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Longitudinal Examination of Peer and Partner Influences on Gender-specific Pathways From Child Abuse to Adult Crime

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Abstract

Research provides increasing evidence of the association of child abuse with adult antisocial behavior. However, less is known about the developmental pathways that underlie this association. Building on the life course model of antisocial behavior, the present study examined possible developmental pathways linking various forms of child abuse (physical, emotional, sexual) to adult antisocial behavior. These pathways include child and adolescent antisocial behavior, as well as adulthood measures of partner risk taking, warmth, and antisocial peer influences. Data are from the Lehigh Longitudinal Study, a prospective longitudinal study examining long-term developmental outcomes subsequent to child maltreatment. Participant families in the Lehigh Longitudinal Study were followed from preschool age into adulthood. Analyses of gender differences addressed the consistency of path coefficients across genders. Results for 297 adult participants followed from early childhood showed that, for both genders, physical and emotional child abuse predicted adult crime indirectly through child and adolescent antisocial behavior, as well as adult partner and antisocial peer influences. However, for females, having an antisocial partner predicted an affiliation with antisocial peers, and that in turn predicted adult crime. For males, having an antisocial partner was associated with less partner warmth, which in turn predicted an affiliation with antisocial peers, itself a proximal predictor of adult crime. Sexual abuse also predicted adolescent antisocial behavior, but only for males, supporting what some have called “a delayed-onset pathway” for females, whereby the exposure to early risks produce much later developmental outcomes.

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Keywords

child abuse; adult crime; partners; peers; gender differences

Introduction

Child abuse is a well-established risk factor for later social, emotional, and behavioral problems over the life course (Cicchetti & Lynch, 1995; T. I. Herrenkohl, 2011; Masten et al., 2005; Rogosch, Oshri, & Cicchetti, 2010; Wildeman et al., 2014). Research has shown that child abuse is a particularly salient risk factor for antisocial behavior and adult crime (Allwood & Widom, 2013; Jung, Herrenkohl, Klika, Lee, & Brown, 2015; Klika, Herrenkohl, & Lee, 2012; Thornberry, Henry, Ireland, & Smith, 2010; Widom & Maxfield, 2001). For example, using prospective data from a sample ($N = 1,196$) in a metropolitan area in the Midwest, Widom and Maxfield (2001) identified an association between child abuse and adult crime later in adulthood. In fact, 42% of the participants in that study who had been physically or sexually abused and neglected as children were arrested for crimes in adulthood (up to age 33), compared to about 33% of the matched controls. Additionally, Moffitt and Caspi (2001) found that abusive parenting practices, such as smacking or hitting a child, and depriving a child of necessities, not only predicted more crime in adulthood, but also more serious and persistent crime over many years.

While findings like these have helped establish a link between child abuse, particularly physical and sexual abuse, and later crime and criminal involvement during adulthood, the developmental pathways that underlie this link are not well understood (Bender, 2010; Burnette, Oshri, Lax, Richards, & Ragbeer, 2012; Cullerton-Sen et al., 2008; T. I. Herrenkohl, Huang, Tajima, & Whitney, 2003). There is some evidence that child abuse increases the early onset of conduct problems and that these problems, once established, can lead to more serious forms of antisocial behavior (e.g., delinquency and crime) as children transition through adolescence into adulthood (Cullerton-Sen et al., 2008; T. I. Herrenkohl, Tajima, Whitney, & Huang, 2005; Jaffee, Caspi, Moffitt, & Taylor, 2004; Klika et al., 2012; Loeber & Farrington, 2000; Maxfield & Widom, 1996; Moffitt & Caspi, 2001; Smith & Thornberry, 1995; Topitzes, Mersky, & Reynolds, 2011). As one example, Widom, Schuck, and White (2006) found that child abuse and neglect predicted adolescent antisocial behavior and that adolescent antisocial behavior predicted later violent crime.

The life course model of antisocial behavior posited by Sampson and Laub (Sampson & Laub, 1990, 1993; Sampson & Laub, 1997; Simons, Stewart, Gordon, Conger, & Elder, 2002) helps explain how early antisocial behavior, as a consequence of child abuse, can lead to adult crime. According to the theory, early onset of antisocial behavior weakens a child's bond to prosocial others, which tend to deter delinquency and crime. Unrestrained by prosocial bonds, and possibly reinforced by antisocial peers, that child's behavior can progress to more serious forms of antisocial behavior, if not remediated. Sampson and Laub proposed that the relative salience of different socializing units varies across developmental periods (Sampson & Laub, 1990, 1993) and that antisocial behavior is tied to how a child is socialized over time. As a child grows older, socializing influences of the family give way to

peers and adults outside the home. While there is individual variability in how this dynamic unfolds during adulthood, it is expected that spouses and intimate partners are particularly influential at this time (Capaldi, Kim, & Owen, 2008; Jaffee, Lombardi, & Coley, 2013; Rhule-Louie & McMahon, 2007; Sampson & Laub, 1990, 1993; Sampson, Laub, & Wimer, 2006; Simons et al., 2002). This basic proposition—that antisocial partners and the quality of romantic relationships influence crime to a greater extent in adulthood than do others—has been empirically supported in several studies: their own (Sampson & Laub, 1990, 1993; Sampson et al., 2006) and those of others (Capaldi et al., 2008; Jaffee et al., 2013; Rhule-Louie & McMahon, 2007; Simons et al., 2002).

