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Early Physical Abuse and Later Violent Delinquency: A Prospective Longitudinal Study

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Abstract

In this prospective longitudinal study of 574 children followed from age 5 to age 21, the authors examine the links between early physical abuse and violent delinquency and other socially relevant outcomes during late adolescence or early adulthood and the extent to which the child's race and gender moderate these links. Analyses of covariance indicated that individuals who had been physically abused in the first 5 years of life were at greater risk for being arrested as juveniles for violent, nonviolent, and status offenses. Moreover, physically abused youth were less likely to have graduated from high school and more likely to have been fired in the past year, to have been a teen parent, and to have been pregnant or impregnated someone in the past year while not married. These effects were more pronounced for African American than for European American youth and somewhat more pronounced for females than for males.

Keywords

physical abuse; violence; delinquency; problem behavior; longitudinal

Child maltreatment is an urgent public health problem for many reasons, not least of which concern the negative effects of early maltreatment on later social and psychological functioning. Of particular concern is the extent to which early physical abuse leads to later aggression and violence, that is, the extent to which “violence begets violence” (Widom, 1989). Although several studies have linked early maltreatment to later aggression and delinquency (e.g., Smith & Thornberry, 1995; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001), the connection between early physical abuse and adolescent violence, per se, is less clear. In addition, much of the literature on the sequelae of early abuse is beset by methodological limitations such as the use of retrospective reports of childhood maltreatment and samples that confound maltreatment with experience in the child protective services system. In the present study, we use a prospective longitudinal design with a community sample in which abuse was measured through in-depth interviews to examine the links between early

physical abuse and violent delinquency and other socially relevant outcomes during late adolescence (at age 18) or early adulthood (at age 21). We also examine the extent to which the child's race and gender moderate these links.

Early Physical Abuse and Later Aggression and Delinquency

Important insight into the links between early physical abuse and later aggression and delinquency has come from a series of longitudinal studies drawing on 676 abused or neglected children, according to substantiated cases recorded from 1967 to 1971, and 520 matched control children drawn from birth records and school records (Widom, 1992, 1998). All participants were interviewed between 1989 and 1995 when they were, on average, 29 years old. Participants who had been abused or neglected were 38% more likely than the matched controls to have been arrested for a violent crime (Widom, 1992). The abused or neglected participants were also 53% more likely to have been arrested as a juvenile. Physical abuse was more likely to lead to subsequent arrest for a violent crime than was sexual abuse or neglect (Widom, 1992). In a separate prospective longitudinal study of at-risk boys, Stouthamer-Loeber and her colleagues (2001) reported that boys with a history of abuse or neglect (defined as having a referral to children and youth services by age 18) were more likely to display overt disruptive delinquent behaviors and conflicts with authorities through late adolescence than were boys who had not been abused or neglected. Similarly, using data from the Rochester Youth Development Study, Thornberry and his colleagues (Ireland, Smith, & Thornberry, 2002; Smith & Thornberry, 1995; Thornberry, Ireland, & Smith, 2001) have found that substantiated abuse or neglect (according to child protective services records available from birth through adolescence) is related to delinquency, drug use, and other problem behaviors when adolescents are 14 to 18 years old.

Although groundbreaking, these studies are limited by their focus on children who were legally defined as abused or neglected and, as a result, who received child protective services (Widom, 1988). Although this method has the advantage of including only those children who were substantiated victims of maltreatment, it also has the disadvantage of confounding the experience of abuse with subsequent receipt of child protective services (e.g., possible removal of the child from his or her family of origin and placement into foster care). The focus on substantiated victims may also magnify the effects of abuse because those children who do come to the attention of child protection authorities are often those who have been most severely maltreated (Barnett, Manley, & Cicchetti, 1991). On the other hand, it is also possible that focusing on substantiated victims may lead to underestimates of effects of abuse because substantiated cases of child maltreatment typically underrepresent true prevalence (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998; Theodore et al., 2005), and unsubstantiated yet "real" cases of abuse may end up in the control group. Yet another problem is that including only substantiated cases places the focus on families that may be known to authorities for other reasons. For example, families in which a parent has a criminal record may be more scrutinized by child protective services, making future arrests more likely.

More recent prospective studies have drawn on community-based samples to illustrate a link between early abuse and later aggression. Grotevant and his colleagues (2006) found that early maltreatment (abuse, neglect, or both) predicted aggressive antisocial behavior at age 21. Brezina (1998) used data from a national sample of male public high school students to show that self-reported harsh parenting in Grade 10 was related to delinquency in Grade 11. Fagan (2003) found, using data from the National Youth Survey, that adolescent self-reports of abuse were related to criminal offending during adolescence and early adulthood. In a recent prospective longitudinal investigation using the same Child Development Project sample used in the present study, at age 16, children who were physically abused prior to kindergarten were rated by their mothers as being almost twice as aggressive as their nonabused counterparts

(Lansford et al., 2002). This study had the added advantage of controlling for a comprehensive set of relevant covariates (i.e., childhood socioeconomic status [SES], single-parent status, family stress, maternal social support, child exposure to violence, child temperament, and child health) that may, in other studies, have spuriously inflated associations between childhood abuse and later outcomes.

