



**The author(s) shown below used Federal funding provided by the U.S. Department of Justice to prepare the following resource:**

**Document Title: An Ecological Model of Risk and Protection for Delinquency and Juvenile Justice Involvement among Maltreated Youth: A Longitudinal Study**

**Author(s): Heather Taussig, Ph.D., Julia Dmitrieva, Ph.D., Edward Garrido, Ph.D., John Cooley, Ph.D.**

**Document Number: 302243**

**Date Received: September 2021**

**Award Number: 2017-JF-FX-0050**

**This resource has not been published by the U.S. Department of Justice. This resource is being made publicly available through the Office of Justice Programs' National Criminal Justice Reference Service.**

**Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.**

**Draft Final Technical Report**

**An Ecological Model of Risk and Protection for Delinquency and  
Juvenile Justice Involvement among Maltreated Youth: A Longitudinal Study**

**Grant Number:** 2017-JF-FX-0050

**Principal Investigator:** Heather Taussig, PhD

**Co-Investigators:** Julia Dmitrieva, PhD & Edward Garrido, PhD

**Postdoctoral Fellow:** John Cooley, PhD

**Submitted:** March 14, 2021

This project was primarily supported by Grant # 2017-JF-FX-0050 (H. Taussig, PI) funded by the Office of Juvenile Justice and Delinquency Prevention and managed by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. Opinions and views expressed in this document are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

## **An Ecological Model of Risk and Protection for Delinquency and Juvenile Justice Involvement among Maltreated Youth: A Longitudinal Study**

### **Purpose of the Project**

The purpose of this study was to test the efficacy of Fostering Healthy Futures, a mentoring and skills group preventive intervention (previously shown to be efficacious for improving mental health outcomes), in reducing delinquency for youth with histories of childhood maltreatment and placement in foster care. Despite significant research demonstrating the strong link from childhood adversity to crime, no known studies have rigorously tested whether an evidence-based, positive youth development program can mitigate the effects of childhood adversity on delinquency and juvenile justice involvement from preadolescence through young adulthood.

### **Background**

It is well established through both cross-sectional and longitudinal studies that youth who have experienced maltreatment are overrepresented among those who self-report delinquency and have juvenile justice involvement (Esposti et al., 2020; Malvaso et al., 2018; Widom et al., 2018). Children in the child welfare system may be at particular risk. A recent study found that, of all youth younger than age 18 arrested and booked in California between 2014-2015, 60.2% had prior child protective services involvement (Eastman et al., 2019). Foster care placement is also strongly associated with delinquency (Goodkind et al., 2020); one longitudinal study found that 57% of youth who emancipated from foster care had been incarcerated by age 25 or 26 (Courtney et al., 2011). Of the young people arrested in the California study, over half had a child protective services' report of maltreatment before the age of 10 (average 5.4 years; Eastman et al., 2019). Thus, delinquency prevention efforts with this population should focus on working with youth before adolescence, when delinquency typically peaks (Moffitt, 1993).

There have been many efforts to prevent delinquency among youth; common strategies include after-school programming, skills training, and youth mentoring (Welsh & Farrington, 2007). Systematic reviews and meta-analyses have found mixed results for these programs, with some indicating no benefit on delinquency (Herrera et al., 2013; Taheri & Welsh, 2016), whereas others have found such programs to have small effects (with effect sizes clustered around .20) on the prevention or reduction of delinquency (Beelmann & Lösel, 2020; Farrington et al., 2017; Lösel & Beelmann, 2003; Raposa et al., 2019; Tolan et al., 2013; van der Stouwe et al., 2020). Very few studies demonstrate long-term effects on delinquency (Hawkins et al., 2020), although there are some notable exceptions (Conduct Problems Prevention Research Group, 2010; Karcher, 2020; van der Stouwe et al., 2020). Each of the reviews calls for more rigorous studies to be conducted given the extreme heterogeneity in findings, which is likely due to the diverse populations served, different program components, variable fidelity to the models, and striking differences in rates of participant engagement and retention (Taheri & Welsh, 2016).

The reviews are consistent, however, in identifying some important delinquency prevention strategies, including social skill and mentoring interventions. Skills training programs for indicated populations that were more intensive, utilized a cognitive behavioral approach, and focused on social competencies were most effective (Beelmann & Lösel, 2020; Lösel & Beelmann, 2003; Welsh & Farrington, 2007). Across the meta-analyses of youth mentoring, effects sizes were strongest when: (1) programs targeted youth with problems and/or those who had been exposed to substantial environmental risk; (2) mentors were motivated by gaining experience for their professional development, and there was a fit between their experience and the goals of the program; and (3) programs emphasized emotional support and provided structure

for mentors to engage in instrumental and advocacy activities with mentees (Christensen et al., 2020; Dubois et al., 2011; Lyons et al., 2019; Raposa et al., 2019; Tolan et al., 2013).

Only one known prior study has conducted a preventive intervention with children in foster care in order to reduce delinquency. Middle School Success was designed for girls in foster care who were entering middle school. The intervention consisted of a 6-session summer group program for foster parents (caregiver management training) and a parallel girls' skills group. During the subsequent academic year, parents and children were provided coaching to reinforce what was learned over the summer. Although only about 50% of the coaching sessions were attended, the program evidenced a marginally significant effect on a composite measure of self-reported delinquency and association with delinquent peers (Kim & Leve, 2011).

No prevention studies with children in foster care have used court records to assess delinquency outcomes, yet a recent systematic review of the association between maltreatment and offending concluded: "it has been shown that experiences of maltreatment can exert different influences on officially measured and self-reported offending outcomes" (Malvaso et al., 2018, p. 30). The authors suggest the use of multiple methods to examine delinquency in order to reduce the risk of measurement biases. Self-reports of delinquency can provide a more accurate picture of the scope of delinquency for several reasons: (1) only a fraction of delinquent behavior is detected by officials, (2) there is bias in who has contact with law enforcement, and (3) youth might have moved out of the area from which records are being collected. On the other hand, youth may deny or exaggerate their involvement with delinquent behaviors, and this may differ as a function of intervention status (e.g., those in the intervention may feel more comfortable reporting problem behaviors or they may underreport behaviors to please the investigator). Issues of study attrition are also more problematic in self-reports, as youth at the highest risk for

delinquency are at the highest risk for attrition in longitudinal studies (Bosick, 2009; Brame & Piquero, 2003). Therefore, the use of both delinquency measurement approaches is warranted, especially given the low concordance between methods used in prior studies (Conduct Problems Prevention Research Group, 2010; Farrington et al., 2007; Murray & Farrington, 2010).

### **Fostering Healthy Futures**

Fostering Healthy Futures (FHF) is a 9-month preventive intervention designed for preadolescent children placed in court-ordered foster care as a result of maltreatment. The program consists of one-on-one mentoring and skills groups, and it incorporates many of the key elements (described above) that have been shown to prevent delinquent behavior and other adverse outcomes (Taussig et al., 2007). Weekly groups employ a cognitive behavioral approach, with an explicit focus on teaching children social skills. Mentors support children in practicing and generalizing these skills in their homes, schools, and communities. There is a focus on both establishing a strong mentor-mentee relationship and on engaging in instrumental, goal-focused activities during mentoring visits, which has been shown to produce maximal benefit (Christensen et al., 2020; Lyons et al., 2019; Rhodes, 2020). FHF has demonstrated positive effects on mental health symptoms and service utilization and has also led to a reduction in placement changes, foster care costs, and residential treatment up to 1-year post intervention (Taussig & Culhane, 2010; Taussig et al., 2019; Taussig et al., 2012; Winokur & Crawford, 2014). Longer-term effects have yet to be examined, and this is the first study to evaluate FHF's impact on delinquency.

The current study sought to contribute to the field by employing a rigorous randomized controlled trial of the FHF program to examine changes in both self-reported and court records of delinquency charges over 7-12 years. The study used multilevel modeling analyses with an

intent-to-treat approach to evaluate trajectories across age for total, non-violent and violent delinquency, given the well-established age-crime curve for delinquency (Moffitt, 1993) and the fact that other intervention studies have found program effects only at certain developmental periods and for specific types of delinquency (Bosick, 2009; Conduct Problems Prevention Research Group, 2010; Duncan et al., 2019; Farrington et al., 2007).

## **Participants**

Study recruitment began in August 2002 in Denver, Colorado and expanded to three additional metro-area counties in 2007. Recruitment letters were sent to families of all children between the ages of 9 and 11 years who were living in out-of-home care within the participating counties. Children were eligible for the study if they (a) had been placed in any type of out-of-home care (i.e., foster care, congregate care, kinship care) by court order due to maltreatment within the preceding year, (b) had lived in their current placement setting for at least 3 weeks, (c) resided within a 35-minute drive to the intervention group sites at the time of recruitment, (d) did not have a developmental disability that would preclude them from participating in group, and (e) demonstrated adequate proficiency in English (caregivers, however, could be monolingual Spanish speaking). Participants were recruited in 10 cohorts over the course of 10 consecutive summers; the first five cohorts comprised the “pilot trial” and the second five cohorts comprised the “efficacy trial.” When multiple siblings were eligible in the pilot trial, one sibling was randomly selected to participate in the RCT. In the efficacy trial, eligible siblings were paired for randomization, and both were included in the trial. Overall, 22 sibling pairs were included in the RCT. Participation in this study was voluntary and could not be court-ordered.

