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Document Title: Firearm Involvement in Delinquent Youth and Collateral Consequences in Young Adulthood: A Prospective Longitudinal Study

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**Special Report for Award Number: 2016-R2-CX-0039**

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I. Purpose of Project

Firearm violence is a substantial public health problem.\textsuperscript{1} Despite declines in homicide and other violent crime,\textsuperscript{2,3} firearms were responsible for nearly 200,000 homicides from 2000 to 2015.\textsuperscript{1,4} Deaths from firearms—including suicide and homicide—are most common among inner-city youth. The rate of death due to firearms is over twice as high in African Americans compared with non-Hispanic whites;\textsuperscript{5} African American males suffer disproportionately.\textsuperscript{1,5}

Both perpetration and victimization of firearm violence are common among delinquent youth. For example, delinquent youth have an extraordinarily high risk of early violent death, and they are four times more likely to die before age 21 than youth in the general population.\textsuperscript{6} One study found that among delinquent males, the cause of death is predominately homicide by firearm (86\% of deaths).\textsuperscript{7} However, prior studies have not examined how exposure to firearms during adolescence predicts subsequent perpetration and victimization of firearm violence.

This study is the first prospective longitudinal study to examine how exposure to firearms during adolescence predicts the perpetration and victimization of firearm violence through young adulthood. The study has several strengths: (1) a large and diverse random sample of juvenile detainees (N=1829) that includes youth processed as juveniles and transferred to adult court; (2) a prospective longitudinal design: participants were first interviewed in the late 1990s and tracked and reinterviewed up to 13 times during the 16 years after detention, up to a median age of 32 years; (3) detailed self-reported data and records on criminal activity, injury and mortality, and risk and protective factors known to affect perpetration and victimization; (4) enough females (n = 665 sampled at baseline) to examine differences by sex; and (5) sufficient racial/ethnic diversity (including ethnic diversity among Hispanics) to provide needed empirical data on Hispanics, now the largest racial/ethnic minority in the U.S.\textsuperscript{8}

The proposed study aimed to address this gap in the literature. We examined firearm involvement (access, ownership, and use) during adolescence and young adulthood (up to a median age of 32), and how involvement differed by sex and race/ethnicity. We examined how firearm involvement during adolescence predicts the
perpetration of firearm violence in young adulthood. We examined patterns of firearm victimization (injury and mortality) over time. Finally, we examined how firearm involvement during adolescence and young adulthood predicts firearm victimization in adulthood.

II. Participants

We recruited a stratified random sample of 1829 youth at intake to the Cook County Juvenile Temporary Detention Center (CCJTDC) in Chicago, Illinois, between November 20, 1995, and June 14, 1998. The CCJTDC is used for pretrial detention and for offenders sentenced for fewer than 30 days. To ensure adequate representation of key subgroups, we stratified our sample by sex, race/ethnicity (African American, non-Hispanic white, Hispanic, other), age (10-13 years or 14-18 years), and legal status (processed in juvenile or adult court). The sample included 1172 males and 657 females; 1005 African Americans, 296 non-Hispanic whites, 524 Hispanics, and 4 other race/ethnicity; mean age, 14.9 years. Face-to-face structured interviews were conducted at the detention center in a private area, most within 2 days of intake.

III. Design and Methods

We conducted follow-up interviews at approximately 3, 5, 6, 8, 12, 14, 15, and 16 years after the baseline interview (hereafter referred to as “after detention”) for the entire sample; subsamples were interviewed at 3.5, 4, 10, 11, and 13 years after the baseline interview. Participants were interviewed whether they lived in the community or in correctional facilities; 81.6% of participants who were still alive had an interview at year 16. Interviews were conducted through 2014.

Participants signed either an assent form (<18 years old) or a consent form (>18 years old). The institutional review boards of Northwestern University and the Centers for Disease Control and Prevention approved all study procedures and waived parental consent for persons younger than 18 years, consistent with federal regulations regarding research with minimal risk.9

At all follow-up interviews, we asked participants about firearm use (recent use, age of first use); access to firearms (current ownership, firearm in household, ease of obtaining a firearm, membership in a gang that carries firearms); perpetration of firearm violence (firing a firearm or showing a firearm in a threatening manner: age at first perpetration, perpetration since last interview); and victimization (gunshot injury; threatened with a weapon). Persons who were incarcerated for 30 days prior to an interview were not asked about certain behaviors (e.g., owning a
firearm, easy access) since prisoners are not allowed to keep weapons. At the 16-year interview, we added retrospective questions about gunshot injury during adolescence for a subsample of participants. Therefore, subsamples used for analyses of specific risk factors vary. Information on firearm-related deaths (homicide, suicide, or accident) were obtained or verified through official records from state medical examiners’ offices.