A number of other studies have corroborated the existence of a link between early physical abuse and later aggression and delinquency by demonstrating concurrent links between retrospectively reported abuse and such problems (e.g., Fergusson & Lynskey, 1997). The interpretation of these findings, however, is clouded by the possibility that current psychosocial functioning biases the recall of prior abuse (see Widom, Raphael, & DuMont, 2004). Similarly, studies relying on clinical samples have also found connections between early abuse (again, typically retrospectively reported) and later problems (e.g., Battle et al., 2004), yet the use of clinical samples can artificially inflate the effects of abuse by limiting the sample to those individuals whose later functioning requires clinical treatment.

In addition to the findings of main effects of physical abuse on subsequent aggression and delinquency, there is some evidence that maltreatment has worse effects on African American than on European American children and worse effects on females than on males. For example, in Widom's longitudinal study, rates of arrest for violent crimes by age 29 were higher for both African American and European American youth who had been abused or neglected than for those who had not been maltreated, but the difference was more pronounced for the African American youth. Furthermore, abuse and neglect were risk factors for arrests for violent crimes for females but not for males (Widom & White, 1997). The same pattern of findings was noted for problem alcohol use at age 29 (Widom, Ireland, & Glynn, 1995), which in itself is a risk factor for aggression and violence (Carr & VanDeusen, 2004; Gmel & Rehm, 2003). In our previous work, the effects of early physical abuse on aggression at age 16 were more pronounced for African American than for European American youth and for girls than for boys (Lansford et al., 2002). Although Fagan (2005) found few gender or ethnic differences in links between self-reported physical abuse at ages 11 to 18 and subsequent frequency of offending (up to ages 27 to 33), she did find that this link was moderated by family income, area of residence, and family structure.

Early Physical Abuse and Other Later Social and Psychological Problems

In addition to links between early physical abuse and later aggression and delinquency, the literature also demonstrates links between early physical abuse and numerous other subsequent social and psychological problems, including internalizing mental health problems such as depression and anxiety (e.g., Cicchetti & Rogosch, 1997; Rogosch, Cicchetti, & Aber, 1995), being the victim or perpetrator of violence in romantic relationships (Arias, 2004; Riggs, O'Leary, & Breslin, 1990), early sexual activity (Small & Luster, 1994), and problems at work (Sansone, Dakroub, Pole, & Butler, 2005). Our own previous work has illustrated that children who were physically abused prior to kindergarten were absent from school more than 1.5 times as many days than were nonabused children, were less likely to anticipate attending college than were nonabused children, and had levels of mother-reported anxiety or depression, dissociation, posttraumatic stress disorder symptoms, social problems, thought problems, and social withdrawal that were, on average, more than three fourths of a standard deviation higher than those of their counterparts who were not physically abused (Lansford et al., 2002). Understanding the extent to which physical abuse contributes to particular subsequent problems is an important task for the field, as is understanding the extent to which the effects of maltreatment on subsequent problems are moderated by factors such as race and gender.

The Present Study

In the present study, we sought to build on and extend the existing literature on the effects of early physical abuse on later aggression and delinquency by examining the links between early physical abuse and adolescent violent delinquency. Two main research questions guide the present study. First, does early physical abuse relate to violent delinquency in late adolescence and early adulthood, independent of potential confounding variables? We hypothesized that physical abuse would relate to violent delinquency, above and beyond the effects of other ecological and child risk factors. Generally, previous studies have not controlled for a wide range of demographic and other variables that could account for the effect of abuse (for examples of exceptions, see Grotevant et al., 2006; Widom & White, 1997). This lack means that differences in adjustment attributed to experiencing abuse or not could actually be the result of differences between these groups on other risk factors such as low SES, family stress, or difficult child temperament. Our second question was whether associations between early physical abuse and subsequent violent delinquency differ by race or gender. We hypothesized that physical abuse would have worse effects on African American than on European American youth and worse effects on females than on males. We also sought to examine the extent to which physical abuse affects violent delinquency, as opposed to other nonviolent delinquency and other types of aggression. From previous research, it appears that physical abuse is related to a wide array of subsequent problems, both violent and nonviolent. However, it is also possible that experiencing the violence of physical child abuse is an especially important predictor of subsequent engagement in violent delinquency. Last, given the broad range of problematic outcomes associated with early maltreatment, we examined the links between early physical abuse and late adolescent sequelae in four other domains: work, romantic relationships, parenthood, and mental health. This study's prospective longitudinal design, use of a community-based sample, focus on the effects of physical abuse (vs. maltreatment in general), and inclusion of a comprehensive set of relevant covariates help to overcome many limitations of previous research.

Method

Participants

The families in the current investigation were participants in the ongoing, multisite, longitudinal study called the Child Development Project (see Dodge, Bates, & Pettit, 1990). Participants were recruited when the children entered kindergarten in 1987 or 1988 at three sites: Knoxville and Nashville, Tennessee, and Bloomington, Indiana. Parents were approached at random during kindergarten preregistration and asked if they would participate in a longitudinal study of child development. About 15% of children at the targeted schools did not preregister. These participants were recruited on the first day of school or by subsequent contact. Of those asked, approximately 75% agreed to participate. At the first assessment, the sample consisted of 585 families. Males composed 52% of the sample. Of the sample, 81% were European American, 17% were African American, and 2% were from other ethnic groups. The present study includes only the European American and African American participants ($n = 574$) because there were too few participants from other ethnic groups to conduct meaningful comparisons. Follow-up assessments were annually conducted through age 21. Of the original 574 families, 81% ($n = 465$) provided age-21 data for the present analyses. The participants who provided age-21 data were of higher SES in kindergarten ($M = 41.51$, $SD = 13.60$) than were those who did not provide age-21 data ($M = 32.15$, $SD = 12.85$), $F(1, 567) = 45.03$, $p < .05$, and were more likely to be European American, $\chi^2(1) = 24.74$, $p < .001$, and female, $\chi^2(1) = 14.60$, $p < .001$.