For participants’ self-reports of delinquency, the follow-up time points differed between the pilot and efficacy trials, but all youth had the opportunity to participate in both a Time 2

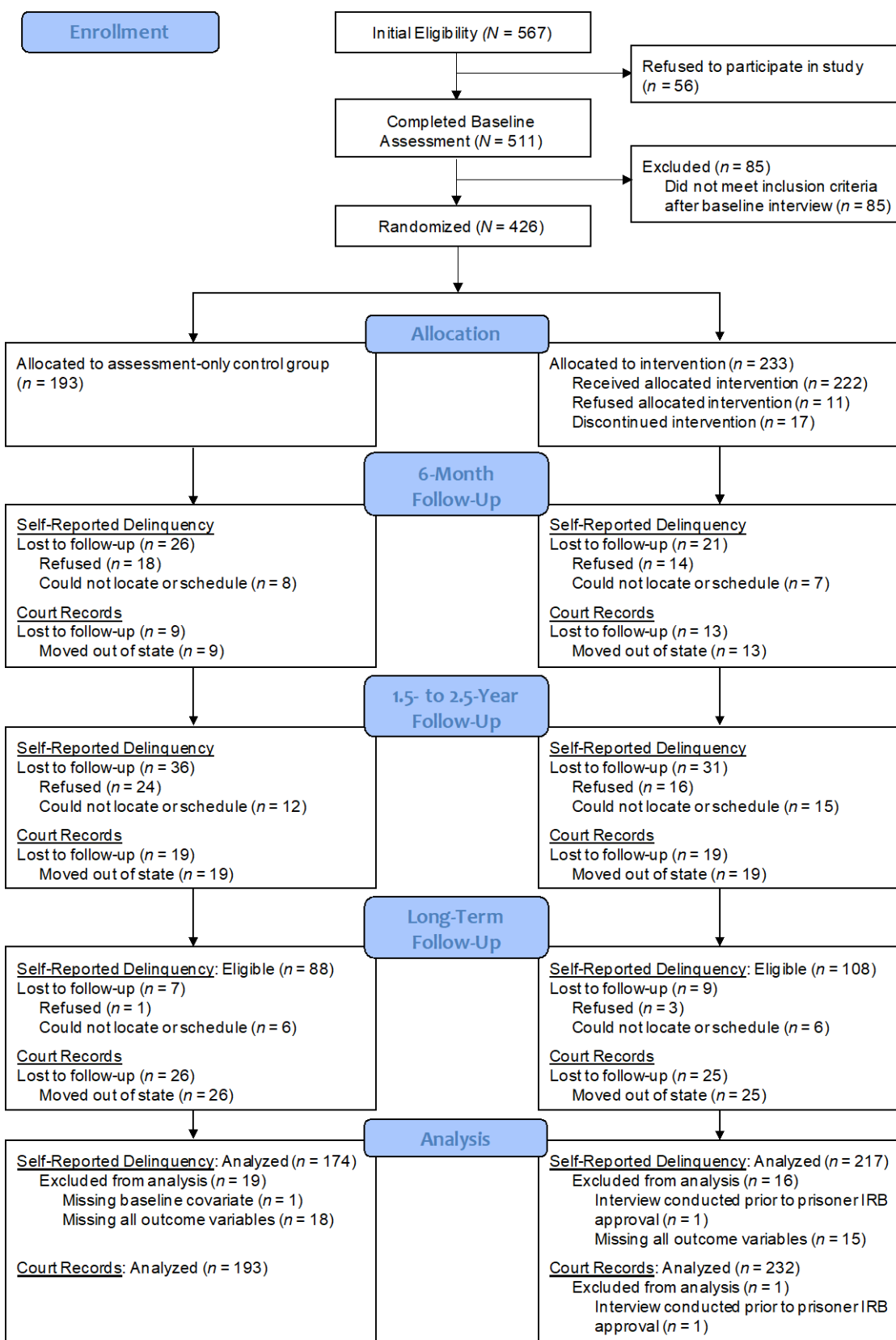
follow-up interview (6 months post intervention) and a Time 3 follow-up interview (1.5 years post intervention for the pilot trial and 2.5 years post intervention for the efficacy trial). Finally, for a subgroup of participants, there was a long-term follow-up interview (called Time 4) that took place when participants were between the ages of 18-22 (with variable amounts of time post intervention). Court records of charges (including charges through age 18) were queried for 7 consecutive years beginning 3 months after the intervention started for each cohort.

As shown in the CONSORT diagram (Figure 1, page 7), 90.1% of recruited children and families agreed to participate. Seventeen percent of the participants did not meet eligibility criteria based on the baseline interview (for additional details, see Taussig et al., 2007). Of the 426 children who were randomized to intervention and control groups, 89.0% were retained at Time 2, 84.3% were retained at Time 3, and 91.8% of those eligible for the Time 4 interview were retained. Baseline characteristics of the 426 children who participated in the RCT are presented in Table 1 on page 8. As shown, the sample was balanced on gender and was racially/ethnically diverse. Approximately half of the children self-identified as Hispanic, half self-identified as White, and over a quarter self-identified as Black (categories were not mutually exclusive).

The analytic sample included 391 participants (174 control and 217 intervention) for the self-reported delinquency outcomes and 425 participants (193 control and 232 intervention) for the court records of delinquency charges. Figure 1 provides reasons for missing data at any given follow-up assessment and details the exclusion reasons for the analytic sample. Not shown are



**Figure 1.** FHF Consolidated Standards of Reporting Trials (CONSORT) diagram



**Table 1***Baseline Characteristics*

	<b>Control</b> <i>n</i> = 193	<b>Intervention</b> <i>n</i> = 233	<b>Total</b> <i>N</i> = 426
<b>Child Characteristics</b>			
Age, <i>M</i> ( <i>SD</i> )	10.3 (0.9)	10.3 (0.9)	10.3 (0.9)
Male, %	52.8	51.1	51.9
Hispanic, %	50.3	52.2	51.3
Black, %	23.8	28.9	26.6
White, %	49.7	51.4	50.6
ACEs, <i>M</i> ( <i>SD</i> )	1.7 (1.1)	1.6 (1.0)	1.7 (1.1)
<b>Maternal Characteristics</b>			
Substance Use, %	66.5	65.7	66.0
Criminal History, %	55.4	65.7	61.0*
Mental Illness, %	41.1	44.2	42.8
Maltreatment History, %	19.3	18.3	18.7
<b>Child Welfare Characteristics</b>			
Physical Abuse, %	23.8	29.6	27.0
Sexual Abuse, %	13.0	9.4	11.0
Emotional Abuse, %	64.2	62.2	63.1
Physical Neglect, %	50.3	46.8	48.4
Supervisory Neglect, %	85.0	82.0	83.3
Educational Neglect, %	23.3	28.8	26.3
Moral-Legal Maltreatment, %	27.5	28.8	28.2
No. Referrals to Social Services, <i>M</i> ( <i>SD</i> )	4.7 (5.4)	4.7 (5.20)	4.7 (5.3)
Placement Type			
Foster Care, %	46.1	38.6	42.0
Kinship Care, %	50.3	56.7	53.8
Congregate Care, %	3.6	4.7	4.2
<b>Delinquency Variables</b>			
Self-Report – Total Delinquency, <i>M</i> ( <i>SD</i> )	0.05 (0.10)	0.03 (0.07)	0.04 (0.09)*
Self-Report – Non-violent Delinquency, <i>M</i> ( <i>SD</i> )	0.06 (0.12)	0.03 (0.08)	0.04 (0.10)*
Self-Report – Violent Delinquency, <i>M</i> ( <i>SD</i> )	0.06 (0.17)	0.05 (0.15)	0.06 (0.16)
Court Records – Total Delinquency, <i>M</i> ( <i>SD</i> )	0.00 (0.00)	0.02 (0.17)	0.01 (0.13) <sup>†</sup>
Court Records – Non-violent Delinquency, <i>M</i> ( <i>SD</i> )	0.00 (0.00)	0.01 (0.11)	0.01 (0.08) <sup>†</sup>
Court Records – Violent Delinquency, <i>M</i> ( <i>SD</i> )	0.00 (0.00)	0.01 (0.09)	0.00 (0.07)

Note. \* $p < .05$  and <sup>†</sup> $p < .10$  for difference between intervention and control groups

the exclusion of data from 18 participants (9 control and 9 intervention) subsequent to their participation in a booster mentoring program when they were between the ages of 14 and 17.

### **Study Protocol**

The current study was approved by the researchers' institutional review board. Written informed consent from legal guardians and youth assent were obtained prior to each interview. Children and their legal guardians also provided assent/consent to obtain court records. Following the baseline interview, children were randomized to condition after stratifying on gender and county. Within each cohort, all children were manually randomized in a single block. Participants were interviewed at each time point by trained research assistants in a private place, typically at their residence, and research assistants were masked to condition. Participants received between \$40-\$100 as compensation for each interview.

FHF is a 9-month program consisting of weekly skills groups and one-on-one, community-based mentoring. Skills groups meet for 1.5 hours/week and utilize a cognitive behavioral curriculum with units addressing emotion recognition, perspective taking, problem solving, anger management, cultural identity, change and loss, healthy relationships, peer pressure, abuse prevention, and future orientation. Mentors are graduate students in social work or psychology who meet weekly with their mentees to build healthy relationships and support their mentees in practicing social skills, engaging in extracurricular activities, and thinking positively about their futures. FHF continues programming regardless of whether children change placements, reunify with their birth families, or are adopted. Mentees do not accompany children to juvenile or family court or make recommendations. High rates of engagement and fidelity were achieved in the two trials: 95% of those offered FHF started the program, 92%

completed it, and there was over 85% attendance at mentoring and skills groups (for additional details on the program design and fidelity, see Taussig et al., 2019; Taussig et al., 2007).

## **Measures**

### ***Demographic, Maternal and Child Welfare Characteristics***

Demographic data (i.e., sex, age, race/ethnicity, county, and placement type) were obtained from child welfare records and child and caregiver reports. Trained research assistants coded Child Protection Services' intake reports and court records of dependency and neglect petitions using a modified version of the Maltreatment Classification System (Barnett et al., 1993) to obtain maternal characteristics (i.e., substance use, criminal history, mental illness, and maltreatment history) and children's maltreatment history (i.e., physical, sexual, and emotional abuse, physical neglect, supervisory neglect, educational neglect, and moral-legal maltreatment).

### ***Adverse Childhood Experiences (ACEs)***

Because adverse childhood experiences (ACEs) are associated with delinquency in both general and foster care samples (Duke et al. 2010; Garrido et al., 2017), we controlled for ACEs. ACEs were assessed with a 6-item measure developed for children in foster care that was comprised of *physical abuse, sexual abuse, removal from a single parent household, violence exposure, caregiver and school transitions* (Raviv et al., 2010). Children's scores of 0 or 1 for each of the six ACE items were summed to form a composite ACE index. In this sample, 87% of children were exposed to at least one ACE, and scores ranged from 0 to 5 ( $M=1.6, SD=1.1$ ).

