Published in final edited form as:

J Interpers Violence. 2021 February ; 36(3-4): NP1833–1855NP. doi:10.1177/0886260518756113.

Does Educational Success Mitigate the Effect of Child Maltreatment on Later Offending Patterns?

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Abstract

Analyses examined offending patterns during adolescence and adulthood and their relation to child maltreatment subtypes and education factors measured during adolescence and adulthood. A total 356 participants were followed from preschool to adulthood in a prospective longitudinal study. Child maltreatment subtypes include physical-emotional abuse, sexual abuse, and neglect. Offending patterns were analyzed as latent classes of: (a) chronic offending, (b) desistence, and (c) stable low-level or non-offending. Physical-emotional and sexual abuse were associated with a higher likelihood of chronic offending relative to stable low-level offending. Education variables, including high educational engagement and good academic performance, predicted a higher likelihood of low-level offending relative to desistence, but not desistence relative to chronic offending. Only educational attainment predicted desistence relative to chronic offending. There was no moderating effect of education variables on the association between child maltreatment subtypes and later offending patterns. Implications for research, practice, and policy are discussed.

Keywords

child abuse; antisocial behavior; crime persistence; adolescence-limited crime; school

Introduction

Child maltreatment, including physical and emotional abuse, sexual abuse, and neglect, can have serious and lasting consequences (T. I. Herrenkohl, 2011b). Retrospective studies, and some prospective studies of child maltreatment, also show a strong developmental link to adult nonviolent and violent offending, including fighting and physical assault (English, Widom, & Brandford, 2002; Klika, Herrenkohl, & Lee, 2013; Smith & Thornberry, 1995; Widom and Maxfield, 2001). However, it is unclear from existing studies whether child maltreatment subtypes of physical-emotional abuse, sexual abuse, and neglect each help to distinguish youth and adult chronic offenders from non-offenders and those who perpetrate antisocial behavior in adolescence only (desisters). It is also unclear whether these same subtypes distinguish chronic offenders from desisters (Moffitt, 1993). Given that offending

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in adolescence can persist into adulthood if left unaddressed, it is important to identify and act on factors that predispose individuals to ongoing patterns of antisocial behavior, which can become more serious over time (Jung et al., 2017; Klika et al., 2013).

A review of the prevention literature highlights the importance of education factors, such as academic achievement and school engagement, as potential buffers or mitigating factors—variables that lessen the risk of chronic offending among individuals who have experienced abuse and neglect (Allwood & Widom, 2013; Monahan, Oesterle, & Hawkins, 2010). However, there have been a relative few prospective studies that address these variables. The purpose of this study was, therefore, to: (a) identify unique patterns of offending in a prospective study; (b) investigate the associations between different subtypes of child maltreatment (physical-emotional abuse, sexual abuse, and neglect) and patterns of offending; and (c) assess whether education factors predict offending patterns and possibly moderate the association between subtypes of child maltreatment and later offending.

Offending in Adolescence to Adulthood

Levels of nonviolent and violent offending can vary over the course of adolescence and adulthood, as shown by studies like those of Farrington (1995), Moffitt (1993), and Patterson (1996). According to Moffitt (1993) and Patterson (1996), there are two categories of offenders: (a) early-onset, life-course persistent offenders and (b) late-onset, adolescence-limited offenders. Early-onset offenders begin to offend early in childhood and then continue the behavior as they enter and move through adulthood. Late-onset and adolescent-limited offenders start to offend in adolescence and then desist before reaching adulthood. While these patterns are generally well documented, some research suggests there are more than just two categories of offender (Odgers, Moffitt et al., 2008). For example, Chung and colleagues (2002) used a latent class analysis to identify five offending trajectories for youth ages 12 – 18. These included non-offenders (24% of the sample), late starters (4.4%), desisters (35.3%), escalators (19.3%), and chronic offenders (7%).

While some researchers allow empirical methods to derive distinct classes or profiles of offenders, others base these profiles on *a priori* categories that fit a particular theory or perspective on lifecourse offending. For example, Loeber and colleagues (1991) classified boys in their sample into seven distinct categories. These included non-offenders, late starters, stable moderates and highs, de-escalators, desisters, and escalators. Stable moderates, de-escalators, and escalators were generally more common in the sample. The downside of this approach is that offending categories may not capture the full extent of variability in the data. In the current investigation, we use a latent class analysis to derive patterns of offending that span adolescence and adulthood. We then examine child maltreatment and education variables as predictors of these patterns. Education variables were further examined as potential moderators of the association between child maltreatment and later offending.

