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How School, Family, and Community Protective Factors Can Help Youth Who Have Experienced Maltreatment

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> **Note:** The information in this brief is pulled from two academic articles that the authors have submitted for publication. Citations for these articles are available upon request by contacting Andra Wilkinson (awilkinson@childtrends.org) or Hannah Lantos (hlantos@childtrends.org)

Abstract

Purpose

Maltreatment during childhood has been linked to negative outcomes later in life, including delinquent and criminal behaviors. This report examines trajectories of delinquent and criminal behavior from adolescence into young adulthood, tests its association with self-reported experiences of childhood maltreatment, and assesses whether hypothesized protective factors affect the link between maltreatment and delinquent and criminal behaviors. Throughout the report, we examine variation by youth's sociodemographic characteristics.

Methods

We use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative longitudinal study of a sample of U.S. adolescents who were in grades 7-12 in the 1994-95 school year, who have been interviewed at three key developmental junctures from adolescence to young adulthood. Self-reported data were used for both maltreatment (measured at the two latter time points) and delinquent or criminal behaviors (measured at the three different time points). Linear mixed-effects analyses were used to model growth curves of the frequency of violent and non-violent offending, from ages 13 to 30. Next, maltreatment frequency was tested as a predictor, and then potential protective factors (at peer, family, school, and neighborhood levels) were tested as moderators. Sex, race/ethnicity, and sexual orientation were also tested as moderators of delinquent or criminal offense frequency, and as moderators of protective effects.

Results

For non-violent delinquent or criminal behaviors, both sex and sexual orientation moderated trends over time, such that males and lesbian, gay, bisexual, or questioning (LGBQ) youth were more likely to commit non-violent offenses. When maltreatment was included, an increasing slope was found such that adolescents who experienced more maltreatment had a faster rate of change in their likelihood of engaging in nonviolent offending behavior; sex moderated this association such that the increase was steeper among maltreated males. For non-violent behaviors, youth's school connection and high-quality relationships with mother or father figures were protective for maltreated youth; neighborhood collective efficacy was protective irrespective of prior experience of maltreatment. For violent behavior, maltreatment was associated with increasingly higher predicted frequencies of offending behavior. School connection, high-quality relationships with mother or father figures, and neighborhood collective efficacy were protective irrespective of prior maltreatment status. Protective effects were unaffected by the sociodemographic variables assessed.

Conclusions

Study results provide insight into patterns of delinquent and criminal behavior from adolescence into young adulthood, the role of prior maltreatment, and the influence of protective factors. We identify areas where teachers, juvenile corrections officers, policymakers and others can intervene to prevent engagement (or re-engagement) in delinquent and criminal behavior among youth who have experienced maltreatment. Most of these variables are also protective for non-maltreated youth, and thus can also inform general efforts at reducing delinquent and criminal behavior.

Background and brief literature review

Experiences of abuse and neglect during childhood (hereon referred to as maltreatment) are, unfortunately, not uncommon in the United States. In 2016, just over nine of every 1,000 children had a maltreatment incident that was substantiated by the child welfare system.[1] Substantiated cases are those where the state finds sufficient data to support the claim and takes action to protect the child. Child maltreatment data are tracked by the federal government. Indicators include multiple types of abuse/neglect (physical, sexual, emotional, or psychological abuse; exploitation; and neglect by someone who is responsible for a child [for example, a teacher, parent, caregiver, or clergy member]).[2] The most common type of maltreatment experienced by children in the United States is neglect. Nearly three-quarters of substantiated maltreatment cases involve neglect, while 18 percent are concerned with physical abuse, and just under 10 percent with sexual abuse. Emotional abuse, parental substance abuse, and lack of supervision make up the balance of cases: nearly 7 percent. In addition, children may experience more than one type of abuse (thus, percentages sum to more than 100). Nearly 14 percent of substantiated cases are found to include multiple types of maltreatment. The combination of physical abuse with neglect is the most common multiple experience (5 percent of all cases).[3]

Maltreatment's contemporaneous effects on children's well-being are often obvious; however, early maltreatment continues to impact well-being into adolescence and adulthood. Adults who experienced child maltreatment are more likely to report poor physical and emotional health,[4–6] a lower ultimate level of educational attainment,[7] and decreased socioeconomic stability.[8] Children who experienced maltreatment are also more likely to report engaging in delinquent and criminal behavior as adolescents and adults.[9] This includes both non-violent offenses—such as truancy or theft—as well as violent offenses, such as fighting or assaulting another person.[10] This pattern is clear among youth already involved in the juvenile justice system: an estimated 40 to 90 percent of incarcerated girls, and 25 to 65 percent of incarcerated boys, experienced maltreatment prior to their involvement in the justice system.[11] This pattern also holds up among children who were not apprehended or prosecuted: one nationally representative study found that 14-year-olds who reported previous experiences of maltreatment were 40 to 60 percent more likely than their non-maltreated counterparts to self-report engaging in delinquent behaviors.[12]

However, while early maltreatment is associated with increases in delinquent and criminal

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behaviors in both adolescence and adulthood,[*] knowledge is lagging in three areas that are important to prevention efforts. First, while juvenile offending behaviors peak in the middle teen years,[13,14] we have less detailed information on the course of this trajectory as teenagers move into adulthood.

Second, we do not know whether the links from maltreatment to offending behavior vary for different sub-populations.[9] Some studies explore certain sub-populations, but many do not include analyses by race/ethnicity or sexual orientation.[15] Additionally, even among those studies that do, conclusions vary. For example, one study found that boys are more likely than girls to engage in delinquent behavior following maltreatment,[16] while another found no difference.[17] Still other work suggests that this relationship changes over time, such that maltreated boys were more likely than maltreated girls to engage in delinquency during adolescence only; the gender differences did not persist into adulthood. Analyses of race[18] have also produced conflicting results—for example, on whether black adolescents are more likely to engage in delinquent behaviors than their non-black counterparts.[19,20] Further, while youth who are lesbian, gay, bisexual, or questioning (LGBQ) are more likely to experience maltreatment,[21] we know little about their subsequent delinquency trajectories. This brief review of the literature highlights some of the complexity of the issues raised by the research questions in this report.

Finally, many existing studies lack longitudinal data of a diverse sample, limiting the ability to draw conclusions about the consequences of maltreatment. Many of these are limited by small, relatively homogeneous[22] samples. Their samples may not be nationally representative,[23] or they consist of the highest-risk youth – often drawn from juvenile justice data. Commonly, data are collected at a single time-point and survey instruments instruct respondents to retrospectively report experiences of both maltreatment and offending; this method may be flawed, if memory has been affected by past experiences of trauma. Additionally, whether the majority of maltreated youth go on to offend, or whether a majority of offending youth have experienced maltreatment are different research questions, with different implications for prevention and rehabilitation.

Given these distressing outcomes, it is important to better understand the relationship between maltreatment and delinquent or criminal behavior. Our analyses using a large and

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[*] *Note: We use the word delinquent to describe behaviors committed by youth below age 18, and we use the word criminal to describe behaviors committed once respondents beaome adults. This study examined youth from ages 12 to 30, thus we use the terms "delinquent and criminal behaviors" as well as "offending" throughout this report to capture the time from adolescence into adulthood. The term offense or offending is specifically used when we are talking about violent or non-violent behaviors. We will continue to use this terminology throughout the brief to describe analyses and results.*

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nationally representative population—most of whom were engaged in neither system—can help the field better understand this relationship outside of the typical samples used to explore this relationship.

This study addresses a number of these challenges by using longitudinal data from a nationally representative study of adolescents who were followed into young adulthood. We used linear mixed-effects models, because data were collected at multiple times from each young person over roughly 12 years. Models allow for an examination of the relationship between maltreatment and delinquency, by producing estimated frequencies of offending behavior at each age, from early adolescence through emerging adulthood (ages 12 through 30). It is possible to create estimates at each age because of the range of ages that are included at each time point that the survey was conducted (e.g., in Wave I respondents range in age from 12-18).

Our study offers some potential advantages over previous work on this topic. First, given the size of the data set, samples by race, sex, and sexual orientation were sufficient to test for statistical differences. Second, we rely on youth self-reports of maltreatment and offending behavior, rather than on administrative data from child welfare or juvenile justice agencies. Thus, we may include more experiences of both maltreatment and delinquency than are represented in official statistics. These are not necessarily youth who had specific experiences in the child welfare system and, in fact, often did not. Adolescents may be willing to disclose in an anonymous survey experiences of maltreatment and delinquent or criminal behaviors which did not come to the attention of civil authorities. This means that we are not analyzing the population of children who have interacted with the child welfare system necessarily bur rather have a nationally representative sample of the general public. Some of the maltreatment instances that we capture here did have child welfare system involvement and others did not. This is important because previous studies have shown that both child welfare investigations and policing practices are patterned by socioeconomic status and race.[11,20,24,25] Therefore, while self-reported maltreatment and offense data may include some incidents that would not be substantiated or prosecuted, they may also include incidents that were not reported, that were rejected prejudiciously by authorities, or for which there were inadequate data to proceed. Inclusion of these cases could more accurately highlight differences in the association between maltreatment and offending behaviors among subgroups. For example, if black families are more likely to be referred to child welfare agencies and black youth are more likely to end up in the juvenile justice system than their white counterparts, it may erroneously seem like there is a stronger link between maltreatment and offending for black children compared to white children.

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In addition to being able to test the relationship between maltreatment and delinquent or criminal behaviors, the data set includes variables that may represent factors that are protective against delinquent or criminal behaviors. While protective factors have been studied in relation to numerous outcomes of adolescent well-being, less is known about how they may differ across sub-populations, and whether they alter the timing of onset, or the trajectory (or both), of offending behaviors.

Our analyses test the idea that protective factors can change the relationship between maltreatment and offending behavior through two mechanisms. First, when young people have strong, supportive relationships with family, teachers, peers, and neighbors, they may learn more pro-social skills and can use those skills to be more resilient in the face of adversity. Second, if they spend more time with friends, family, teachers, or in other positive activities, young people may simply have fewer opportunities to engage in delinquent behavior.

The number of potential protective factors is vast, and they include some that are stable and others that change over time. We focus on protective factors that are relatively malleable -- where straightforward policy or programmatic changes could have a large impact on outcomes. Such factors are also ones that individual people may be able to promote. For instance, while a community program may not be able to increase a family's income, it might be able to improve interactions between a teen and a parent or make a child feel safer at school. While we do not explore the evidence on specific interventions here, there are effective interventions designed to promote the protective factors identified by our study.

