Easy Access to Firearms: Juveniles' Risks for Violent Offending and Violent Victimization

R. Barry Ruback, Jennifer N. Shaffer and Valerie A. Clark

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What is This?

Easy Access to Firearms: Juveniles' Risks for Violent Offending and Violent Victimization

R. Barry Ruback,[1] Jennifer N. Shaffer,[2] and Valerie A. Clark[1]

Abstract

Keeping firearms at home may increase personal safety but it may also increase the risk of injury. This study uses data from three waves of the National Longitudinal Study of Adolescent Health to assess the extent to which adolescents' easy access to firearms at home increases the risk of violent offending and violent victimization. Access to firearms was higher for males, Whites, and adolescents having two parents, especially fathers. Current access to firearms at home significantly increased the odds of both violent offending and violent victimization, even after controlling for prior access, prior offending, and prior victimization. This relationship persisted into early adulthood; access to firearms still significantly increased the odds of violent offending and violent victimization.

[1]Penn State University, University Park
[2]Arizona State University, Phoenix

Corresponding Author:
R. Barry Ruback, Department of Sociology, 211 Oswald Tower, Penn State University, University Park, PA 16802
Email: bruback@psu.edu

There are more than 250 million privately owned firearms in the United States and more than a third of the households in the country contain at least one (Wellford, Pepper, & Petrie, 2004). The empirical debate over firearm ownership centers on whether guns provide adults with increased protection from crime (Kleck & Gertz, 1998) or put household members at greater risk of homicide, suicide, and serious injury (Dahlberg, Ikeda, & Kresnow, 2004; Kellermann et al., 1993). Although there is considerable disagreement about the extent to which adults should be able to own and use firearms, few seriously argue that juveniles should have easy access to guns. High-profile incidents at Columbine and other high schools across the country, in which students shot classmates and teachers, indicate that there are real dangers when some juveniles have access to firearms.

Research on adolescents and guns has focused mainly on urban adolescents who are either at high risk for violent offending or who are known to have committed a violent offense (Ash, Kellermann, Fuqua-Whitley, & Johnson, 1996; Lizotte, Krohn, Howell, Tobin, & Howard, 2000). Thus, it is not clear whether the findings from this line of research are generalizable to all juveniles or whether they are specific to "high-risk" samples (Kleck & Hogan, 1999). In addition, prior research has focused primarily on the relationships between juveniles' possession of guns and their risks both for committing a homicide and for being involved with gangs or drugs. Relatively less attention has been given to the risks of gun possession for criminal involvement more generally.

The present study extends previous literature in three ways. First, using a large nationally representative sample, it summarizes the prevalence of juveniles' access to firearms at home and the factors associated with easy access to firearms at home. In this study, "easy access" is based on the perceptions of the adolescents. Second, it examines the effects of this access on juveniles' risk for violent offending and violent victimization, other than homicide, after controlling for a number of important predictors of juveniles' involvement in violent crime as both victims and offenders. Finally, this research examines the lasting effects of easy access to firearms on violent victimization and offending into early adulthood.

Juveniles and Firearms

At least half of all adolescents in the United States believe that they could easily obtain a gun if they wanted one (Sheley & Wright, 1998), and about three quarters of American incarcerated youth believe that they could obtain a gun with "no trouble at all" (Sheley & Wright, 1993). In one study of 434 gun-owning households with children below the age of 18, researchers found that more than

25% of these households stored loaded firearms and about 10% of these households stored loaded and unlocked firearms (Azrael, Miller, & Hemenway, 2000). In a subsequent study of the same data, the authors found that in gun-owning households with older adolescents (ages 13 to 17) weapons were more likely to be stored unlocked and loaded than were weapons in houses with younger children (ages 0 to 12; Johnson, Miller, Vrintiotis, Azrael, & Hemenway, 2006). In another study of adolescents' access to firearms, about three quarters of participating adolescents from gun-owning households reported knowing the storage location of the household firearms and 36% of the adolescents reported that they had handled these firearms at least once (Baxley & Miller, 2006).

This access may lead to carrying guns. Approximately, 6% of high school–aged juveniles in the United States have carried a gun outside home in the past 30 days (Grunbaum et al., 2000), although the numbers are higher for boys (about 10%) than for girls (about 2%; Snyder & Sickmund, 1999). Perhaps not surprisingly, 20% of incarcerated male juveniles report carrying a gun all or almost all of the time (Decker, Pennell, & Caldwell, 1997). The rates of carrying weapons vary by locale. In urban areas, 23% of adolescents carry guns outside home (Sheley, McGee, & Wright, 1992), whereas in suburban areas, 17% carry firearms outside home (Sheley & Brewer, 1995). The rates of gun possession and carrying are even higher among youth who live in rural areas (Sheley & Wright, 1998).

Handguns are the most common type of firearm that juveniles carry outside home because they are easier than rifles and other long guns to conceal. Among juveniles who reported carrying a gun outside home, 80% reported carrying a handgun and only 20% reported carrying a long gun (Sheley & Wright, 1998).

Risks of Easy Access for Offending

Research suggests there are two categories of gun owners (Lizotte et al., 2000; Lizotte & Sheppard, 2001). In the first group are low-risk gun owners who tend to live in rural places, to have the required permits for ownership and use, and to own guns for socially approved reasons. The second group consists of high-risk owners who tend to be urban and to own guns illegally. These high-risk owners are more likely than low-risk owners to use guns in criminal activity.

Whether juveniles are high- or low-risk gun owners is also related to their self-reports of why they own guns. Although juveniles may obtain and carry firearms for a number of reasons, the most common explanation is self-protection. Among the general population of juveniles, 43% report that they carry a gun for protection (Sheley & Wright, 1998), about the same as the 46% of adults in the United States who report owning firearms for self-protection (Cook & Ludwig, 1997).

Among juveniles at high risk for offending, 60% report carrying a gun for protection. Among incarcerated offenders, 74% report possessing a gun for protection (Sheley & Wright, 1993).