IV. Data Analysis

All analyses were conducted using commercial software (Stata 15; Stata-Corp) with its survey routines. To generate prevalence estimates and inferential statistics that reflect CCJTDC’s population, each participant was assigned a sampling weight augmented with a nonresponse adjustment to account for missing data. Taylor series linearization was used to estimate standard errors.

We report the prevalence of firearm involvement in two ways: (1) prior to age 18; and (2) three years after detention (median age 18.9), both by sex and race/ethnicity (self-identified: African American, Hispanic, non-Hispanic white, other). We also report the prevalence of firearm victimization (by sex and race/ethnicity) at three time points: 5, 12, and 16 years after detention. Firearm victimization is defined as having been injured or killed by a firearm.

Firearm Involvement in Childhood and Perpetration and Ownership in Adulthood

We used generalized linear mixed models (GLMMs) to examine associations between types of firearm involvement prior to age 18 and firearm use or ownership through young adulthood (up to median age 32). We used all available interviews, an average of 6 interviews per person (range, 1-13 interviews). Ownership or use of firearms at each follow-up interview in young adulthood was modeled as binomial with a logit link function. All GLMM models included covariates for: sex, race/ethnicity, and age at detention (10-18 years). We modeled time since detention using restricted cubic splines with 3 interior knots. Time at risk (days since the previous interview minus days incarcerated) was included as an offset. Four participants who identified as “other” race/ethnicity were excluded.

Firearm Involvement after Detention and Subsequent Firearm Victimization

We used logistic regression to examine the association between firearm involvement, assessed three years after detention (median age 18.9) and subsequent firearm victimization through young adulthood (up to median age 32). We estimated a separate model for each type of firearm involvement. All models included covariates for sex,
race/ethnicity, age at detention, legal status, and days incarcerated. We excluded from all models the 26 participants who were incarcerated during the entire follow-up period (from three years after detention through sixteen years after detention). Four participants who identified as “other” race/ethnicity were also excluded.

V. Findings

a. Firearm Involvement in Adolescence: Prevalence and Sex and Racial/Ethnic Differences. Eighty-four percent (84%) of males and 63% of females were involved with firearms as adolescents (prior to age 18).

Significant results are summarized by type of involvement, below:

i. Access to firearms. Approximately three quarters of males and half of females reported “easy access” to firearms prior to age 18 (respectively, 74.6%, 49.4%). Males had three times the odds of “easy access” compared with females (95% CI 1.3-7.2).

ii. Firearm use. Nearly three quarters of males (73.1%) and approximately one quarter of females (28.9%) reported “any use” of a firearm prior to age 18. Males were more likely to have used a firearm compared with females (OR 6.7, 95% CI 5.1-8.9). Among youth who had ever used a firearm prior to age 18, males were younger at first use than females: mean age 13.9 years versus mean age 14.5 years.

Firearm use prior to age 18 also differed by race/ethnicity. Among males, both Hispanics and African Americans were more likely than non-Hispanic whites to have used firearms (respectively, OR 2.3, 95% CI 1.5-3.4; OR 1.6, 95% CI 1.1-2.4). Among females, Hispanics were more likely than non-Hispanic whites or African Americans to have used firearms (respectively, OR 2.3, 95% CI 1.5-3.4; OR 1.6, 95% CI 1.1-2.4). African American females who used a firearm were younger at first use compared with non-Hispanic white females (mean age 13.3 years versus mean age 14.2 years).

iii. Firearm in the household. Approximately 15.6% of males and 9.6% of females reported that there was a firearm in their household prior to age 18 (the sex difference was not statistically significant).

iv. Member of a gang that carried firearms. More than one quarter of males (28.5%) and one tenth of females (13.3%) reported being in a gang that carried firearms prior to age 18 (OR 2.6, 95% CI 1.1-5.9). Racial/ethnic differences were not statistically significant for males or females.

v. Firearm ownership. More than one quarter of males (28.5%) and 7.3% of females reported owning a firearm prior to age 18 (OR 5.1, 95% CI 1.8-14.4). Nearly one third of African American males owned a
firearm (31.5%); however, racial/ethnic differences were not statistically significant for males (16.2% non-Hispanic whites; 17.7% Hispanics) or females (8.2% African Americans; 14.3% non-Hispanic whites; 0% Hispanics).

vi. **Threatened with a weapon.** Victimization was common: approximately three quarters of males (76.0%) and 61.3% of females reported that they had been “threatened with a weapon” prior to age 18. Males had twice the odds of being threatened (OR 2.0, 95% CI 1.4 – 2.9). Among males, non-Hispanic whites were more likely to have been threatened with a weapon compared with Hispanics (84.5% vs 67.9%; OR 2.6, 95% CI 1.1 – 2.4); about three quarters of African American males had been threatened (77.2%).