As potential protective factors, we include connection to parents, peers, school, and neighborhood. At the family level, previous research finds that a relationship with one's mother or father can moderate the link between abuse and delinquency. A non-abusing parent can be an important ally to a young person as they try to recover from the abuse experience. Relationships with peers who are not engaging in offending behavior can also be protective for maltreated youth.[26] In addition to peers and parents who disapprove of antisocial behavior, a positive connection to school has been found to decrease rates of lifetime violence, delinquency, and status offenses in youth exposed to physical abuse.[27] Finally, at the neighborhood level, a 2010 study found that shared trust and a high degree of neighborhood collective efficacy significantly reduced the odds of neglected youth exhibiting violence during adolescence.[12]

Although previous research has explored protective factors, much of the existing literature is limited. First, researchers have rarely examined multiple types of protective factors in the same study; typically, data pertain solely to the parent, peer, or school level. While we too include

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each protective factor in the models separately, the discussion of the four types of factors is included all together and future work can continue to build on this issue. Second, prior studies are often limited methodologically,[28] using cross-sectional analyses, recollections of past experiences, small samples, and/or simple regression models. Finally, earlier studies typically analyzed a homogeneous[22] sample (often low-income children of color), precluding examination of variation by other important sociodemographic characteristics.

In sum, our study builds on an existing literature that finds a strong linkage between experiences of maltreatment and delinquent and criminal behaviors, by studying these patterns across a wider age range, including a more granular analysis by age, and analyzing factors that may disrupt the link we hope to add to our understanding of the nuances of these connections and how to prevent them. Specifically, our use of linear mixed-effects models to explore how self-reports of maltreatment are related to self-reports of offending in a nationally representative study sample, allows us to address a number of limitations of the extant literature.

Research Questions

To contribute to our understanding of the role that sociodemographic and protective factors play in the maltreatment-delinquency relationship, Child Trends' researchers addressed the following questions:

Research Question 1:
What is the relationship between childhood maltreatment and delinquent and criminal behaviors [**] **from adolescence into young adulthood?**
Hypothesis: Prior maltreatment experiences will be associated with an increased frequency of delinquent and criminal behavior across development that is significantly higher than the pattern for youth who did not experience childhood maltreatment.[6,7,9,10,19]
Research Question 2:
How does the relation between childhood maltreatment and delinquent and criminal behaviors vary by sex, race/ethnicity, and sexual orientation?
Hypothesis: The positive association between frequency of childhood maltreatment and delinquent and criminal behaviors will be moderated by sex, race/ethnicity, and sexual orientation, such that the relationship will be stronger for females, youth of color, and LGBQ youth, compared to their male, white, or heterosexual peers.[6,15,16,21]
Research Question 3:
Do any of the following protective factors decrease the risk that someone who experienced maltreatment would go on to engage in delinquent and criminal behaviors? The protective factors include school connectedness, relationship quality with a mother and/or father, time spent with friends, and neighborhood collective efficacy.
Hypothesis: The positive association between maltreatment frequency and the delinquent and criminal behaviors will be moderated by the hypothesized protective factors such that the relationship will be weaker for youth exposed to the protective factor compared to youth who were not.[28,29] Furthermore, protective effects will be greater for youth who have experienced maltreatment than for those who have not.
Research Question 4:
Do the effects of any of these potential protective factors vary by youth's sex, race/ethnicity, and sexual orientation?
Hypothesis: Protective factors' moderation of the relationship between maltreatment frequency and delinquent and criminal behaviors will vary by sex, race/ethnicity, and sexual orientation; because prior findings on this topic are inconsistent, we make no prediction of the specific ways protective effects will vary.[29–31]

[**]*Reminder: The current study uses the word delinquent to describe behaviors committed by youth below the age of 18, and we use the word criminal to describe behaviors committed once respondents have become adults. This study examined youth from ages 12 to 30, thus we use the terms "delinquent and criminal behaviors" as well as "offending" throughout this report to capture the time from adolescence into adulthood.*

Study methods and analytical techniques

Sample

This study used data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a longitudinal study that includes a nationally representative sample of U.S. adolescents who were in grades 7-12 in the 1994-95 school year (Wave I, ages 11-19). There have been four in-home interviews to date, with the fifth currently in the field. The present analysis sample is restricted to respondents interviewed at Waves I, III (ages 18 to 26), and IV (ages 24 to 32), who had valid sampling weights (N=12,288) and complete data on all variables of interest (N=10,613, 86 percent). The second wave of data collection did not include students who were seniors in high school in the first wave. Therefore, we excluded Wave-II data. Details of the Add Health study and design are described elsewhere.[32] The Institutional Review Board (IRB) at Child Trends deemed all analyses exempt from review because they relied upon secondary data.

Measures

Independent variable: Child maltreatment frequency

We measured childhood maltreatment with an ordinal variable capturing frequency (0 [never] – 10 [10 or more times]) of experiencing childhood abuse or neglect. It included two maltreatment types: 1) emotional, physical, or sexual abuse before age 18, and 2) supervisory neglect before sixth grade by a parent or an adult caregiver. Responses were retrospective at Waves III and IV; maltreatment questions were not asked in Wave I. While retrospective reports can be impacted by changes in memory over time, they are valued in child welfare research because they can identify cases otherwise missed and adults may be more able to disclose, and capture the chronicity of, maltreatment.[33] Our variable captures frequency of maltreatment rather than type, because recent evidence suggests the frequency of maltreatment is a better indicator of potentially negative consequences than the type of maltreatment.[34]

Dependent variable: Delinquent and criminal behavior frequency

We quantified delinquency and criminal offending via two scales measuring frequency of different behaviors during the 12 months prior to each wave of data collection. We included violent and non-violent offending as separate variables. The construction of these scales for these analyses mirrors previously used measures of offending derived from Add Health data.[35,36] Both scales had alpha-scores suggesting sufficient internal consistency (Violent offending: alpha=.60-.73 across waves; non-violent offending: alpha=.50-.66 across waves). The violent offending scale included the following indicators: shooting or stabbing someone; hurting someone badly enough to need bandages or care from a doctor or nurse; using or threatening a weapon to get something from someone; pulling a knife or gun on someone; seeing someone

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shoot or stab another person; and being in a group fight. Non-violent offending included the following indicators: deliberately damaging property that didn't belong to you; going into a house or building to steal something; stealing something worth less than $50; stealing something worth more than $50; selling marijuana or other drugs; and taking an illegal drug using a needle. Our choice of indicators was constrained by the items included in all waves of the survey, and by whether items were better suited as control variables in the regression models. For example, a broader substance use measure could have been included as an indicator of non-violent offending. However, in this sample, substance use is common. Therefore, while it was a variable that did not differentiate many respondents when used as an indicator in the scale, we still felt it was an important behavior to control for in our models.

Tables 1a and 1b below show the mean and standard deviation for both non-violent and violent offense frequency at each wave. Though most of the analyses were conducted by age rather than wave, the distribution of the outcome measure by wave shows the trend over time, and is more consistent with other published studies using Add Health data. For example, in adolescence (Wave I) the mean frequency of committing violent offenses in the past year was 0.72 (or less than one average violent offense), and by young adulthood (Wave IV), dropped to 0.19. Average offending frequency at no time rose above one offense per year, highlighting that most adolescents do not engage in these behaviors often or at all.

Table 1a: Mean and standard deviation for past-year frequency of non-violent offenses			Table 1b: Mean and standard deviation for past-year frequency of violent offenses		
Non-violent offense frequency	Mean	SD	Violent offense frequency	Mean	SD
Wave I	0.86	1.77	Wave I	0.72	1.66
Wave III	0.49	1.34	Wave III	0.30	1.06
Wave IV	0.25	0.90	Wave IV	0.19	0.90

Moderator variables

We tested five hypothesized protective factors as moderators of the relationship between maltreatment and later offending. All were measured at Wave I. Our selection of potential protective factors and their measurement were based on prior research. Specifically, we selected potential protective factors at the level of the family (relationship quality with a mother or father figure respectively, which were considered distinct protective factors and modeled separately), peers (time spent with friends), school (school connectedness), and neighborhood (collective efficacy). These are described in more detail below.

We calculated **Relationship quality with a mother or father figure** as a summative scale of five items (alpha=0.95 [mothers], 0.98 [fathers]) that inquired about the respondent's relationship

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with either a parent or parental figure: how close do you feel to your mother/father; how much do you think she/he cares about you; most of the time your mother/father is warm and loving towards you; you are satisfied with the way you and your mother/father communicate; and overall you are satisfied with your relationship with your mother/father.[37–39] We created separate scales for mothers and fathers, as the scales were not highly correlated. We also coded respondents as '0' on either scale, if they reported no relationship with a mother or father figure.

We calculated **time with friends** with a single item assessing how many times the respondent had hung out with friends in the past week (0 [not at all] – 3 [5 or more times]). Past research found peer support could be a protective factor.[40] Unfortunately, the peer support measure available in Add Health showed minimal variation. While more robust measures of peer relationships are available in Add Health, they are restricted to a saturation sample.[41] Time with friends was intended as a partial proxy for peer support. We are aware this measure would be strengthened if we also included measures of peer delinquent or pro-social behaviors; however, these were not available in the full Add Health sample.

We calculated **school connectedness** with a standardized summative scale (alpha=0.73) of eight items assessing whether the respondent felt connected to school: if s/he feels they are a part of their school, close to the people at school, safe at school, that the teachers care about them, etc.[42,43]

Finally, we calculated **neighborhood collective efficacy** with a standardized summative scale of five items (alpha=0.60). This estimated whether the respondent felt connected to their neighborhood with items such as: feels safe in their neighborhood, thinks people in the neighborhood look out for each other, etc.[44]

We conductive sensitivity analyses of both the standardized scales (school connection and neighborhood collective efficacy) by comparing mean to high scores and low to high scores.

Sociodemographic variables used for stratification

We used several key stratification variables in order to answer the primary research questions. These included sex, race/ethnicity from Wave I (Hispanic and non-Hispanic White, Black, Asian, Native American, and Other), and sexual orientation/attraction (we categorized a respondent as non-heterosexual if they identified as homosexual or bisexual, or if they reported attraction to the same sex).

Control variables

A number of important potentially confounding variables were also identified following a review of analyses of similar outcomes.[45–47] We controlled for these in all of the models. We measured trouble in school with an indicator assessing whether the respondent had ever repeated a grade, while another indicator assessed whether they had ever been suspended, expelled, or had dropped out. To estimate the socioeconomic status of the subject's childhood home, we used an indicator of whether anyone in the household had received public assistance before the respondent was 18-years-old. We also included whether the respondent had ever lived in a foster home. Finally, we controlled for use of substances before Wave I, including alcohol, cigarettes, marijuana, and other illicit substances. We did not include injection drug use in this measure, as it was included in the non-violent offending frequency measure.

Analyses

In order to analyze outcomes across ages, we structured the dataset by age instead of wave. This allowed us to depict the trajectory of offending behaviors from adolescence to young adulthood. We used linear mixed-effects models to estimate growth curves for the two dependent variables: violent and non-violent offending. These models allow for estimation of change over time, while controlling for unobserved time-invariant characteristics that could confound any associations.