In addition, an emerging understanding in the crime literature highlights the role of peers in the continuity of antisocial behavior. There have been many studies of antisocial peer influences on delinquency and crime among *adolescents* (Dishion, Spracklen, Andrews, & Patterson, 1996; Gifford-Smith, Dodge, Dishion, & McCord, 2005; Matsueda & Anderson, 1998; Thomas & McGloin, 2013), but relatively few of peer influences on *adult* crime (Capaldi et al., 2008; Simons et al., 2002; Warr, 1998; Wright, Caspi, Moffitt, & Silva, 2001). There are, however, a few studies on the topic worthy of mention. For example, Wright et al. (2001) found that antisocial peer influences were associated with increased criminal involvement at age 21 among participants of the Dunedin Multidisciplinary Health and Development Study. Using data from a community-based sample of 206 young men at risk for delinquency, Capaldi and colleagues (2008) found that having antisocial peers predicted more criminal arrests during young adulthood, even after accounting for partner influences. These findings raise the possibility that peer influences may play as much a role as do spouses and other intimate partners in promoting crime in adults, although this proposition has not been tested, particularly in the context of child abuse experience.

In one study, Simons et al. (2002) investigated a developmental pathway for antisocial behavior that conceptually links early onset antisocial behaviors, antisocial adult partners, the quality of adult romantic relationships, and antisocial peers. In that study, informed by the notion of “assortative mating” (Knight, 2011; Rhule-Louie & McMahon, 2007), Simons and colleagues proposed that individuals who have a history of early antisocial behavior will develop intimate relationships in adulthood with others who have a similar behavior history. Furthermore, they posited that individuals in an intimate relationship with an antisocial partner are likely to experience less support from their partner, since antisocial partners “are likely to be self-centered and difficult, thereby decreasing the chances of a committed, supportive relationship.” As a result, it is expected that the poor quality of this intimate relationship will promote and reinforce crime in those already so inclined. Romantic partners are also, according to the authors, expected to predict adult criminal behavior indirectly by influencing other relationships in an individual's social circle, including peers. In the same study, they reported empirical evidence supporting the proposed path. Yet, very little is known about whether the pathways articulated by Simons et al. (2002) may explain the influence of partners and peers during adulthood on antisocial behavior, particularly beyond the normative peak age that is triggered by child abuse measured many years earlier.

Building on the life-course model of antisocial behavior and the prior studies discussed above, the current investigation focuses on the life course process of antisocial behavior as

the developmental pattern underlying the link between physical, emotional, and sexual child abuse and crime during adulthood. Specifically, we hypothesize that child abuse of various forms will increase an individual's initial vulnerability to antisocial behavior during childhood, which is in line with prior empirical studies (Allwood & Widom, 2013; Jung et al., 2015; Klika et al., 2012; Thornberry et al., 2010; Widom & Maxfield, 2001; Widom et al., 2006). Antisocial behavior during childhood that is triggered by child abuse will, in turn, predict antisocial behavior in adolescence, as suggested by the life course model of antisocial behavior introduced earlier (Loeber & Farrington, 2000; Sampson & Laub, 1990, 1993; Sampson & Laub, 1997). Adolescent antisocial behavior is hypothesized to predict an individual's affiliation with an antisocial partner during adulthood, which will, in turn, predict quality of romantic relationship, assessed in our study as partners' warmth, as informed by "assortative mating" (Knight, 2011; Rhule-Louie & McMahon, 2007) and Simons' conceptualization of the relationship between antisocial partners and quality of romantic relationships (Simons et al., 2002) discussed above. Building on discussions of a link between partner and peers during adulthood (Capaldi et al., 2008; Simons et al., 2002; Warr, 1998; Wright et al., 2001), a partner's warmth is hypothesized to influence an individual's affiliation with antisocial peers, which ultimately predicts crime and criminal involvement during adulthood.

Gender Differences

Findings of several published studies point to possible gender differences in the association between child abuse and crime (Bender, 2010; Daly & Chesney-Lind, 1988; Fagan, 2001; Howell, 2003; Johansson & Kempf-Leonard, 2009; Silverthorn & Frick, 1999).