### ***Self-Reported Delinquency***

Delinquency was measured with The Adolescent Risk Behavior Survey (ARBS; Taussig, 1998), a youth-report measure that assesses past-year and lifetime engagement in risk behaviors including delinquency. The ARBS is a compilation of scales from two risk behavior surveys that

have been used with racially and ethnically diverse samples and have shown adequate reliability and validity: the National and Denver Youth Surveys (Huizinga, 2017) and the National Adolescent Student Health Survey (American School Health Association, 1989). Table 2 lists the delinquent behaviors that were assessed at each timepoint, whether they were classified as non-violent or violent, and the percent of youth who endorsed each behavior at each time point. Separate total, non-violent, and violent delinquency composite variables were constructed at each time point by computing the percentage of acts endorsed (yes/no) within each category. As shown in the table, between 23.0-37.3% of the sample endorsed at least one delinquent behavior at each time point.

**Table 2**

*Percentage of Sample with Self-Reported Delinquency Across Study Time Points*

<b>Participants Endorsing Delinquent Behaviors</b>	<b>Time 1</b>	<b>Time 2</b>	<b>Time 3</b>	<b>Time 4</b>
<b><u>Non-Violent Delinquency, %</u></b>	<b>18.9</b>	<b>13.5</b>	<b>27.5</b>	<b>35.4</b>
Truancy, %	4.3	4.0	12.3	—
Theft, %	8.0	7.4	11.8	11.7
Burglary, %	1.4	0.3	0.8	0.6
Weapon possession, %	2.1	1.6	3.9	14.5
Vandalism, %	6.6	6.1	8.7	2.2
Arson, %	2.8	1.3	3.1	0.0
Grand theft auto, %	—	0.0	0.4	0.0
Selling drugs, %	—	0.0	1.6	7.8
Driving under the influence, %	—	—	0.7	4.5
Fraud, %	—	—	—	7.8
Other misdemeanors, %	—	—	3.6	16.2
<b><u>Violent Delinquency, %</u></b>	<b>11.1</b>	<b>13.5</b>	<b>13.4</b>	<b>13.0</b>
Fighting, %	10.6	13.5	12.3	10.1
Serious violence, %	0.7	1.1	2.0	6.1
Robbery, %	—	—	—	1.7
<b><u>Other</u></b>				
Animal abuse, %	1.7	2.1	1.1	0.6
<b><u>Total, %</u></b>	<b>25.9</b>	<b>23.0</b>	<b>33.1</b>	<b>37.3</b>

*Note. Dashed lines indicate that the delinquent behavior was not assessed at that time point.*

### ***Court Records of Delinquency Charges***

The current grant provided for the collection and cleaning of court records. Court records of delinquency or criminal charges filed by a prosecutor's office in county or district court were queried for participants in the years prior to their study enrollment and then for 7 consecutive years beginning 3 months after the intervention started. Each cohort had the same number of years in which delinquency charges were coded post-intervention. Court records for all participants were extracted from a state-wide electronic court case management system allowing for all filings (both juvenile and adult, as some individuals were 18 years old) to be matched on name and date of birth. Court records were coded for each year, and each offending date was counted only once. That is, if a participant was involved in a single incident that resulted in charges of assault, illegal possession of a weapon, and robbery on the same date, this incident was coded as one charge in that year (one count recorded for total, one count for violent, and one count for non-violent charges). Non-violent charges comprised a range of behaviors, including possession of a controlled substance, trespassing, theft, speeding, and criminal mischief. Violent charges involved behaviors such as menacing, assault, robbery, and murder. Variables representing the number of total, non-violent, and violent charge dates each year were created. As shown in Table 3, between 0.2%-8.7% of the sample had at least one delinquent charge in any study year.

**Table 3**

*Percentage of Sample with Court Charges Across Study Time Points*

<b>Participants with</b>	<b>Y -1</b>	<b>Y0</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>	<b>Y6</b>	<b>Y7</b>
Non-Violent Charge, %	0.7	0.0	0.0	1.2	3.7	3.3	4.6	6.4	5.6
Violent Charge, %	0.2	0.2	1.0	2.0	1.2	0.8	1.6	2.6	4.1
Any Charge, %	0.9	0.2	1.0	3.0	5.0	3.8	5.4	8.7	8.5

### **Some key descriptive statistics regarding charges:**

- In looking at the post-baseline data, 20.1% of the total sample had one or more charge dates. Of those who had charges, 60% had only one day on which they committed an offense (Range = 0-12).
- As expected, boys were more likely to have charges than girls (28.4% vs. 11.2%;  $p < .001$ ). Only 23 girls had an charge, precluding us from modeling data for girls separately from boys.
- Additionally, age at baseline was significantly related to charges; those who had a charge were, on average, 10.5 years old at baseline vs. 10.2 years of age for the group with no charges ( $p = .02$ ).
- There was no difference between the percentages of racial/ethnic minority and non-minority youth who had charges.

### **Analytic Strategy**

#### ***Baseline Differences and Attrition***

Equivalence between intervention and control groups on baseline characteristics was assessed using chi-square tests for categorical variables and independent samples *t*-tests for continuous variables. Next, baseline predictors of attrition (defined as having no self-report data modeled) across condition were examined using a series of logistic regressions. A chi-square test was then used to assess whether the rate of attrition varied by intervention condition. Finally, logistic regression models examined whether interactions between each baseline variable and intervention status predicted attrition status.

#### ***Multilevel Models***

Analyses proceeded in two parts, examining intervention effects on the trajectories of (1) self-reported delinquency and (2) court records of delinquency charges over age. In each

instance, a separate model investigated the trajectory of total, non-violent, and violent delinquency. Multilevel models examined a quadratic trajectory of within-individual changes in delinquency over age. At the between-individual level, the models tested for intervention effects on the intercept, linear slope, and quadratic coefficients, while controlling for covariates (including those that differed at baseline), as described below. All analyses used an intent-to-treat approach and utilized Maximum Likelihood Estimation; thus, trajectories were analyzed for all participants, including those with some missing outcome data.

### ***Trajectories of Self-Reported Delinquency***

Delinquency variety variables were operationalized as the percent of different delinquent behaviors endorsed by a participant at each wave. Given the non-normal shape of the distribution for these variables, we employed a multilevel model with a Poisson distribution. We tested the model for Poisson outcomes vs continuous outcomes and found a better fit (based on AIC and BIC criteria) for the Poisson models. The four waves of data were modeled in the following way:

$$\begin{aligned} \text{Level 1:} \quad & E(\text{Delinquency}_{ij} \mid \beta_j) = \lambda_{ij} \quad \log[\lambda_{ij}] = \beta_{0j} + \beta_{1j} \text{Age}_{ij} + \beta_{2j} \text{Age}_{ij}^2 \\ \text{Level 2:} \quad & \beta_{0j} = \gamma_{00} + \gamma_{01} \text{Int}_j + \gamma_{02} \text{Male}_j + \gamma_{03} \text{MatCrime}_j + \gamma_{04} \text{ACES}_j \\ & \quad + \gamma_{05} \text{BaselineDel}_j + \gamma_{06} \text{Black}_j + \gamma_{07} \text{Hisp}_j + u_{0j} \\ & \beta_{1j} = \gamma_{10} + \gamma_{11} \text{Int}_j + \gamma_{12} \text{Male}_j + \gamma_{13} \text{BaselineDel}_j + u_{1j} \\ & \beta_{2j} = \gamma_{20} + \gamma_{21} \text{Int}_j + \gamma_{22} \text{Male}_j \end{aligned}$$

Models controlled for baseline delinquency (collected prior to the intervention), sex, race/ethnicity (i.e., Hispanic, Black), maternal criminal history (which differed between groups at baseline), and ACEs. Subsequent trajectories of delinquency were based on three follow-up waves that spanned assessments between 10 and 22 years of age. The age variable was centered at age 10, intervention (Int) was coded as 0 = control, 1 = intervention, and all other covariates were grand-mean centered.



### *Trajectories of Delinquency Court Charges*

Court record variables encoded for the number of total, non-violent, and violent charge dates each year. Once again, a Poisson model was used to estimate quadratic trajectories for these non-normally distributed variables. Charges were calculated for each year following the intervention, and analyzed over age (centered at youngest reported age of 8.75 at baseline):

$$\begin{aligned} \text{Level 1:} \quad & E(\text{Charges}_{ij} \mid \beta_j) = \lambda_{ij} & \log[\lambda_{ij}] &= \beta_{0j} + \beta_{1j} \text{Age}_{ij} + \beta_{2j} \text{Age}_{ij}^2 \\ \text{Level 2:} \quad & \beta_{0j} = \gamma_{00} + \gamma_{01} \text{Int}_j + \gamma_{02} \text{Male}_j + \gamma_{03} \text{MatCrime}_j + \gamma_{04} \text{ACEs}_j + \gamma_{05} \text{Priors}_j + \gamma_{06} \text{Black}_j \\ & + \gamma_{07} \text{Hisp}_j + \gamma_{08} \text{County1}_j + \gamma_{09} \text{County2}_j + \gamma_{10} \text{County3}_j + u_{0j} \\ & \beta_{1j} = \gamma_{10} + \gamma_{11} \text{Int}_j + \gamma_{12} \text{Male}_j + u_{1j} \\ & \beta_{2j} = \gamma_{20} + \gamma_{21} \text{Int}_j + \gamma_{22} \text{Male}_j \end{aligned}$$

In addition to sex, race/ethnicity, maternal criminal history, and ACEs, the model controlled for participant's county at the time of placement in foster care (four counties dummy-coded with three variables) because counties differed in their methods of reporting of charges to the state. Similar models were also run separately for boys.

### **Sibling Non-Independence and Clinical Trial Effects**

In order to examine the impact of non-independent data from siblings, analyses were run with the full sample and then replicated with a sample that contained only one randomly selected sibling. Because no significant differences were found after dropping one sibling, results are reported for the full sample. In addition, the analyses contain data from two separate clinical trials (pilot and efficacy); therefore, we tested whether the trial moderated the significant impact of the intervention on outcomes.

