Longitudinal Study on the Effects of Child Abuse and Children's Exposure to Domestic Violence, Parent-Child Attachments, and Antisocial Behavior in Adolescence

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Abstract

This study examined the unique and combined effects of child abuse and children's exposure to domestic violence on later attachment to parents and antisocial behavior during adolescence. Analyses also investigated whether the interaction of exposure and low attachment predicted youth outcomes. Findings suggest that, while youth dually exposed to abuse and domestic violence were less attached to parents in adolescence than those who were not exposed, those who were abused only, and those who were exposed only to domestic violence, the relationship between exposure types and youth outcomes did not differ by level of attachment to parents. However, stronger bonds of attachment to parents in adolescence did appear to predict a lower risk of antisocial behavior independent of exposure status. Preventing child abuse and children's exposure to domestic violence could lessen the risk of antisocial behavior during adolescence, as could strengthening parent-child attachments in adolescence. However, strengthening attachments between parents and children after exposure may not be sufficient to counter the negative impact of earlier violence trauma in children.

The United States Department of Health and Human Services (USDHHS) reported that in 2007 an estimated 794,000 children were found to have been abused and neglected (U.S. Department of Health and Human Services, 2009). The majority of these substantiated cases were for neglect, although a sizeable number of cases (10.8%) involved physical abuse. Girls and boys are at almost equal risk for child abuse according to the USDHHS report: 51.5% of documented victims in 2007 were female and 48.2% were male. It is estimated

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that 1,760 children died in 2007 from child abuse or neglect, with an overall fatality rate of 2.35 per 100,000 children.

Children's exposure to domestic violence (also called intimate partner violence or IPV) is another public health concern, which, like abuse, is very costly and widespread (Gewirtz & Edleson, 2007; Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008; WHO, 2002). The United States Bureau of Justice found nonfatal IPV affected 1 in 320 households, with injuries occurring in just over half of all such cases (U.S. Department of Justice, 2001–2005b). In many households in which IPV occurs, children are present and often witness the physical injuries and emotional pain inflicted on adult victims. Others may not witness the violence directly, but are well aware of violence in the home (Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997). The U.S. Department of Justice reports that children were present in homes where IPV occurred in more than a third (35.2%) of all documented cases; in up to an additional 15.5% of cases it was unknown if children were present, so the number is likely substantially higher. A conservative estimate is that over 200,000 children in the U.S. are exposed to domestic violence annually (U.S. Department of Justice, 2001–2005a). Other sources indicate as many as 3 to18 million children are exposed to IPV in some form (Tajima, Herrenkohl, Moylan, & Derr, in press).

Much has been published on the deleterious effects of child abuse, with established links to later delinquency in youth (Smith & Thornberry, 1995), aggression and violence (Maas, Herrenkohl, & Sousa, 2008; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001), and many other health risk behaviors and emotional problems during adolescence (e.g., school dropout, substance use, sexual risk taking, teenage pregnancy, depression) (Fergusson, Horwood, & Lynskey, 1996; Fergusson & Lynskey, 1997; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Widom, 2000; Wolfe, 1999; Wolfe, Scott, Wekerle, & Pittman, 2001).

Although the effects on children of exposure to domestic violence have been less well studied than have those of abuse, findings suggest that domestic violence impacts children's development similarly (Edleson, 1999b; Fantuzzo, et al., 1997; Graham Bermann, 1998; Hughes, 1988; Lichter & McCloskey, 2004; Litrownik, Newton, Hunter, English, & Everson, 2003; McCloskey, Figueredo, & Koss, 1995; McCloskey & Lichter, 2003; Moffitt & Caspi, 2003; Sudermann & Jaffe, 1997). As with child abuse, children's exposure to domestic violence can lead to short-and longer term outcomes of internalizing and externalizing behavior problems during adolescence, including delinquency, status offenses, and perpetration of violence (Curie, 2006; Ehrensaft, et al., 2003; Herrenkohl, et al., 2008).

Strong evidence indicates that physical child abuse and exposure to domestic violence often co-occur (Appel & Holden, 1998; Dong, et al., 2004; Edleson, 1999c; Herrenkohl, et al., 2008). Appel and Holden's (1998) review of research found rates of co-occurrence for abuse and domestic violence exposure in the range of 6% – 18% for community samples and around 40% for clinical samples.[1] In Edleson's (1999c) review of research, abuse and domestic violence exposure overlapped in 30% – 60% of all identified cases.

The extent of overlap in child abuse and children's exposure to domestic violence makes it difficult to determine if their longitudinal effects on youth development are distinguishable. Even still, it is surprising how little research has tried to tease out their unique and combined effects, particularly given the range of adverse outcomes known to relate to these forms of early trauma. Additionally, few studies have examined whether abuse and exposure to domestic violence affect boys and girls in the same ways, despite the interest in gender

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[1]Co-occurrence is reflected in the percent overlap in cases in which children who witnessed domestic violence also directly experienced child abuse

differences (Edleson, 1999a; Herrenkohl, et al., 2008; Maughan & Cicchetti, 2002; Sternberg, et al., 1993). Possible explanations for the slow progress on co-occurring forms of violence and gender differences are the lack of suitably designed studies (i.e., gender-balanced and longitudinal), poor or insufficient measurement of abuse or domestic violence exposure, and/or the absence of relevant theories and well-developed hypotheses. Yet, to advance knowledge and practice, it is important that research extend to these topics (McCloskey, et al., 1995).