Child Maltreatment and Offending

Evidence of a link between child maltreatment and adolescent and adult offending can be found in the research literature, although relatively few studies have included subtypes of

maltreatment as predictors of offending patterns (English et al., 2002; Klika et al., 2013; Smith & Thornberry, 1995; Widom and Maxfield, 2001). In one study, Maxfield and Widom (1996) found that individuals with histories of child maltreatment were at higher risk than were matched controls for violent offending in adolescence and in adulthood. Analyses of offending were, in this case, point estimates of crime at two different time points. In another study, Widom and Maxfield (2001) examined the association between a measure of child maltreatment and offending trajectories. They found that child maltreatment was associated with persistent offending from adolescence into adulthood. However, adult arrests among those who had been arrested in adolescence were the same for individuals with and without a history of child maltreatment. While child maltreatment increased the risk of offending, it did not change the continuity offending from adolescence to adulthood.

Findings from studies not limited to child maltreatment are also instructive. For example, Farrington and Hawkins (1991) found that poor child-rearing practices (consistent and moderate vs. erratic and harsh parenting) predicted offending in adolescence, but not persistent offending (re-conviction) between the ages of 21 and 32. In another study, Loeber et al. (1991) found that a negative caretaker-child relationship was associated with an escalation in offense severity. Notably, Chung et al. (2002) found no connection between poor family management measured at age 10 – 12 and chronic offending, relative to desistence, from ages 13 – 21.

In summary, research does appear to show a link between child maltreatment and later offending, and between other aspects of parenting and offending, but there is some inconsistency, possibly due to the different measures and methods that are used in the studies reviewed. Additionally, researchers have yet to examine how subtypes of child maltreatment relate to patterns of offending, which is important to advancing this line of investigation.

Protective Effects of Education on Offending Patterns in Relation to Child Maltreatment

Studies suggest that education factors (e.g., good academic performance and school bonding) predict fewer conduct problems and less delinquent behavior and crime (e.g., Loukas, Ripperger-Suhler, & Horton, 2009). Because schools play a critical role in the socialization and development of children and youth (Cicchetti & Toth, 1997; Garbarino, Dubrow, Kostelny, & Pardo, 1992), it is presumed that education factors will attenuate the effects of early risk factors and thereby lessen potential for offending (Heller, Larrieu, D'Imperio, & Boris, 1999; E. C. Herrenkohl, Herrenkohl, & Egolf, 1994; Zielinski & Bradshaw, 2006). More specifically, when children are bonded to school, are engaged, and are performing well academically, they will be less inclined to engage in problematic behaviors and more apt to devote themselves to activities that align with the goals of schooling (Hawkins & Herrenkohl, 2003).

Relatedly, Loukas, Roalson, and Herrera (2010) showed that high levels of school bonding moderated the risk effect of low-quality parent-child relationships on problematic youth behaviors such as fighting, lying, and cheating. Ryan, Hernandez, and Herz (2007) found that school enrollment was protective against chronic offending for male youth transitioning from foster care. Loeber et al. (1991) found that education factors, such as school bonding (commitment), high academic achievement, and the absence of school suspensions predicted

desistance from crime. Further, Zingraff, Leiter, Johnsen, and Myers (1994) showed that academic achievement and positive attitudes toward school predicted desistance from crime during adolescence among children who had been physically abused.

Although informative, most studies on these topics are limited because they are cross-sectional and because they focus on a single period of development and cannot assess changes in behavior over time. Examining child maltreatment, education, and offending with prospective data that span adolescence and adulthood will strengthen the field's understanding of how lifecourse patterns of risk and protection unfold.

The study of child maltreatment, education, and offending should be informed by developmental theory. The social development model (SDM) provides a useful perspective from which to examine risk and protection related to these variables (Catalano & Hawkins, 1996). The SDM combines hypotheses from social control theory (Hirschi, 1969; Kempf, 1993; Krohn & Massey, 1980), social learning theory (Akers, 1985; Bandura, 1977), and differential association theory (Matsueda, 1988; Sutherland & Cressey, 1973). The theory focuses particularly on socialization processes that lead to bonds of attachment to prosocial and antisocial others and institutions (e.g., school). The nature and strength of these bonds determines whether one engages in a predominance of prosocial or antisocial behavior. Schools are a prosocial institution, and education factors are an extension of the protective influences that schools can have on behavior. According to the SDM, schools provide opportunities for prosocial engagement and bonding to prosocial others, which will lead to beliefs that favor prosocial over antisocial behavior.

Other theories are also relevant to the topics under investigation. For example, Cicchetti and Lynch (1993) offer an ecological/transactional model of family and community violence that builds on the ideas first expressed in Bronfenbrenner's (1979) social ecological model of child development and Belsky's (1980) extension of that original framework. According to Cicchetti and Lynch, children's functioning in the context of family violence is related to a confluence of risk and mitigating factors associated with the individual child, his or her surroundings, and the broader ecology. Transient and more enduring protective factors, which can include those related to education, can help to lessen the effects of risks posed to children by their exposure to violence, and by child maltreatment specifically. Other researchers have described a similar dynamic to explain resilience from chronic stress (Leadbeater, Schellenbach, Maton, & Dodgen, 2004; Sousa et al., 2017).