Unfortunately, the knowledge base on gender differences remains generally lacking and often mixed—either at a conceptual level or an empirical level (Bender, 2010; Burnette et al., 2012; Cullerton-Sen et al., 2008; Fagan, 2001; T. I. Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008; Herrera & McCloskey, 2001; Widom et al., 2006). Some have conceptualized that child abuse is a more salient “gendered” predictor of antisocial behavior in a sense that child abuse is a potent risk factor, particularly for *girls'* involvement in antisocial behaviors (Chesney-Lind & Shelden, 2004; Giordano, Deines, & Cernkovich, 2006). Supporting this notion, Burnette et al. (2012) found that harsh parenting (which, in the extreme, qualifies as child abuse) was a statistically significant predictor of adolescent antisocial behavior for *girls* but not for boys. Furthermore, some have noted that such “gendered” influence of child abuse on *girls'* antisocial behavior may differ by abuse type. For example, Cullerton-Sen et al. (2008) reported that there were no gender differences with respect to the impact of physical abuse on adolescent aggression, whereas *sexual abuse* predicted relational aggression only for *girls*.

On the other hand, it has been also posited that child abuse is a more salient “gendered” predictor of antisocial behaviors in *boys*. For example, Chodorow, among others, has suggested that abused girls will be more inclined than boys to internalize the stress and emotional hardship of being maltreated because they are socialized to direct their feelings inward. When exposed to risk, girls react by becoming depressed or anxious, whereas boys, socialized to be more confrontational and outwardly aggressive, will routinely show their emotional pain through behaviors that bring them into contact with law enforcement (Broidy

& Agnew, 1997; Zahn, 2009). Supporting this notion of gender differences in socialization, Widom (1998) found that *boys* exposed to child abuse were more likely to be involved in antisocial behavior than girls. To add to the complexity, Moffitt et al. (2001) reported that harsh parenting increased adolescent antisocial behaviors for both genders.

Further, there has been some suggestive evidence that gender differences exist not only in the main relationship between child abuse and antisocial behavior but also its intervening developmental pathways. For example, it has been noted that the adverse consequences of child abuse might surface at different developmental periods for males and females. Silverthorn and Frick (1999) proposed a “*delayed-onset pathway*” for females, whereby antisocial behavior begins *later* for *females*. Consistent with this perspective, Topitzes et al. (2011) found that child maltreatment predicted juvenile delinquency for males, leading to adult arrests at age 24. The same study found that, for females, child maltreatment was not predictive of juvenile delinquency, but it was predictive of adult arrest. Widom et al. (2006) reported that child physical or sexual abuse (coupled with child neglect) were predictive of early aggression and later violent arrests for males but not for females, although there was no evidence of a “*delayed-onset pathway*” necessarily for females as there was in the Topitzes study.

Potential gender differences with respect to partner influences on adult antisocial behavior have been also noted and tested in multiple empirical studies and findings are often mixed; that is, some studies have found that the association of antisocial partners and adult criminal behavior is stronger for *females* (Simons et al., 2002; van Schellen, Apel, & Nieuwbeerta, 2012), whereas others show that *males* are influenced more (King, Massoglia, & MacMillan, 2007; Rhule-Louie & McMahon, 2007). To add to the confusion, certain studies suggest that the influence of romantic relationships on antisocial behavior does not differ across two genders (Allwood & Widom, 2013). Potential gender differences have been also proposed with respect to antisocial peer influence on adult antisocial behavior but have been examined in a very limited way (Simons et al., 2002; Warr, 1998). In particular, Bender (2010) proposed that peer factors are likely more relevant for *males'* antisocial behaviors when there is a history of child maltreatment. However, the hypothesis appears not to have been tested empirically, suggesting the need for more inquiry into the issues and dynamics already mentioned (Topitzes et al., 2011).

Building on our current knowledge base, we generated four gender-specific hypothesized pathways from child abuse to adult crime. Given that theoretical conceptualization on this topic is still emerging and empirical findings on this topic are often mixed (Bender, 2010; Burnette et al., 2012; Cullerton-Sen et al., 2008; Fagan, 2001; T. I. Herrenkohl et al., 2008; Herrera & McCloskey, 2001), our gender difference hypotheses include non-directional hypotheses, and even when a direction for each hypothesis will be stated, they are exploratory in nature.

H1—Guided by discussions about potential gender differences in the degree of the association between child abuse and adult crime (Bender, 2010; Daly & Chesney-Lind, 1988; Fagan, 2001; Howell, 2003; Johansson & Kempf-Leonard, 2009; Silverthorn & Frick, 1999) and findings from Cullerton-Sen et al. (2008), we hypothesized that (a) sexual abuse

will have a direct impact on antisocial behavior for females but not for males, and (b) there will be no gender differences with respect to the impact of physical and emotional abuse.

H2—Building on the conceptual notion of a “delayed-onset pathway” among females with a child abuse history and its related studies (Silverthorn & Frick, 1999; Topitzes et al., 2011; Widom et al., 2006) and findings from Cullerton-Sen et al. (2008), we hypothesized that the impact of sexual abuse on either child or adolescent antisocial behavior will be stronger for males whereas for females its influence will be delayed to adulthood.