For the first two research questions, nine models were fit for each of the two dependent variables. We used the first five models to estimate patterns of offenses, starting with an unadjusted model, next adding covariates, and finally testing moderation of the base pattern of offenses by sex, race/ethnicity, and sexual orientation. We used the next four models to test whether childhood maltreatment is significantly associated with the initial level and subsequent change in criminal offending, and whether the association varies by sex, race/ethnicity, or sexual orientation.

For the last two research questions, a total of 40 models were fit for each of the two dependent variables. We used the first 10 models to test moderation of the relationship between childhood maltreatment and the intercept and slope of offending frequency, by the five potential protective factors. We used the next 30 models to test whether any moderating effects varied significantly by gender, race/ethnicity, and sexual orientation. We tested these as moderation, rather than mediation, models because linear mixed-effects models test the association between childhood maltreatment and offending frequency, reported at three different time junctures. Thus, the models produce a curve rather than a point-estimate, and so

are better suited for a moderation (a "what variables bend the curve?" question) as opposed to a mediation analysis.

All significant models were specified to include a random intercept and slope, to examine variation of effects. The intraclass correlation coefficient (ICC), was used to determine the percentage of variance in offense frequency attributable to variance among individuals. However, the sampling weights for the Add Health data inhibit testing if the ICC is significantly different than zero. So, the ICCs from the first, basic model (without covariates), and a model with a protective factor were compared to determine how much of the variance in offense frequency was explained by the predictor variables.

Findings

The analytic sample (summarized in Table 2) was comprised of equal proportions of male and female respondents. Approximately one-third of the sample were young people of color. Over 10 percent reported sexual attraction to either both sexes or the same sex, and/or reported their sexual orientation as something other than exclusively heterosexual. The majority of the sample (67 percent) reported experiencing at least one type of maltreatment in childhood. Nearly one-third (32.5 percent) of the sample had committed non-violent offenses, and nearly 30 percent had committed violent offenses, during their adolescence (Wave I). The percentage who committed non-violent or violent offenses declined at each successive time point; we share this data by wave rather than by age, to show the general developmental trend. Again, it is important to note that this is a national dataset that includes self-reported data from the general population and is not a sample of children who had substantiated claims or had been formally involved with the child welfare system.

Table 2: Descriptive data on analytic sample		
	N or mean	Weighted % or SD
Sex		
Male	5373	50.6%
Female	5240	49.4%
Race/ethnicity		
Hispanic	1249	11.8%
Black	1600	15.1%
Asian	375	3.5%
American	217	2.0%
Other	102	1.0%
White	7070	66.6%
Sexual Orientation		
LGBQ	1305	12.3%
Age at Wave I	15.4	1.8
Age at Wave III	21.8	1.9
Age at Wave IV	28.3	1.9
Non-violent offending (any in past year)		
at Wave I	3449	32.5%
at Wave III	1983	18.7%
at Wave IV	1145	10.8%
Violent offending (any in past year)		
at Wave I	3113	29.3%
at Wave III	1308	12.3%
at Wave IV	650	6.1%

Maltreatment (any during childhood)	7145	67.3%
Control Variables		
Public assistance in household before age 18	1673	15.8%
Ever repeated or been held back a grade	2150	20.3%
Ever suspended, expelled or dropped out	142	1.3%
Ever used alcohol, cigarettes, or illicit substances	6181	58.2%
Ever in a foster home	173	1.6%

The key predictor and outcome measures in these analyses varied by sociodemographic characteristics (Table 3). The average childhood maltreatment frequency was lowest for whites and highest for Native Americans adolescents (M = 2.54 and 3.56, respectively). Average number of past-year non-violent offenses in adolescence was higher for LGBQ youth compared to their non-LGBQ counterparts (M=1.10 vs. 0.82). For violent offenses, average frequency in adolescence was again lowest for white and highest for Native American adolescents (M = 0.57 vs. 1.26). Average frequency of both non-violent and violent offenses was higher for males compared to females during adolescence.

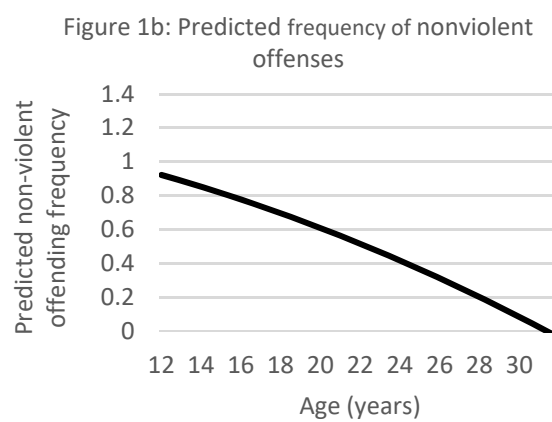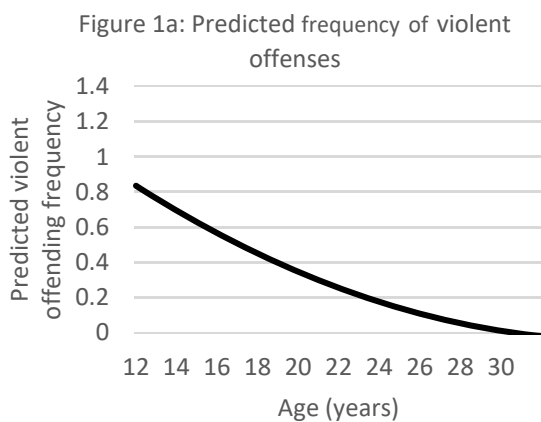| Table 3: Sociodemographic variation in frequency of childhood maltreatment, and non-violent and violent offenses in adolescence						
	Average maltreatment frequency (Waves III and IV)		Average frequency of past-year non-violent offenses in adolescence (Wave I)		Average frequency of past-year violent offenses in adolescence (Wave I)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Sex						
Male	2.51	2.48	1.13***	1.93	0.97***	1.87
Female	2.78***	2.92	0.58	1.47	0.45	1.28
Race/ethnicity (white=referent)						
Hispanic	2.88**	3.22	1.07*	2.33	1.13***	2.74
Black	2.64	3.10	0.65*	1.78	1.01***	2.28
Asian	3.31***	4.03	0.97	2.65	0.63	2.06
Native American	3.56***	3.18	1.26*	2.05	1.26***	2.11
Other	2.52	2.12	1.09	2.11	0.58	1.62
White	2.54	2.40	0.84	1.58	0.57	1.24
LGBQ						
No	2.53	2.65	0.82	1.74	0.72	1.67
Yes	3.40***	2.93	1.10***	1.99	0.67	1.59
* p<0.05, ** p<0.01, *** p<0.001 Note: "<0.001" is used for values (positive or negative) that round to 0.00						

Results of the first set of analyses can be organized into two main parts: in the first, we studied the pattern of delinquent and criminal behaviors by age across different sub-populations; in the second, we looked at the *relationship* between maltreatment and delinquent and criminal behaviors across age. In both cases, we also tested for differences in the patterns across sociodemographic variables. We found that offending frequency generally increases through the early to middle teen years and then has a steady – though not always linear – decline from adolescence into young adulthood.

Delinquent and criminal behavior frequency into young adulthood

The predicted frequency of delinquent and criminal behaviors from adolescence into young adulthood declines in figures 1a and 1b, for both violent (L) and non-violent (R) offending. Data for the figures are in Table 4 (page 20). In comparing the figures, we see the slope for predicted violent offending frequency has a more rapid decline during adolescence than that for non-violent.

> **Methods note:** The figures show *predicted* frequencies. The graphs visually represent our statistical model, and do not depict the actual frequency of criminal offenses by age as reported by our sample. Additionally, the shapes of the lines are constrained by our modeling technique.

Figure 1a: Predicted frequency of violent offenses

Figure 1b: Predicted frequency of nonviolent offenses

Differences in offending frequency, by sociodemographic variables

Examining the role of sociodemographic variables in moderating offending frequency, there are significant differences by sex. Data in both figures and tables are presented below. The tables show the model coefficients, while the figures show what these coefficients actually do to the shape of the predicted trajectory over time. As shown in Figures 2a (Table 4, Model 3) and 2b (Table 5, Model 3) below, the predicted offending frequency for both violent and non-violent offending is significantly higher across development (age) for males (blue) compared to females

(red). By the middle teen years, females are committing, on average, no offenses per year, while for males this is not true until they reach their mid to late 20s.

Figure 2a: Predicted past-year violent offense frequency, by gender

Figure 2b: Predicted past-year non-violent offense frequency, by gender
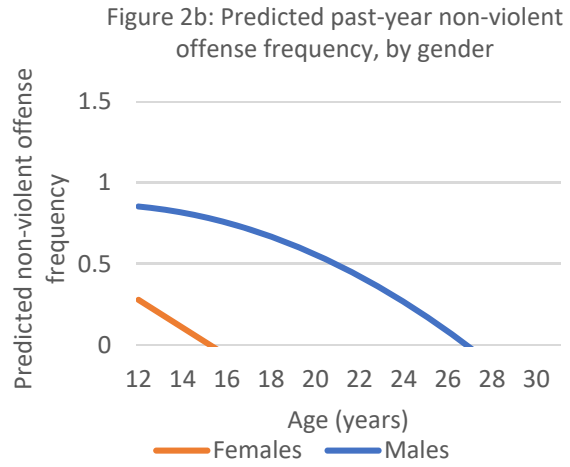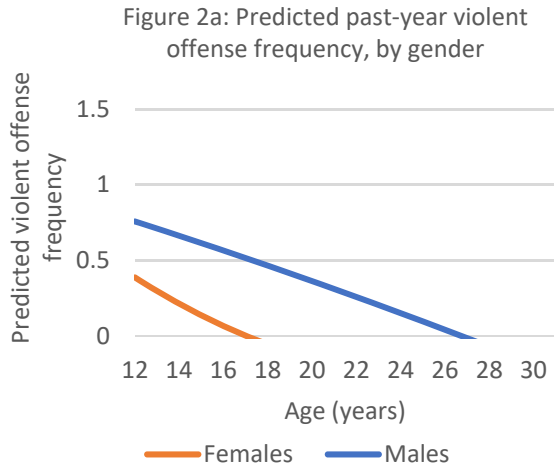
We also found evidence of significant moderation by sexual orientation, such that individuals identifying as LGBQ (dotted line in the figure below) have significantly higher predicted non-violent offending frequency across development compared to non-LGBQ individuals (solid line) (Figure 3, Table 5, Model 5).