## Results

### Differences on Baseline Characteristics

Across the 28 estimated baseline comparisons (see Table 1), there were three statistically significant and two marginally significant differences. Intervention youth were more likely than control youth to have mothers with criminal histories,  $\chi^2(1, N=426) = 4.64, p = .03$ . They also had lower rates of self-reported total,  $t(324.82) = 2.49, p = .01$ , and non-violent,  $t(301.89) = 2.70, p = .007$ , delinquency; in contrast, there was a statistical trend for intervention youth to have more total court charges,  $t(231.00) = -1.90, p = .06$ , and non-violent court charges,  $t(231.00) = -1.74, p = .08$ , compared to control youth (only intervention youth had charges at baseline).

### Attrition

Attrition analyses were conducted for self-reported delinquency only. We first compared those with any data modeled ( $n = 391$ ) to those whose data were not modeled ( $n = 35$ ). There was no difference in the rate of attrition by intervention condition,  $\chi^2(1, N=426) = 1.24, p = .27$ . Further, there were no significant predictors of attrition across conditions. Interaction analyses examined whether intervention status moderated the impact of any baseline characteristics on attrition. Of the 28 analyses conducted, only one was statistically significant. Specifically, there was a significant intervention group x maternal criminal history interaction predicting attrition,  $b = -1.58, SE = 0.74, p = .03$ . Follow-up analyses indicated that there was a trend for intervention youth with maternal criminal history to be less likely to attrit,  $b = -.97, SE = .52, p = .06$ ; control youth with maternal criminal history were nonsignificantly more likely to attrit.

## Outcome Analyses

### *Self-Reported Delinquency*

Table 3 on page 18 reports estimates of change in total, non-violent, and violent self-reported delinquency over age. Overall, the significant positive effect of age and the significant negative effect of quadratic age coefficients indicated that youth delinquency followed a curvilinear trajectory that increased during early-to-mid adolescence and declined during mid-to-late adolescence. Intervention status was not associated with the delinquency intercept or linear slope for any outcome. However, intervention status was associated with lower quadratic coefficients for total ( $b = -.03, p < .01$ ; ER = .97, 95% CI for ER = [0.95, 0.99]) and non-violent delinquency ( $b = -.05, p < .001$ ; ER = .95, 95% CI for ER = [0.95, 0.96]). That is, the intervention was associated with a 3% decline in the event ratio for the quadratic coefficient for total delinquency and a 5% decline in the event ratio for the quadratic coefficient for non-violent delinquency. Given the non-linear nature in the interpretation of the event ratio (similar to an odds ratio) results, we also provide an illustration of the intervention effects on the predicted trajectories of delinquency over age. As can be seen in Figure 2a on page 19, total self-reported delinquency began to decelerate at an earlier age and at a faster rate for the intervention group as compared to the control group, resulting in the overall lower mid-adolescent peak of delinquent behavior. Youth in the intervention group had 30% less self-reported delinquency than those in the control group at age 14, 59% less at age 16, and 82% less at age 18. The pattern of effects was similar for non-violent delinquency (see Figure 2b), albeit at overall lower rates. Compared to the control group, youth in the intervention group evidenced 33% less delinquency at age 14, 51% at age 16, and 76% at age 18. There was no significant intervention effect for self-reported violent delinquency.

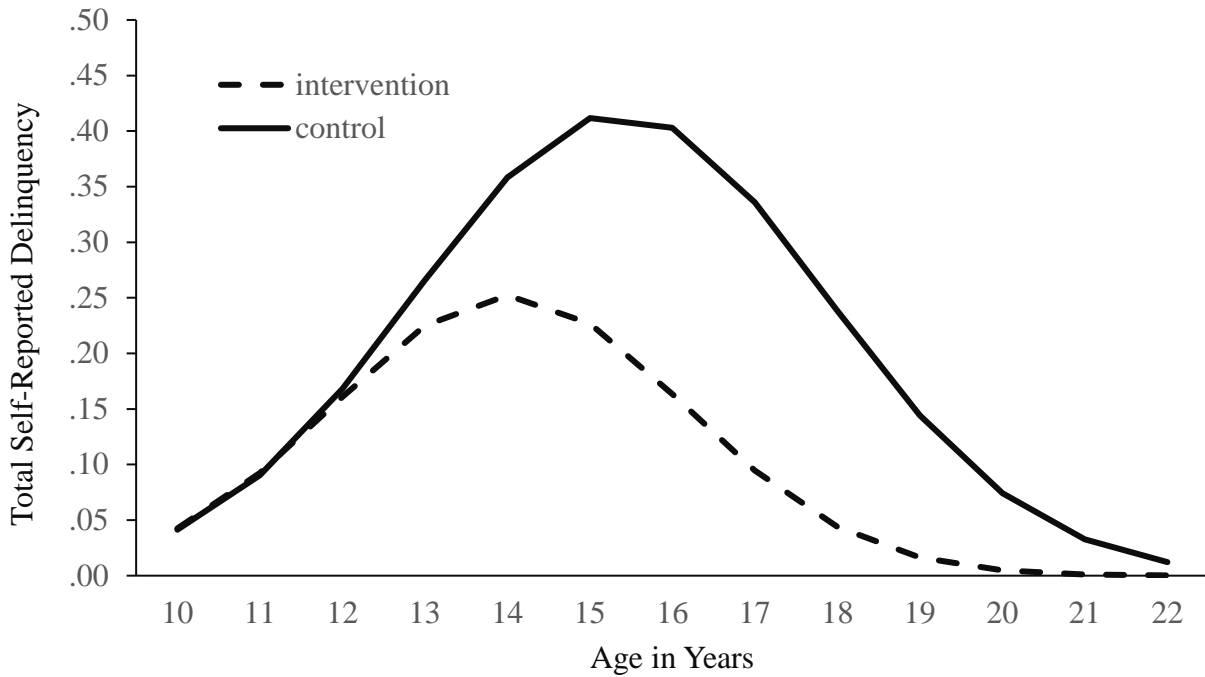
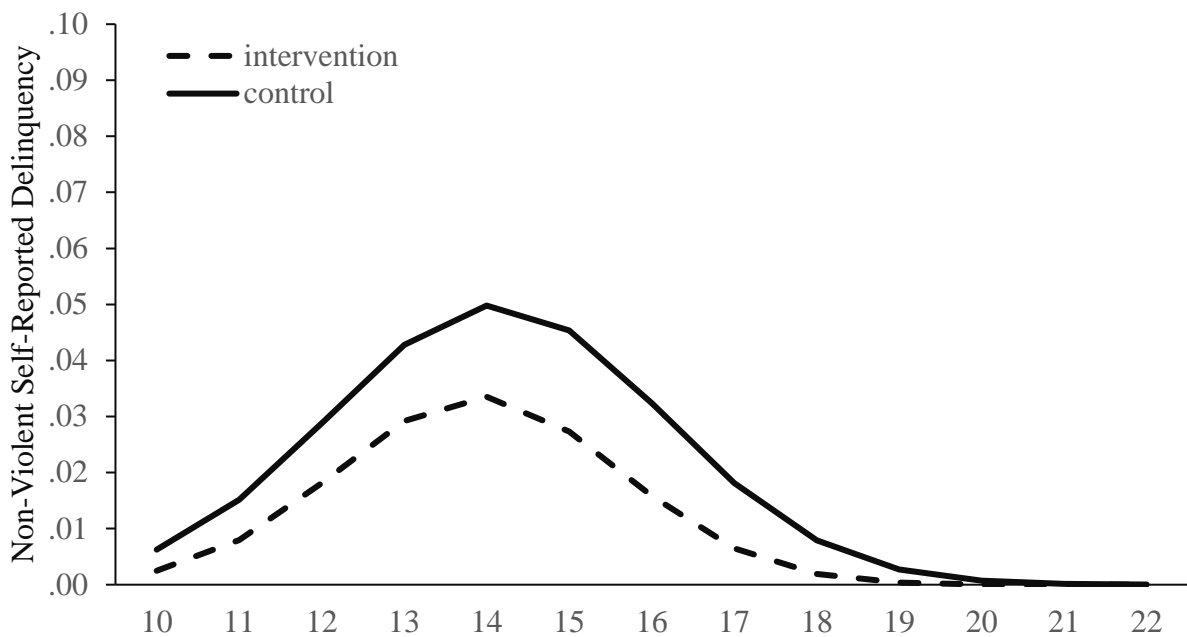
**Table 3***Estimated Coefficients for Intervention Effects on the Trajectories of Self-Reported Delinquency over Age*

	Total Delinquency			Non-Violent Delinquency			Violent Delinquency		
	<i>b</i>	Event Rate Ratio	95% CI	<i>b</i>	Event Rate Ratio	95% CI	<i>b</i>	Event Rate Ratio	95% CI
Intercept, $\gamma_{00}$	-3.18			-5.07			-2.49		
Male, $\gamma_{01}$	1.99**	7.32	(1.93, 27.70)	2.47***	11.85	(0.00, 0.02)	0.81	2.25	(0.23, 22.17)
ACEs, $\gamma_{02}$	0.92***	2.52	(1.70, 3.73)	1.11***	3.05	(3.57, 39.32)	0.79***	2.20	(1.48, 3.26)
Maternal criminal history, $\gamma_{03}$	0.24	1.27	(0.54, 2.98)	0.37	1.45	(1.94, 4.81)	0.07	1.07	(0.46, 2.49)
Black, $\gamma_{04}$	0.22	1.25	(0.49, 3.19)	0.24	1.27	(0.62, 3.38)	0.53	1.69	(0.67, 4.31)
Hispanic, $\gamma_{05}$	0.04	1.04	(0.44, 2.46)	0.64	1.91	(0.50, 3.21)	-0.50	0.61	(0.25, 1.47)
Baseline delinquency, $\gamma_{06}$	0.08*	1.09	(1.02, 1.16)	0.09*	1.09	(0.84, 4.31)	0.01	1.01	(0.97, 1.05)
Intervention, $\gamma_{07}$	0.02	1.02	(0.28, 3.79)	-0.92	0.40	(1.01, 1.18)	0.75	2.12	(0.24, 18.58)
Age, $\gamma_{10}$	0.86***	2.36	(1.68, 3.33)	1.01**	2.74	(2.06, 3.63)	0.60	1.82	(0.71, 4.69)
Male, $\gamma_{11}$	-0.49*	0.61	(0.39, 0.97)	-0.92***	0.40	(0.27, 0.59)	-0.14	0.87	(0.26, 2.96)
Baseline delinquency, $\gamma_{12}$	-0.02	0.98	(0.96, 1.00)	-0.02	0.98	(0.97, 1.00)	0.00	1.00	(0.99, 1.02)
Intervention, $\gamma_{13}$	0.03	1.03	(0.66, 1.61)	0.33	1.39	(0.94, 2.05)	-0.28	0.76	(0.26, 2.24)
Age <sup>2</sup> , $\gamma_{20}$	-0.08***	0.92	(0.91, 0.94)	-0.12***	0.88	(0.88, 0.89)	-0.10	0.90	(0.81, 1.01)
Male, $\gamma_{21}$	0.04***	1.04	(1.02, 1.06)	0.09***	1.09	(1.09, 1.10)	0.09	1.10	(0.93, 1.29)
Intervention, $\gamma_{22}$	-0.03**	0.97	(0.95, 0.99)	-0.05***	0.95	(0.95, 0.96)	0.00	1.00	(0.89, 1.14)