H3—Building on suggestive empirical evidence indicating divergent influence of partners on antisocial behavior across genders in a crime literature (Allwood & Widom, 2013; King et al., 2007; Rhule-Louie & McMahon, 2007; Simons et al., 2002; van Schellen et al., 2012), we hypothesized that the relative salience of partner-related characteristics, including partner's risk-taking behavior and warmth, will differ across genders either as partners directly promote or limit adult antisocial behavior, or as they indirectly predict adult antisocial behavior by influencing peers.

H4—Consistent with a prior conceptual discussion (Bender, 2010) in the context of child abuse history, we hypothesized that affiliation with antisocial peers will have a stronger association with increased criminal involvement among males compared to their female counterparts.

Figure 1 visually presents a model of hypothesized pathways linking child abuse to adult crime, and the dotted lines represent the four gender-specific hypotheses listed above. Given that the current knowledge base in the topic area of gender differences is yet to be consolidated, gender differences in all the remaining paths were also tested and reported in the current study.

Method

Participants

Data are from the Lehigh Longitudinal Study, a prospective longitudinal study examining long-term developmental outcomes subsequent to child maltreatment. Participant families in the Lehigh Longitudinal Study were recruited in 1973 - 1974 in two counties of eastern Pennsylvania by two county child welfare agencies who referred to the study all new and some ongoing cases in which there was at least one abused or neglected child 18 months to 6 years of age in the home. The fully integrated sample included children from child welfare agency abuse and neglect caseloads ($n = 249$) and other childcare settings including Head Start centers, daycare, and nursery programs ($n = 208$). Data were collected during “preschool” (1976 - 1977, 18 months to 6 years of age), “school-age” (1980 - 1982, 8 - 11 years of age), “adolescence” (1990 - 1992, 18 years of age on average), and “adulthood” (2010, 36 years of age on average) waves. Trained interviewers conducted face-to-face interviews with parents (preschool and school-age assessments) and with parents and youth (adolescence assessment). For the adult wave of the study, Computer Assisted Personal Interviewing (CAPI) was also used, where the survey programmed on laptop computers was administered. Analyses presented here build on data from all four waves of data collection.

Out of those still living, approximately 80% of the original sample ($N = 357$) participated in the 2010 interview. A total of 14 participants (about 5% of the overall sample) were no longer living at the time of the adult assessment in 2008 - 2010. Analyses of sample retention showed that, although more of the original child welfare abuse group was lost to attrition, there were no significant group differences in gender, age, childhood SES, or ratings of neglect or parent-reported physically abusive discipline (R. C. Herrenkohl, Egolf, & Herrenkohl, 1997). More details about the sample are provided in prior published papers (R. C. Herrenkohl, Herrenkohl, Egolf, & Wu, 1991; T. I. Herrenkohl, Hong, Klika, Herrenkohl, & Russo, 2013; T. I. Herrenkohl, Klika, Herrenkohl, Russo, & Dee, 2012). Since one of the main developmental pathways linking child abuse to adult crime in our study is romantic partners, participants who didn't have a partner at the adulthood wave of data collection were excluded from the analyses, bringing the final analysis sample to 297 study participants.

As with the original sample, the analysis sample is evenly distributed across two genders (48.8% female). The racial and ethnic composition of the analysis sample ($n = 297$) is consistent with the original sample—the majority of participants are European American (80.5%). More than half of the analysis sample (58.6%) lived below the federal poverty threshold during the “preschool” wave of data collection.

Measures

Outcome (adulthood wave, 36 years old)—Adult crime was based on 29 dichotomous items assessing participants' involvement in criminal activities during the past year, including a wide range of law-violating behaviors. Example criminal activities include ‘purposely damaged or destroyed property,’ ‘been involved in a gang fight,’ and ‘used force or strong-arm methods to get money or things from people.’ The endorsed items were added up and then were recoded to 0, 1, 2, or 3 or above since few participants exceeded this range.

Focal predictor (preschool wave, 18 months to 6 years)—Child abuse. Three different types of abusive parental discipline, the main exogenous variable in the proposed analysis, were reported by parents in the preschool-age wave. **Physical abuse** is based on 12 items assessing the frequency of physically abusive discipline by caregivers in the last 3 months and prior to that last 3 months. Example items include shaking a child, slapping a child's face, and burning a child. **Emotional abuse** is based on eight items assessing the frequency of emotionally abusive discipline by caregivers during the last 3 months. Example items include taking meals away from a child, embarrassing a child in front of others, and threatening to send a child away. **Physical and emotional abuse** were combined into a dichotomous variable representing whether a respondent experienced physical and/or emotional abuse in the assessment period. **Sexual abuse** is based on a combination of participants' retrospective reports of having been sexually abused by caregivers in childhood (prior to age 18 years) from both the adolescent and adult waves of the study. A positively endorsed response either at the adolescent survey or at the adult survey was assigned 1 (yes), and 0 (no) otherwise. Of note, reflecting findings from Cullerton-Sen et al. (2008), the

sexual abuse variable is modeled apart from physical and emotional abuse since it was hypothesized to behave differently from physical and emotional abuse across genders.