The second most common explanation juveniles offer for owning or possessing a firearm is sport or recreation. Juveniles who report that they own guns for sport (e.g., hunting or target shooting) are less likely to offend than are juveniles who report that the primary reason they own guns is for protection (Sheley & Wright, 1998). Juveniles are least likely to report carrying a firearm to aid in criminal activity (Sheley & Wright, 1993). More generally, substantial numbers of juveniles who carry guns report that they feel safer and that they feel more energized and powerful (Lizotte & Sheppard, 2001).

Studies of the Rochester Youth Development Study indicate that juveniles who own guns for protection are significantly more likely to commit violent offenses than are juveniles who own guns primarily for sport and recreation (Lizotte et al., 2000; Lizotte & Sheppard, 2001). However, regardless of their reasons for possessing firearms, juveniles who own or possess guns are more likely to be involved in crime as offenders than are juveniles who report not owning or possessing guns (Lizotte et al., 2000).

The most common sources juveniles rely on to acquire firearms are friends (38%), family (23%), and street dealers (11%; Sheley & Wright, 1993). Importantly, when asked how they would go about getting a gun if they needed one, 53% of juveniles in an inner-city setting and 45% of incarcerated juvenile offenders reported that they would "borrow it from a family member or friend" (Sheley & Wright, 1993). That so many juveniles rely on familial sources for acquiring a gun suggests that there are substantial risks involved when juveniles have easy access to firearms at home.

Juveniles' peers also have an important influence on whether they will be high- or low-risk gun owners. Low-risk gun owners are socialized by their families into gun ownership, whereas high-risk gun owners' socialization into gun ownership and use is more influenced by their peers (Lizotte et al., 2000). Moreover, research on juveniles and guns has consistently supported a "contagion effect" in gun possession and ownership, in that juveniles often obtain and carry guns in response to beliefs that their peers own or possess guns (Lizotte et al., 2000; Sheley & Wright, 1993; Sheley & Wright, 1998).

Risks of Easy Access for Victimization

In addition to increasing juveniles' risk for offending, the presence of firearms at home may also place individuals at an increased risk of homicide, serious injury, and violent victimization. Several studies have linked home access to

firearms to injury and homicide (e.g., Cummings, Koepsell, Grossman, Savarino, & Thompson, 1997; Kellermann, 1996; Kellermann et al., 1993; Shaffer & Ruback, 2002). Adolescents are already at an increased risk of firearm homicide. In 2005, 1,885 adolescents aged 10 to 19 died from an intentional gunshot wound, making homicide by firearms the second and third leading causes of death for adolescents aged 15 to 19 and 10 to 14, respectively (Centers for Disease Control, 2009). In addition, engaging in delinquency is strongly associated with death or injury by a firearm (Loeber et al., 1999).

In contrast, Kleck (1998, 2001) has argued that the observed associations between gun possession and risk of homicide victimization are probably spurious, that is, the relationship between gun possession and risk of violent victimization would disappear when some unknown third variable, which is related to both factors, is held constant. In addition, aggregate changes in gun laws and restrictions do not appear to influence firearm homicides (McPhedran, Baker, & Singh, 2010).

In part, the debate over whether the relationship between firearms and risk for homicide victimization is real or spurious relates to the fact that the simple presence of firearms at home increases household members' risk of death by *any* means, not just firearm-related homicides (Cummings et al., 1997). In reviewing these findings, Kleck (2001) documented that the apparent causal mechanism through which household gun possession could increase risk of homicide—that offenders kill household members with guns kept at home—is too infrequent to support a true effect of gun possession on risk for homicide victimization.

The "contagion effect" suggests another possible mechanism through which gun possession or ownership might increase individuals' risk of being killed and of violent victimization more generally. That is, juveniles might be arming themselves to protect themselves, particularly if they are involved in criminal activities. For example, consider that in the 1990s juvenile involvement in the illegal-drug trade was associated with a rise in gun-related violence. As criminal involvement carries an increased risk of victimization in general, either because offenders carry money and other desirable goods or because of the risks associated with informal dispute resolution, juveniles arm themselves as protection against this increased risk (Blumstein, 1995). Thus, it may be the case that the observed relationship between firearms and violent victimization reflects their spurious association with violent offending. That is, offending may increase the likelihood of both firearm possession and violent victimization, suggesting that models that statistically control for juveniles' violent offending would find little or no effect of firearms on their victimization risk. The fact that juvenile offenders and juveniles at high risk for offending report carrying firearms for "protection" also supports this possibility.

The present study assesses the prevalence of easy access to firearms at home over three waves of panel data starting when the juveniles were aged 11 to 17. Our research addresses four issues. First, it examines factors that predict juveniles' easy access to firearms at home. Second, it addresses whether easy access to firearms at home increases the likelihood of violent offending among juveniles. Does prior access to firearms at home (i.e., access 11 or more months before the second wave of data) increase the likelihood of future violent offending net of prior violent offending and prior violent victimization? Or, is the effect of access to firearms in the household only contemporaneous? That is, is more recent access (i.e., within the year leading up to the second-wave interview) to firearms more important in predicting violent offending than prior access to firearms?

The third purpose of this research is to assess whether easy access to firearms increases the likelihood of violent victimization, other than homicide, among juveniles. Similar to the analyses predicting violent offending, the models that predict violent victimization address whether prior access to firearms has an effect on violent victimization over and above the effect of prior violent victimization, prior violent offending, and concurrent access to firearms. If so, as Kleck (1998) hypothesized, are there other factors related to both that might account for the observed effect?

The last major objective of this research is to assess the long-term effects of easy access to firearms. Are there long-term effects of access to firearms, early violent offending, and early violent victimization (other than homicide)? Given the strong relationship between past and future violent behavior (for both offending and victimization), it seems intuitive that these variables would be correlated in the present analysis. In sum, the present analyses assess the effects of past and current access to guns.

Method

The findings reported in this research are based on statistical analyses of the restricted-access data set from three waves of the National Longitudinal Study of Adolescent Health (Add Health Study), which is being conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill.