Procedures and Measures

Early physical abuse—During the summer before the children entered kindergarten, detailed interviews regarding children's developmental history were conducted with mothers in their homes. Mothers responded to a variety of questions regarding the child's misbehavior, who typically dealt with the child's misbehavior, which discipline strategies were used, whether the parent ever used physical discipline, the most severe forms of physical discipline that were used, whether the child was ever disciplined severely enough that he or she may have been hurt, and whether the parent ever worried that someone may have harmed the child. For each of two eras in the child's life (age 12 months to 4 years and age 4 to 5 years), the mother was asked to openly respond to the question, "Do you remember any times that your child was hit severely enough by any adult to be hurt or to require medical attention? If so, describe these times. Describe the marks on your child." Following this discussion, interviewers paused to privately rate the probability that the child had been severely harmed, using a criterion of intentional strikes to the child by an adult that left visible marks for more than 24 hr or that required medical attention. A score of 0 was assigned if abuse had definitely not or probably not occurred, and a score of 1 was assigned if abuse had probably occurred or definitely occurred or if the authorities had been involved. Agreement between independent raters for this classification was 90% ($\kappa = .56$; see Dodge, Pettit, Bates, & Valente, 1995). A total of 69 children (11.8% of the sample; 27 European American boys, 24 European American girls, 11 African American boys, 7 African American girls) were classified as having experienced early physical abuse, a rate comparable to other reports using national samples (Straus & Gelles, 1990). All parents signed statements of informed consent before participating in the study and were aware that cases of abuse made known to the researchers would be reported as appropriate. Discussion of each child classified as abused was held in close collaboration with experts at relevant local agencies to determine which cases should be reported to the department of human services. Authorities had been involved with 7 of the 69 children classified as physically abused, and 6 new cases were reported to agencies; the other cases were determined not to be cases of ongoing abuse and imminent danger (and thus were not reportable in Tennessee or Indiana at that time).

Violent delinquency, nonviolent delinquency, and aggression—There were two measures of violent delinquency: self-reported violent delinquency and official court records of violent offenses. There were six measures of nonviolent delinquency and aggression: official court records of nonviolent offenses, official court records of status offenses, self-reported arrests, self-reported broad-band externalizing problems, and romantic relationship violence (perpetration and victimization).

Specifically, at the age-18 assessment, adolescents were asked how many times in the past 12 months they had engaged in each of 11 types of serious violence (e.g., threatened someone with a weapon, been in a gang fight, raped someone). Responses were summed to create an index of serious violent delinquency during late adolescence ($\alpha = .85$). Adolescents were also asked how many times in the past 12 months they had stolen something under five different circumstances (e.g., broke into a house, building, or car, secretly stole items). Responses were summed to create an index of serious nonviolent delinquency during late adolescence ($\alpha = .75$). Juvenile court record data were available from the time the participants were 5 years old through the age of 16 to 18 (depending on the participant's age in the calendar year in which court record data were last obtained; Cohort 1 participants were 17 to 18 years, and Cohort 2 participants were 16 to 17 years). A dichotomous variable indicated whether the participant had ever committed a violent offense (e.g., assault), a nonviolent offense (e.g., vandalism), a status offense (e.g., underage drinking), or any of these three types of offenses.

At the age-21 assessment, young adults were asked whether they had ever been arrested and charged with a misdemeanor or a felony; a composite arrest variable was created to reflect whether they responded yes to either question (0 = no, 1 = yes). An additional composite variable was created to reflect whether they had court records of committing any offenses or whether they self-reported being arrested and charged with a misdemeanor or felony. All young adults completed the 126-item Young Adult Self Report (Achenbach & Rescorla, 2003). They reported whether each item was *not true* (0), *somewhat or sometimes true* (1), or *very or often true* (2). To create a scale reflecting broad-band externalizing behavior problems, 28 items (e.g., steals, lies or cheats; gets in many fights) were summed ($\alpha = .87$).

Also, at the age-21 assessment, young adults who had been in a romantic relationship for at least 2 months ($n = 263$) completed an abbreviated version of the Conflict Tactics Scale (Straus, 1979) in which they used a 7-point scale (0 = *never*, 6 = *almost every day*) to indicate behaviors during disagreements with their romantic partner. Three items (i.e., whether the participant had threatened to throw something; pushed, shoved, or grabbed; or hit) were averaged to create a scale ($\alpha = .83$) reflecting whether the participant had been a perpetrator of romantic relationship violence. A comparable set of three items was averaged to create a scale ($\alpha = .91$) reflecting whether the participant had been a victim of romantic relationship violence.

Other social and psychological problems—At the age-21 assessment, young adults were asked whether they had graduated from high school and whether they had been fired or laid off in the past year; each was used as a single-item indicator of a socially relevant outcome (0 = no, 1 = yes). Young adults were asked whether, in the past year, they had smoked marijuana, sniffed or inhaled a substance, used cocaine or crack, used LSD or heroin, or tried any other way to get high; they were then asked about their use of each of these substances in the past 30 days. Items were summed to create a composite illicit drug use variable reflecting the sum of how many substances the participant had used in the past year and in the past 30 days (range = 0 to 10).