Developmental pathway measures

Antisocial behavior during childhood and adolescence—*Childhood antisocial behavior (school age wave, 8 - 11 years of age)* was assessed through a modified version of the Child Behavior Checklist (Achenbach, 1978, 1988), which was completed by parents during the school-age wave of the study. Twenty-eight items tap into child aggression and delinquency in the past year. Example items include ‘cruel,’ ‘destroys things,’ ‘vandalizes,’ and ‘steals,’ which were assessed using a 3-point scale (0 = not true; 1 = somewhat true; 2 = very true or often true). The items form the two subscales (Cronbach’s $\alpha = .84$ and $.71$, respectively). Items were standardized and then were summarized into a single composite scale of antisocial behavior during childhood.

Adolescent antisocial behavior (adolescence wave, 18 years of age on average) is based on 39 lifetime antisocial behaviors including acts such as stealing, breaking and entering, and property damage, which were reported by youth at the adolescent survey. Positively endorsed responses were assigned 1, and 0 otherwise, and were summed into a single summary measure of adolescent antisocial behavior for consistency with earlier publications (Moylan et al., 2010) and with the scaling strategy used in the National Youth Survey (Elliott, 1987) from which items and scales for the current study were selected.

Partners and peers during adulthood—*Partner’s risk-taking behavior (adulthood wave, 36 years of age on average)* is based on five binary items (1 = yes, 0 = no) asking about the presence or absence of partners’ involvement in delinquent behavior, including substance use, violence, and criminal involvement. Items include, for example, “During past year did partner regularly drink alcohol heavily?”, “During past year did partner regularly physically beat or seriously hurt people?”, and “During past year did partner regularly commit serious crimes?” Endorsed items were summed into a summary composite variable indicating degree of partners’ involvement in risk-taking behavior.

Partner’s warmth (adulthood wave, 36 years of age on average) is based on six items assessing participant’s perceived emotional support from their partner and their assessment of the quality of the relationship. Items include, for example, “On average, about how often do you receive informal emotional support from your partner?”, “How much warmth and affection have you received from your spouse/partner or boyfriend/girlfriend?”, and “How much support and encouragement have you received from your spouse or partner/boyfriend or girlfriend?” Items are assessed using a 4-point (0 = poorly; 1 = so-so; 2 = well; 3 = very well) or 5-point (0 = very little; 1 = not too much; 2 = some; 3 = quite a bit; 4 = a great deal) scale. All items were standardized to ensure a common metric and equal weight across items. The standardized items were averaged into a single composite measure representing this construct (Cronbach’s $\alpha = .89$).

Antisocial peers (adulthood wave, 36 years of age on average) is based on 10 items assessing participant’s perception of their peers’ endorsement of antisocial behaviors. Items include, for example, “How would close friends react to you if you sold hard drugs?”, “How

would close friends react to you if you hit/threatened to hit someone without reason?”, and “How would close friends react to you if you damaged/destroyed property not belonging to you?” Items are evaluated using a 5-point Likert scale (0 = strongly disapprove; 1 = moderately disapprove; 2 = neither approve nor disapprove; 3 = moderately approve; 4 = strongly approve). All items were standardized to ensure a common metric and equal weight across items. The standardized items were averaged into a single composite measure tapping into this construct (Cronbach's alpha = .88).

Covariates

Covariates include childhood socioeconomic status (SES), a standardized composite measure of parents' occupational status, educational level, family income, and total rooms in the family's home, which were assessed during the preschool wave of the study; **gender** (1 = female; 2 = male); and **official child welfare involvement** (0 = no; 1 = yes).

Results

Analysis Plan

The analysis strategy was divided into two parts. First, hypothesized pathways from child abuse to adult crime were tested for in the full sample of 297. Second, a multiple-group analysis framework was used to evaluate potential gender differences in the degree to which abuse leads to crime in the same ways for males and females.

Gender differences in the structural paths were tested by examining whether imposed equality restrictions on each structural path coefficient across genders significantly worsen model fit. A ‘*configural path model*’ was estimated first as a base model-the same pattern of path was specified across genders but all path coefficients in the model were allowed to vary across genders. The fit of this configural path model was then compared to the fit of a more constrained model, where each path coefficient of interest was constrained to be equal across genders, in order to test whether an equality restriction on a specific path coefficient of interest across genders significantly worsens the model fit. The difference in model fit across two models was tested using a modified χ^2 difference test, known as the DIFFTEST option in Mplus version 7.1 (Muthén & Muthén, 1998-2012), since we used a weighted least-squares parameter estimator (WLSMV) to take into account the categorical nature of an endogenous variable. For all the models, multiple fit indexes were used to evaluate whether a model appropriately fits the data, including comparative fit index (CFI) .95 (Hu & Bentler, 1999), root-mean-square error of approximation (RMSEA) .06 (Hu & Bentler, 1999), and weighted root mean square residual (WRMR) 1.0 (Yu, 2002) as guidelines for excellent fit. Missing data were handled with full-information maximum likelihood (FIML), a recommended method to handle missingness (Schlomer, Bauman, & Card, 2010) that is available in Mplus.