Figure 3: Predicted non-violent offense frequency, moderation by sexual orientation
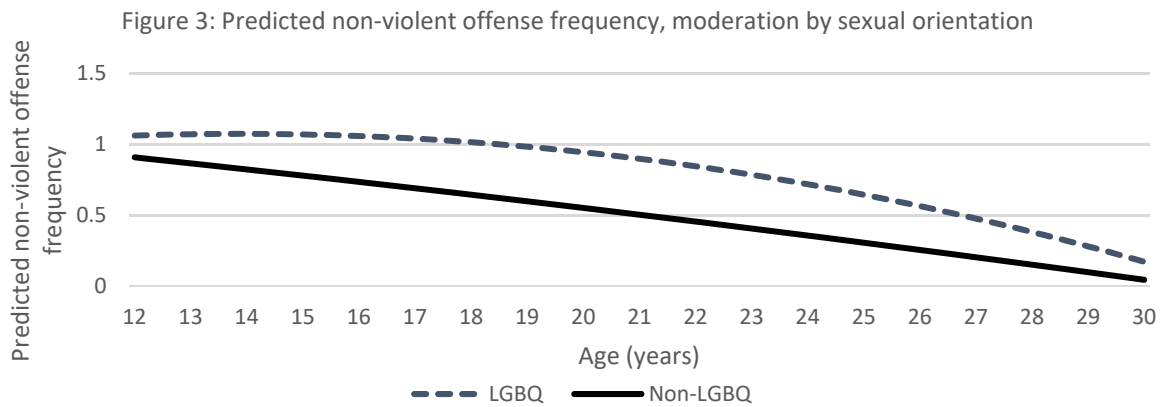
In tests for moderation by race/ethnicity, results, though statistically significant, are not sufficiently robust to be meaningful. The coefficients and their significance-level are shown in the tables below, but, for example, there are statistically significant differences only in the tails of the distributions, potentially due to wider confidence intervals.

Tables 4 (violent offending) and 5 (non-violent offending) below show the results for models including, respectively, the covariates alone, (M2 in the tables), moderation by sex (M3 in both tables), and, where significant, moderation by sexual orientation (M5 in table 5). Models

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included in the tables are those depicted in the accompanying figures only. We do not show results for non-significant findings.

Table 4: Selected Models showing Regression Coefficients (betas) for Violent Delinquency

Model	Covariates (M2)	Moderation by Sex (M3)
Age	-0.11***	-0.04
Age^2	<0.01***	<0.01
Hispanic (ref: white)	0.16***	0.17***
Black (ref: white)	0.26***	0.25***
Asian (ref: white)	0.08*	0.07*
Native American (ref: white)	0.19*	0.19*
Other race/ethnicity (ref: white)	-0.03	-0.02
Female (ref: male)	-0.38***	0.69*
Female x Age		-0.13***
Female x Age^2		<0.01***
LGBQ (ref: heterosexual)	0.04	0.04
Public assistance in household before age 18	0.07*	0.07*
Ever repeated or been held back a grade	0.22***	0.22***
Ever suspended, expelled, or dropped out	0.20*	0.20*
Ever used alcohol, cigarettes, or illicit substances	0.34***	0.34***
Ever in a foster home	0.15*	0.15*
Intercept	1.83***	1.28***

* p<0.05, ** p<0.01, *** p<0.001
Note: "<0.001" is used for values (positive or negative) that round to 0.00

Table 5: Selected Models showing Regression Coefficients (betas) for Non-Violent Delinquency

Model	Covariates (M2)	Moderation by Sex (M3)	Moderation by Sexual Orientation (M5)
Age	-0.02	0.06*	-0.03*
Age^2	<0.01**	<0.01***	<0.01
Hispanic (ref: white)	0.03	0.03	0.03
Black (ref: white)	-0.01	-0.01	-0.01
Asian (ref: white)	0.03	0.03	0.03
Native American (ref: white)	0.03	0.03	0.03
Other race/ethnicity (ref: white)	-0.07	-0.06	-0.07
Female	-0.46***	0.73*	-0.46***
Female x Age		-0.15***	
Female x Age^2		<0.01***	

LGBQ	0.30***	0.30***	-0.96*
LGBQ x Age			0.13**
LGBQ x Age^2			<0.01**
Public assistance in household before age 18	0.08*	0.08*	0.08*
Ever repeated or been held back a grade	-0.02	-0.02	-0.02
Ever suspended, expelled, or dropped out	0.23*	0.23*	0.23*
Ever used alcohol, cigarettes, or illicit substances	0.46***	0.46***	0.46***
Ever lived in a foster home	0.13	0.13	0.13
Intercept	1.20***	0.58*	1.36***
* p<0.05, ** p<0.01, *** p<0.001			
Note: "<0.001" is used for values (positive or negative) that round to 0.00			

Association of violent offending with prior maltreatment

We next examined the association between child maltreatment and non-violent and violent offending frequency across ages. Figure 4a (Table 6, Model 7-1) shows that maltreatment is associated with a significantly altered pattern of predicted offending frequency across ages. Specifically, for violent behavior, there was an increasing intercept as maltreatment was associated with increasingly higher predicted frequencies of offending behavior. Youth with a history of childhood maltreatment have nearly three times the level of violent offending as their counterparts with no reported history of child maltreatment; moreover, this gap persists into adulthood and does not appear to vary by maltreatment frequency. Cumulative maltreatment frequencies of three and six incidents are used as examples in these figures, since these were commonly reported frequencies.

Figure 4a: Predicted violent offense frequency, moderation by maltreatment level
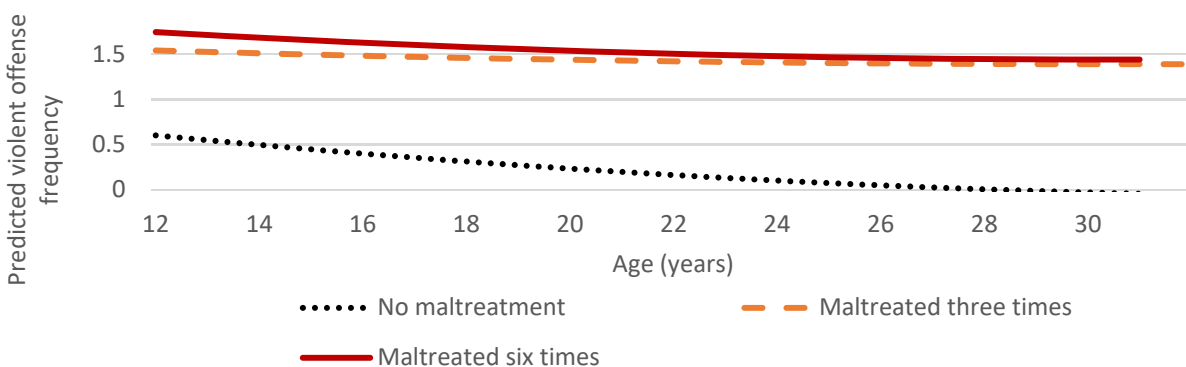
Table 6, below, shows results for violent offending for the relationship once maltreatment is taken into consideration. In this table, M7 is the model for maltreatment as a predictor of violent offending.

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Table 6: Frequency of Violent Offending using Maltreatment as a Predictor: Selected Models	
Model	**Violent Offending:** Maltreatment as Predictor (M7) Regression Coefficients (betas)
Maltreatment frequency	0.16**
Age x Maltreatment	-0.01
Age^2 x Maltreatment	<0.01
Age	-0.08***
Age^2	<0.01**
Hispanic (ref: white)	0.16***
Black (ref: white)	0.25***
Asian (ref: white)	0.06
Native American (ref: white)	0.16
Other race/ethnicity (ref: white)	-0.02
Female (ref: male)	-0.38***
LGBQ (ref: heterosexual)	0.02
Public assistance in household before age 18	0.03
Ever repeated or been held back a grade	0.21***
Ever suspended, expelled, or dropped out	0.19*
Ever used alcohol, cigarettes, or illicit substances	0.32***
Ever in a foster home	0.1
Intercept	1.42***
* p<0.05, ** p<0.01, *** p<0.001 Note: "<0.001" is used for values (positive or negative) that round to 0.00	

Association of non-violent offending with prior maltreatment

Next, as seen in Figure 4b (Table 7, Model 7), we examined this pattern for non-violent offending. Maltreatment frequency moderates the trajectory of non-violent offending such that adolescents who experienced more maltreatment had a faster rate of change in their likelihood of engaging in nonviolent offending behavior (Figure 3b). For youth who report childhood maltreatment, the predicted frequency of non-violent offending increases in early adolescence and peaks in the later teenage years; with greater maltreatment frequency, the increase in offending is steeper and peaks at a higher point. By age 21, the curves for youth who have experienced maltreatment appear to decrease below those with no maltreatment history. This should be interpreted with caution for two reasons. First, there may not be statistically significant differences at the tails, partially because the sample sizes are smaller at those ages.

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Second, the model design allows for only one bend in the predicted curve meaning the increase in adolescence is followed by an apparent decrease in young adulthood.

Figure 4b: Maltreatment level moderates predicted non-violent offense frequency
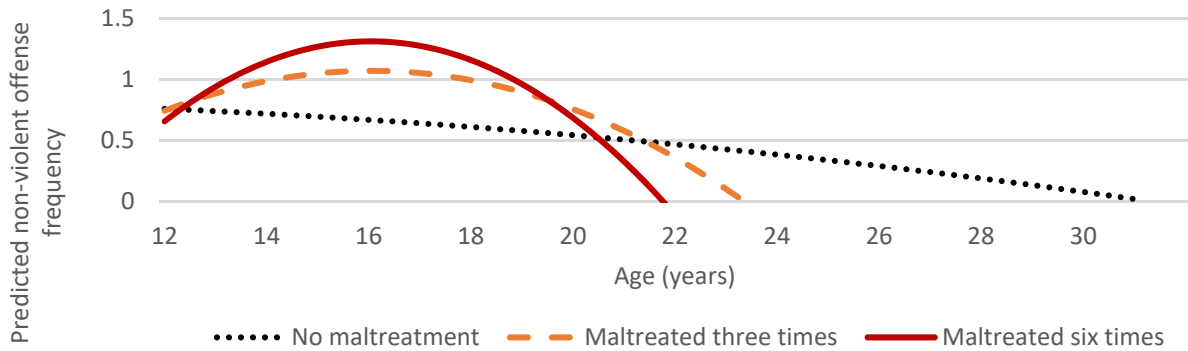
Table 7, below, shows modeled results for non-violent offending, conditional on childhood maltreatment.