The Add Health Study is a longitudinal panel study that began with a nationally representative sample of more than 90,000 juveniles in Grades 7 through 12, in 132 U.S. schools. The Add Health Study used a clustered sampling design based on a stratified sample of 80 high schools and 52 paired middle schools. Clusters were sampled with unequal probability. Although this method reduced the costs of data collection, the design complicated the statistical analyses because the observations were not independently and identically distributed

(Chantala & Tabor, 1999). Students in these 132 schools completed an in-school questionnaire. In addition, a subsample of more than 20,000 students, stratified by grade and gender, were selected for in-home interviews. The in-home interviews, conducted throughout 1994 and 1995, collected information about family composition and dynamics, substance use, criminal and delinquent activities, violent victimization, and access to firearms. Subsequent in-home interviews were conducted approximately 1 year later in 1996 when the adolescents were in Grades 8 through 12 and then again throughout the years 2001 and 2002 when the adolescents were in early adulthood (ages 24 to 32).

The analyses and data used for this research are divided into two parts. The first consists of an analysis of the effects of easy access to firearms on violent offending and victimization over the first 2 waves of data for those adolescents who were of ages 11 to 17 in the first interview. Only adolescents who were present for the first 2 waves of interviews are included in these data and analyses. This sample consists of 12,584 juveniles: 6,078 boys and 6,506 girls; 4,304 juveniles of ages 11 to 14 and 8,280 juveniles of ages 15 to 17; 6,770 White respondents, 2,718 African American respondents, and 3,096 respondents from other racial backgrounds. Respondents who did not have complete data for all of the variables included in the analyses over the first 2 waves of data or who were older than 18 during the first wave of interviews were excluded from the analyses. In addition, some households had more than one child represented in the sample. To eliminate the bias that would otherwise result from the fact that responses from children within the same household were correlated, only one child from each household was included in the data. As this study is particularly interested in young adolescents, the youngest sibling was chosen. If a household had two children of the same age, one was randomly selected for the analysis. Sample characteristics for Wave 1 and Wave 2 of the data are displayed in Table 1.

The second set of analyses and data covers respondents who were included in Waves 1 and 3 of the in-home interviews. This set of analyses examines the long-term effects of easy access to firearms during adolescence, of violent offending, and of violent victimization on violent offending and victimization (other than homicide) that occurs during early adulthood (Wave 3). There are 12,454 respondents included in these analyses. Sample characteristics for Wave 3 measures are displayed in Table 2.

Analytical Approach

First, the sample is described in terms of the percentage of juveniles who reported having easy access to firearms, who reported violent offending, and

Table 1. Means and Standard Deviations— Measures From Waves 1 and 2 (*n* = 12,521)

Variable Name	Description	Wave 1		Wave 2	
		M	SD	M	SD
Dependent measures					
Violent offending	Binary measure, coded "1" if respondents engaged in any one of the following five items within the previous 12 months: got into a serious physical fight, hurt someone seriously, used or threatened to use a weapon to get something, shot or stabbed someone, pulled a knife or gun on someone	38%	—	22%	—
Violent victimization	Binary measure, coded "1" if respondents experienced any one of the following four items within the previous 12 months: someone pulled a knife or gun on respondent, respondent was shot, respondent was cut or stabbed, respondent was jumped	37%	—	15%	—
Independent measures					
Availability of guns	Binary measure, coded "1" if guns were easily accessible at home	16%	—	21%	—
Gender	Dummy measure, coded "1" if respondent was male (reference = female)	48%	—	—	—
Age	Continuous measure of age in years	15	1.43	16	1.46
African American	Dummy variable, coded "1" if respondent was African American	22%	—	—	—
Other race	Dummy variable, coded "1" if respondent was not African American or White	25%	—	—	—
Two-parent home	Binary measure, coded "1" if respondent lived in two-parent home	—	—	72%	—
Household SES	Standardized mean of parental occupational prestige and parental education, ranges from 0 to 5	2.94	1.34	—	—

(continued)

Table 1. (continued)

Variable Name	Description	Wave 1		Wave 2	
		M	SD	M	SD
Physical development	Standardized composite index of four items for males and three items for females reflecting how physically developed respondents rated themselves; juveniles who scored in the 50th percentile or higher were coded as more physically developed	—	—	50%	—
Unstructured socializing	Measure of how much time the respondent spent "just hanging out" with friends during the past week. Ranges from 0 (*not at all*) to 3 (*5 or more times*)	—	—	1.97	1.01
Not in school	Binary measure, coded "1" if respondent was not in school during most recent school term	—	—	1%	—
Self-esteem	Seven-item scale, a standardized composite index reflecting respondents' evaluation of their social skills and personal qualities, ranges from 1 to 5	—	—	4.08	0.59
Depression	19-item scale, measures respondent's level of depression based on how often they felt sad, hopeless, and inept during the previous week. Scale ranges from 1 to 5, with lower scores representing less depression	—	—	0.59	0.39
Hostile school climate	Four-item scale, standardized composite index reflecting the extent of trouble respondents had with teachers and other students in the school and how safe the juvenile felt at school, ranges from 1 to 5	—	—	2.30	0.68
Safe neighborhood	Dichotomous measure of whether the respondent felt safe in his or her neighborhood, 1 = *feels safe*, 0 = *does not feel safe*	—	—	0.89	0.32
Witness violence	Binary measure, coded "1" if respondent witnessed someone being shot or stabbed within previous 12 months	—	—	12%	—
Support from others	Seven-item scale, a standardized composite index reflecting how much adults, friends, and teachers cared about them, ranges from 1 to 5	—	—	4.06	0.57

(continued)

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Table 1. (continued)

Variable Name	Description	Wave 1		Wave 2	
		M	SD	M	SD
Parental supervision	Six-item scale, a standardized composite index reflecting how often a respondent's parents were home when they were also home, ranges from 0 to 5	—	—	3.34	0.71
Drunkenness	Six-item scale of how often respondent was drunk in the previous 12 months, ranging from 0 (never) to 6 (everyday or almost every day)	—	—	0.43	0.50
Drug use	Binary measure, coded "1" if respondent reported using illegal drugs during the previous 12 months	—	—	25%	—
Deal drugs	Binary measure, coded "1" if respondent reported dealing drugs within the previous 12 months	—	—	7%	—

Note: SES = socioeconomic status.