In a discussion of lifecourse theory, yet another relevant perspective, Elder (1985) refers to turning points as a way to describe the shift that can occur when individuals at risk for poor functioning encounter protective factors that put them on a better path. Allwood and Widom (2013) apply this perspective to the study of adults with histories of child maltreatment. They found that fewer maltreated individuals who graduated from high school (a turning point) were arrested for criminal behavior after age 18. The current study builds on related concepts of risk, protection, and development in order to examine the potential protective effects of education factors generally consistent with these theories.

Methods

Data and Procedure

Data are from the Lehigh Longitudinal Study, which began in 1973 – 1974 as the evaluation portion of a child abuse and neglect treatment and prevention program in two counties of eastern Pennsylvania (R. C. Herrenkohl, Herrenkohl, Egolf, & Wu, 1991). Selection of the sample was accomplished over a 2-year period by referrals from two county child welfare agencies, of cases in which there was at least one abused or neglected child age 18 months to 6 years present in the home ($n = 249$). The children served by child welfare agencies participated in one of several group settings (e.g., day care, Head Start). It was also from these settings that children from outside of the child welfare system were enrolled in the study ($n = 208$). The original sample ($N = 457$) was composed of near equal numbers of males ($n = 248$) and females ($n = 209$). The racial and ethnic composition of the sample is consistent with the makeup of the two-county area from which participants were drawn: 1.3% ($n = 6$) American Indian/Alaska Native, 0.2% ($n = 1$) Native Hawaiian or Other Pacific Islander, 5.3% ($n = 24$) Black or African American, 80.7% ($n = 369$) White, 11.2% ($n = 51$) more than one race, and 1.3% ($n = 6$) unknown. Eighty-six percent of children were from two-parent households. About 61% of families were in poverty according to the income-to-needs ratio in 1976 ($n = 276$).

The first “preschool” wave of the study took place in 1976 – 1977 when children recruited into the study were 18 months to 6 years of age. A second “school-age” assessment was conducted in 1980 – 1982 when the children were 8 years old on average. A third “adolescent” assessment was conducted in 1990 – 1992 when they were 18 years of age on average. An adult wave of the study was completed in 2010, after intensive locating and interviewing efforts. Approximately 80% of the original sample still living ($N = 356$) was located and assessed via a comprehensive, interviewer-administered survey. In the adult assessment, participants were 36 years of age (range = 31 – 41) on average and the sample remained gender balanced: 170 (47.9%) females and 186 (52.1%) males. The ethnic/racial composition was also maintained, with 79.1% ($n = 280$) being White. Analyses of the current sample showed that, although more of the original child welfare group was lost to attrition, there were no statistically significant group differences in gender, age, childhood socioeconomic status (SES), or ratings of neglect or parent-reported physically abusive discipline (T. I. Herrenkohl et al., 2013). Study procedures were approved by the Human Subjects Division at the University of Washington and the Office of Research and Sponsored Programs at Lehigh University.

Measures

Child maltreatment includes several subtypes of abuse (physical, emotional, and sexual) and neglect. Data for measures of these subtypes are from parent reports, retrospective self-reports, and observations of parent-child interactions. Official records of abuse/child welfare involvement were also included to account for abuse and neglect not captured by other data sources.

Physical-emotional abuse was measured in the preschool wave of the study by parents' reports of their and other caregivers' use of physically (12 items) and emotionally (7 items) abusive disciplining practices (see Appendix A for the list of items). All items were rated as abusive by child welfare experts using a 5-point severity rating scale (T. I. Herrenkohl et al., 2016). Physical abuse was measured for (a) the last 3 months and (b) prior to the last 3 months. Emotional abuse was assessed for the last 3 months only. The number of abusive disciplining practices determined to have been used by each caregiver at each assessment was summed in order to form a combined measure of physical and emotional abuse. Scores on this composite measure ranged from 0 to 25 ($M = 6.58$, $SD = 5.48$).

Sexual abuse is based on participants' retrospective reports of having been sexually abused in childhood (prior to age 18 years) from the adolescent and adult waves of the study. In the adolescence wave of the study, participants were asked: "How many times has someone pressured or pushed you to do sexual things you didn't want to do?" and "How many times have you been sexually attacked or raped or an attempt made to do so?" Some adolescents were additionally asked whether they had been sexually abused. Similar questions were asked of participants in the adult wave of the study. To gain a more complete picture of sexual abuse, other sources of data were examined. These include interview notes and child welfare case records. In total, 142 participants (41.9% of the sample) were found to have been sexually abused.