Questions regarding the age of the participant's first child (for the participants who had a child by the age of 21) and the participant's own age were used to create a variable reflecting whether the participant had been a teen parent (i.e., had a child before the age of 20). Questions regarding whether the participant had become pregnant or impregnated someone in the past year and the participant's marital status were used to create a variable reflecting whether in the past year the participant had become pregnant or impregnated someone while not married.

To create a scale reflecting internalizing problems, 24 items (e.g., nervous or tense, feels worthless) from the Young Adult Self Report (Achenbach & Rescorla, 2003) were summed ($\alpha = .91$).

Covariates—We controlled for sociodemographic, family functioning, and child behavior factors that have been shown to be related both to the likelihood that a child will be maltreated and to long-term adjustment (see Berger, 2004). In the course of the developmental interview conducted when the child was age 5, mothers were asked questions about a number of these risk factors. SES was based on an index computed from parental education and occupation levels and ranged from 11 (unskilled laborers, menial service workers) to 66 (major professionals; Hollingshead, 1979). Families were coded as headed by a single parent (0 = no, 1 = yes) on the basis of mothers' reports of who lived in the household at the time of the initial assessment. Family stress was coded by the interviewer on a 5-point scale (1 = *minimal challenge*, 2 = *little stress*, 3 = *moderate or average stress*, 4 = *somewhat stressful*, 5 = *severe and/or frequent challenges*) following questions regarding whether the family had experienced different types of major stressors (e.g., death of a family member, divorce) and how these changes affected the child. The rating was separately made for the period when the child was

1 to 4 years old and for the past year; ratings were averaged across these two periods. Maternal social support was coded by the interviewer on a 5-point scale (1 = *very isolated*, 2 = *somewhat isolated*, 3 = *normal support*, 4 = *well supported*, 5 = *very well supported*) following questions regarding mothers' social contact and who was available to help them in times of need. As with the stress variable, the rating was separately made for the period when the child was 1 to 4 years old and for the past year, and ratings were averaged across these two periods. Child exposure to violence was coded by the interviewer after mothers answered questions about the kinds of conflicts, arguments, or violence the child was exposed to between his or her parents, between others in the home, and outside the home (1 = *none*, 2 = *mild verbal*, 3 = *major verbal*, 4 = *mild physical or major verbal*, 5 = *physical more than once*). Three aspects of child temperament (i.e., resistance to control, unadaptability, and difficult temperament) were assessed using the 16-item Retrospective Infant Characteristics Questionnaire (Bates, Freeland, & Lounsbury, 1979; Bates, Pettit, Dodge, & Ridge, 1998). Each item was rated on a 7-point scale, with 1 representing *easy, adaptable temperament* and 7 representing *difficult, unadaptable temperament*; items were averaged to create the temperament scales. Finally, mothers were asked to describe the child's health during the prenatal through early postnatal period. Interviewers then rated whether the child was healthy at birth (coded as 1), had minor or brief problems (coded as 2), or had major health problems (coded as 3; for more details about these risk factor measures, see Deater-Deckard, Dodge, Bates, & Pettit, 1998).

Missing Data

Rates of missing data vary depending on the outcome and year of assessment. Missing data were handled through pairwise deletion. Rates of missing data ranged from 0% (for the initial assessment of physical abuse before kindergarten) to 55% (for being a victim or perpetrator of violence in the romantic relationship, as the relevant questions were asked of only the 45% of respondents who reported being in a romantic relationship for at least 2 months). For the remaining self-report outcomes at ages 18 and 21, the average rate of missing data was 20%, which primarily reflects the 19% attrition rate between the prekindergarten and age-21 assessments.

Results

Table 1 shows descriptive statistics and bivariate correlations among the variables. As shown, the outcomes were correlated in theoretically predictable ways. That is, the different indicators of adjustment problems at age 18 and age 21 were generally positively related to one another and to experiencing physical abuse in the first 5 years of life.

Main Effects of Physical Abuse on Violent Delinquency and Other Outcomes

For our first research question, we examined the main effect of early physical abuse on subsequent violent delinquency and other socially relevant outcomes. We tested our hypotheses using a series of 2 (abused: yes or no) \times 2 (race: European American or African American) \times 2 (gender: male or female) analyses of variance. Because some of the outcomes were dichotomous, we conducted supplementary chi-square analyses and logistic regressions to test the robustness of the ANOVAs with dichotomous outcomes (see Lunney, 1970, for a simulation study related to this issue). The findings across these three types of analyses were consistent. Therefore, to be consistent across outcomes, we report just the ANOVA results below. The main effects of abuse are summarized in Table 2. The first five columns show the main effects of abuse without controlling for other risk factors associated with abuse. The second five columns depict the main effects of abuse controlling for childhood SES, single-parent status, family stress, maternal social support, child exposure to violence, child temperament, and child health.