Table 7: Non-violent Offending Behavior with Maltreatment as a Predictor: Selected Models	
Model	**Non-violent Offending:** Maltreatment as Predictor (M7) Regression Coefficients (betas)
Maltreatment frequency	-1.64***
Age x Maltreatment	0.22***
Age^2 x Maltreatment	-0.01***
Age	0.01
Age^2	<0.01***
Hispanic (ref: white)	0.02
Black (ref: white)	-0.01
Asian (ref: white)	<0.01
Native American (ref: white)	0.03
Other race/ethnicity (ref: white)	-0.07
Female (ref: male)	-0.46***
LGBQ (ref: heterosexual)	0.28***
Public assistance in household before age 18	0.06
Ever repeated or been held back a grade	-0.04
Ever suspended, expelled, or dropped out	0.21*
Ever used alcohol, cigarettes, or illicit substances	0.43***
Ever in a foster home	0.11
Intercept	0.82***
* p<0.05, ** p<0.01, *** p<0.001 Note: "<0.001" is used for values (positive or negative) that round to 0.00	

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Relationship between child maltreatment and offending, by selected sociodemographic characteristics

We found sex was a significant moderator, such that the relationship between maltreatment and predicted non-violent offending is stronger for males than females. In Figure 5, below (data shown in Table 8, Model 8), the curve for males who have been maltreated is higher compared to that for females. Males who experienced maltreatment (solid blue line) have the greatest predicted non-violent offense frequency during their teenage years and it is above the other three lines. For violent offending, there was no indication of moderation by sex. This figure is not shown.

Figure 5: Predicted non-violent offense frequency: Testing moderation by gender and maltreatment level
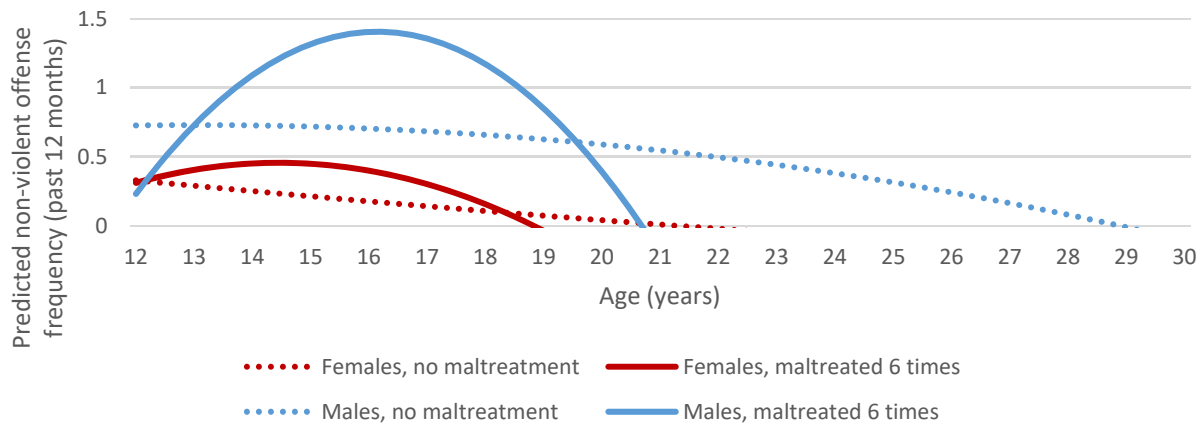
Table 8: Testing Moderation of Non-violent Offending by Prior Maltreatment, by Sex: Selected Models	
Model	**Non-Violent Offending:** Moderation by Sex of Maltreatment Predictor (M8) Regression coefficients (betas)
Maltreatment frequency Age x Maltreatment Age^2 x Maltreatment	-2.77*** 0.36*** -0.01***
Age Age^2	0.08** <0.01***
Hispanic (ref: white) Black (ref: white) Asian (ref: white) Native American (ref: white)	0.02 -0.01 <0.01 0.04

Other race/ethnicity (ref: white)	-0.08
Female (ref: male)	0.65*
Female x Age	-0.13***
Female x Age^2	<0.01***
Female x Maltreatment	1.87*
Female x Maltreatment x Age	-0.23*
Female x Maltreatment x Age^2	0.01*
LGBQ (ref: heterosexual)	0.28***
Public assistance in household before age 18	0.06
Ever repeated or been held back a grade	-0.04
Ever suspended, expelled, or dropped out	0.21*
Ever used alcohol, cigarettes, or illicit substances	0.43***
Ever in a foster home	0.11
Intercept	0.24
* p<0.05, ** p<0.01, *** p<0.001 Note: "<0.001" is used for values (positive or negative) that round to 0.00	

We found no evidence that race or sexual orientation moderated the relationship between childhood maltreatment and either non-violent or violent offense frequency. Analysis of the ICCs across the respective models indicated that the bulk of the variance in violent offending is within individuals over time, rather than across individuals. For example, the baseline model for violent offending frequency (M1) estimates 16 percent of the variance in violent offending frequency is due to variance across individuals; the predictor variables added in subsequent models reduced this to 10 percent. For non-violent offending, the corresponding decrease was from 19 to 13 percent. Including random effects by intercept and slope did not add meaningful variation to any of the demonstrated models. These results are shown in Table 9, below.

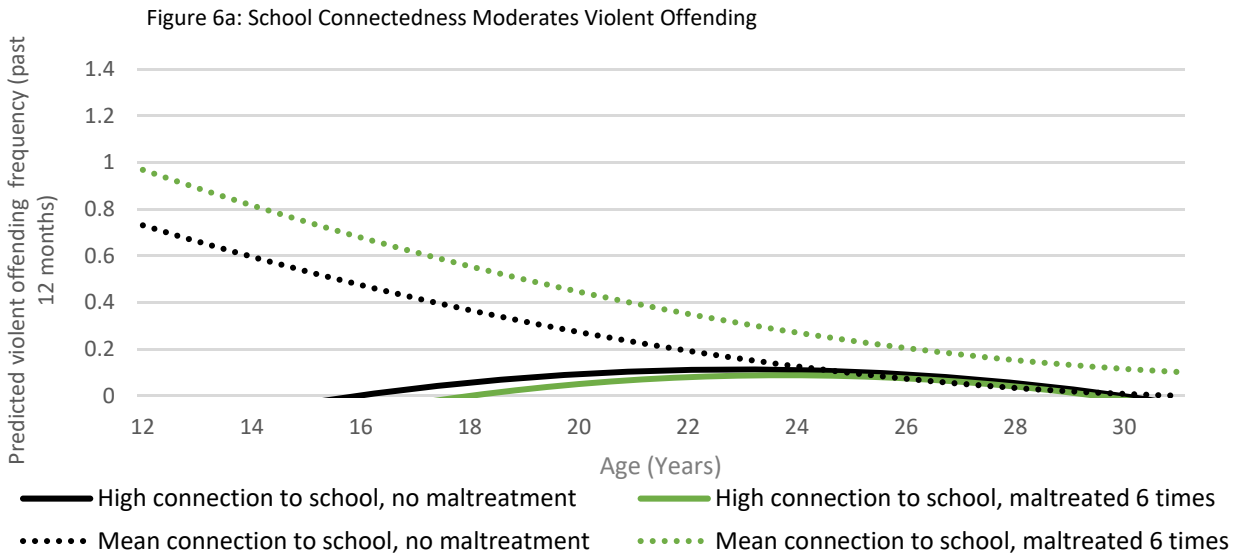| Table 9: Intraclass correlation coefficients (ICC)			
Violent offending		Non-violent offending	
Baseline model (M1)	Maltreatment predictor (M7)	Baseline model (M1)	Maltreatment predictor, moderation by Sex (M8)
ICC = 0.16	ICC = 0.10	ICC = 0.19	ICC = 0.13

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Protective factors

The foregoing analyses were designed to answer the first two research questions; the next analyses aimed to answer the last two research questions. Results of these analyses can be broken down into two main parts: first, we studied whether selected factors protectively moderated the association between maltreatment and offense frequency; next, we studied whether this moderation effect varied by selected sociodemographic characteristics of youth. We found that school connectedness, a strong maternal/paternal relationship, and neighborhood collective efficacy moderated (in this case, diminished) the association between childhood maltreatment and violent offense frequency. This finding held true for non-violent offenses, as well. We found little evidence that the moderation effects of protective factors differed by the selected sociodemographic characteristics. In this section we present the findings and further discussion of how to interpret these findings is included in the discussion section.

> **Tips for reading the graphs:** For ease of interpretation, graphs on the following pages adopt a few consistent features. First, data for respondents who did not report maltreatment are shown in **black,** while data for participants who reported childhood maltreatment are shown in color. Second, data for respondents who reported the protective factor are shown with a solid line, while data for those without the factor are shown with a dotted line. One way to remember this is that we have theorized that higher protective factors sets the respondent on more solid footing developmentally and therefore, this is the solid line. Also, for all of these graphs, we present results for violent offenses first, followed by those for non-violent offenses.

School connectedness: Violent offending

Several factors functioned protectively to moderate the association between maltreatment and violent offending. One is connection to school.

Specifically, having a strong connection to school reduces the predicted frequency of violent offending to nearly zero across early adolescence, regardless of childhood maltreatment; for those youth with only a moderate connection to school, predicted violent offending frequency is significantly higher. Reporting a low level of connection to school predicted the worst outcomes (not shown here). We found no evidence that the moderating effect of school connection varied by maltreatment status; rather, a strong positive connection to school was protective irrespective of prior maltreatment (Figure 6a).

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Figure 6a: School Connectedness Moderates Violent Offending

- —— High connection to school, no maltreatment
- —— High connection to school, maltreated 6 times
- ···· Mean connection to school, no maltreatment
- ···· Mean connection to school, maltreated 6 times

School connectedness: Non-violent offending

As we found with violent offending, school connectedness also moderated the association between childhood maltreatment and non-violent offending, although the patterns are more complex. As shown below (Figure 6b), the trajectory for non-violent offenses among formerly maltreated youth with a strong connection to school is distinctly different from the trajectory for their counterparts with only a moderate school connection. For the strongly-connected group, predicted non-violent offending declines through early adolescence, before rising steeply in later adolescence. In contrast, among maltreated youth with only a moderate school-connection, predicted non-violent offenses rise in frequency during early adolescence, before declining rapidly by the early 20s. For youth with no reported childhood maltreatment, the trajectory of predicted non-violent offending begins at higher level for those with only moderately positive school-connection, although it declines steadily with increasing age, converging (by the mid-20s) with the trend for youth with strong school-connection. We might expect school connection to have less of an impact as children are old enough to no longer be in school and for this to be exhibited in the patterns post age-18.