Neglect was measured at the preschool wave of the study using observations of the parent-child interactions and interviewers' observations of a family's living environment. Items were based on the "child level of living" scale developed and validated by Polansky and colleagues (Polansky, Borgman, & De Saix, 1972; Polansky, Cabral, Magura, & Phillips, 1983; Polansky, Chalmers, Bittenwieser, & Williams, 1978), and scores of the following four subscales were summed: *neglectful home environment* (range: 0 – 6) indicating evidence of poor upkeep (e.g., dirty dishes, food scraps on floor, dirt, house smells of urine and/or spoiled food, broken glass and/or rusty cans, and garbage); *physical neglect* (range: 0 – 5) indicating evidence of poor dental and/or medical care of children and physical injuries; *inadequate supervision* (range: 0 – 2) indicating poor judgment about leaving a child alone or with an older sibling unable to care for the child; and *emotional neglect* (range: 0 – 2) based on the number of observers who reported any emotional neglect. Neglect was a sum of these four subscales, and ranged from 0 to 12 with a mean of 1.97 and a standard deviation of 2.26.

Offending—Three different types of past-year offending were scaled from 29 survey items contained in both the adolescent and adult assessments (see Appendix B). Offenses were categorized to reflect those of the National Incident-Based Reporting System (NIBRS: Federal Bureau of Investigation, 2013), which specifies crimes against persons, property, and society (Jung, Herrenkohl, Klika, Lee, & Brown, 2015). Indicators were coded to reflect the presence or absence of each offense type. In adolescence, 63.8% ($n = 213$) of youth were determined to have committed at least one person offense during the past year; 67.7% ($n = 226$) and 31.8% ($n = 106$) committed property and society offenses, respectively. In adulthood, 16.3% ($n = 28$) committed one or more person offenses in the past year; 9.3% (n

= 33) and 10.7% (n = 38) committed one or more property and society offenses, respectively.

Education factors include four variables assessed in either in adolescence or adulthood.

Educational engagement was measured using youth self-reports of aspired education level, expected education level, perceived importance of schoolwork, importance of past educational experience, perceived satisfaction with educational experience, perceived importance of graduating from college, and weekly hours spent studying or doing schoolwork outside school (seven items total). One indicator, i.e. hours spent studying outside school, was assessed on a 6-point scale (1 = 1 – 5; 2 = 6 – 10; 3 = 11 – 15; 4 = 16 – 20; 5 = 21 – 25; 6 = 26 or more), and four indicators for perceived importance or satisfaction were measured on a 5-point scale. The other two indicators for aspired or expected education level were measured on a 5-point scale ranging from 1 = less than high school to 5 = post college. The variable of educational engagement was created by averaging z-scores of these seven indicators. Cronbach's alpha was 0.81 and scores ranged from –1.98 to 1.34 with a mean of 0.00 and a standard deviation of 0.69.

Academic performance was measured by nine indicators consisting of four items from the Achenbach Youth Self-Report form of the CBCL (Achenbach, 1997: YSR); another set of the same four items was reported by parents; and a single additional item asked about the grades that best describe the adolescents' performance during the most recent grading period (1 = Mostly Fs to 5 = Mostly As). The YSR items reported by adolescents and parents were assessed on a 4-point scale (1 = failing; 2 = below average; 3 = average; 4 = above average) with respect to how adolescents were doing in each of the following four subject areas: English or language arts, history or social studies, arithmetic or math, and science. The Cronbach's alpha for this scale was 0.87. The variable of academic performance was created by averaging z-scores of these nine indicators. Scores ranged from –2.48 to 1.28 with a mean of 0.00 and a standard deviation of 0.70.

Suspension was measured by a single item asking whether one had ever been suspended from school in Grades 7 – 9. Results show that 43.7% (n = 145) of adolescents were suspended in those grades.

Education attainment was rated as ordinal data collected at the adult survey indicating highest level of education attained by participants. This variable was analyzed as continuous, with a mean of 4.14 and a standard deviation of 1.98. It ranged from 1 to 8 (1 = eighth grade or less; 2 = some high school; 3 = high school grad or GED; 4 = some college; 5 = 2-year college grad; 6 = 4-year college grad; 7 = some post graduate; 8 = post college/professional degree).

Control variables include child welfare involvement, childhood socioeconomic status (SES), gender, and IQ. *Child welfare involvement* is an indicator of official childhood maltreatment. This variable distinguishes individuals who were, as children, involved with child welfare for abuse and neglect from those without prior child welfare involvement. Those with child welfare involvement were coded 1 and those without child welfare involvement were coded 0. *Childhood SES* is a standardized composite measure of parents'

occupational status, educational level, and family income, with a range of -5.43 to 9.18 , a mean of 0.16 , and a standard deviation of 3.35 . *Gender* was coded males = 1 ($n = 186$) and females = 0 ($n = 170$). *IQ* was measured at school age using scores from the Wechsler Intelligence Scale for Children-Revised (WISC-R; Wechsler, 1974). This study used z -scores that ranged from -3.39 to 2.51 with a mean of 0.02 and a standard deviation of 1.03 .