Consistent with hypotheses, adolescents who had been physically abused in the first 5 years of life were more likely to have been arrested as a juvenile for violent and nonviolent offenses, although they were not more likely to self-report serious violent or nonviolent delinquent behaviors. They were also more likely to be the perpetrator of romantic relationship violence and to have externalizing behavior problems. In addition, young adults who had been physically abused were at risk for nonviolent problem behaviors: They were less likely to have graduated from high school and were more likely to have been fired in the past year, to have been a teen parent, and to have been pregnant or to have impregnated someone in the past year while not married (see Table 2). As shown in the table, almost all of these effects were found both with and without the inclusion of the covariates. Although the inclusion of the control variables rendered the effect of abuse nonsignificant for two variables (perpetrating romantic relationship violence and externalizing problems during young adulthood), for all other outcomes the effect of abuse was attenuated but remained significant.

The differences, even after including the covariates, were sizable in magnitude. Adjusted means indicate that participants who had been abused were almost twice as likely to have been arrested; were more than twice as likely to have committed all three types of offenses documented in the juvenile court records, to have been a teen parent, and to have been pregnant or to have impregnated someone in the past year while not married; and were more than 3 times as likely to have been fired in the past year. In addition, young adults who had been abused were 30% less likely to have graduated from high school.

Effects of Physical Abuse on Violent Delinquency and Other Outcomes: Moderation by Race and Gender

For our second research question, we examined the potential moderating role of race and gender on late adolescent and young adult outcomes. In addition to the covariates and the main effects for abuse, we examined two interaction terms: abuse by race and abuse by gender (we did not examine the 3-way interaction because of the small cell sizes for the abused African American girls and boys).

Of the 17 abuse-by-race interactions tested, there were eight significant interactions. As shown in Table 3, physical abuse in the first 5 years of life was more strongly related to negative outcomes for African American than for European American adolescents and young adults for violent offenses documented in juvenile court records, nonviolent offenses documented in juvenile court records, any offenses documented in juvenile court records, self-reported arrests, any court or self-report evidence of arrest, not graduating from high school, being a teen parent, and being pregnant or impregnating someone in the past year without being married. The pattern was similar in seven of the nine nonsignificant abuse-by-race interactions. The significant abuse-by-gender interactions are also shown in Table 3. Of the 17 abuse-by-gender interactions tested, there were two significant interactions: Gender qualified the main effect of physical abuse on being fired and being a teen parent. Although physical abuse in the first 5 years of life was related to a higher likelihood of being fired in the past year and of being a teen parent for both males and females, the risk was disproportionately higher for females who had been abused.

Given these significant interactions, we separately conducted post hoc ANCOVAs by race or by gender for the outcome variables that showed significant interactions. As seen in Table 3, the effects were significant for African American youth but were not significant for European American youth. Compared to African American youth who had not been physically abused, African American youth who had been physically abused were twice as likely to have court records for violent offenses, almost 3 times as likely to have court records for nonviolent offenses, almost 5 times as likely to self-report arrests, almost 4 times less likely to have graduated from high school, more than 4 times as likely to have been a teen parent, and almost

3 times as likely to have been pregnant or impregnated someone in the past year. In terms of gender, the effects were found to be significant for females but not for males. Compared to females who had not been physically abused, females who had been physically abused were approximately 3 times more likely to have been fired and to have been a teen parent.

Discussion

In this article, we examined the links between early physical abuse and violent delinquency and other socially relevant outcomes during late adolescence (at age 18) or early adulthood (at age 21). The study is notable in overcoming several limitations in previous research by utilizing prospective, longitudinal data from a community-based sample. Outcomes included both self-reports of violent delinquency and externalizing behaviors and official arrest record data, and analyses controlled for important background variables that may have affected later outcomes. Moreover, we examined not only main effects but also the extent to which race and gender moderated these links.

On the whole, our findings extend the literature on delinquency and aggression by showing that physical abuse predicts subsequent violent delinquency, at least according to arrest data. These effects persisted during a 17-year period and extended through late adolescence. Physically abused children were also more likely to exhibit a host of other problematic outcomes, including being less likely to graduate from high school and being more likely to be fired from their job, to get pregnant or to impregnate someone while not married, and to become a teen parent. Thus, early physical abuse led not only to later violent delinquency but also to a more global pattern of violent and nonviolent dysfunction.

Future work is needed to understand the mechanisms that underlie linkages between early physical abuse and subsequent negative outcomes; such work may enhance understanding of why physical abuse is linked to subsequent dysfunction across a range of outcomes, not just to future violent delinquency. Such research is critical to improve on preventive interventions to reduce the incidence of abuse and to enhance treatment programs serving victimized children. In our previous work, we have delineated the important role of cognitive mechanisms that mediate these associations. Children who are physically abused are more likely to develop biased patterns of processing social information. For example, they are more likely to attribute hostile attributions about others' intentions, to access retaliatory aggressive responses, and to view aggressive behaviors as morally acceptable. These biased cognitive patterns partially mediate the effect of physical abuse on later violent behavior (Dodge et al., 1995).

Attachment theory and research also offer insight into potential mechanisms underlying the association between early abuse and later problems (Berlin & Dodge, 2004; Lyons-Ruth & Jacobvitz, 1999; van IJzendoorn, Schuengel, & Bakerman-Kranenburg, 1999; Zeanah & Zeanah, 1989). According to attachment theory and research, in maltreating dyads, the parent comes to serve as both a source of comfort and a source of harm, which in turn leaves the child in a protracted state of confusion and anxiety. This insecurity then impairs many aspects of behavior and mental health. Still other possible mechanisms underlying the links between physical abuse and later violent delinquency and other problems include genetic risks and interactions between intrapersonal risks (e.g., impulsivity) and environmental processes (DeBellis et al., 1999; Pollak, 2005; Putnam, 2005).