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Figure 6b: School Connectedness Moderates the Association Between Childhood Maltreatment and Non-violent Offending Frequency

High connection to school, no maltreatment
Mean connection to school, no maltreatment
High connection to school, maltreated 6 times
Mean connection to school, maltreated 6 times
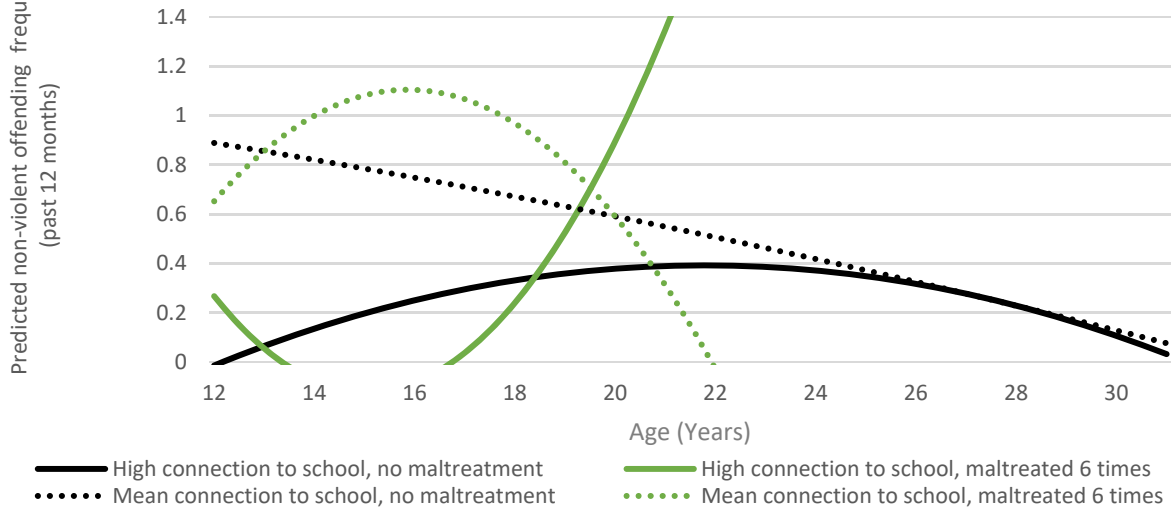
Relationship with a parental figure: Violent offending

Graphs depicting mother and father relationships are shown side-by-side below. First, a high-quality relationship with a mother figure was a protective moderator of predicted violent offending (Figure 7a). Specifically, high-quality maternal relationships decreased violent offending in adolescence, but the effect faded by early adulthood. We found no evidence that this relationship varied by childhood maltreatment status, suggesting that a positive relationship with a maternal figure is protective for all adolescents.

Figure 7a: Mother Relationship Moderates Violent Offending Frequency

Quality mother relationship, no maltreatment
Quality mother relationship, maltreated 6 times
No mother relationship, no maltreatment
No mother relationship, maltreated 6 times

Figure 8a: Father Relationship Moderates Violent Offending Frequency

Quality father relationship, no maltreatment
Quality father relationship, maltreated 6 times
No father relationship, no maltreatment
No father relationship, maltreated 6 times

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A high-quality relationship with a father figure (in graph above) was likewise associated with declines in violent criminal offending. Compared to those with no father relationship, those with a high-quality relationship had significantly lower predicted violent offending in adolescence (Figure 8a). This association, like the one for the maternal relationship, does not vary significantly by childhood maltreatment history.

Relationship with a parental figure: Non-violent offending

Similar to the patterns seen for predicted violent offending, a high-quality maternal relationship moderated the association between childhood maltreatment status and non-violent offending frequency, decreasing predicted offending frequency starting in adolescence, regardless of prior maltreatment (Figure 7b). Father figure relationship quality was also a significant protective moderator of the of non-violent offending frequency, irrespective of maltreatment status (Figure 8b).

Figure 7b: Mother Relationship Moderates Non-violent Offending Frequency

Figure 8b: Father Relationship Moderates Non-violent Offending Frequency
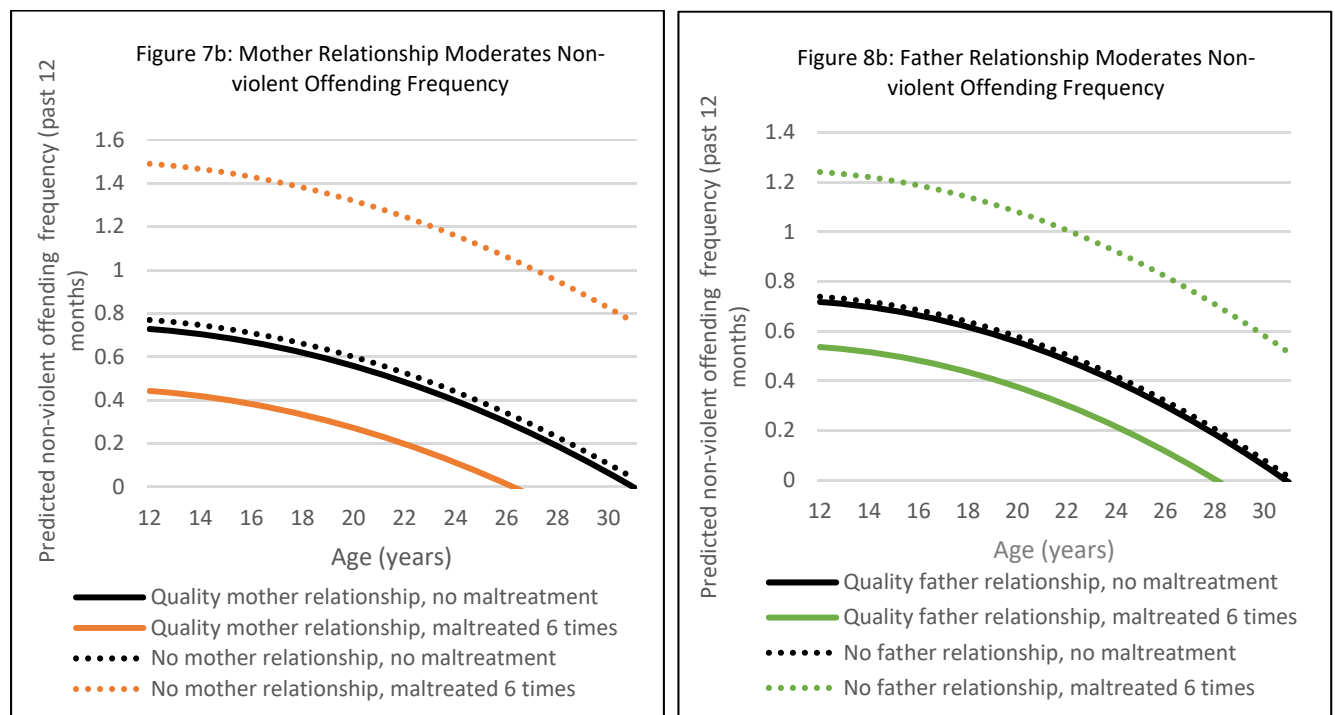
Neighborhood collective efficacy: Violent offending

Neighborhood collective efficacy was associated with lower violent offending frequency. High, compared to average levels of collective efficacy, were protective moderators of predicted violent offending. Once again, we found no evidence of variation by maltreatment status (Figure 9a). Comparisons of high versus low collective efficacy, yielded similar results.

Figure 9a: Neighborhood Collective Efficacy Moderates Violent Offending
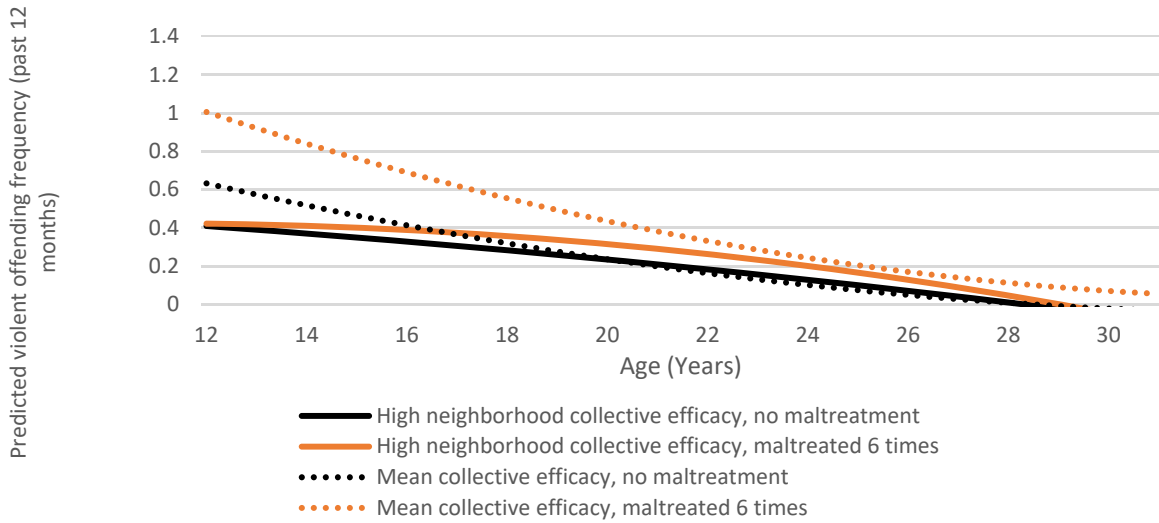
Neighborhood collective efficacy: Non-violent offending

In the case of non-violent offending, neighborhood collective efficacy also had protective effects, but neither those who experienced maltreatment nor those who did not saw these effects persist into emerging adulthood. Note that the shapes of these curves are different suggesting that the pattern of delinquent behaviors is different for those with high versus average neighborhood collective efficacy but the protective effect remains the same (distance between dotted and solid lines at the intercept). This relationship did not vary by maltreatment status (Figure 9b).

FIgure 9b: Neighborhood Collective Efficacy Moderates Non-violent Offending Frequency

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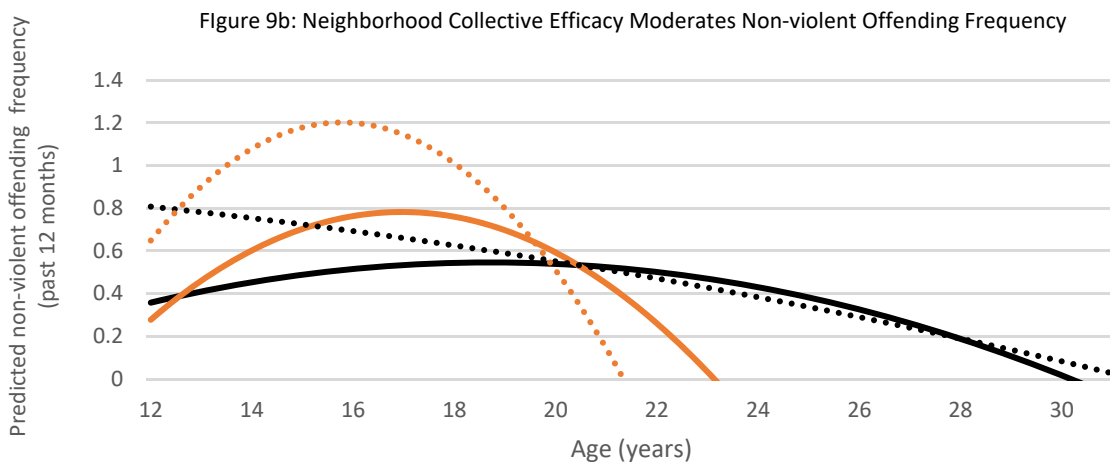
Protective Factors: Variation by Selected Sociodemographic Characteristics

We examined how our tested models might vary according to sex, race/ethnicity, and other sociodemographic characteristics. In particular, we were interested in how protective moderation of the relationship between childhood maltreatment and offense frequency might differ by one or more of these characteristics. These figures are not shown here given their complexity.