*Note.* Intervention (0 = Control Group, 1 = Intervention Group); \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Figure 2**

*Trajectories of Total (Figure 2a) and Non-Violent (Figure 2b) Self-Reported Delinquency over Age by Intervention Condition*

**(a)****(b)**

### *Court Records of Delinquency Charges*

Table 4 on page 21 reports estimates of change in total, non-violent, and violent delinquency court charges over age. Similar to self-reported delinquency, a significant positive effect of age and a significant negative effect of quadratic age coefficients indicated that rates of charges followed a curvilinear trajectory that increased during early-to-mid adolescence and declined during mid-to-late adolescence. The intervention group experienced a higher intercept for violent charges (i.e., they had higher rates of pre-baseline charges at age 9;  $b = 4.58, p < .01$ ;  $ER = 97.6, 95\% \text{ CI for } ER = [3.6, 2,651]$ ). However, intervention status was associated with a lower linear rise in total charges ( $b = -.97, p < .05$ ;  $ER = .38, 95\% \text{ CI for } ER = [0.15, 0.99]$ ) and violent charges ( $b = -1.48, p < .01$ ;  $ER = .23, 95\% \text{ CI for } ER = [0.08, 0.69]$ ). That is, the intervention was associated with a 62% decline in the event ratio for the linear slope for total charges and a 77% decline in the event ratio for the linear slope for violent charges. Figure 3 provides an illustration for how these non-linear intervention effects translate into counts of delinquency charges at each age. As can be seen in Figure 3a on page 22, the intervention group had higher counts of early (ages 9-12) modeled total charges, but lower rates during the peak offending years (around ages 15 and 16). Compared to the control group, youth in the intervention group had 15% fewer total delinquency charges at age 15 and 16. For charges involving violent behavior (see Figure 3b), the control group experienced a sharp rise that peaked around age 16, whereas the intervention group experienced a more shallow rise in violent charges over age. Compared to the control group, youth in the intervention group evidenced 30% fewer violent delinquency charges at age 15 and 28% fewer at age 16. For both total and violent delinquency charges, the pattern of differences was reversed by age 18. However, due to scarcity of data at the upper age-range and the tendency of the quadratic equations to overestimate the

**Table 4**

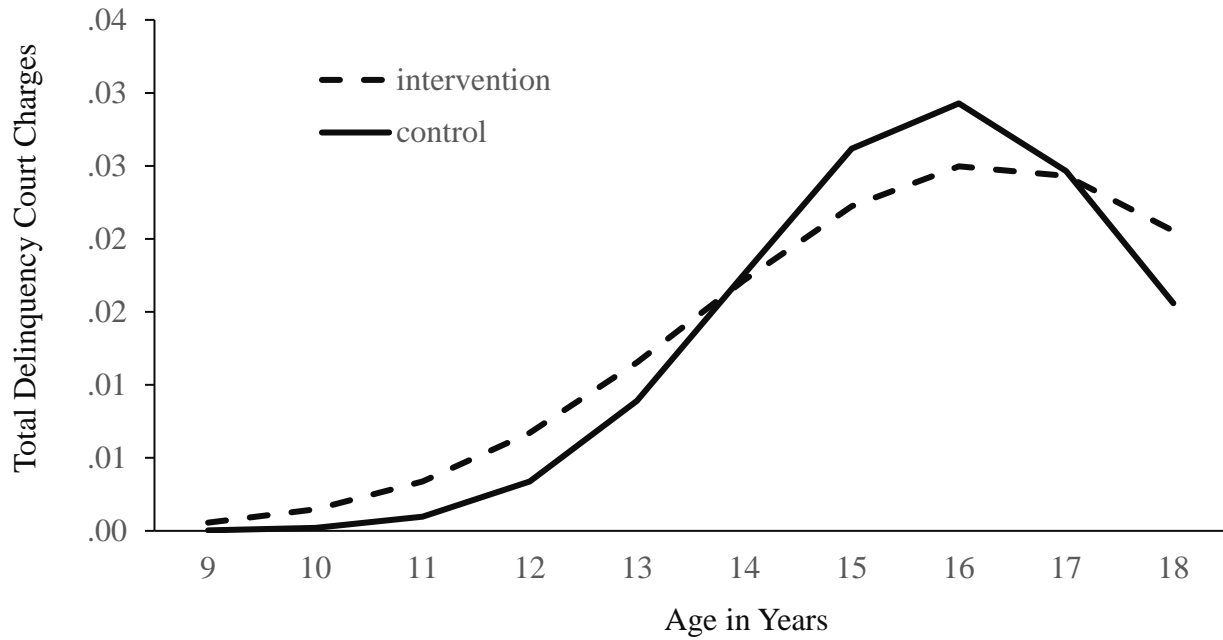
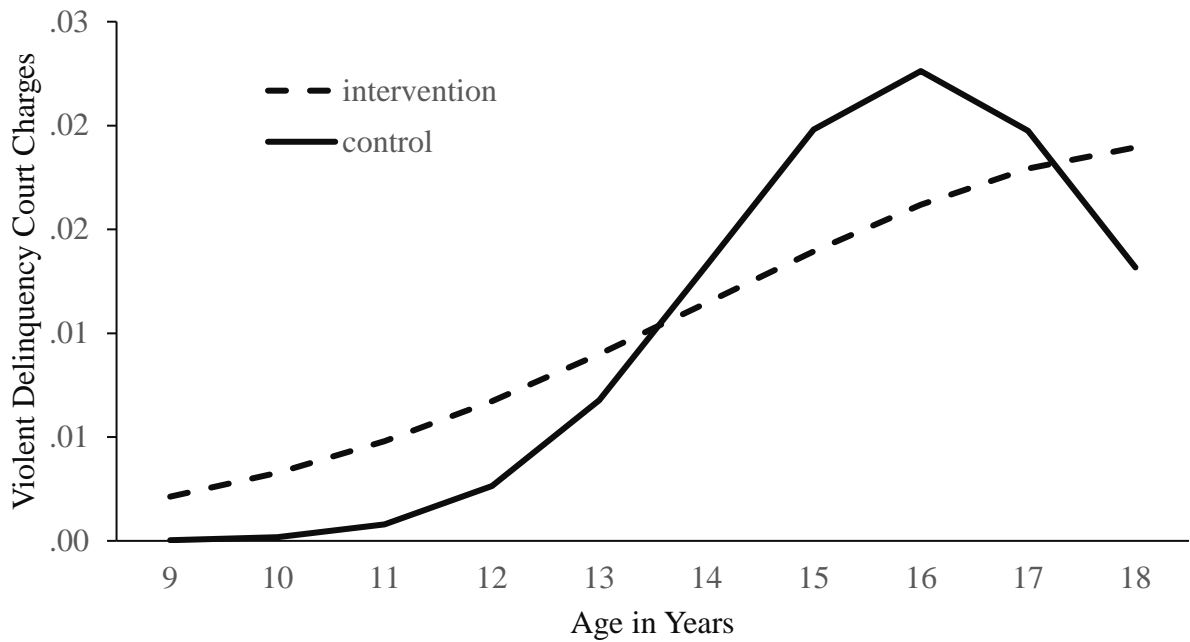
*Estimated Coefficients for Intervention Effects on the Trajectories of Court Reported Charges of Delinquency over Age*

	Total Charges			Non-Violent Charges			Violent Charges		
	b	Event Rate Ratio	95% CI	b	Event Rate Ratio	95% CI	b	Event Rate Ratio	95% CI
Intercept, $\gamma_{00}$	-10.47			-10.88			-10.85		
Male, $\gamma_{01}$	2.03	7.65	(0.68, 86.60)	2.56	12.93	(0.55, 305.40)	1.58	4.84	(0.21, 114.20)
ACEs, $\gamma_{02}$	0.38***	1.46	(1.23, 1.74)	0.39**	1.47	(1.22, 1.77)	0.37*	1.45	(1.08, 1.95)
Maternal criminal history, $\gamma_{03}$	0.33	1.39	(0.90, 2.14)	0.32	1.37	(0.86, 2.18)	0.21	1.23	(0.63, 2.39)
Black, $\gamma_{04}$	0.04	1.04	(0.63, 1.72)	-0.22	0.80	(0.45, 1.42)	0.67	1.96	(0.98, 3.92)
Hispanic, $\gamma_{05}$	0.02	1.02	(0.63, 1.65)	-0.04	0.96	(0.59, 1.57)	0.20	1.22	(0.61, 2.44)
County 1, $\gamma_{06}$	-0.04	0.96	(0.55, 1.67)	0.28	1.33	(0.73, 2.41)	-0.53	0.59	(0.24, 1.45)
County 2, $\gamma_{07}$	-0.64	0.53	(0.24, 1.19)	-0.19	0.83	(0.35, 1.94)	-0.91	0.40	(0.12, 1.39)
County 3, $\gamma_{08}$	0.44	1.55	(0.74, 3.22)	0.60	1.83	(0.86, 3.91)	0.06	1.06	(0.34, 3.32)
Intervention, $\gamma_{09}$	3.13	22.93	(1.00, 528.20)	2.16	8.71	(0.22, 348.70)	4.58**	97.59	(3.59, 2,651)
Age, $\gamma_{10}$	1.97***	7.17	(2.77, 18.55)	2.01***	7.45	(2.44, 22.73)	1.95***	7.02	(2.76, 17.87)
Male, $\gamma_{11}$	-0.47	0.62	(0.27, 1.47)	-0.69	0.50	(0.16, 1.59)	-0.42	0.66	(0.24, 1.83)
Intervention, $\gamma_{12}$	-0.97*	0.38	(0.15, 0.99)	-0.62	0.54	(0.18, 1.62)	-1.48**	0.23	(0.08, 0.69)
Age <sup>2</sup> , $\gamma_{20}$	-0.14***	0.87	(0.81, 0.94)	-0.14***	0.87	(0.79, 0.95)	-0.13***	0.87	(0.81, 0.95)
Male, $\gamma_{21}$	0.06	1.06	(0.98, 1.14)	0.08	1.08	(0.98, 1.20)	0.04	1.04	(0.96, 1.14)
Intervention, $\gamma_{22}$	0.07	1.07	(1.00, 1.16)	0.04	1.05	(0.96, 1.13)	0.11*	1.12	(1.02, 1.23)