Table 2. Means and Standard Deviations— Wave 3 Measures (n = 12,454)

Variable Name	Description	M	SD
Dependent measures			
Violent offending	Binary measure, coded "1" if respondents engaged in any one of the following five items within the previous 12 months: got into a serious physical fight, hurt someone seriously, used or threatened to use a weapon to get something, shot or stabbed someone, pulled a knife or gun on someone	13%	—
Violent victimization	Binary measure, coded "1" if respondents experienced any one of the following four items within the previous 12 months: someone pulled a knife or gun on respondent, respondent was shot, respondent was cut or stabbed, respondent was jumped	7%	—
Independent measures			
Availability of guns	Binary measure, coded "1" if respondent owned a firearm not used for work	8%	—
Age	Continuous measure of age at Wave 3	21	1.48
Public assistance	Binary measure, coded "1" if respondent received any public assistance	11%	—
No high school education	Binary measure, coded "1" if respondent did not finish high school	10%	—
Self-esteem	Seven-item scale, a standardized composite index reflecting respondents' evaluation of their social skills and personal qualities, ranging from 1 to 5	3.82	2.35
Witness violence	Binary measure, coded "1" if respondent witnessed someone being shot or stabbed within previous 12 months	6%	—
Drunkenness	Six-item scale of how often respondent was drunk in the previous 12 months, ranging from 0 (never) to 6 (everyday or almost every day)	1.14	1.44
Drug use	Binary measure, coded "1" if respondent reported using illegal drugs during the previous 12 months	34%	—
Deal drugs	Binary measure, coded "1" if respondent reported dealing drugs within the previous 12 months	8%	—

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who reported being a violent crime victim. Next, factors related to juveniles' easy access to guns are examined at both the bivariate and multivariate levels. Finally, using both bivariate and multivariate analyses, the effects of juveniles' easy access to guns on their risk for violent offending and violent victimization are explored. All of the analyses and statistical tests for this research were conducted using the survey estimation procedures in Stata 10, a publicly available statistical package capable of handling complex survey designs like that used in the Add Health Study. The last section of analyses includes both the short-term effects that occur during adolescence and the long-term effects that occur during early adulthood.

Measures

The measure of juveniles' access to firearms used in the analyses is a dichotomous measure based on juveniles' yes/no response to the following item: "Is a gun easily available to you in your home?" In the results presented here, juveniles who reported not knowing whether a gun was easily accessible to them at home were coded as *not having easy access to a gun*. To test that assumption, we also analyzed the data coding these juveniles as missing cases. The results were essentially the same.

Accordingly, references to juveniles' "easy access to a gun" in the text indicate perceived access to a gun at home only. It is likely that some juveniles had easy access to guns from other sources, especially peers. Moreover, it is also probable that some households possessed a weapon, although the juvenile was unaware of this fact. Thus, this measure likely underestimates juveniles' actual access to guns. In addition, respondents were asked to indicate the type of firearm that was easily available at home (i.e., a handgun, a shotgun, a rifle, or another type of firearm).

The measures of violent offending and violent victimization used in the analyses (for the violence that occurs during both adolescence and early adulthood) were dichotomous measures based on the respondent's yes/no responses to multiple items. The measure of violent victimization included the following four items, which reflect serious physical violence during the previous 12 months: (a) someone pulled a knife or gun on the respondent, (b) respondent was shot, (c) respondent was cut or stabbed, and (d) respondent was jumped. The response alternatives for these items are the following: *never*, *once*, and *more than once*. Juveniles who reported experiencing any of the victimizations asked about in the scale items were assigned a score of 1 (*violently victimized*), and juveniles who reported that they did not experience any of the victimizations asked about in the scale items were assigned a score of 0 (*not violently victimized*). It is

important to keep in mind that most of the measures discussed in this research necessarily rely on the willingness and accuracy of the juvenile respondents' self-reports. Analyses of the National Crime Victimization Survey (NCVS) indicate that juveniles are less likely than adults to report violent victimization to the police, although juveniles and adults are equally likely to report theft offenses (Finkelhor & Ormond, 1999). In addition, the Add Health survey instrument did not specifically ask juveniles about victimization at home (e.g., child abuse) or about property victimization.

The measure of violent offending included the following five items, which reflect serious physical offenses against other persons during the previous 12 months: the respondent (a) was in a serious physical fight, (b) hurt someone badly enough to require medical attention, (c) used or threatened to use a weapon to get something from someone, (d) shot or stabbed someone, and (e) pulled a knife or gun on someone. The response alternatives for these items are the following: *never*, *1 or 2 times*, *3 or 4 times*, and *5 or more times*. Juveniles who reported engaging in any of these acts one or more times were assigned a score of 1 (*violent offender*), and juveniles who reported that they never engaged in any of these items were assigned a score of 0 (*no violent offenses*).

Logistic regression is the most appropriate form of regression for these analyses, given the binary nature of the dependent variables. Most of the sample had not engaged in violent offending or been the victim of violence in both Waves 2 and 3. Of those who had engaged in violence or had been the victims of violence, very few had experienced more than one of the violence items. Probability models, such as logistic regression, are best for binary data because the error terms are necessarily heteroscedastic. Using ordinary least squares regression to predict these outcomes would be inefficient and would create biased coefficients (Liao, 1994).

Several other relevant factors were also controlled for, including prior violent offending and violent victimization. Both of these Wave 1 measures are very similar to the Wave 2 measures. The multivariate analysis of juveniles' easy access to weapons included the following independent variables: gender (whether respondent is male, female being the reference), age (in years), time spent hanging out with friends (3-point scale), whether alcohol, tobacco, or other illegal drugs are easily accessible at home (dichotomous measures), household structure (dichotomous measure of whether respondent lives with two parents), and whether the family receives public assistance.