Sex was the one significant moderator that we found: for females without a history of childhood maltreatment, school connection was protective against violent offending, but this was not true for their male counterparts. However, among youth who had experienced child maltreatment, school connection was equally protective of violent offending for both males and females.

As we saw at the beginning of this report, there was moderation by the sociodemographic variables on the association between protective factors and offenses (this was true in different instances for either violent and non-violent depending on the variables), but these sociodemographic characteristics did not moderate protective effects on the relationship between *maltreatment* and non-violent offenses. For example, the relationship between father relationship-quality and offending varies by race/ethnicity; however, across all examined race/ethnic groups, the relationship between maltreatment and offending was unchanged by father relationship-quality. We note these results in order to highlight the complexity of many of these relationships, but we do not interpret them further here, given that the variation was unrelated to our key research question: the association with maltreatment status.

Similar to the previous tests of the ICC, most of the variance in predicted violent and non-violent offending is within individuals over time, rather than among them. Comparing across the respective models (Table 10), decreasing ICC values indicated the predictor variables (protective factors) explained some of the variance in offense frequency. For example, the baseline model (M1) indicates 16 percent of the variance in violent offending is due to variance among individuals. The addition of school connection, in M12, reduced this to 11 percent. Models for non-violent offending showed a corresponding decline from 19 to 13 percent of variance explained. The introduction of random effects by intercept and slope did not add meaningful variation to any of the tested models.

These results are shown in Table 10, on the next page.

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Table 10: Intraclass correlation coefficients			
Violent offending		Non-violent offending	
M1: Baseline model	M12: School connection protective factor	M1: Baseline model	M12: School connection protective factor
ICC = 0.16	ICC = 0.11	ICC = 0.19	ICC = 0.13

Conclusion

What we did

The first set of findings presented here described patterns in the relationship between childhood maltreatment and later delinquent and criminal behaviors from adolescence into young adulthood, and how these patterns varied by selected sociodemographic characteristics. Specifically, we found that the frequency of childhood maltreatment affected the initial frequency of these offending behaviors, and their trajectory over time from ages 12 to 30. We examined whether this pattern varied by sex, race/ethnicity, and sexual orientation. In the second part of our analyses, we then took the research a step further to examine whether potential protective factors interrupted the link between maltreatment and later offending. Identifying how these protective factors changed the direction and absolute levels of offending trends can highlight areas where interventions may be effective and for whom.

Summary of key findings

A summary of our key findings by research question is shown below.

Effect of Demographics
We found **no evidence** that the relationship between childhood maltreatment and later delinquent and criminal behaviors **differed by** a young person's **race/ethnicity or sexual orientation**.
However, we found selective **moderation by gender**. Among youth who **experienced maltreatment, males were more likely** to be involved in later delinquent and criminal behaviors **than females**.
Protective Factors and Violent Offenses
A **strong connection to school, high-quality relationships with a mother or father figure, and neighborhood collective efficacy had protective effects** for all children; it did not vary by childhood maltreatment status.
Protective Factors and Non-violent Offenses
Neighborhood collective efficacy had a protective effect that did not vary by childhood maltreatment status.
A strong **connection to school** and **a high-quality relationship with a mother or father figure** had **protective effects, especially** for young people **who experienced childhood maltreatment.**
Effects of Sociodemographic Characteristics on Protective Factors
We found **no evidence** that the protective effects we found varied by sex, race/ethnicity, or sexual orientation.

What we found

The link between child maltreatment and later engagement in delinquent or criminal behaviors varies significantly by sex. Specifically, non-violent offenses were significantly more frequent among maltreated males than among their female counterparts. We found no differences in the relationship between maltreatment and either violent or non-violent offending, by either race/ethnicity or sexual orientation.

Our second set of findings focused on whether potential protective factors modified the link between maltreatment and later offending behavior. We tested whether potential protective factors changed either the rate of change (positivity or negativity and steepness of the slope) of this relationship across development or its initial level (intercept).

We found protective factors that changed the trajectory of offending for youth generally, or, in some cases, for youth who have experienced childhood maltreatment. We were interested in identifying protective factors across multiple levels[48] that may be actionable for policy-makers and practitioners. The factors we chose for analysis are identified in the scientific literature as protective against engagement in delinquent behaviors. They include peer relationships, relationship quality with a mother and/or father figure,[16,49] connection to school,[47] and neighborhood collective efficacy.[50]

What do the findings mean?

Positive connections to school, parents, and one's neighborhood may **all have protective effects** when it comes to non-violent and violent offenses among young people. These effects are sometimes **particularly strong for youth who experienced maltreatment in childhood.** There were no differences by the tested demographic characteristics, suggesting that **children can benefit from these protective factors regardless of their sex, race/ethnicity, or sexual orientation.**

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Discussion

Key methodological considerations

We briefly highlight three methodological features of our study to keep in mind when interpreting these results. First, we included an age-squared term in the tested models, to allow for nonlinearity in the graphs, but it permits only a single curve. Therefore, some of the results are affected by this limitation of the model. We tested for cubed terms and did not find significance and so decided to only use the squared terms. Second, our models tested for differences in both rate of change (slope) and initial magnitude (intercept). Depending on the model, significant results were found for both or just one. While some models had statistically significant findings with regard to intercept levels, this does not imply that *all* of the lines are statistically different from one another. Rather, it means that at least one of the predicted lines is significantly different from the others. Finally, our findings could be constrained by the fact that protective factors were measured only at Wave I – patterns may be different with later protective factors measured.

Three key patterns in the findings

Our findings suggest three ways protective factors may moderate the association between childhood maltreatment and offending behavior: 1) by being negatively associated with offending behavior, regardless of childhood maltreatment status, 2) by affecting the initial level of delinquent or criminal behaviors (the intercept) alone, and 3) by affecting both the intercept and the trajectory of delinquent or criminal behaviors across age.

1) General protectiveness: A third pattern in our results was moderation of offending overall. Protective factors were negatively associated with offending frequency, for both those who reported maltreatment and those who did not. We describe this as a "generally protective" effect, as it was not dependent on maltreatment status. All of the outcomes for violent offending (figures 6a, 7a, 8a, and 9a) are examples of this pattern. These results imply that protective factors can operate for all children irrespective of some characteristics of their history of adversity. Given that maltreatment can be difficult to identify (whether using administrative records, or youth's own report), a focus on promoting protective factors can help prevent violent offending among a broad population of adolescents.

2) Intercept pattern: A second pattern is that, in some cases, intercept values alone indicated moderation of the maltreatment-offending association. An example is the moderation of non-violent offending by high-quality parental relationships (Figures 7b and 8b). In these graphs there is a large difference between the two, colored lines (one

solid and one dotted). These indicate that high-quality parental figure relationships appear most protective for those who reported childhood maltreatment; they are somewhat less protective for those not reporting maltreatment. In addition, our findings show that both mother- and father- figure relationships matter.

3) Intercept and slope pattern: There is only one result where both the intercept and slope pattern showed evidence of moderation by a protective factor. Figure 6b (school connectedness and non-violent behavior) shows that school connectedness moderates the association between maltreatment and offending. Youth reporting childhood maltreatment but with a high connection to school have relatively low offending at baseline, and this behavior declines steeply during early adolescence, followed by a predictable increase in the later teen years. Both conceptual and analytic constraints likely drive this increase. Conceptually, a rise in non-violent offending starting around age 18, the age at which most students would have either graduated or left the school they were connected to, is not surprising. For youth reporting a strong connection to school and not reporting prior maltreatment, the predicted non-violent offending also peaks after age 18. Analytically, our figures are constrained by our model specifications: the restriction of the shape to a parabola with the squared term means that the declines and rises will be symmetrical or that, for these steep declines, there will always be a steep rise following (or vice versa). This means for youth who were maltreated and reported a strong connection to school, their predicted decline in non-violent behavior in adolescence contributes to the predicted incline in young adulthood.

In contrast, youth with a high connection to school, who did not experience maltreatment, had a gradual increase in offending behavior until around 20 years of age when it declined – ultimately to more similar to children with no maltreatment and moderate reported school connection. Finally, the plotted curves of non-violent offending by youth with only an average connection to school are more similar to each other regardless of childhood maltreatment experiences: offending levels are high (or increasing, in the case of maltreated youth) through adolescence, and decline in emerging adulthood. These results suggest not only that the four groups are distinct in important ways, but also that the mechanisms explaining why school connection matters may also differ. This topic deserves further exploration in future research. It is also important to note that we compared youth with strong school connection to those with average school connection, since these categories include the majority of the sample. However, not surprisingly, outcomes are still worse for those with weak school connection (results not shown).

Three other important findings

We also saw three other important patterns in the data. First, notwithstanding the overall patterns we noted about, we also saw, in most cases, that there were consistently different patterns between the trajectories for non-violent and violent offending. One potential explanation for these results is that violent offenses are less common, and that violent offenders are simply systematically different from non-violent offenders. Additionally, in the case of violent offenses, the harm is typically more immediate and personal. In contrast, instances of non-violent offending are typically more anonymous. Perpetrators of violence may be more likely to struggle with emotion regulation, social isolation, and aggression.[51] The protective factors that we have chosen are inherently social and (in some cases, personal). Thus, their role in moderating violent offenses may be quite different from how they might affect non-violent behaviors. While we were not able to test for these differences, we suggest they would be worth exploring in future research.

Second, neighborhood collective efficacy may be an example of an underlying mechanism moderating both violent and non-violent adolescent offending. As previously noted, this factor operates protectively for both violent and non-violent offending through two mechanisms: 1) opportunity to engage in certain behaviors and 2) watchful adults. Organizations may want to focus on these features of neighborhoods when developing interventions. One example is Mothers Against Senseless Killings (MASK), a Chicago organization that supports mothers in different neighborhoods to set up chairs on street corners in the summer. These mothers then watch over and provide food for neighborhood children; while not yet evaluated, city statistics indicate declining violence in the neighborhoods where MASK operates.[52]

Finally, we had important null findings. We did not find any significant patterns in models that included time spent with friends. We hypothesized that this measure might be a good indicator of positive connection to peers that would be associated with fewer delinquent behaviors.[53] However, time spent with friends could have either negative or positive effects, depending on friends' predilections. A measure that identifies pro-social peer relationships would be preferable. We also found no differences by any of the sociodemographic characteristics that we included (sex, race/ethnicity, or sexual orientation) in the influence of protective factors. Knowing that protective factors are important for many children, not only for select groups – for instance, black children, or females, or those who were not maltreated – is important because it implies that we should focus on providing these services to all children.