Analysis

Analyses were conducted in three phases. In the first phase, latent class analysis (LCA) was used to empirically classify participants based on patterns of offending in adolescence and adulthood. This analysis used maximum likelihood estimation with robust standard errors. Binary variables of the three different types of offenses in adolescence and adulthood were included as six indicators of the offending pattern latent classes. Models estimating one to four classes were compared on the sample-size-adjusted Bayesian Information Criterion (BIC) that shows improvement in fit with each additional class. In addition, Lo-Mendell-Rubin (LMR) likelihood ratio tests and the bootstrapped likelihood ratio test (BLRT) were also referenced in order to select the model with the best fit. A second LCA of offending patterns was performed with males and females as separate subgroups in order to determine how gender should be incorporated into the analyses.

The second phase introduced measures of childhood maltreatment, education factors, and control variables as predictors of class membership generated in the first phase. A three-step approach (R3STEP) was used; as such, multinomial logistic regressions based on estimated posterior probabilities were employed to estimate the effects of predictors on class membership of offending patterns (Asparouhov & Muthén, 2014; Vermunt, 2010). Missing data were handled using multiple imputations (Muthén & Muthén, 1998–2012). Forty imputed data sets were created by Bayesian analysis in Mplus 7.11, and estimates and standard errors in subsequent analyses were obtained by averaging across 40 analysis runs.

The third phase examined whether the effects of education factors moderated the effects of child maltreatment on offending patterns, defined by the latent classes. Multiplicative interaction terms of child maltreatment variables and each education factor were entered into models.

Results

Phase 1: Latent Classes of Offense Pattern from Adolescence to Adulthood

Estimation of a series of latent class models determined that a three-class model best fit the data (see Figure 1). The sample-size-adjusted BIC was lowest for the three-class model ($= 1,906.06$). The bootstrapped likelihood ratio tests showed that the three-class model was preferable to the four-class model ($p = 0.33$). The entropy was moderate ($= 0.64$), but the highest among the models of varying number of classes. The largest class [Class 1: $n = 185$ (52.0%)] is labeled 'desistence' and is characterized by elevated likelihood of offending in adolescence and a lower likelihood of offending in adulthood. The second largest class [Class 2: $n = 134$ (37.6%)] is labeled 'stable low' and is characterized by a low likelihood of offending in adolescence and adulthood. The smallest class [Class 3: $n = 37$ (10.4%)] is

labeled ‘chronic offending’ and is characterized by a high likelihood of offending in adolescence and high likelihood of offending in adulthood. As shown in Figure 1, the same three-class model still best fit the data when gender was introduced as a covariate. It had the lowest sample-size-adjusted BIC ($= 2,391.51$) and higher entropy ($= 0.80$). There was no evidence that the inclusion of gender in the model changed the nature of the offender classes.

Phase 2: Effect of Child Maltreatment and Education Factors

As shown in Table 2, physical-emotional abuse and sexual abuse predicted a higher likelihood of chronic offending relative to stable low offending. That was also true for sexual abuse. Physical-emotional abuse and sexual abuse were also marginally significantly predictive of chronic offending relative to desistence. However, none of the child maltreatment variables—physical-emotional abuse, sexual abuse, or neglect—predicted a higher likelihood of desistence relative to stable low offending.

The salience of educational factors was examined, along with the child maltreatment variables and covariates held constant. Successful schooling experiences assessed in adolescence were significantly, inversely associated with chronic offending and desistence when compared to stable low offending. For example, lower educational engagement and academic performance predicted desistence and chronic offending relative to stable low offending. Similarly, school suspension in Grades 7 – 9, a risk factor, predicted a higher likelihood of desistence and chronic offending relative to stable low offending. Lower education attainment predicted a higher likelihood of chronic offending relative to stable low offending and desistence.

Discussion

This study investigated whether child maltreatment subtypes predicted later offending patterns that were compiled from data that span two waves of a longitudinal study. The study also investigated whether education factors predicted offending patterns and moderated the risk for offending posed by physical-emotional and sexual abuse. No evidence of variable moderation was in this case found. However, education variables were independently related to offending patterns in some instances, after accounting for child maltreatment subtypes and other variables, including childhood SES, gender, and IQ.

Notably, physical-emotional child abuse and sexual abuse appeared to distinguish chronic offending from stable low offending, but that was not the case for neglect. That neglect was not a salient predictor in the study is interesting and potentially important, in that it *has* been linked to adult crime and juvenile delinquency in other studies (e.g., English et al., 2002; Mersky & Reynolds, 2007; Widom & Maxfield, 2001; Yun, Ball, & Lim, 2011). However, measurement differences across these studies may play a role in the inconsistent results, as may the developmental coverage of offending patterns reflected in the data.