*Note.* Intervention (0 = Control Group, 1 = Intervention Group); \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Figure 3**

*Trajectories of Total (Figure 3a) and Violent (Figure 3b) Delinquency Court Charges over Age by Intervention Condition*

**(a)****(b)**



necessarily matched by the symmetric robust decline after peak offending), we hesitate to make decisive conclusions about the nature of the intervention effect at age 18. There was no intervention effect on non-violent charges.

Due to the higher rate of offending among boys, we modeled changes in charges for this group separately. Table 5 on page 24 reports estimates of change in total and violent charges over age for boys. Overall, significant Age and Age<sup>2</sup> coefficients indicated that boys' offending also followed a curvilinear trajectory. The treatment group had a higher rate of charges at age 8.75, prior to the start of the intervention ( $b_{07} = 2.96, p = .06$ ). However, boys in the treatment group had a lower rise in offending, as compared to boys in the control group ( $b_{11} = -1.09, p = .055$ ).

As can be seen in Figure 4a, court charges reached peak levels around age 16 for the control group. For boys in treatment group, their rise in offending was slower and they had a lower peak value of offending. For violent charges, boys in the treatment group were involved in more early (age 8.75) violent offending than boys in the control group ( $b_{07} = 3.56, p < .05$ ). Again, the treatment group had lower linear rise in violent charges ( $b_{11} = -1.30, p < .05$ ). As can be seen in Figure 4b, violent charges followed qualitatively different trajectories for boys in treatment and control groups. For the control group, violent offending increased throughout middle and late adolescence, appearing to peak around age 17. For boys in the treatment group, violent charges did not appear to change in any appreciable way.

***Moderating Effect of Study Trial.*** There were no significant intervention x trial interactions in predicting delinquency.

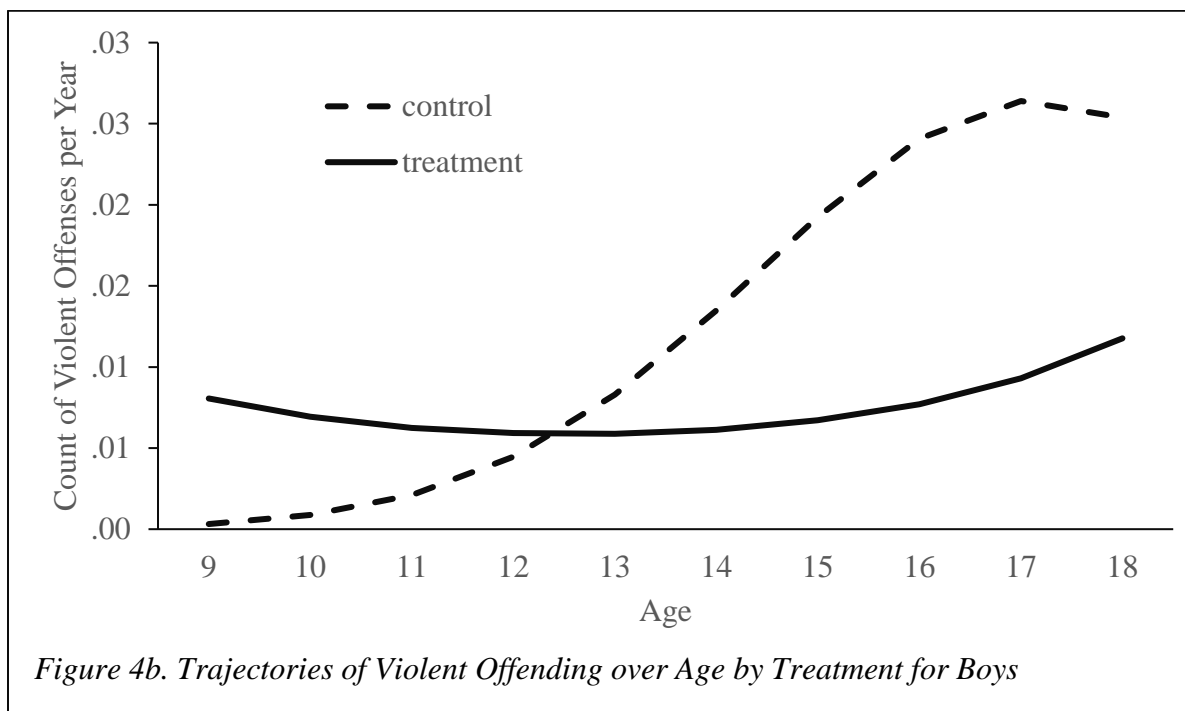
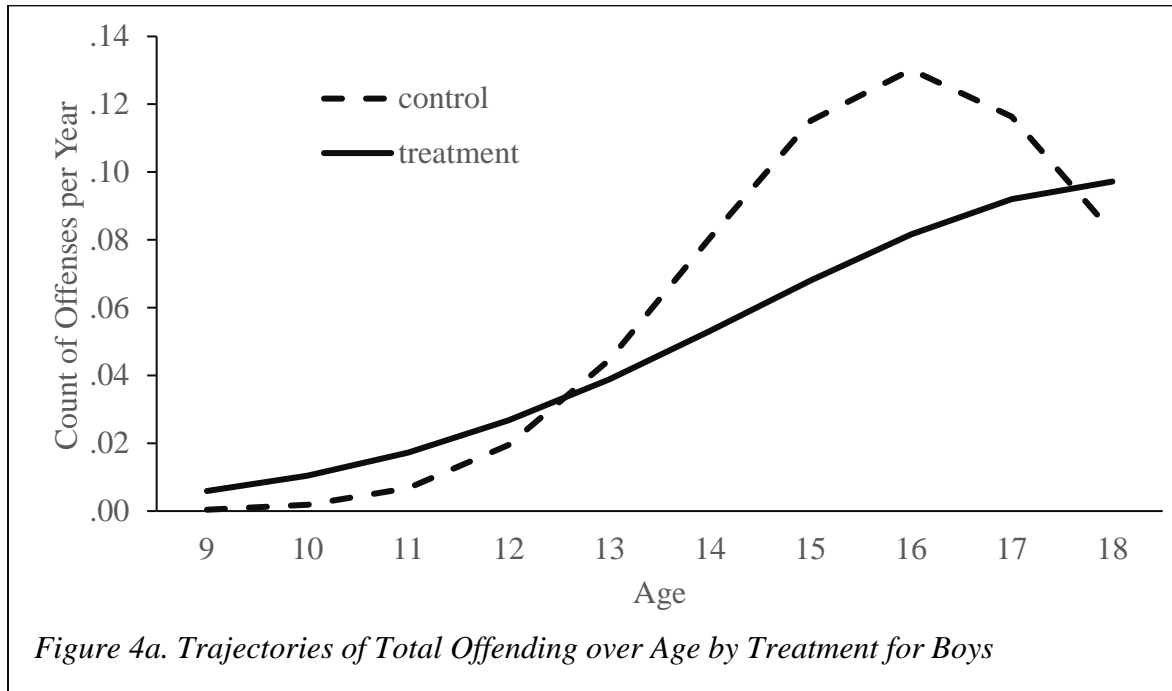
**Table 5***Estimated Coefficients for Treatment Effects on the Trajectories of Offending over Age for Boys*

	Total Offending			Violent Offending		
	b	Event Rate Ratio	95% CI	b	Event Rate Ratio	95% CI
Intercept, $\pi_0$	-8.24	.00	(.0, .0)	-8.33	.00	(.0, .0)
ACEs, $b_{01}$	.29*	1.34	(1.0, 1.7)	.44*	1.55	(1.0, 2.4)
Maternal criminal history, $b_{02}$	.13	1.13	(.7, 1.9)	.00	1.00	(.4, 2.3)
Minority status, $b_{03}$	.03	1.03	(.5, 2.0)	.58	1.79	(.5, 6.6)
County 1, $b_{04}$	.16	1.18	(.6, 2.2)	-.41	.66	(.2, 2.2)
County 2, $b_{05}$	-.15	.86	(.3, 2.3)	-1.02	.36	(.1, 1.9)
County 3, $b_{06}$	.05	1.06	(.4, 2.5)	.03	1.03	(.3, 3.9)
Tx (0=control; 1=tx), $b_{07}$	2.96 <sup>†</sup>	19.30	(.8, 459.1)	3.56*	35.04	(1.0, 1170.4)
Age, $\pi_1$	1.71***	5.51	(2.8, 10.8)	1.11*	3.04	(1.2, 7.8)
Tx (0=control; 1=tx), $b_{11}$	-1.09 <sup>†</sup>	.34	(.1, 1.0)	-1.30*	.27	(.1, 1.0)
Age <sup>2</sup> , $\pi_2$	-.12***	.89	(.8, .9)	-.07	.94	(.9, 1.0)
Tx (0=control; 1=tx), $b_{21}$	.09	1.09	(1.0, 1.2)	.10 <sup>†</sup>	1.11	(1.0, 1.2)

<sup>†</sup>  $p = .06$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## Figure 4