Understanding the findings

When it comes to our selected sociodemographic variables, we consider the predominantly null findings around their role as potential covariates as informative. It is likely that humans have universal biological, cognitive, and behavioral adaptations in response to childhood maltreatment.[54,55,56,57] All youth – regardless of race/ethnicity or sexual orientation –respond negatively to maltreatment. These findings should prompt us to begin to more broadly think about trauma and youth behavior within specific community contexts, so as to respond more appropriately to their specific needs.

We also hypothesized that LGBQ youth might struggle with mental health and exhibit more externalizing behaviors.[58,59,35] We did not see this in our results.[1] This may indicate either that non-heterosexual youth are doing better overall than we hypothesized, and are more similar to their heterosexual peers, or that their struggles are more likely to be reflected in internalizing rather than externalizing symptoms.[35,60,61]

Finally, we hypothesized that we would see differences across race, due to differences in stressors and violence exposure. While we found no race-related variation in the relationship between delinquent or criminal behavior and childhood maltreatment, other studies provide substantial evidence for differential treatment subsequent to criminal or delinquent behavior. In comparison to their white counterparts, both black and Latino students are significantly more likely to receive a suspension, a discrepancy that appears as early as preschool.[62,63] This trend persists through adolescence, when black and Latino youth are more likely to have contact with police, experience arrest, or have other engagement in the juvenile justice system.[24,25] This is particularly true for males. Our findings reinforce the need to reexamine areas where in the trajectory from childhood maltreatment to juvenile delinquency and offending inequities persist, so that we can create more just juvenile and adult justice systems.

Potential mechanisms

In the text-box below, we offer some speculations as to the mechanisms that may explain the protective effects we found:

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[1] Note that, though we did find small differences in non-violent offending behavior by sexual orientation, these differences were found overall and were not conditional on childhood maltreatment. Specifically, youth who identified as heterosexual or homosexual reported similar patterns of offending behavior when they had experienced earlier maltreatment. Thus, though the picture could be different following other types of adversity, sexual orientation does not appear to affect externalizing behavior following childhood maltreatment.

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SCHOOL CONNECTION

Children spend a significant portion of their lives in school, and school-connection may be particularly protective against offending behavior. Because school can be reliable and consistent, it is potentially an easy protective factor to focus on and prioritize: for most adolescents, attending school is a routine part of their lives. Connection to school may reflect youth's engagement in supervised activities at school that keep them out of trouble, or that they have relationships with teachers or other staff who can be positive role models.[64,65] For these reasons, the role of this protective factor may diminish once adolescents have graduated from high school. In fact, previous research indicates that this is the case when it comes to delinquent behaviors.[66] However, our own findings could be constrained by the fact that protective factors were measured only at Wave I; with measurement of these variables over time (especially for adolescents who matriculated to college), we might find, for example, that post-secondary school connection is also protective, or alternatively that these protective effects are bound to a particular developmental stage, after which offending normatively declines.

PARENTAL RELATIONSHIP QUALITY

Maltreatment and other adverse experiences can negatively affect one's ability to cope with stress, which can, in turn, lead to acting out. On the other hand, trusting, safe relationships can be leveraged to teach and develop coping skills.[67] When children are hurt by the people who are supposed to care most about them, it may be particularly important for them to have other supportive adult relationships.[68] In some cases, this may be the other parent. Our results suggest youth with no parental relationship are most at risk. We also note here two methodological limitations of our study that may bear on this issue: we compared youth reporting high-quality relationships with youth reporting no such relationships, since this potentially most vulnerable group was often not included in previous studies (comparisons have been made to youth with poor quality relationships rather than no relationship). Second, because we analyzed separately maternal and paternal relationships it is possible that one parent could have been a maltreatment perpetrator, with the other parent having a protective role.

NEIGHBORHOOD COLLECTIVE EFFICACY

For both non-violent and violent offending, neighborhood collective efficacy was protective. Collective efficacy likely impacts offending behavior in two ways: by affecting opportunities to engage in positive or negative behaviors, and by increasing adult monitoring and supervision. A higher level of collective efficacy is associated with less violence neighborhood overall.[69] This holds regardless of neighborhood income level – even lower-income neighborhoods with high levels of collective efficacy have less violence.[70,71] Thus, adolescents (both those who were maltreated and those who were not) living in these neighborhoods may have fewer opportunities to engage in antisocial behaviors. Second, according to Fagan and colleagues, children in neighborhoods with high collective efficacy know two things: that they are more likely to be supervised by adults, and that there are more adults around them to support them when needed, both factors that result in them being less likely to engage in criminal behaviors.[50]

Strengths

Our methods were novel in terms of our source of data, the variables we selected, and the analytic methods we used. Because we used a nationally representative dataset, our findings may be more generalizable than those relying on other types of data sources. For example, both child protective services reports and policing of delinquent behaviors can be concentrated in low-income communities of color.[27] Therefore, a nationally representative dataset may include sub-populations that are under-represented in administrative data.

Because we used of self-reports of both childhood maltreatment and delinquency, we likely include youth who are not counted in typical administrative data – either because their experiences went undetected, or were not reported. This may account for why rates of maltreatment reported in this study are higher than those confirmed in government reports. Even those incidents that did not result in a system-response may have an important influence on subsequent youth behavior. Further, the Add Health study captured maltreatment frequency, not simply whether or not it had ever occurred. The frequency of maltreatment may matter more than maltreatment type, because types of maltreatment tend to co-occur.[48,63] Similarly, the Add Health dataset includes multiple response categories for our selected protective factors, rather than a binary "yes/no". Thus, we are able to compare individuals with "high" levels of a protective factor to those with an "average" level of protective factor. This is a more conservative estimate than comparing to "low" levels, since it allows us to include a greater, more representative proportion of the sample.

We were also able to examine in our analysis protective factors at multiple levels – a choice studies with a more limited data source are precluded from. Studies using more restricted samples typically do not have data adequate to test various sub-populations, particularly those that are small

By using linear mixed-effects models, we decreased the likelihood of confounds related to endogeneity. Many potential factors may be predictors of both maltreatment and delinquency, and we were unable to control for all of them. However, linear mixed effects models, by examining an individual's change over time, control for those unobserved factors that are time invariant. This robust method allowed us to examine how associations change with the frequency, and also to test for model differences by sex, race/ethnicity, and sexual orientation. We were able to report on change across development rather a single significant association.

We were able to stratify analyses by race/ethnicity and sexual orientation. Our data cover nearly 20 years of age. Our samples are well represented by the predicted plots. Building from these strengths in future research is important, because parents, educators, healthcare

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providers, judges, and juvenile justice practitioners are eager to know what experiences—both negative and positive – are critical in preventing future delinquent behaviors

Limitations

This study had several limitations. First, in order to study participants from adolescence into young adulthood, it means that the experiences of childhood maltreatment may have happened quite some time ago. As a result, these data pertain to a cohort that may differ in important ways from today's youth. Fortunately, reports of childhood maltreatment have declined in the last two decades.[72] However, offending behaviors have also declined significantly over this period, bolstering the argument that these trends could be intertwined.[73] Exploring the linkages between specific *types* and frequencies of maltreatment with specific offending behaviors may be an important next step. Second, our measure of social connection was limited. The peer support measure had almost no variation, which limited us to a measure of time spent with friends. However, time spent with friends can be a positive indicator – the child has friends, is close to friends, is pro-social – or can be a negative indicator – they spend time with friends who are a negative influence.[74] The lack of significant findings for this indicator raises questions about its value for our purposes.

Third, our use of an age-squared term in the models allowed for nonlinearity in the predicted offending frequencies over time but did allow for only one curve in the lines, likely contributing to some perplexing tails on some of the figures. We tested some models adding an age cubed term to see if it improved the interpretability of the simple slopes but the terms were not significant.

Implications for policy, practice, and future research

Our findings regarding variation by gender have implications for the dialogue surrounding male offending.[73,16] In particular, our findings may cast doubt on notions such as that "boys will be boys." First, the stronger relationship between maltreatment and non-violent offending for males suggests males' higher rates of offending may not reflect simply their proclivity for risk behavior, but also an externalizing response to earlier maltreatment. Previous literature finds externalizing responses (e.g., delinquency) are more common for males, compared to the internalizing responses (e.g., depressive symptoms) that are more common for females.[75,76] Our findings can inform how police officers, judges, teachers, and others view males' externalizing behaviors. Our findings suggest that externalizing behavior can be a sign of an underlying problem that is creating ongoing stress and affected young men's mental and physical well-being. In fact, the very phrase "boys will be boys" may reflect the fact that males have not learned how to cope with stressful and harmful conditions other than through externalizing behaviors. Helping adolescent boys and young men to understand and identify their stress responses could result in their decreasing reliance on externalizing responses--behavior that can leave them vulnerable to re-traumatizaton and incarceration.[77]

This study also extends our understanding of the relationship between maltreatment and later offending. More typically, studies explore the linkage between early childhood experiences of abuse, neglect, or trauma, and long-term health outcomes or self-sufficiency.[78, 79,80] Prior research on delinquency outcomes has mostly focused on adolescence or early adulthood (often to age 21 only).[18,81] In contrast, our study examined whether the commonly reported decline in offending behavior extends through the 20s. Prior studies also examine outcomes at a single timepoint, whereas we analyzed data from respondents at different ages, to describe the trajectory of offending from ages 12 to 30.

Our models suggest several potential future analyses. In analyzing protective effects, we chose factors that were supported by the literature, but there are likely multiple such factors at each level. Additionally, these factors are not protective in a vacuum, but likely interact. Including multiple protective factors in the same model may be an important next step. Including information about the maltreatment perpetrator would add nuance – especially for the parent-relationship models. We see evidence for protective effects fading over time. Explanations for this are various, but it will require more longitudinal studies to determine whether these factors may show less fade-out, for instance if one continues onto college or remains in the same neighborhood. We also have unanswered questions about how the timing of both maltreatment and the presence of a protective factor are related. Specifically, more detail on the timing of any maltreatment and the presence of one or more protective factors could be

informative. Finally, we lack sufficient understanding of the mechanisms through which these protective factors reduce anti-social behaviors and offending. Such questions should guide future research that identifies the most important protective factors, results of which could inform both prevention efforts, and strategies to reduce recidivism.

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