Measures of substance use were also included in the logistic models predicting violent offending and victimization. These measures include whether the juvenile reported using alcohol, tobacco (e.g., cigarettes or "dip"), and illegal drugs (e.g., marijuana, cocaine, heroin, or psychedelics) during the previous

12 months leading up to the Wave 1 interview. The means and standard deviations for the included independent variables are provided in Table 1.

In addition to the individual-level variables described above, seven contextual factors, based on block-level data from the 1990 U.S. Census, were also controlled for (a) neighborhood disadvantage (an index of the proportion of single-female headed households, the population receiving public assistance, the population living below the poverty level, and the population of unemployed individuals), (b) neighborhood resources (an index of the proportion of the population with managerial positions and the proportion of the population with incomes above US$75,000), (c) whether the respondent lived completely inside an urbanized area, (d) the proportion of the population classified as rural, (e) the proportion of the population classified as farm, (f) the proportion of the population that is African American, and (g) the number of arrests per 100,000 people for violent offenses. More detailed descriptions of these contextual factors are listed in Table 1.

The analyses that include Waves 1 and 3 included similar measures, although some of the key measures were adjusted to fit the context of early adulthood. In particular, access to firearms was a dichotomous measure based on the following question: "Do you own a handgun? Don't count a gun you must have for your job." The analyses also included measures of education (a dichotomous measure of whether the respondent completed high school or a general education diploma), and, in order to account for economic disadvantage, a measure of whether the respondent received public assistance (e.g., food stamps, unemployment benefits) was also included. One final unique variable in the long-term analyses was an indicator of whether the respondent lived in a farm. Similar to the analyses of Waves 1 and 2, the second set of analyses included measures of self-esteem, whether the respondent witnessed violence, how often the respondent got intoxicated, a dichotomous measure of drug use (i.e., marijuana, cocaine, hallucinogens, and inhalants), and a dichotomous measure of whether the respondent had dealt drugs within the previous 12 months.

Results

The bivariate results that follow are based on tests of data from Wave 2. Differences between percentages in Table 3 were tested using standard chi-square tests, with significance set at $p < .05$. All of the multivariate analyses relied on logistic regression modeling techniques using the survey logit procedures in Stata 10.

Easy Access to Firearms

The percentages of juveniles at Wave 2 reporting that firearms are easily available to them at home, reporting violent offending, and reporting that they were violent crime victims were high. Referencing Table 1, 21% reported having easy access to guns, 22% reported committing a violent offense during the past year, and 15% reported being a violent crime victim during the past year. Ten percent of juveniles in the sample reported having easy access to only one type of gun at home, 5% reported having access to two types of guns, 5% reported having access to three types of guns, and about 1% reported having access to four types of guns. More than a fifth of the juveniles had easy access to at least one weapon. Of those juveniles who reported easy access to firearms, the type of firearms they had access to were evenly distributed between handguns, shotguns, and rifles (about 12% each).

Table 3 shows that the percentage of juveniles with easy access to a gun at Wave 2 depends on juveniles' sociodemographic and neighborhood characteristics. The results presented in this table are generally consistent with previous research on juveniles' ownership and possession of firearms. Older juveniles, Whites, and juveniles residing in two-parent households were significantly more likely to report having easy access to guns than were their demographic counterparts. Boys were also more likely to report more access to guns at home compared to girls. Given that gender likely does not influence whether parents choose to keep guns easily accessible at home, this finding may reflect the fact that male juveniles are more likely to be aware of the firearms in their households. Juveniles whose parents scored above the median on the measure of socioeconomic status were more likely to report easy access to guns.

There were also significant differences in juveniles' reports of easy access to a gun by characteristics of the neighborhoods they lived in. Notably, juveniles who reported that they generally felt safe in their neighborhoods were significantly more likely to report easy access to guns than were juveniles who reported that they generally did not feel safe in their neighborhoods. Easy access to guns was also more prevalent in neighborhoods that scored below the median on arrests for violent crime and in highly rural areas. The measure of violent crime reflects Uniform Crime Reports rates of arrests for Part 1 Index Offenses per 100,000 population at the block-group level, divided at the median. The measure of rurality reflects the percentage of rural population at the block-group level from the 1990 U.S. Census, divided at the median.

Table 3. Percentage of Juveniles Reporting Easy Access to Guns at Wave 2 by Selected Characteristics

	Access to Firearms	
	Yes	No
Male[a]	27	73
Female	17	83
Age 11 to 14[a]	19	81
Age 15 to 17	23	77
White[a]	29	71
Minority	12	88
Two parents[a]	25	75
Other family structure	13	87
High SES[a]	22	78
Low SES	19	81
Neighborhood safe[a]	22	78
Neighborhood not safe	16	84
High rural[a]	33	67
Low rural	14	86
High-violent crime[a]	17	83
Low-violent crime	25	75

Note: SES = socioeconomic status. Access to guns was taken from Wave 2, as was age and family structure. All of the other measures were taken from Wave 1.
a. Significant at $p < .05$.

Factors Influencing Juveniles' Easy Access to Firearms

In addition to the bivariate relationships presented in Table 3, multivariate analyses were used to identify factors that influence whether juveniles have easy access to guns at home at Wave 2. As shown in Table 4, the strongest individual-level predictor of juveniles' easy access to guns was gender. Consistent with prior research, boys were more likely to report easy access to guns in the household. Also, consistent with past findings, non-White juveniles were less likely than White juveniles to have easy access to firearms. Juveniles residing in two-parent households were significantly more likely to report having easy access to guns than were parents living in other family structures. Other analyses, not shown, indicated that this result largely reflects the presence of

Table 4. Significant Predictors of Juveniles' Easy Access to Guns at Wave 2

Predictor	Logistic Coefficient	Odds Ratio
Male	0.67 (.06)	1.96
Age (in years)	0.04 (.02)	1.04
Non-White	−0.73 (.07)	0.48
Two-parent household	0.56 (.07)	1.75
Access to alcohol	0.57 (.06)	1.76
Access to tobacco	0.20 (.06)	1.23
Physical development	0.20 (.06)	1.22
Hostile school environment	0.14 (.04)	1.15
Time spent hanging out	−0.10 (.03)	0.91
Depression	−0.23 (.09)	0.80
Proportion farm population	3.32 (.56)	27.74
Urban	0.44 (.08)	1.55
Proportion rural population	0.42 (.09)	1.53
Neighborhood resources	−0.21 (.04)	0.81
Constant	−2.95 (.52)	
Pseudo R^2	0.12	

Note: Standard errors are in parentheses. Access to guns was taken from Wave 2, as were all of the other time-variant personal characteristics. Gender, race, and neighborhood characteristics were taken from Wave 1 interviews.

fathers in the household. That is, access to guns at home appears to be more strongly related to the presence of fathers rather than mothers.