Interestingly, for many of these outcomes, the findings were qualified such that the deleterious effects of physical abuse were seen primarily for African American children or for females (for the two outcomes that showed significant gender moderation). First, for African American but not European American youth, physical abuse was related to committing more nonviolent offenses, self-reporting more arrests, having a lower likelihood of graduating from high school,

and having a higher likelihood of being a teen parent and becoming pregnant or impregnating someone in the past year while not married.

African American youth are more likely than European American youth to experience other problems unexplored in the present study such as racism, residential instability, and living in a violent neighborhood (Coard, Wallace, Stevenson, & Brotman, 2004). The negative effects of racism on child development are well documented (see Garcia Coll et al., 1996). It may be that these multiple risks (rather than race per se) exacerbate the negative effects of experiencing physical abuse (and/or make youth more violent, depressed, etc., regardless), perhaps because they offer fewer supports for treating the effects of the abuse. The European American children, on the other hand, may have been protected from the longer-term effects of physical abuse through supports in their larger environments. Overall, there is a need for greater attention to race and ethnicity in child maltreatment research (Behl, Crouch, May, Valente, & Crouch, 2001; Miller & Cross, 2006). In addition, to provide more information about mechanisms through which race may operate, it would be important for future research to examine psychological and social context variables for which race may serve as a proxy.

In addition, it is notable that most of the significant moderated effects discerned here pertain to outcomes in the juvenile justice and education systems (juvenile arrest record for violent offending, juvenile arrest record for nonviolent offending, self-report of arrest, graduation from high school). Although speculative, another possible explanation for these findings pertains to the likelihood that African American children, once abused or otherwise in need of treatment, will receive inadequate care. For example, African American children are less likely than European American children to receive mental health services, particularly for externalizing symptoms (Thompson, 2005). There is also disproportionate representation of children of color who receive public sector services that, in turn, often exacerbate rather than ameliorate children's problems. For example, African American children are more likely to be placed in the special education system, which in turn is often characterized by inadequate services, low-quality curriculum and instruction, and isolation from peers (Civil Rights Project, 2005). African American youth are also disproportionately represented in the juvenile justice system (Feyerherm, 1993; Hamparian & Leiber, 1997), where participation in and of itself represents a risk factor for continued offending (Dodge, Dishion, & Lansford, 2006; Howell, 2003). Once in the juvenile justice system, children are less likely to receive treatment for mental health problems than are those who do not enter the juvenile justice system (Rawal, Romansky, Jenuwine, & Lyons, 2004; Shelton, 2005). Not only may child protective services, juvenile justice, and education systems fail some students, some families are also more likely to be known to these systems. For example, African American youth are over-represented in out-of-home placements for suspected and substantiated maltreatment (Lu et al., 2004).

Although the findings suggested more similarities than differences in the extent to which abuse leads to problematic outcomes later in life for girls and boys, we did find two significant differences: The effects of being fired and for becoming a parent before age 20 were significant for physically abused females but not for physically abused males. These results are consistent with prospective, longitudinal findings from another study that found physical abuse to be a better predictor of teen parenthood for females than for males (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998). It may be that the risky sexual behaviors leading to pregnancy are part of a broader constellation of adolescent problem behavior outcomes that are seen in maltreated children (Widom & White, 1997). However, teen childbearing may be a specific outcome for some girls who use motherhood to achieve unmet needs for intimacy (Hamburg, 1986). It is worth noting that significant findings for teen pregnancy have not been found in other studies (e.g., Widom & Kuhns, 1996). And still other studies have included only girls, making it impossible to test for gender moderation (Romano, Zoccolillo, & Paquette, 2006; Smith, 1996). There is a need for additional study of the impact of physical abuse for both genders on

risky sexual behaviors, teen pregnancy, and adolescent parenthood and processes that underlie such linkages. Such research would help to inform the design of prevention and intervention programs.

As previously noted, in the present sample, physical abuse status was a significant predictor of anxiety or depression through age 16 (Lansford et al., 2002), but in the present study it was not significant at age 21. These results suggest that the long-term effects of internalizing symptoms may abate in young adulthood. Our findings also are not consistent with other studies that have found significant longitudinal associations between maltreatment and intimate partner violence (White & Widom, 2003), internalizing symptoms (Horwitz, Widom, McLaughlin, & White, 2001), and females' substance use (Schuck & Widom, 2001). Some of these inconsistencies may be explained by sampling differences. The Stouthamer-Loeber et al. (2001) study followed only males through age 18. Widom's participants had been the victims of substantiated physical abuse, sexual abuse, and neglect and were followed later into adulthood through age 29. It may be that, particularly for substance use and partner violence, effects in this sample may be more evident as participants get older. It is also possible that these effects are present only in the more deviant samples likely to result from identifying maltreatment through substantiated reports.

