked cabinet ($1 = yes$, $0 = no$).[4]

Whether the household had experienced a recent active shooter incident was coded in several different ways with regard to geographic and temporal proximity. First, a binary variable was created for whether an active shooter incident had occurred the month prior: an observation was coded as "1" if the household was interviewed in the month following an active shooter incident, and "0" if the household was interviewed the month prior to an incident. Because only the year and month and not the exact date of the interview is not known, interviews that occurred during the month of the incident were excluded from the analyses.[5] For example, for the shooting on August 27, 2003 in Illinois, interviews occurring during September 2003 were coded as having experienced a recent shooting in the country, whereas interviews occurring in July 2003 were coded as occurring prior to a shooting. Analogous binary variables were created for 2 months before and after an active shooter incident (e.g., June and July 2003 as before, September and October as after), and 3 months before and after each incident. For incidents in which the period before and after a shooting overlap (e.g., a shooting occurs in January 2002 and March 2002), the months following the incident are coded as having experienced a shooting; in this case February would be a "1"). Thus, more observations are coded as following a recent incident than as prior to an incident. In addition, the number of fatalities per incident (range: 0–9) was coded as a separate variable to interviews occurring prior to or following an incident as a proxy of incident severity. Because of the frequency and overlap of incidents, this control was only included as a control in the 1 month analyses.

An analogous set of binary variables was created for having experienced a recent active shooter incident in a household's state of residence within 1, 2, or 3 months. Using the shooting on August 27, 2003 in Illinois again as an example, households located in Illinois that were interviewed in September 2003 were coded as having experienced a recent shooting in their state ("1"), whereas households in Illinois that were interviewed in July 2003 were coded as occurring prior to a shooting ("0"). Again, analogous variables for 2 and 3 months prior to and after active shooter incidents were created for within-state incidents.

Analyses controlled for a range of family characteristics, including: whether the child was a twin, age, sex, and race/ethnicity; whether the respondent was the child's biological mother; the total number of individuals living in the household; household income; whether the child's mother was married; mother's age; the number of books in the home; the highest level of parent education at wave 1; whether the parent expects the child to graduate college or attain higher education; home ownership; perceived safety of the household's residential

[1] The ECLS-B over-sampled Asian and American-Indian children, twins, and low birth weight children. Reported sample sizes are rounded to the nearest 50, per NCES regulations.

[2] For the report and full list of incidents, see: https://www.fbi.gov/news/stories/2014/september/fbi-releases-study-on-active-shooter-incidents/pdfs/a-study-of-active-shooter-incidents-in-the-u.s.-between-2000-and-2013.

[3] Respondents could also refuse to answer or respond that they did not know. However, fewer than 1% of respondents did so, and these observations were omitted from the analysis.

[4] At wave 3 only, respondents who had guns also reported whether their guns had locking devices to prevent them from going off accidentally, including trigger locks, cable locks, locking racks, and barrel blocking. However, very few respondents replied to this question, so it was not included in analyses.

[5] The number of observations excluded for this reason varied across the national and state models and number of months (FBI, 2013; North et al., 1997; Bjelopera et al., 2013). In the national model examining one month prior to and following an incident, 20.4% of observations were excluded for occurring during the month of the incident.