Importantly, the strongest neighborhood-level predictor of whether juveniles had easy access to guns was the proportion of the population classified as farm by the U.S. Census Bureau. The proportion of rural population and whether the juvenile lived inside a completely urbanized area were also significant predictors of juveniles' access to guns. Juveniles residing in areas characterized by high proportions of farm or rural populations were significantly more likely to report having easy access to guns than were juveniles residing in areas characterized by relatively low proportions of farm or rural populations. These findings seem to support claims that it is not simply having access to guns that increases juveniles' risk for criminal involvement. That is, although juveniles residing in rural areas are most likely to have easy access to guns, gun-related crime is most prevalent in urban areas.

Easy Access to Firearms and Juveniles' Involvement in Crime

There were significant bivariate relationships between easy access to a gun and juveniles' involvement in violent offending. Compared with juveniles

without easy access to a gun, a much larger proportion of juveniles with easy access committed at least one violent offense (45% vs. 37%). A larger proportion of juveniles with easy access also carried a weapon to school compared with juveniles without easy access (16% vs. 8%), and more juveniles with firearm access were involved in selling drugs (16% vs. 8%). Easy access to a gun was also significantly related to juveniles' violent victimization at the bivariate level. Compared to juveniles without easy access to a gun, a larger proportion of juveniles who reported having easy access to a gun reported being the victim of a violent crime (49% vs. 35%). All of these differences between groups are statistically significant ($p < .05$).

Easy Access to Firearms and Violent Offending

Multivariate analyses were used to examine how easy access to firearms at home influences the likelihood of violent offending. The results presented in Table 5 indicate that even after controlling for other important factors related to violent offending, having easy access to a gun at home at Time 1 increased the odds of violent offending by 16% (based on Model 1). In Model 2, Wave 1 violent offending was controlled for. As past violent victimization is also highly predictive of violent offending (Shaffer & Ruback, 2002), a control for Wave 1 violent victimization was also added. As can be seen in Model 2, once prior violent offending and violent victimization were controlled for, the effect of Wave 1 easy access to firearms decreased in size and became nonsignificant. Once Wave 2 access to firearms was included in the analysis, the effect of Wave 1 access changed direction, decreasing the odds of violent offending by 14% (Model 3). Current access to firearms had a much stronger relationship with violent offending (54% increase in odds), indicating that more recent access to firearms is more important than general access to firearms.

The effects of the other variables in the model were generally consistent with previous research. Although it is not possible to determine from the Add Health data whether juveniles used the guns available at home when committing a violent offense, it is clear that the presence of guns at home is itself a risk factor for violent offending or is related to some factor or process that is a risk factor. To examine whether easy access to guns on violent offending was particularly problematic for some juveniles but not for others, some models included interaction terms between gender, adolescent social support, parental supervision, and area violent crime rate. When these interaction terms were included, lower order effects were also included. None of the interaction terms was significant more often than would be expected by chance.

Table 5. Significant Predictors of Wave 2 Violent Offending

Predictor	Model 1		Model 2		Model 3	
	Coefficient (SE)	Odds Ratio	Coefficient (SE)	Odds Ratio	Coefficient (SE)	Odds Ratio
Male	0.97 (.05)	2.63***	0.72 (.06)	2.06***	0.63 (.06)	1.87***
Not in school	0.86 (.12)	2.37***	0.67 (.12)	1.96***	0.62 (.13)	1.86***
Depression	0.40 (.07)	1.49***	0.30 (.08)	1.35***	0.29 (.08)	1.34***
Hostile school	0.37 (.04)	1.44***	0.29 (.04)	1.34***	0.27 (.04)	1.31***
Witnessed violence	1.38 (.08)	3.98***	1.24 (.08)	3.45***	1.15 (.08)	3.15***
Tobacco use	0.34 (.06)	1.41***	0.25 (.06)	1.29***	0.24 (.06)	1.27***
Alcohol use	0.47 (.06)	1.60***	0.45 (.06)	1.57***	0.41 (.06)	1.51***
Drug use	0.42 (.06)	1.53***	0.41 (.06)	1.51***	0.40 (.07)	1.49***
Deal drugs	0.84 (.09)	2.32***	0.75 (.09)	2.12***	0.73 (.09)	2.08***
Wave 1 access to guns	0.15 (.06)	1.16*	0.06 (.06)	1.06	−0.16 (.07)	0.86*
Wave 1 violent offending			1.40 (.05)	4.07***	0.94 (.06)	2.57***
Wave 1 violent victimization			0.89 (.06)	2.44***	0.91 (.06)	2.49***
Wave 2 access to guns					0.43 (.08)	1.54***
Constant	−0.08 (.44)		−1.29 (.46)		−1.39 (.47)**	
Pseudo R^2	0.19		0.26		0.27	

Note: The F tests of difference between Models 1 and 2 and between Models 2 and 3 are both significant at $p < .001$.
*$p < .05$. **$p < .01$. ***$p < .001$.