The present study has a number of limitations. First, the identification of physical abuse status did not take into consideration the chronicity or severity of the abuse, factors that importantly relate to the effects of abuse (Ethier, Lemelin, & Lacharite, 2004). For example, using the criterion of intentional strikes to the child that left marks for more than 24 hr may have captured not lower-level but repeated forms of abuse. The assessment of physical abuse was also limited to the first 5 years of life. This limitation is countered, however, by the fact that children who were not physically abused by age 5 but were subsequently abused would have been classified into the nonabused group, which would have attenuated differences between the nonabused and abused groups. Another limitation is the lack of data on other types of child maltreatment (emotional abuse, sexual abuse, and neglect). A strength of the study was the inclusion of several covariates that may otherwise have been confounded with abuse. These covariates were assessed early in the study, proximal to the time abuse status was measured, because of their likely relation to the experience of being abused. However, the analyses do not take into account covariates concurrently measured with the outcome measures or other developmental experiences that may also have important consequences for adjustment by early adulthood. Interestingly, the differences between the abused and nonabused young adults were primarily found using the more objective measures of court records and clear-cut outcomes such as graduation from high school and whether the young adult had been a teen parent. The abused and nonabused young adults did not significantly differ on the more subjective measures such as self-perceptions of the experience of romantic relationship violence or self-reported violent or nonviolent delinquency. A direction for future research will be to determine whether these findings replicate and, if so, what mechanisms may account for those differences.

On balance, the findings extend the literature on the understanding of effects of physical abuse on later violent delinquency, aggression, and other socially relevant outcomes. The findings demonstrate the long-term effect of physical abuse and show that the effects range across a wide array of outcomes, even after controlling for a number of potentially confounding covariates. The results also suggest especially problematic outcomes for African Americans and females, making both of these groups important foci for further study and intervention.

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TABLE 1

Descriptive Statistics and Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Possible range	0-1	0-45	0-36	0-1	0-1	0-1	0-1	0-1	0-1	0-56	0-6	0-6	0-1	0-1	0-10	0-1	0-1	0-48
<i>M</i>	.12	3.90	2.09	.05	.10	.07	.14	.12	.22	7.44	.12	.17	.83	.08	.78	.13	.08	9.15
<i>SD</i>	.30	9.14	6.09	.22	.31	.25	.35	.33	.41	6.13	.46	.61	.38	.27	1.37	.33	.27	7.34
Number of yes responses	69	—	—	28	60	39	82	56	126	—	—	—	370	37	—	62	36	—
1. Physical abuse ^d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Self-reported violent delinquency ^b	-.08	.37*	-.05	.53*	.38*	.66*	.09	.68*	.25*	.42*	.25*	.15*	.13*	.08	.05	.03	.02	.02
3. Self-reported nonviolent delinquency ^b	-.07	.10*	.05	.36*	.84*	.13*	.11*	.31*	.17*	.24*	.17*	.17*	.24*	.08	.07	.05	.04	.04
4. Violent offenses (court records) ^b	.09*	.14*	.05	.56*	.08*	.03	.14*	.22*	.21*	.21*	.21*	.21*	.21*	.08	.07	.05	.04	.04
5. Nonviolent offenses (court records) ^b	.15*	.14*	.08	.43*	.64*	.51*	.11*	.22*	.21*	.21*	.21*	.21*	.21*	.08	.07	.05	.04	.04
6. Status offenses (court records) ^b	.09*	.28*	.24*	.03	.08*	.13*	.14*	.22*	.21*	.21*	.21*	.21*	.21*	.08	.07	.05	.04	.04
7. Any offenses (court records) ^b	.14*	.21*	.17*	.43*	.64*	.51*	.11*	.22*	.21*	.21*	.21*	.21*	.21*	.08	.07	.05	.04	.04
8. Self-reported arrests ^c	.12*	.21*	.17*	.43*	.64*	.51*	.11*	.22*	.21*	.21*	.21*	.21*	.21*	.08	.07	.05	.04	.04
9. Any arrests (court records or self-report) ^c	.05	.33*	.32*	.06	.11	.10	.11	.31*	.25*	.42*	.25*	.15*	.13*	.08	.05	.03	.02	.02
10. Externalizing problems ^c	.12*	.07	.09	.18*	.12	.11	.09	.22*	.17*	.24*	.17*	.17*	.24*	.08	.07	.05	.04	.04
11. Perpetrator romantic relationship violence ^c	.07	.16*	.17*	.07	.19*	.03	.14*	.22*	.21*	.24*	.13*	.18*	.24*	.08	.07	.05	.04	.04
12. Victim romantic relationship violence ^c	-.21*	-.13*	-.10	-.16*	-.20*	-.23*	-.22*	-.20*	-.23*	-.12*	-.11	-.15*	-.13*	.08	.07	.05	.04	.04
13. Graduated from high school ^c	.17*	.06	.05	.07	.10	.12	.14*	.14*	.14*	.13*	.01	.06	-.07	.08	.07	.05	.04	.04
14. Fired in past year ^c	-.05	.23*	.23*	.02	.06	.13*	.08	.23*	.20*	.41*	.13*	.18*	-.07	.07	.05	.03	.02	.02
15. Drug use ^c	.11*	.01	-.03	.21*	.24*	.19*	.24*	.10*	.20*	-.05	-.04	.07	-.38*	.07	.05	.03	.02	.02
16. Teen parent ^c	.12*	.09	-.03	.11*	.07	.05	.05	.09*	.07	-.01	.03	-.04	-.15*	.00	.03	.17*	.02	.02
17. Pregnant or impregnated someone in past year ^c	.02	.26*	.19*	.09	.07	.07	.05	.14*	.11*	.60*	.33*	.20*	-.07	.03	.18*	-.02	.03	.03
18. Internalizing problems ^c																		

^a Age-5 assessment.^b Age-18 assessment.^c Age-21 assessment.* $p < .05$.