Results show that measures of child maltreatment relate somewhat inconsistently to the offending patterns identified in our data. This is particularly evident when findings for “child welfare involvement,” a covariate that captures official reports of abuse and neglect, were

included with those for the other measures. For example, measures of physical-emotional and sexual abuse distinguished chronic from stable low-level offending, but child welfare involvement did not. It may be that these measures capture different information about the experiences of children who encounter abuse and neglect, or that one measure is more influenced by other variables in the model, such as SES or child gender. Specific types of abuse may relate differently to factors such as poverty, which has a strong relationship to abuse regardless of whether the abuse is substantiated (Drake & Pandey, 1996). Additionally, while the effects of formal child welfare involvement are unknown, it is possible that engagement with the system has its own effects on the risk of offending (Elder, 1985; Van Wert, Mishna, & Malti, 2016). Whatever the reason, our inclination is not to view these findings as not necessarily inconsistent, but instructive about the ways variables that tap similar concepts can relate differently to outcomes of interest. According to Kohl et al. (2009), substantiated reports of child abuse and neglect as no more reliable than those based on other data sources, such as parent or self-reports. Thus, substantiated reports need not be considered the more relevant or informative.

School success in adolescence reflected in variables of academic performance, educational engagement, and the absence of suspensions was associated with stable low-level offending relative to desistance and chronic offending. Findings suggest that these education variables may be independently related to offending, but not necessarily protective from the risk of chronic offending associated with child maltreatment (Loukas et al., 2009). That is also the case for educational attainment, which reduced the risk of chronic offending relative to desistance. This latter finding is consistent with Allwood and Widom's (2013) study, which found a lower rate of adult offending among individuals with at least a high school degree. The finding also aligns with the idea of turning points described in lifecourse theory (Elder, 1985). Of course, the causal direction of educational attainment is, in this case, unclear, since individuals reported retrospectively from adulthood on their educational achievement. It is also possible, similar to involvement with the child welfare system, that the child's relationship to school could have either mitigating or exacerbating effects on the effects of maltreatment experienced in childhood (Crooks, Scott, Wolfe, Chiodo, & Killip, 2007). More research on all the education variables is warranted since findings here and elsewhere show they play a role in adolescent and adult offending, although precisely what role remains unclear.

The practice implications that extend from this study include primary prevention focused on lessening the prevalence of child maltreatment and school-based reform to support the needs of vulnerable children, including those who have experienced trauma (T. I. Herrenkohl, 2011a). Strategies focused on helping school professionals become aware of the impacts of child abuse and neglect are critical to building supportive environments that promote resilience and lessen risk for further harm, which can happen when poor conduct (which is common among maltreated children) is met with highly punitive responses. The approach taken in certain trauma-informed schooling models may be key to transforming schools so that all children have the chance to thrive, even those who have faced extreme adversity (Brooks, 2006; Wolpow, Johnson, Hertel, & Kincaid, 2009).

Limitations and Conclusions

This study contributes to the literature by examining the unexplored questions of whether subtypes of child maltreatment predict offending patterns during adolescence and adulthood. However, this study is not without limitations. First, although the study was designed as longitudinal, education attainment was assessed in adulthood and other education variables were measured in adolescence, obscuring the temporal order of variables for examining causality. Relatedly, information about sexual abuse in this study was obtained from a variety of sources over the course of childhood, adolescence, and adulthood. Further, analyses of the study are based on two assessments, which do not fully capture offending patterns of those in the study. Despite limitations, this study addressed unexamined questions, adds important information to the literature, and provides useful implications for prevention and intervention.

Acknowledgments

Funds for this project were provided by the National Institute of Child Health and Human Development (RO1 HD049767) and the National Institute of Justice (2012-IJ-CX-0023). The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies. The funding agencies played no role in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

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Appendix A. Items measuring physical and emotional abuse

	Physical abuse items	n (%)	Emotional abuse items	n (%)
1	Pepper in mouth	78 (21.9)	Take meals away	15 (4.2)
2	Slap face	220 (61.8)	Threaten to leave	117 (32.9)

	Physical abuse items	<i>n</i> (%)	Emotional abuse items	<i>n</i> (%)
3	Shake	155 (43.5)	Embarrass	119 (33.4)
4	Pull hair	172 (48.3)	Threaten to send away	125 (35.1)
5	Hit with stick	213 (59.8)	Isolate in dark room	4 (1.1)
6	Hit with strap	164 (46.1)	Ridicule	120 (33.7)
7	Bite	93 (26.1)	Lock out of house	8 (2.2)
8	Bite to bruise	14 (3.9)		
9	Slap to bruise	89 (25.0)		
10	Hit to bruise	63 (17.7)		
11	Burn	21 (5.9)		
12	Burn to leave mark	10 (2.8)		

Appendix B. Survey items measuring crime and endorse rates for each item: *n* (%)