vii. **Gunshot injury.** Nearly 1 in 10 males had a gunshot injury prior to age 18 (9.4%), compared with 3.3% of females (OR 3.0, 1.3-7.3). One quarter of Hispanic males (25.6%) had been injured by a firearm prior to age 18, compared with 6.6% of African American males and 4.7% of non-Hispanic white males (respectively, OR 4.9, 95% CI 1.6-14.7; OR 7.0, 95% CI 1.5-32.2).

b. **Firearm Involvement in Adolescence and its Relationship to Firearm Perpetration and Ownership in Adulthood.** We discuss findings separately for perpetration in adulthood and ownership in adulthood:

i. **Firearm perpetration.** In adulthood (by median age 32), 41.3% of males and 10.5% of females had perpetrated firearm violence. Nearly every type of firearm involvement in adolescence was associated with perpetration of firearm violence as an adult. Youth who owned firearms prior to age 18 had 9 times the odds of perpetrating firearm violence in adulthood compared with those who did not (AOR 9.0, 95% CI 4.5 – 18.2). Youth who had easy access to or used a firearm prior to age 18 had more than 5 times the odds of perpetrating firearm violence in adulthood (respectively, AOR 5.1, 95% CI 2.4 – 10.7; 5.1, 95% CI 3.6-7.3). Having a firearm in the household, being threatened with a weapon, and having had a gunshot injury prior to age 18 also predicted firearm perpetration in adulthood (respectively, AOR 3.6, 95% CI 1.5-8.5; AOR 3.1, 95% CI 2.0-4.9; AOR 2.4, 95% CI 1.2-4.9). Only being in a gang that carries firearms was not significantly associated with perpetration of firearm violence in adulthood (AOR 1.7, 95% CI 0.9-3.2).

ii. **Firearm ownership.** Firearm ownership in adulthood was prevalent: 37.9% of males and 21.4% of females. Owning a firearm prior to age 18 was most strongly associated with firearm ownership in adulthood (AOR 16.9, 95% CI 7.9-36.3). Youth who had used a firearm, had a firearm in their household, or had easy access
to a firearm each had about 6 times the odds of owning a firearm in adulthood compared with youth who had not (respectively, AOR 6.2, 95% CI 4.3-9.0; AOR 6.4, 95% CI 2.5-16.6; AOR 5.5, 95% CI 2.5-11.8). Being in a gang that carried firearms and being threatened with a weapon also predicted firearm ownership in adulthood (AOR 3.7, 95% CI 1.9-7.4; AOR 2.6, 95% CI 1.7-4.2). Only having a gunshot injury prior to age 18 was not significantly associated with later ownership in adulthood (AOR 1.9, 95% CI 0.8-4.5).

By the time of our final report to NIJ, we will have completed our examination of risk and protective factors of firearm perpetration and victimization. We will focus on identifying predictors of resilience to firearm involvement. Despite being exposed to firearms during adolescence, some participants do not perpetrate firearm violence during adulthood. Knowledge of modifiable protective factors can provide the empirical basis for developing effective interventions.

c. Firearm Victimization.

i. Sex differences. Firearm victimization was common among males. During the first five years after detention (median age 20.5 years), 18.2% of males were either injured or killed by a firearm. More than one quarter of males (27.5%) had been either injured or killed by 12 years after detention (median age 28 years). By 16 years after detention (median age 32 years), nearly one third of males had been injured or killed by a firearm (32.2%). Firearm victimization was less common among females: 2.2%, 3.0% and 4.0% of females had been injured or killed by a firearm in the 5, 12 and 16 years after detention, respectively. Depending on the time point, males had between 11 and 15 times the odds of being injured or killed by a firearm (respectively, OR 11.1, 95% CI 5.7-21.6; OR 15.3, 95% CI 8.6-27.4; OR 12.8, 95% CI 7.4-22.0).