*Trajectories of Total (Figure 4a) and Violent (Figure 4b) Delinquency Court Charges over Age by Intervention Condition for Boys*



## Discussion

This study sought to examine whether the Fostering Healthy Futures (FHF) program had an impact on the longitudinal course of delinquency for children who had been in foster care during preadolescence. Despite the heterogeneity of their life experiences and the multitude of factors that contribute to engagement in delinquency, results suggest that the FHF program weakened the pipeline that is too often found between child maltreatment and delinquency as well as between the child welfare and juvenile justice systems. The effects of the program were not immediate nor were they invariant across types of delinquency and measurement method. For self-reported total and non-violent delinquency, quadratic effects suggested that children in the intervention (relative to the control group) had a slower and lower rise in their delinquent behavior until the age of 14, which was followed by a much more precipitous drop until young adulthood. For court records of delinquency charges, there was a steady rise in both groups until the age of 16, but the control group had a higher linear rise, especially for violent delinquency. We hypothesize, based on prior studies, that the different trajectories are due to youth engaging in and endorsing more delinquent behaviors prior to coming to the attention of the authorities (Bosick, 2009; Farrington et al., 2007). The different impact of the intervention on non-violent and violent outcomes for the two different measures of delinquency is difficult to understand, although there was not 1:1 item correspondence between the measures. Other studies have found differences by informant and subtype of delinquency, most without clear explanation (Cernkovich et al, 1985; Conduct Problems Prevention Research Group, 2010; Cuervo et al., 2018; Malvaso et al., 2018; Mersky et al., 2012 van der Stouwe et al, 2020). Certainly, this is an important area for further investigation. Given the strengths and limitations of both types of data collection in the current study, the positive findings across both methods of data collection for

total delinquency are encouraging. Other strengths of the study include the fact that full intent-to-treat analyses were conducted, there was no differential attrition across groups, and the models included baseline delinquency and covariates that differed between groups at baseline.

Although it is difficult to compare effects sizes in the current study to those of studies which have not employed multiple time points, the small to medium size of the effects replicates what has been found across systematic reviews and meta-analyses of programs intended to reduce delinquent behavior and in evaluations of programs that utilize skills training and mentoring as core intervention components (Beelmann & Lösel, 2020; Dubois et al., 2011; Farrington et al., 2017; Raposa et al., 2019; Sandler et al., 2014). Indeed, it may be that the combination of these preventive intervention components and high rates of program fidelity enabled the FHF program to evidence this impact on delinquency (Christensen et al., 2020; Taheri & Welsh, 2016). It is rare in studies with high-risk and highly mobile populations to achieve such high rates of program engagement and completion. For example, in a review of mentoring programs for children of incarcerated parents, almost half of children did not participate for the expected duration. Even more concerning were the recruitment and retention rates; in one study there was a 33% enrollment rate, a less than 80% completion rate for the baseline assessment, and a 50% retention rate for the post-assessment (Jarjoura, 2016). These patterns of attrition underscore the need to collect court record data in addition to self-reports of delinquency in order to model change over time as a function of intervention status.

Another strength of the current study was its external validity. In reviews of prevention programming for youth, a self-selection bias has been noted (Taheri & Welsh, 2016). In the current study, all children who had recently been placed in out-of-home care within the target age range, with few exceptions, were recruited for the study; of those, 90% enrolled and 95% of

those randomized to the intervention began it. Since children did not sign up for the program and they were not referred by caseworkers, the results can be generalized to children whose families or caseworkers might not recognize a need to enroll their child in a preventive intervention or who believe that a child/family might not engage.

The study was not, however, without limitations. There remain many questions about the long-term efficacy of skills training and mentoring on reducing delinquency, and these program components cannot be disentangled. Furthermore, children and families were not masked to condition and the impact of adjunct services or baseline placement type were not examined. There were some baseline differences on delinquency which were accounted for in the models, but the impact of these differences on the trajectories is unknown. Court records of delinquency charges were modeled, which does not account for all law enforcement contact related to delinquent behavior, nor does it reflect an official finding of guilt on the charges. Youth may have been arrested but never had a case filed, or had a case filed that was ultimately dismissed or expunged. Additionally, the sentence (e.g. diversion, probation, or detention/incarceration) a youth received if found guilty was not included. Importantly, individuals who are incarcerated are less likely to have repeat charges due to restricted opportunities to offend (Cernkovich et al., 1985; Widom et al., 2018). This might have contributed to the drop in number of charges for the control group at older ages, as the control group may have had more and longer periods of detention due to their higher levels of delinquency at earlier ages. Finally, as is the case with most longitudinal studies of delinquency prevention programs, program process (including dose-response effects), moderating and mediating effects were not examined (Sandler et al., 2014); these remain directions for future inquiry.

## Study Conclusions and Implications

Given that entry into the child welfare system typically occurs before children have contact with the juvenile justice system, there is an important window of opportunity to intervene with children who have experienced maltreatment and foster care to prevent delinquency and justice system involvement. Despite this prospect, there are few “true” delinquency *prevention* programs in the U.S. Moreover, few have demonstrated long-term efficacy, and only a fraction are designed for our highest-risk youth (Conduct Problems Prevention Research Group, 2010; Lab, 2018). Despite the drop in youth crime in the early part of the 21st century, the costs of confinement of children and adolescents ranges between \$8-\$21 billion a year in the U.S. (Justice Policy Institute, 2014). A decade ago, it was estimated that diverting a “14-year-old high-risk juvenile from a life of crime” would save between \$2.6-\$5.3 million (Cohen & Piquero, 2009). Although there is scant evidence for the long-term efficacy of delinquency prevention programs (Farrington & Hawkins, 2019), and some suggestion that mentoring programs for high-risk youth might be iatrogenic (cf. McCord, 1978), there has been enormous public and private investment in these programs (Justice Policy Institute, 2009; Taheri & Welsh, 2016). Public policy, it seems, has been operating independent of the evidence, despite frequent calls to only fund programs “that work.” FHF, which was implemented before most children had entered the juvenile justice system, is the only known prevention program to have demonstrated a reduction in delinquency over a 7-12 year period for youth who have experienced the deleterious impacts of child maltreatment and foster care placement. We hope such findings encourage the dissemination and implementation of engaging and effective programming to support vulnerable youth in charting a healthy course through adolescence and adulthood.

## References

- American School Health Association (1989). *The National Adolescent Student Health Survey: A report on the health of America's youth*. American School Health Association.
- Barnett, D., Manly, J. T., & Cicchetti, D. (1993). Defining child maltreatment: The interface between policy and research. In D. Cicchetti, & S. Toth (Eds.), *Child abuse, child development, and social policy* (pp. 7-74). Ablex.
- Beelmann, A., & Lösel, F. (2020). A comprehensive meta-analysis of randomized evaluations of the effect of child social skills training on antisocial development. *Journal of Developmental and Life-Course Criminology*. Advance online publication. <https://doi.org/10.1007/s40865-020-00142-8>
- Bosick, S. J. (2009). Operationalizing crime over the life course. *Crime & Delinquency*, 55(3), 472-496. <https://doi.org/10.1177/0011128707307223>
- Brame, R., & Piquero, A. (2003). Selective attrition and the age-crime relationship. *Journal of Quantitative Criminology*, 19(2), 107-127. <https://doi.org/10.1023/A:1023009919637>
- Cernkovich, S., Giordano, P., & Pugh, M. (1985). Chronic offenders: The missing cases in self-report delinquency research. *The Journal of Criminal Law and Criminology*, 76(3), 705-732. <https://doi.org/10.2307/1143519>
- Christensen, K. M., Hagler, M. A., Stams, G., Raposa, E. B., Burton, S., & Rhodes, J. E. (2020). Non-specific versus targeted approaches to youth mentoring: A follow-up meta-analysis. *Journal of Youth and Adolescence*, 49(5), 959-972. [10.1007/s10964-020-01233-x](https://doi.org/10.1007/s10964-020-01233-x)
- Cohen, M., & Piquero, A. (2009). New evidence on the monetary value of saving a high risk youth. *Journal of Quantitative Criminology*, 25(1), 25-49. <https://doi.org/10.1007/s10940-008-9057-3>
- Conduct Problems Prevention Research Group. (2010). Fast track intervention effects on youth arrests and delinquency. *Journal of Experimental Criminology*, 6(2), 131-157. <https://doi.org/10.1007/s11292-010-9091-7>
- Courtney, M. E., Dworsky, A., Brown, A., Cary, C., Love, V., Vorhies, V (2011). *Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 26*. Chapin Hall Center for Children at the University of Chicago. <https://www.chapinhall.org/wp-content/uploads/Midwest-Eval-Outcomes-at-Age-26.pdf>
- Cuervo, K., Villanueva, L., Born, M., & Gavray, C. (2018). Analysis of violent and non-violent versatility in self-reported juvenile delinquency. *Psychiatry, Psychology, and Law*, 25, 72-85.
- Dubois, D. L., Portillo, N., Rhodes, J. E., Silverthorn, N., & Valentine, J. C. (2011). How effective are mentoring programs for youth? A systematic assessment of the evidence. *Psychological Science in the Public Interest*, 12, 57-91. [doi.org/10.1177/1529100611414806](https://doi.org/10.1177/1529100611414806)