TABLE 2
Differences Between Physically Abused and Nonabused Young Adults

Outcome	Unadjusted Means						Adjusted Means					
	Not Abused			Abused			Not Abused			Abused		
	M	SD	F	M	SD	F	M	SD	F	M	SD	F
Self-reported violent delinquency	4.16	9.61	0.92	1.96	3.67	3.88	1.93	9.22	0.92	1.93	3.77	1.61
Self-reported nonviolent delinquency	2.26	6.43	0.54	0.85	1.81	2.17	0.82	6.13	0.54	0.82	1.87	0.06
Violent offenses (court records)	0.04	0.20	6.28*	0.10	0.30	0.04	0.12	0.20	6.28*	0.12	0.33	4.30*
Nonviolent offenses (court records)	0.09	0.29	14.99***	0.19	0.39	0.09	0.22	0.29	14.99***	0.22	0.42	13.71***
Status offenses (court records)	0.06	0.23	12.72***	0.16	0.37	0.05	0.19	0.23	12.72***	0.19	0.40	7.67**
Any offenses (court records)	0.13	0.34	9.85**	0.23	0.43	0.13	0.28	0.34	9.85**	0.28	0.45	6.20*
Self-reported arrests	0.11	0.31	16.32***	0.25	0.44	0.10	0.21	0.30	16.32***	0.21	0.42	6.18*
Any arrests (court records or self-report)	0.20	0.40	14.12***	0.35	0.48	0.20	0.34	0.40	14.12***	0.34	0.48	6.34*
Achenbach externalizing problems	7.34	6.06	3.87*	8.23	6.60	7.34	7.93	6.11	3.87*	7.93	6.53	0.43
Perpetrator of romantic relationship violence	0.10	0.36	4.60*	0.28	0.91	0.11	0.05	0.38	4.60*	0.05	0.12	0.73
Victim of romantic relationship violence	0.16	0.56	0.00	0.29	0.94	0.15	0.05	0.52	0.00	0.05	0.12	3.47
Graduated from high school	0.86	0.35	23.82***	0.62	0.49	0.87	0.62	0.34	23.82***	0.62	0.49	15.20***
Fired in past year	0.07	0.25	14.31***	0.21	0.41	0.07	0.26	0.25	14.31***	0.26	0.45	9.55**
Drug use	0.80	1.41	0.00	0.60	0.96	0.78	0.60	1.38	0.00	0.60	0.99	0.04
Teen parent	0.11	0.32	9.37**	0.23	0.43	0.11	0.24	0.31	9.37**	0.24	0.43	4.15*
Pregnant or impregnated someone in past year	0.07	0.25	10.57**	0.17	0.38	0.06	0.16	0.24	10.57**	0.16	0.37	11.13**
Achenbach internalizing problems	9.10	7.24	0.44	9.49	8.14	9.17	8.86	7.09	0.44	8.86	8.18	0.52

NOTE: Not abused $n = 505$; abused $n = 69$. Rates of missing data vary depending on the outcome and year of assessment. Adjusted means control for socioeconomic status, single-parent status, family stress, maternal social support, child exposure to violence, child temperament, and child health.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 3

Significant Two-Way Interactions From ANCOVAs

Variable	Abused		Not Abused		F
	Adjusted M	SD	Adjusted M	SD	
Court record of violent offenses					6.54*
European American	0.02	0.15	0.01	0.12	0.00
African American	0.38	0.50	0.19	0.40	0.87
Court record of nonviolent offenses					18.50***
European American	0.07	0.26	0.07	0.25	0.01
African American	0.63	0.50	0.22	0.42	7.24**
Court record of any offenses					8.28**
European American	0.14	0.35	0.10	0.31	0.03
African American	0.63	0.50	0.26	0.44	3.97*
Self-reported arrests					5.41*
European American	0.15	0.36	0.10	0.30	0.02
African American	0.44	0.53	0.09	0.29	6.13*
Court record or self-report of arrest					8.65**
European American	0.21	0.42	0.18	0.38	0.02
African American	0.69	0.48	0.30	0.46	5.31*
Graduated from high school					9.53*
European American	0.75	0.44	0.88	0.32	1.24
African American	0.20	0.42	0.77	0.43	8.77*
Teen parent					3.85*
European American	0.12	0.33	0.08	0.28	0.11
African American	0.58	0.52	0.24	0.43	2.37
Pregnant or impregnated someone in past year					12.24**
European American	0.06	0.24	0.05	0.21	0.10
African American	0.50	0.53	0.17	0.38	9.30**
Fired in past year					6.37*
Females	0.30	0.47	0.06	0.25	17.23***
Males	0.23	0.43	0.07	0.26	0.16
Teen parent					9.37**
Females	0.48	0.51	0.16	0.37	4.26*
Males	0.04	0.20	0.05	0.22	0.10

NOTE: Not abused $n=505$ (203 European American females, 43 African American females, 223 European American males); abused $n=69$ (24 European American females, 7 African American females, 27 European American males, 11 African American males). Rates of missing data vary depending on the outcome and year of assessment. Adjusted means control for socioeconomic status, single-parent status, family stress, maternal social support, child exposure to violence, child temperament, and child health.

* $p < .05$.

** $p < .01$.

*** $p < .001$.