ii. Racial/Ethnic differences. Both African American and Hispanic males were more likely to be victimized by a firearm than non-Hispanic white males. By 5 years after detention, approximately one fifth of Hispanic males (20.7%) and African American males (18.5%) had been injured or killed, compared with 6.9% of non-Hispanic white males. By 12 years after detention, more than one quarter of African American males (29.1%) and nearly one quarter of Hispanic males (24.8%) had been injured or killed, compared with one tenth (10.9%) of non-Hispanic white males. In the 16 years after detention, more than one third of African American males (33.4%) had been injured or killed, compared with about one quarter of Hispanic males (27.8%), and one tenth of non-Hispanic white males (10.5%). Depending on the time point (5, year, 12 year
and 16 year), African American males had between 3 and 5 times the odds of firearm victimization, compared with non-Hispanic white males (respectively, OR 3.3, 95% CI 1.6-6.9; OR 4.0, 95% CI 2.2-7.4; OR 4.9, 95% CI 2.6-9.2); Hispanic males had between 3 and 4 times the odds of firearm victimization compared with non-Hispanic white males (respectively, OR 4.0, 95% CI 2.0-8.1; OR 3.1, 95% CI 1.6-5.7; OR 3.5, 95% CI 1.9-6.7). There were no significant racial/ethnic differences in firearm victimization among females.

d. Firearm Involvement and its relationship to Subsequent Firearm Victimization. We examined the association between firearm involvement at median age 18.9 years* and subsequent firearm victimization between 3 and 16 years after detention (up to median age 32 years). There were no significant associations. Future analyses will investigate whether firearm involvement predicts time-to-injury using survival analyses. For example, we will examine: whether youth who have used a firearm are more likely to be injured or killed by a firearm earlier in adulthood, compared with youth who have never used a firearm; whether youth who have been threatened with a weapon are more likely to be injured or killed by a firearm earlier in adulthood, compared with youth who have never been threatened with a weapon. Survival analyses will also allow us to control for time spent in incarceration.

VI. Implications for Criminal Justice Policy and Practice in the United States

Between 2013 and 2017, firearms were the second leading cause of death among adolescents. Yet, only recently have we begun to view firearm violence as a public health crisis. As the United States is home to an estimated 300 million firearms, we must learn to live safely with them. We need an aggressive approach to preventing firearm violence, as we would address any other public health crisis.

The criminal justice system is in a unique position to help prevent firearm violence. Firearm victimization and perpetration are bidirectional: victims may become perpetrators, and perpetrators may become victims. Historically, the criminal justice system has primarily focused on offenders. However, focusing on offenders is already too late to intervene and only addresses half the problem. Prior research has demonstrated that firearm violence spreads through social networks, similar to how epidemics of disease spread. A public health approach to

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*The independent variables for the analyses of subsequent firearm victimization used variables on firearm involvement which were added at the first follow-up interview; participants were then aged 18.9 years. Note that the independent variables used in the analysis of subsequent firearm ownership and perpetration (pages 4-7 of this report) used data only from participants who were younger than 18 years. Prevalence estimates of firearm involvement were largely similar in the two analyses, with some modest differences. Details will be provided in the final report to NIJ.
firearm violence recognizes that firearm violence goes beyond the individual who pulls the trigger and emphasizes that importance of addressing victims and strengthening communities. By collaborating with public health organizations, the criminal justice system can help to shift the focus from offenders to a public health approach.

For example, the criminal justice system often utilizes practices such as “hot spot” policing, in which police increase their presence in high crime areas. However, this practice by itself can increase the tension between the community and police. One encouraging approach is to implement community outreach programs in similar ways as hot spot policing. Community outreach is predicated on collaboration with local law enforcement. Law enforcement agencies provide expertise in selecting target areas, refer high-risk individuals that require assistance to services, and implement community outreach training within the department. Programs that have adopted such approaches, such as Cure Violence, have been shown to reduce shootings, firearm injuries, and firearm deaths.

References


10. *Stata statistical software: Release 15* [computer program]. College Station, TX: StataCorp LP; 2017.


22. Green B, Horel T, Papachristos AV. Modeling contagion through social networks to explain and predict gunshot violence in chicago, 2006 to 2014contagion through social networks to explain and predict gunshot
violence contagion through social networks to explain and predict gunshot violence. *JAMA Internal Medicine.* 2017;177(3):326-333.


Deposit Update

Dear Karen Abram,

Thank you for submitting this project to ICPSR.

Project Title: Firearm Involvement in Delinquent Youth and Collateral Consequences in Young Adulthood: A Prospective Longitudinal Study

Project ID: NACJD_NIJ-110228

Signed: 2019-06-21 by Karen Abram

Funding Sources: United States Department of Justice. Office of Justice Programs. National Institute of Justice (2016-R2-CX-0039)

Please review the file manifest carefully to be sure that it corresponds to what you intended to submit to ICPSR. If you would like to make any changes, you will need to recall the project.

ICPSR staff will review your submission and will contact you should any adjustments be necessary. If you have questions or would like to further discuss the status of this project, please send a message to a member of the ICPSR Collection Development Team through the Project Communication Log, which can be accessed at the bottom of the NACJD_NIJ-110228 workspace.

Sincerely,
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