Descriptive Statistics

Table 1 shows means or percentages related to the main exogenous variable, child abuse, the main endogenous variable, adult crime, and developmental pathway variables for the full sample and then by gender. A larger percentage of males (65.10%) than females (50%) were

identified as having experienced physical and/or emotional abuse ($\chi^2 = 6.94$, $df = 1$, p -value = .008). Also of note, a much larger percentage of females (57.60%) than males (27.30%) were identified as having been sexually abused ($\chi^2 = 26.50$, $df = 1$, p -value = .000).

Evaluation of the Hypothesized Pathways

Figure 2 presents unstandardized coefficients and standard errors from the model testing the hypothesized pathways depicted in Figure 1 using the data from the full analysis sample. Physical/emotional abuse as well as sexual abuse were associated with antisocial behavior during childhood, which, in turn, predicted antisocial behavior during the adolescent assessment. Antisocial behavior at age 18 was associated with having a risk-taking partner at age 36, which was negatively associated with partner's warmth. A partner's risk-taking behavior increased the participant's affiliation with antisocial peers in adulthood, which in turn predicted more risk for adult crime. Note that in the conceptual model depicted in Figure 1 we considered that there might be an unmediated direct effect from child abuse to adult crime. As shown in Figure 2, the effects of sexual abuse on adult crime remained significant even after taking into account all other variables in the model. This was not the case for physical/emotional abuse, which was fully mediated. Also noteworthy is the lack of direct effects on adult crime for partner's warmth. Also, in the full group analysis, partner's warmth was not predictive of participants' affiliation with antisocial peers or their involvement in crime during adulthood. Out of these developmental pathways, indirect tests indicated that the impacts of emotional and physical abuse were mediated via antisocial behaviors during childhood and adolescence as well as affiliation with antisocial peers during adulthood at a trending level ($b = .01$, p -value = .087). As for sexual abuse, its impacts on adult crime were mediated via antisocial behaviors during childhood and adolescence as well as affiliation with antisocial peers during adulthood at a trending level ($b = .01$, p -value = .076); via antisocial behavior during adolescence and affiliation with antisocial peers during adulthood at a trending level ($b = .03$, p -value = .052); and via antisocial behaviors during adolescence, partner risk-taking behavior, and affiliation with antisocial peers during adulthood at a trending level ($b = .01$, p -value = .085).

Evaluation of Gender-specific Hypothesized Pathways

Figure 3 presents unstandardized coefficients and standard errors for each gender from that model. Subsequent multiple-group analysis provided partial support for our four gender-specific hypotheses.

Our gender-specific hypothesis 1 posited a direct influence of sexual abuse on adult crime for females, but not for males (H1 in Figure 1). As shown in Figure 3, the path from sexual abuse to adult crime for females was statistically significant, whereas the same path was not for males. A multiple-group analysis revealed that there were gender differences in this direct path at a trending level ($\chi^2 = 2.85$, p -value = .09).

Our gender-specific hypothesis 2 concerns a "delayed-onset pathway" among females with child sexual abuse history, and thus posited that the path from child sexual abuse to antisocial behaviors during earlier developmental periods, namely childhood (8 - 11 years of age) and adolescence (18 years of age), might be stronger for males (H2-1, H2-2, and H2-3

in Figure 1). The notion of a delayed-onset pathway was supported particularly in the context of sexual abuse. As shown in Figure 3, the path from sexual abuse to antisocial behavior during adolescence (H2-2 in Figure 1) was statistically significant for males, whereas the same path was not statistically significant for females. A multiple-group analysis revealed that there is indeed a statistically significant gender difference in this path ($\chi^2(1) = 4.29$, $p\text{-value} = .04$). On the other hand, the path from sexual abuse to adult crime (H2-3 in Figure 1) was statistically significant for females, whereas the same path was not statistically significant for males. A multiple-group analysis revealed that there were gender differences in this direct path at a trending level ($\chi^2 = 2.85$, $p\text{-value} = .09$).

Hypothesis 3 suggested gender differences would exist in the direct and indirect effects of partner's risk-taking behavior and warmth on crime in adulthood. Two paths, represented as H3-1 and H3-3 in Figure 1, concern direct influences of partner's risk-taking behavior and warmth on adult crime. Two more paths, represented as H3-2 and H3-4 in Figure 1, pertain to the indirect influences of partner characteristics on later crime at age 36 via their influence on participants' affiliation with antisocial peers. As shown in Figure 3, for both genders the influences of partner's risk-taking behavior and warmth on adult crime at age 36 were completely mediated through an individual's affiliation with antisocial peers. On the other hand, different aspects of partner characteristics emerge as important influences on an individual's peer network across genders. For males, a partner's risk taking predicted less warmth, which then predicted an individual's affiliation with antisocial peers (a multiple-group analysis: $\chi^2 = 9.3$, $p\text{-value} = .002$ and $\chi^2 = 3.43$, $p\text{-value} = .06$, respectively). For females, the partner's risk-taking behavior directly influences an individual's affiliation with antisocial peers (a multiple-group analysis: $\chi^2 = 5.50$, $p\text{-value} = .019$).