Importantly, Kleck (1998, 2001) has argued that previous studies of the effect of firearms on individuals' risk for violent offending, particularly homicide offending, reflect the fact that these studies have typically confounded the effects of gun possession and selling drugs. We tested for this possibility by

adding to the model described above a dichotomous measure of whether respondents reported selling marijuana or other drugs during the previous 12 months. The results of this analysis indicated that the effects of juveniles' easy access to guns on their risk of violent offending are independent of the effects of being involved in crime as a drug dealer. Specifically, including the measure of whether juveniles were involved in selling drugs during the previous year did not reduce the effect of easy access to a gun on violent offending. The possibility that easy access to guns on violent offending differs depending on whether the juvenile was involved in drug dealing was also tested by including an interaction term for these two factors. The interaction term was not significant, indicating that, at least among juveniles, drug dealing did not condition the effect of access to firearms on violent offending.

In addition to the analysis predicting juveniles' risk of any violent offending, we also conducted multivariate analyses separately predicting each of the five violent offending items included in the Violent Offending Scale. Controlling for all of the factors included in the model predicting any violent offending, *current* easy access to a gun significantly increased the likelihood of juveniles being in a serious fight, pulling a weapon (gun or knife) on someone, and hurting someone badly enough to require medical attention. Juveniles' easy access to a gun was not significantly related to juveniles' threatening someone with a weapon (knife or gun) to get something they wanted or to juveniles' shooting someone. This pattern of results suggests that when juveniles are involved in shooting someone, they are not using a firearm that they acquired at home. However, having easy access to a gun does significantly increase the likelihood that juveniles will be involved in serious, violent offenses against others.

Finally, to determine whether easy access to a gun is more problematic for juveniles who had previously committed a violent offense, we included an interaction term between violent offending in the 1st year of the study and easy access to a gun at home during the 2nd year of the study. The results of this analysis indicated that prior violent offending and current easy access to a weapon all increased juveniles' risk for violent offending, but that the risks associated with easy access to a gun were not stronger for juveniles who had previously committed a violent offense.

Easy Access to Firearms and Violent Victimization

Table 6 presents the results of the multivariate model examining the effect of easy access to guns on juveniles' risk of violent victimization. The results shown there suggest that even after controlling for important factors related

Table 6. Significant Predictors of Wave 2 Violent Victimization

Predictor	Model 1		Model 2		Model 3	
	Coefficient (*SE*)	Odds Ratio	Coefficient (*SE*)	Odds Ratio	Coefficient (*SE*)	Odds Ratio
Male	1.23 (.06)	3.41***	1.00 (.07)	2.72***	0.99 (.07)	2.69***
Not in school	0.56 (.14)	1.75***	0.37 (.14)	1.45**	0.37 (.14)	1.44**
Depression	0.59 (.08)	1.81***	0.52 (.09)	1.69***	0.53 (.09)	1.70***
Hostile school	0.23 (.05)	1.26***	0.15 (.05)	1.16**	0.15 (.05)	1.17***
Witnessed violence	1.95 (.08)	7.00***	1.79 (.08)	5.98***	1.77 (.08)	5.88***
Tobacco use	0.46 (.07)	1.58***	0.39 (.07)	1.48***	0.38 (.07)	1.47***
Alcohol use	0.31 (.07)	1.36***	0.25 (.07)	1.28***	0.24 (.07)	1.27***
Drug use	0.40 (.07)	1.49***	0.34 (.07)	1.41***	0.36 (.07)	1.43***
Deal drugs	0.61 (.09)	1.84***	0.53 (.09)	1.69***	0.52 (.09)	1.68***
Wave 1 access to guns	0.22 (.07)	1.24**	0.14 (.08)	1.14	−0.05 (.08)	0.95
Wave 1 violent victimization			1.16 (.07)	3.20***	1.16 (.07)	3.19***
Wave 1 violent offending			0.26 (.07)	1.30***	0.26 (.07)	1.30***
Wave 2 access to guns					0.44 (.09)	1.56***
Constant	−2.87 (.53)***		−3.92 (.54)***		−3.91 (.55)***	
Pseudo R^2	0.24		0.28		0.29	

Note: The *F* tests of difference between Models 1 and 2 and between Models 2 and 3 are both significant at $p < .001$.
**$p < .01$. ***$p < .001$.

to violent victimization, early easy access to a gun at home increased the odds of a violent victimization by 24% (Model 1). However, just as we observed with predicting violent offending, once prior victimization and violent offending were controlled for, early access to firearms was reduced in size and significance (Model 2). Also, consistent with the prior analysis, within-year access

to firearms (second wave) was much larger and positive as compared with prior access (Model 3). Within-year access to firearms was associated with a 56% increase in the odds of violent victimization.

In addition to analyses predicting juveniles' risk of any violent victimization, we also conducted analyses predicting each of the four violent victimization items included in the Violent Victimization Scale. Controlling for all of the factors included in the model predicting any violent victimization, easy access to a gun significantly increased the likelihood of only one of the violent victimization items: someone jumping the juvenile. Easy access to a gun was not a significant predictor of juveniles' risk of being shot, being cut or stabbed, or someone pulling a knife or gun on them.

Long-Term Effects of Easy Access to Firearms

In the final set of analyses, the effect of access to firearms on violent offending and violent victimization into early adulthood were examined. The results of these analyses, displayed in Table 7, reveal a pattern similar to the previous analyses discussed.

Gender (being male), whether the respondent dealt drugs, and whether the respondent owns a firearm that is not for his or her employment were strong and significant predictors of violent offending in early adulthood. Owning a firearm increased the odds of violent offending by 152%. Whether the respondent witnessed violence (i.e., saw another person get shot or stabbed) was the strongest predictor of violent offending, increasing the odds of violent offending by 382%.

The analyses predicting violent victimization were similar, with gender, dealing drugs, and owning a firearm being strong predictors of victimization. Owning a firearm increased the odds of violent victimization by 93%. Whether the respondent witnessed violence was the strongest predictor of violent victimization, and it was five times larger than the next strongest predictor (gun ownership). Witnessing violence increased the odds by 969%. For both violent offending and victimization in early adulthood, all of the predictors listed above increased the odds of both events even after controlling for earlier behaviors (Wave 1 violent offending and victimization).