	Survey items for crime	Type	Adolescence	Adult
1	Purposely damaged/destroyed property of your parents or other family members?	PR	99 (29.6)	49 (13.9)
2	Purposely damaged/destroyed property of your employer?	PR	25 (7.5)	7 (2.0)
3	Purposely damaged/destroyed property that did not belong to you, not counting family or work property?	PR	144 (43.1)	85 (24.1)
4	Purposely set fire or tried to do so?	PR	48 (14.4)	19 (5.4)
5	Broke or tried to break into a building or vehicle to steal something or just to look around?	PR	97 (29.0)	63 (17.7)
6	Stole or tried to steal things worth more than \$50?	PR	77 (23.1)	70 (19.7)
7	Took a vehicle for a ride or driven without the owner's permission?	PR	104 (31.2)	75 (21.2)
8	Stole or tried to steal a motor vehicle?	PR	35 (10.5)	33 (9.3)
9	Used checks illegally or used phony money to pay for something?	PR	16 (4.8)	29 (8.2)
10	Knowingly bought, sold, or held stolen goods?	PR	118 (35.5)	61 (17.3)
11	Stole money or other things from your parents or other family members?	PR	151 (45.2)	98 (27.8)
12	Stole money, goods, or property from the place where you work?	PR	67 (20.1)	49 (13.8)
13	Used or tried to use credit cards without owner's permission?	PR	19 (5.7)	16 (4.5)
14	Snatched someone's purse or wallet or picked someone's pocket?	PR	26 (7.8)	12 (3.4)
15	Embezzled money?	PR	45 (13.6)	6 (1.7)
16	Used force or strong-arm methods to get money or things from people?	PR	28 (8.4)	19 (5.4)
17	Tried to cheat someone by selling them something that was worthless?	PR	88 (26.5)	21 (5.9)
18	Had or tried to have sexual relations with someone against their will?	PE	8 (2.4)	4 (1.1)
19	Was involved in a gang fight?	PE	81 (24.3)	30 (8.4)
20	Hit or threatened to hit parent(s)?	PE	113 (33.8)	59 (16.7)
21	Hit or threatened to hit your supervisor or other employee?	PE	56 (16.8)	31 (8.8)
22	Threatened to hit anyone?	PE	215 (64.4)	118 (33.5)

	Survey items for crime	Type	Adolescence	Adult
23	Hit anyone?	PE	245 (73.4)	168 (47.7)
24	When you hit this person, did you have the idea of seriously hurting or killing this person?	PE	77 (23.1)	8 (2.3)
25	Was paid for having sexual relations with someone?	S	18 (5.4)	16 (4.5)
26	Paid someone for having sexual relations with you?	S	2 (0.6)	11 (3.1)
27	Carried a hidden weapon?	S	97 (29.1)	73 (20.5)
28	Sold marijuana or hashish?	S	76 (22.8)	64 (18.0)
29	Sold hard drugs?	S	43 (12.9)	43 (12.1)

Note. PR = Property Crime, PE = Person Crime, S = Society Crime

	Total sample with no covariates				Multi-sample as stratified by gender			
	1 class	2 classes	3 classes	4 classes	1 class	2 classes	3 classes	4 classes
Loglikelihood	-1026.27	-944.11	-926.01	-920.33	-1234.27	-1160.22	-1140.35	-1128.69
AIC	2064.54	1914.21	1892.01	1894.65	2494.55	2374.45	2362.70	2367.39
Adjusted BIC	2,068.75	1,923.34	1,906.06	1,913.62	2,503.68	2,393.41	2,391.51	2,406.02
Entropy	-	0.60	0.64	0.63	-	0.81	0.80	0.84
LMR adjusted LRT	-	$p < 0.001$	$p < 0.01$	$p = 0.07$	-	-	-	-
BLRT	-	$p < 0.001$	$p < 0.001$	$p = 0.33$	-	-	-	-

AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; LMR adjusted LRT = Lo-Mendell-Rubin (LMR) adjusted likelihood ratio test; BLRT = Bootstrapped likelihood ratio test

Figure 1.

Latent classification of offending patterns from adolescence to adulthood.

Note. Figure for each gender group is available upon request.

Table 1

Descriptive Statistics

	<i>N</i>	<i>n (%)</i>	<i>M (SD)</i>	Range
Child maltreatment				
Physical-emotional abuse	352	-	6.58 (5.48)	0–25
Neglect	356	-	1.97 (2.26)	0–12
Sexual abuse	339	142 (41.9)	-	-
Child welfare involvement	356	181 (50.8)	-	-
Education variables				
Educational engagement (adolescence)	332	-	0 (0.69)	–1.98–1.34
Academic performance (adolescence)	332	-	0 (0.70)	–2.48–1.28
Suspended (Grades 7–9)	332	145 (43.7)	-	-
Education attainment	317	-	4.14 (1.98)	1–8
Crime variables				
Adolescent crime against person	334	213 (63.8)	-	-
Adolescent crime against property	334	226 (67.7)	-	-
Adolescent crime against society	333	106 (31.8)	-	-
Adult crime against person	356	28 (16.3)	-	-
Adult crime against property	356	33 (9.3)	-	-
Adult crime against society	356	38 (10.7)	-	-
Control variables				
Childhood SES	356	-	0.16 (3.35)	–5.43–9.18
IQ	285	-	0.02 (1.03)	–3.39–2.51
Male	356	186 (52.2)	-	-
Poverty ^a	351	211 (60.1)	-	-

^aThe variable of poverty was used only as an indicator for a latent class of risk, along with four child maltreatment variables.