- Duke, N.N., Pettingell, S.L., McMorris, B.J., & and Iris W. Borowsky, I.W. (2010). Adolescent violence perpetration: Associations with multiple types of adverse childhood experiences. *Pediatrics*, 125(4), e778-e786; <https://doi.org/10.1542/peds.2009-0597>
- Duncan, R. J., Rolan, E., Marceau, K., Lewis, K. M., Bavarian, N., DuBois, D. L., & Flay, B. (2019). Childhood protective factors and a prevention program reduce later problem behaviors. *Journal of Applied Developmental Psychology*, 65, 101063. <https://doi.org/10.1016/j.appdev.2019.101063>
- Eastman, A. L., Foust, R., Prindle, J., Palmer, L., Erlich, J., Giannella, E., & Putnam-Hornstein, E. (2019). A descriptive analysis of the child protection histories of youth and young adults arrested in California. *Child Maltreatment*, 24, 324-329. [doi.org/10.1177/1077559519837667](https://doi.org/10.1177/1077559519837667)
- Esposti, M. D., Pereira, S. M., Humphreys, D. K., Sale, R. K., & Bowes, L. (2020). Child maltreatment and the risk of antisocial behaviour: A population-based cohort study spanning 50 years. *Child Abuse & Neglect*, 99, 104281. <https://doi.org/10.1016/j.chiabu.2019.104281>
- Farrington, D. P., Gaffney, H., Lösel, F., & Ttofi, M. M. (2017). Systematic reviews of the effectiveness of developmental prevention programs in reducing delinquency, aggression, and bullying. *Aggression and Violent Behavior*, 33, 91-106. <https://doi.org/10.1016/j.avb.2016.11.003>
- Farrington, D.P., Hawkins, J.D. (2019). The need for long-term follow-ups of delinquency prevention experiments. *JAMA Network Open*, 2(3):e190780. doi:10.1001/jamanetworkopen.2019.0780
- Farrington, D. P., Jolliffe, D., Loeber, R., & Homish, D. L. (2007). How many offenses are really committed per juvenile court offender? *Victims & Offenders*, 2(3), 227-249. <https://doi.org/10.1080/15564880701403934>
- Garrido, E. F., Weiler, L. M., & Taussig, H. N. (2017). Adverse childhood experiences and health-risk behaviors in vulnerable early adolescents. *Journal of Early Adolescence*, 38(5), 661-680. <https://doi.org/10.1177/0272431616687671>
- Goodkind, S., Shook, J., Kolivoski, K., Pohlig, R., Little, A., & Kim, K. (2020). From child welfare to jail: Mediating effects of juvenile justice placement and other system involvement. *Child Maltreatment*, 25(4), 410-425. <https://doi.org/10.1177/1077559520904144>
- Hawkins, S., Karcher, M. J., Stewart, K., & DuBois, D. L. (2020). *Mentoring for preventing and reducing delinquent behavior among youth*. National Mentoring Resource Center. [https://nationalmentoringresourcecenter.org/images/PDF/Mentoring for Preventing and Reducing Substance Use and Associated Risks Among Youth Outcome Review.pdf](https://nationalmentoringresourcecenter.org/images/PDF/Mentoring_for_Preventing_and_Reducing_Substance_Use_and_Associated_Risks_Among_Youth_Outcome_Review.pdf)
- Herrera, C., DuBois, D. L., & Grossman, J. B. (2013). *The role of risk: Mentoring experiences and outcomes for youth with varying risk profiles*. Bill & Melinda Gates Foundation. [https://www.mdrc.org/sites/default/files/Role%20of%20Risk\\_Final-web%20PDF.pdf](https://www.mdrc.org/sites/default/files/Role%20of%20Risk_Final-web%20PDF.pdf)

- Huizinga, D. (2017). *Denver youth survey waves 1-5, (1988-1992)* (ICPSR 36473) [Data set]. ICPSR. <https://doi.org/10.3886/ICPSR36473.v1>
- Jarjoura, R. (2016). *Mentoring for children of incarcerated parents*. National Mentoring Resource Center. <https://www.evidencebasedmentoring.org/mentoring-for-children-of-incarcerated-parents-national-mentoring-resource-center-review/>
- Justice Policy Institute. (2009). *The costs of confinement: Why good juvenile justice policies make good fiscal sense*. [http://www.justicepolicy.org/images/upload/09\\_05\\_rep\\_costsofconfinement\\_jj\\_ps.pdf](http://www.justicepolicy.org/images/upload/09_05_rep_costsofconfinement_jj_ps.pdf)
- Justice Policy Institute. (2014). *Sticker shock: Calculating the full price tag for youth incarceration*. [http://www.justicepolicy.org/uploads/justicepolicy/documents/sticker\\_shock\\_final\\_v2.pdf](http://www.justicepolicy.org/uploads/justicepolicy/documents/sticker_shock_final_v2.pdf)
- Karcher, M. J. (2020). *Ten-year follow-up on the RCT study of mentoring in the learning environment (SMILE): Effects of the communities in schools mentoring program on crime and educational persistence*. Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice. <https://www.ncjrs.gov/pdffiles1/ojjdp/grants/254619.pdf>
- Kim, H. K., & Leve, L. D. (2011). Substance use and delinquency among middle school girls in foster care: A three-year follow-up of a randomized controlled trial. *Journal of Consulting and Clinical Psychology, 79*(6), 740-750. <https://doi.org/10.1037/a0025949>
- Lab, S. P. (2018). Prevention and prevarication: The fits and starts of prevention in the USA. *Crime Prevention and Community Safety, 20*(4), 243-255. <https://doi.org/10.1057/s41300-018-0052-9>
- Lösel, F., & Beelmann, A. (2003). Effects of child skills training in preventing antisocial behavior: A systematic review of randomized evaluations. *The Annals of the American Academy of Political and Social Science, 587*(1), 84-109. <https://doi.org/10.1177/0002716202250793>
- Lyons, M. D., Mcquillin, S. D., & Henderson, L. J. (2019). Finding the sweet spot: Investigating the effects of relationship closeness and instrumental activities in school-based mentoring. *American Journal of Community Psychology, 63*(1-2), 88-98. [doi.org/10.1002/ajcp.12283](https://doi.org/10.1002/ajcp.12283)
- Malvaso, C. G., Delfabbro, P., & Day, A. (2018). The maltreatment–offending association: A systematic review of the methodological features of prospective and longitudinal studies. *Trauma, Violence, & Abuse, 19*(1), 20-34. <https://doi.org/10.1177/1524838015620820>
- Mccord, J. (1978). A thirty-year follow-up of treatment effects. *American Psychologist, 33*, 284-89.
- Mersky, J.P., Topitzes, J., & Reynolds, A.J. (2012). Unsafe at any age. *Journal of Research in Crime and Delinquency, 49*(2), 295-318.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior. *Psychological Review, 100*(4), 674-701.

- Murray, J., & Farrington, D. P. (2010). Risk factors for conduct disorder and delinquency: Key findings from longitudinal studies. *The Canadian Journal of Psychiatry*, 55(10), 633-642. <https://doi.org/10.1177/070674371005501003>
- Raposa, E., Rhodes, J., Stams, G., Card, N., Burton, S., Schwartz, S., Sykes, L., Kanchewa, S., Kupersmidt, J., & Hussain, S. (2019). The effects of youth mentoring programs: A meta-analysis of outcome studies. *Journal of Youth and Adolescence*, 48(3), 423-443. <https://doi.org/10.1007/s10964-019-00982-8>
- Raviv, T., Taussig, H. N., Culhane, S. E., & Garrido, E. F. (2010). Cumulative risk exposure and mental health symptoms among maltreated youth placed in out-of-home care. *Child Abuse & Neglect*, 34(10), 742-751. <https://doi.org/10.1016/j.chiabu.2010.02.011>
- Rhodes, J. (2020). *Older and wiser: New ideas for youth mentoring in the 21st century*. Harvard University Press.
- Sandler, I., Wolchik, S. A., Cruden, G., Mahrer, N. E., Ahn, S., Brincks, A., & Brown, C. H. (2014). Overview of meta-analyses of the prevention of mental health, substance use, and conduct problems. *Annual Review of Clinical Psychology*, 10(1), 243-273. <https://doi.org/10.1146/annurev-clinpsy-050212-185524>
- Taheri, S. A., & Welsh, B. C. (2016). After-school programs for delinquency prevention: A systematic review and meta-analysis. *Youth Violence and Juvenile Justice*, 14(3), 272-290. <https://doi.org/10.1177/1541204014567542>
- Taussig, H. N. (1998). *Risk behaviors in maltreated adolescents* [Unpublished doctoral dissertation]. San Diego State University & the University of California San Diego.
- Taussig, H. N., & Culhane, S. E. (2010). Impact of a mentoring and skills group program on mental health outcomes for maltreated children in foster care. *Archives of Pediatrics & Adolescent Medicine*, 164(8), 739-746. <https://doi.org/10.1001/archpediatrics.2010.124>
- Taussig, H. N., Culhane, S. E., Garrido, E., & Knudtson, M. D. (2012). RCT of a mentoring and skills group program: Placement and permanency outcomes for foster youth. *Pediatrics*, 130(1), e33-e39. <https://doi.org/10.1542/peds.2011-3447>
- Taussig, H. N., Culhane, S. E., & Hettleman, D. (2007). Fostering Healthy Futures: An innovative preventive intervention for preadolescent youth in out-of-home care. *Child Welfare*, 86, 113-131.
- Taussig, H. N., Weiler, L. M., Garrido, E. F., Rhodes, T., Boat, A., & Fadell, M. (2019). A positive youth development approach to improving mental health outcomes for maltreated children in foster care: Replication and extension of an RCT of the fostering healthy futures program. *American Journal of Community Psychology*, 64(3-4), 405-417. <https://doi.org/10.1002/ajcp.12385>

- Tolan, P., Henry, D., Schoeny, M., Bass, A., Lovegrove, P., & Nichols, E. (2013). Mentoring interventions to affect juvenile delinquency and associated problems: A systematic review. *Campbell Systematic Reviews*, 9(1), 1-158. <https://doi.org/10.4073/csr.2013.10>
- van der Stouwe, T., Gubbels, J., Castenmiller, Y. L., & et al. (2020). The effectiveness of social skills training (SST) for juvenile delinquents: A meta-analytical review. *Journal of Experimental Criminology*. <https://doi.org/10.1007/s11292-020-09419-w>
- Welsh, B. C., & Farrington, D. P. (2007). Scientific support for early prevention of delinquency and later offending. *Victims & Offenders: Early Intervention*, 2(2), 125-140. <https://10.1080/15564880701263114>
- Widom, C., Fisher, J., Nagin, D., & Piquero, A. (2018). A prospective examination of criminal career trajectories in abused and neglected males and females followed up into middle adulthood. *Journal of Quantitative Criminology*, 34, 831-852. [10.1007/s10940-017-9356-7](https://doi.org/10.1007/s10940-017-9356-7)
- Winokur, M. & Crawford, G. (2014). *Fostering Healthy Futures child welfare cost study*. Prepared for the Colorado Department of Human Services.