Finally, hypothesis 4 suggests that an individual's affiliation with antisocial peers will have a stronger association with increased criminal involvement among males, compared to females (H4 in Figure 1). As shown in Figure 3, the path from an individual's affiliation with antisocial peers to crime at age 36 was statistically significant for both males and females. A multiple-group analysis indicated that there were no gender differences in this path ($\chi^2(1) = .05$, $p\text{-value} = .82$).

Gender differences in all the remaining paths not directly related to our four hypotheses were also tested and are presented in Figure 3.

Discussion

The link between child abuse and adult crime has been widely established in the relevant literature. However, current knowledge of this link is limited in two potentially important ways. First, little is known about developmental pathways through which child abuse is linked to adult crime. Second, little consensus exists regarding gender differences in the linkage between child abuse experience and adult antisocial behavior or in its mediating paths. The present study speaks to these gaps by investigating a model linking child abuse to crime at age 36 which is conceptually guided by the life course model of antisocial behavior.

Results from the full-group analysis provide empirical evidence supporting the main premise of developmental pathways linking child abuse to adult crime via its punitive initial link to early onset of antisocial behavior, having a risk-taking partner, having compromised quality of romantic relationship, and being affiliated with antisocial peers. These findings are consistent with the tenets of the life course model of antisocial behavior (Sampson & Laub, 1990, 1993; Sampson & Laub, 1997; Simons et al., 2002) and thus indeed have predictive capacity for explaining the link between child abuse experience and adult criminal involvement by demonstrating that childhood abuse experience does seem to trigger the life course process of antisocial behavior which includes an individual's persistent involvement in antisocial behavior and compromised social network.

Tests for gender differences provided further insight into the hypothesized link between child abuse and adult crime. The current findings show that sexual abuse has an unmediated effect on adult crime for females. The current findings indicate that exposure to sexual abuse potentially functions as a critical entry point to the life course of antisocial behavior, particularly for *girls*. This finding extends those of other studies showing a link between sexual abuse and aggression in adolescence for girls (Cullerton-Sen et al., 2008) to criminal involvement in adulthood and suggests that sexual abuse, rather than other types of child abuse, is likely to function as a highly “gendered” factor (Chesney-Lind & Shelden, 2004; Giordano et al., 2006).

Relatedly, a ‘delayed-onset pathway’ hypothesis among females with child abuse history (Silverthorn & Frick, 1999; Topitzes et al., 2011; Widom et al., 2006) was supported for sexual abuse in the present study. The notion of gender socialization (Chodorow, 1978) and changes in the sources of gender socialization (Ryle, 2011) might explain such ‘delayed-onset’ of the detrimental impact of sexual abuse on antisocial behaviors among females. Girls might not resort to antisocial behaviors as their primary expression of emotional hardship during childhood and adolescence, since gender scripts for girls suggest that antisocial behavior is unacceptable (Chodorow, 1978). The saliency of earlier gender scripts on antisocial behaviors, however, might wane later in life, as one's thought about gender might be reshaped through another round of socialization process under the influence of socializing groups other than family (for example, peers) (Ryle, 2011). The groups other than family are “generally larger, more temporal, more interpersonal, and more specialized than primary groups” (Ryle, 2011, p. 153). In our study, physical and emotional abuse increases one's affiliation with antisocial peers during adulthood. Considering this in the context of gender socialization and its change over one's life course, girls with history of exposure to child abuse might experience another round of socialization under the influence of antisocial peers regarding social norms about antisocial behaviors as they reach adulthood. The antisocial peers might endorse antisocial behaviors as a socially acceptable way to cope with stress related to earlier sexual abuse experience, thereby resulting in the “delayed onset” of the exposure to sexual abuse. The question remains why a ‘delayed-onset pathway’ process operates more prominently with sexual abuse but not with physical and emotional abuse, which suggests a fruitful direction for future research.

Results showed that different aspects of partner-related characteristics emerge as important in the hypothesized link across genders. For males, a warm and caring romantic relationship

functions as a protective developmental pathway against adult crime by deterring males from antisocial peers during adulthood, whereas for females it does not provide such protection. This finding is consistent with past research reporting that romantic relationships reduced an individual's involvement with antisocial peers only among males (Simons et al., 2002).