This study includes weighted proportions of socioeconomically disadvantaged individuals, so a categorical variable that provides a definitive cutoff for socioeconomic status serves the purpose of selecting out a high-risk group better than a continuous variable of childhood SES in this study. Poverty measure was created on an income-to-needs ratio in 1976. The majority was under the poverty line; 21.4% (n = 75) were working poor; and only 18.5% (n = 65) were non-poor.

Table 2

Prediction of Latent Offending Patterns by Childhood Maltreatment and Education Factors

Chronic vs. Desistence							
Effects of child maltreatment (N = 356)							
	B (SE)	95% LL	95% UL	OR	95% LL	95% UL	
Child maltreatment							
Physical-emotional abuse	0.08 (0.04)	+	0.00	0.16	1.08	1.00	1.17
Sexual abuse	1.05 (0.61)	+	-0.15	2.25	2.86	0.86	9.45
Neglect	0.10 (0.12)		-0.14	0.34	1.11	0.87	1.40
Control variables							
Childhood SES	0.07 (0.13)		-0.18	0.32	1.07	0.83	1.38
Male	0.54 (0.61)		-0.66	1.74	1.72	0.52	5.67
IQ	-0.07 (0.38)		-0.81	0.67	0.93	0.44	1.96
Child welfare involvement	0.50 (0.97)		-1.40	2.40	1.65	0.25	11.04
Effects of education factors (N= 356)							
Education attainment	-0.55 (0.28)	*	-1.10	0.00	0.58	0.33	1.00
Educational engagement	-0.30 (0.45)		-1.18	0.58	0.74	0.31	1.79
Academic performance	-0.40 (0.50)		-1.38	0.58	0.67	0.25	1.79
Suspension (Grades 7-9)	1.46 (1.03)		-0.56	3.48	4.31	0.57	32.42
Chronic vs. Stable low							
Effects of child maltreatment (N = 356)							
	B (SE)	95% LL	95% UL	OR	95% LL	95% UL	
Child maltreatment							
Physical-emotional abuse	0.12 (0.05)	**	0.02	0.22	1.13	1.02	1.24
Sexual abuse	1.56 (0.65)	*	0.29	2.83	4.76	1.33	17.01
Neglect	0.04 (0.13)		-0.21	0.29	1.04	0.81	1.34
Control variables							
Childhood SES	0.05 (0.13)		-0.20	0.30	1.05	0.81	1.36
Male	2.29 (0.65)	***	1.02	3.56	9.87	2.76	35.30
IQ	-0.06 (0.37)		-0.79	0.67	0.94	0.46	1.94
Child welfare involvement	1.38 (0.93)		-0.44	3.20	3.97	0.64	24.60

Chronic vs. Stable low

Effects of child maltreatment (N = 356)	B (SE)	95% LL	95% UL	OR	95% LL	95% UL
Effects of education factors (N = 356)						
Education attainment	-0.66 (0.29)	*	-1.23	-0.09	0.52	0.29
Educational engagement	-1.13 (0.45)	*	-2.01	-0.25	0.32	0.13
Academic performance	-1.34 (0.53)	*	-2.38	-0.30	0.26	0.09
Suspension (Grades 7-9)	3.36 (1.05)	**	1.30	5.42	28.79	225.43

Desistence vs. Stable low

Effects of child maltreatment (N = 356)							
	B (SE)	95% LL	95% UL	OR	95% LL	95% UL	
Child maltreatment							
Physical-emotional abuse	0.04 (0.04)	-0.04	0.12	1.04	0.96	1.13	
Sexual abuse	0.24 (0.44)	-0.62	1.10	1.27	0.54	3.01	
Neglect	-0.07 (0.12)	-0.31	0.17	0.93	0.74	1.18	
Control variables							
Childhood SES	-0.02 (0.07)	-0.16	0.12	0.98	0.85	1.12	
Male	1.76 (0.44)	***	0.90	2.62	5.81	13.77	
IQ	0.02 (0.21)	-0.39	0.43	1.02	0.68	1.54	
Child welfare involvement	0.88 (0.51)	+	-0.12	1.88	2.41	6.55	
Effects of education factors (N = 356)							
Education attainment	-0.11 (0.15)	-0.40	0.18	0.90	0.67	1.20	
Educational engagement	-0.83 (0.35)	*	-1.52	0.44	0.22	0.87	
Academic performance	-0.94 (0.33)	**	-1.59	0.39	0.20	0.75	
Suspension (Grades 7-9)	1.90 (0.51)	***	0.90	2.90	6.69	18.17	

 $p < 0.001$,**
 $p < 0.01$,*
 $p < 0.05$,+
 $p < 0.10$

Note: Effects of child maltreatment show findings of a single model estimating the effects of child maltreatment. Effects of education factors present separate models for each education variable, accounting for strong correlations among education variables. Each model included maltreatment and control variables as covariates.