Discussion

The analyses suggest three major conclusions. First, easy access to a gun at home increases the likelihood of violent offending and of violent victimization, other than homicide. The percentage of juveniles with easy access to a gun at home who committed a violent offense was significantly higher (45%) than

Table 7. Significant Predictors of Wave 3 Violent Offending and Violent Victimization

Predictor	Violent Offending		Violent Victimization	
	Coefficient (*SE*)	Odds Ratio[a]	Coefficient (*SE*)	Odds Ratio
Male	1.03 (.07)	2.80***	0.75 (.09)	2.12***
Age (in years)	−0.11 (.02)	0.90***	−0.06 (.03)	0.94*
Other race	0.52 (.07)	1.69***	0.25 (.09)	1.28**
Self-esteem	−0.38 (.07)	0.68***	−0.24 (.09)	0.79**
Witnessed violence	1.57 (.09)	4.82***	2.37 (.10)	10.69***
No high school	0.26 (.09)	1.30**	0.07 (.12)	1.07
Public assistance	0.31 (.10)	1.36***	0.07 (.13)	1.07
Live on farm	0.01 (.29)	1.01	−0.40 (.46)	0.67***
Drunkenness	0.24 (.02)	1.27***	0.12 (.03)	1.13***
Drug use	0.24 (.04)	1.27***	0.24 (.05)	1.27***
Deal drugs	0.83 (.09)	2.30***	0.47 (.12)	1.60***
Wave 1 access to guns	0.05 (.07)	1.05	−0.07 (.10)	0.93
Wave 1 gun ownership	0.92 (.09)	2.52***	0.66 (.11)	1.93***
Wave 1 violent offending	0.47 (.07)	1.60***	—	—
Wave 1 violent victimization	—	—	0.52 (.10)	1.68***
Wave 3 gun ownership	0.40 (.07)	1.50***	0.36 (.10)	1.43***
Constant	−0.35 (.51)		−2.32 (.67)	
Pseudo R^2	0.23		0.23	

a. The logistic coefficient represents the effect of a given predictor variable on the log odds of the outcome. Positive numbers indicate risk factors; negative numbers indicate protective factors.
*$p < .05$. **$p < .01$. ***$p < .001$.

the percentage of juveniles without easy access to a gun at home who committed a violent offense (37%). Similarly, the percentage of juveniles with easy access to a gun who were victimized by violence was significantly higher (49%) than the percentage of juveniles without easy access to a gun at home who committed a violent offense (35%).

In the multivariate analyses, access to firearms was among the largest predictors of violent offending and violent victimization, even after controlling

for several relevant factors. After controlling for past violence, including both offending and victimization, access to firearms in the home maintained a strong relationship with violent offending and victimization. These findings are consistent with most research on juveniles' access to firearms. This relationship persisted into early adulthood; access to firearms significantly increased the odds of violent offending and violent victimization in early adulthood net of violence that occurred during adolescence.

The second major conclusion is that current access to firearms is more important than earlier or general access to firearms in determining violent offending and violent victimization. The consistent pattern of within-year results, even during early adulthood, provides additional support for the claim that easy access to guns at home increases juveniles' risk for violent offending. However, it is important to keep in mind that it was not possible to establish the temporal ordering of juveniles' violent offending and their easy access to a gun at home when considering within-year effects. Thus, it might be, based on the "contagion effect" hypothesis, that offending may lead juveniles to seek out a gun, which in turn leads to violent victimization. In other words, offending may be predictive of the propensity to seek out guns. Another possible interpretation of these results is that the mere presence of guns elicits aggression. In an experiment conducted by Berkowitz and LePage (1967), the authors found that the presence of a firearm significantly increased the likelihood of an aggressive response to negative stimuli. The authors concluded that, regardless of whether the firearm is actually in use, the mere presence of this weapon led to increased aggression.

Third, illegal activities that juveniles could engage in with or without a gun did not moderate the relationship between easy access to firearms at home and violent offending. Including controls for what juveniles might do with an accessible gun at home (e.g., using drugs while carrying a weapon, carrying a weapon to school, and using a weapon in a fight) did not substantially reduce the effect of easy access to a gun on juveniles' risk for violent offending. Moreover, easy access to a gun at home did not significantly interact with a number of variables (e.g., selling drugs, race, gender, living in an urban area) that previous research has suggested to make access to guns especially problematic for juveniles. These findings suggest that risk of easy access is independent of what juveniles actually do or do not do with the weapons.

Policy Implications

The findings of these analyses have two policy implications. First, easy access to a gun at home is an important risk factor for violent offending. The finding

that having easy access to a gun at home significantly increases juveniles' risk for violent offending within the same year suggests that easy access to a gun is a risk factor for violent offending or is correlated with some factor or process that increases the likelihood of violent offending. The cross-year analyses suggest that easy access to a firearm has only a relatively short-term influence on juveniles' risk for violent offending. That is, easy access was a significant predictor of violent offending within years but not across years (after taking into account prior offending and victimization). This implication, in turn, suggests that households should take steps to ensure that guns kept at home are properly stored and are not easily accessible to juveniles. It may be that by simply preventing juveniles' easy access to firearms, caregivers can also reduce the associated risks of offending (directly) and of victimization (indirectly).

Second, easy access to a gun at home is an additional risk factor for known juvenile offenders. This finding suggests that counseling the caregivers of juvenile offenders to take extra precautions to prevent easy access to weapons at home would be useful for decreasing the likelihood of future violent offenses. Moreover, because violent offending is a significant risk factor for violent victimization, reducing the increased risk of violent offending associated with access to guns may also be an effective strategy for reducing violent victimization among these juveniles.

Declaration of Conflicting Interests

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Bios

R. Barry Ruback is a professor of crime, law, and justice and sociology at Penn State University, University Park. He is interested in decision making in the legal system including victims' reporting decisions and judges' sentencing decisions.

Jennifer N. Shaffer is an assistant professor of criminology and criminal justice at Arizona State University, Phoenix.

Valerie A. Clark is a doctoral candidate in crime, law, and justice at the Penn State University, University Park. She is currently writing her dissertation about the effects of adolescent intimate partner abuse titled "Correlates and Consequences of Offending and Victimization: An Analysis of Intimate Partner Abuse Among Adolescents."