Multiple-group analyses also revealed that adult antisocial peers play a significant role in adult crime for both genders. The finding provides an empirical test of Bender's (2010) proposition suggesting that, for males with a history of exposure to child maltreatment, peer factors might be more relevant for antisocial behavior outcomes during adolescence. The study findings here indicate that Bender's hypothesis is not supported in the current study of child abuse consequences on adult crime beyond its normative peak age. The current finding is, however, consistent with some prior studies in a broad antisocial literature, such as the one by Simons et al. (2002). Our research corroborates that more attention to an individual's affiliation with antisocial peers, which has been relatively ignored in the context of child abuse and subsequent adult crime, is needed to disrupt the stability in antisocial behavior over the life course among those with child abuse history.

These findings should be understood in the context of study limitations. First, our child abuse measures were derived from caregivers' self-reports. Although there is an ongoing debate about relative validity of self-report measures compared to official, self-reports also have been reported to produce valid and reliable information on child maltreatment (Smith, Ireland, Thornberry, & Elwyn, 2008). Second, all the adult measures, including having a risk-taking partner, being in a warm and caring relationship, being exposed to antisocial peers, and adult crime, were measured at age 36. The order of these constructs was conceptually driven and theoretically guided by the life course model of antisocial behavior and multiple prior studies, and a temporal order among these variables during adulthood was not technically present. Finally, the study sample is not nationally representative, and generalization of study findings should be interpreted with that understanding. A replication of study findings in a large sample will be a productive avenue for a future study.

The current study makes at least two significant contributions to the existing literature. First, by integrating child abuse literature with life course perspectives on antisocial behavior, the study conceptually articulates potential developmental pathways linking child abuse and adult crime. By capitalizing on longitudinal data spanning from childhood to adulthood, the current investigation provides a rigorous empirical test of the hypothesized pathway. Second, the current study tests four conceptually guided gender-specific hypotheses. These tests are particularly important given that empirical findings in this topic are just emerging (Bender, 2010; Burnette et al., 2012; Cullerton-Sen et al., 2008; Fagan, 2001; T. I. Herrenkohl et al., 2008; Herrera & McCloskey, 2001).

In taking this approach, this study found that physical and emotional abuse predicted adult crime indirectly through child and adolescent antisocial behavior as well as adult partners and antisocial peer influences for both genders. These findings suggest that the negative impact of child abuse on adult crime is indeed a developmental process that unfolds over an individual's life course spanning childhood, adolescence, and adulthood. Hence, our research

suggests that mitigating negative consequences of child abuse on adult crime can and should begin in varying developmental periods by targeting different forms of manifestation of antisocial behavior and/or different ecological contexts. Our research also suggests that antisocial peers during adulthood, along with partners, should be considered as important avenues for intervention and policies to disrupt the stability in adult crime triggered by earlier exposure to child abuse. The current study findings also suggest that having a risk-taking partner plays a significant role in the hypothesized pathway from child abuse to adult crime for females, whereas having a warm and caring relationship does for males, indicating that intervention efforts narrowly targeted at either aspect may not be effective in reducing adult crime among those with child abuse history. Intervention efforts that involve a broad spectrum of program components designed to nurture a warm and caring romantic relationship and then reduce partners' risk-taking behavior are needed to effectively promote desistence from antisocial behavior which was set in motion by child abuse.

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Figure 1. Hypothesized pathways linking child abuse to adult crime, gender-specific pathways noted

Note:

a.

----- Hypothesized pathways for both genders

..... Gender-specific hypothesized pathways

b.

H1: Gender-specific hypothesis 1 listed on page 11.

H2-1 to H2-3: Gender-specific hypothesis 2 listed on page 12.

H3-1 to H 3-4: Gender-specific hypothesis 3 listed on page 12.

H4: Gender-specific hypothesis 4 listed on page 13.

Figure 2. SEM model for the full analysis sample, unstandardized coefficients and standard error

Note:

a. Only statistically significant paths were presented. Regular font p-value < .05; *italic* p-value < .10.

Figure 3. SEM models by gender, unstandardized coefficients and standard error (females/males)

Note:

- Paths that are statistically significant for either gender are presented.
- Bold means statistically significant at p-value = .05 for each gender.
- Dotted lines mean statistically significant gender differences.

Table 1
Descriptive Statistics for Child Abuse and Adult Crime, by Gender

	Full sample			Females		Males	
	M/%	SD/n		M/%	SD/n	M/%	SD/n
Outcome							
Adult crime	0.42	0.77		0.40	0.74	0.44	0.8
Focal predictor							
Physical and emotional abuse	57.80%	171		50.00%	72	65.10%	99
Sexual abuse	42.20%	119		57.60%	80	27.30%	39
Developmental pathway measures							
Childhood antisocial behavior	-0.01	0.94		-0.24	0.77	0.19	1.03
Adolescent antisocial behavior	10.83	7.75		7.92	6.27	13.46	8.04
Partner's risk-taking behavior	0.62	0.86		0.67	0.9	0.57	0.83
Partner's warmth	-0.01	0.83		-0.17	0.98	0.15	0.63
Antisocial peers	0	0.69		-0.1	0.66	0.1	0.71