Wolfe et al.'s (2003) meta-analysis of studies on dual exposure found only four studies that adequately documented the developmental impact of dual exposure on children's later development and risk of internalizing and externalizing behaviors. Effect sizes given in this review suggest that children doubly exposed to abuse and domestic violence fare worse (i.e., are at higher risk) than are those not exposed or exposed only to abuse or domestic violence alone. Hughes and colleagues refer to this as a "double whammy" phenomenon (Hughes, Parkinson, & Vargo, 1989). However, some research has found little or no evidence of a double whammy or dual exposure effect. For example, Sternberg et al.'s (1993) study of the impacts of child abuse and domestic violence reported no greater risk of depression or problem behaviors among adolescents who had been abused and exposed to spouse abuse when compared to those with single exposures. Yet, as expected, children exposed to abuse alone or spouse abuse alone were at higher risk of later problems than were children with no history of family violence (Sternberg, et al., 1993). Additionally, Maughan and Cicchetti's (2002) examination of exposure to interadult violence and maltreatment found that, while maltreatment was predictive of poor behavior in children, neither interadult violence alone or in combination with maltreatment resulted in a statistically significant increase of child behavior problems above those of nonexposed peers (Maughan & Cicchetti, 2002). Other studies provide mixed or contrasting findings (Cunningham, 2003; Feerick & Haugaard, 1999; Heyman & Slep, 2002; Shipman, Rossman, & West, 1999).

Whether children are resilient to the effects of child abuse and exposure to domestic violence is an issue of primary interest to researchers and practitioners in the child welfare field (Herrenkohl, et al., 2008). The study of protective factors (factors that promote resilience and buffer risk in children exposed to violence) is crucial to understanding how children overcome, or positively cope in the face of adversity (Masten, 2001). One consideration is whether children doubly exposed to abuse and domestic violence are measurably more vulnerable (i.e., are at higher risk) and less protected from the consequences of exposure when compared to those with single exposure (i.e., abuse or domestic violence). A hypothesis consistent with the double whammy/dual exposure idea is that children will suffer more emotional harm when they see, and simultaneously experience, abuse at the hands of a trusted adult — a compounding trauma of sorts that interferes with children's bonds of attachment to primary caregivers and leads to later social and behavioral deficits (McCloskey, et al., 1995). Indeed, research has shown that children who are exposed to violence in the home are generally less attached to, and receive less support from their caregivers (Levendosky, 2002); Rikhye et al., 2008; Styron & Janoff Bulman, 1997). In a review of 13 studies on the impact of physical maltreatment and/or neglect of children on the quality of parent-child attachments, Morton and Browne (1998) reported that 76% of all maltreated infants were classified as being insecurely attached (Morton & Browne, 1998).

Bowlby's (1969) theory of attachment emphasizes the foundational role of healthy parent-child relationships and the importance of these relationships for children's healthy development over the long term (Bowlby, 1969). According to Bowlby and other attachment researchers, early (secure) attachments allow children to explore the surrounding environment, to learn skills of engagement, and to develop confidence in their own ability to

thrive independent of others (Davies, 2004). Strong, secure attachments aid in the development of "internal working models" of the self and others that provide a young child with current and future relationship goals and expectancies. It was Ainsworth et al. (1978) who developed a classification schema for measuring and studying the quality of attachment for infants and their caregivers. Initially, Ainsworth et al. described three attachment styles: secure, insecure-avoidant, and insecure ambivalent (Ainsworth, Blehar, Waters, & Wall, 1978). Later, Main and Solomon (1986) added a fourth attachment style, disorganized/disoriented attachment, to account for the large number of children that did not fall neatly into Ainsworth's original categories (Main, 1986).

Studies have shown very positive outcomes for children with secure attachments. In contrast, children with weak, avoidant, or unhealthy attachment styles typically do less well as they proceed through developmental stages (Bowlby, 1969; Herrenkohl et al., 2008, Rikhye, 2008; Styron & Janoff-Bulman, 1997). Vandro et al. (2008) found that children with insecure attachments at age 1 were at higher risk of conduct problems in the first grade. Using a sixth-grade sample, Eliot and Cornell (2009) found that insecure attachments were associated with aggressive attitudes and both self-reported and peer-nominated measures of bullying (Eliot & Cornell, 2009).

A majority of studies with maltreated samples have focused on attachment styles or qualities during infancy or early childhood. Few have examined parent-child attachment for vulnerable adolescents in relation to one or more hypothesized outcomes. Attachments in adolescence remain important and are predictive of positive youth development (Aceves & Cookston, 2007; Allen, Moore, Kuperminc, & Bell, 1998; Simons, Paternite, & Shore, 2001). Attention to whether strong parent-child attachments provide some protection for youth who earlier experienced abuse and domestic violence in the home is important because attachments formed or carried into adolescence may offer stability at a point youth encounter other risk factors known to promote problem behaviors, such as delinquency and violence (Maas et al., 2008). For example, youth strongly attached or bonded to one or more parents may be less vulnerable to antisocial peer influences, which are known to predict youths' involvement in delinquency and violence during mid- and late-adolescence (Catalano & Hawkins, 1996).

To study patterns of attachment for adolescents, Armsden and Greenberg (1987) developed the Inventory of Parent and Peer Attachment (IPPA), a 60-item questionnaire that assesses an adolescent's feelings of trust, communication, and alienation from a parent/caregiver. More trust and communication, and lower scores of alienation translate to stronger overall attachment, as measured by a single, composite measure (for peers and parents separately). In their study, Armsden and Greenberg found that adolescents more securely attached to their parents had higher scores of well-being, including self-esteem and life satisfaction. Insecure attachments to parents, in contrast, were linked to higher scores of adolescent depression, anxiety, and resentment/alienation (Armsden & Greenberg, 1987).

How abuse and children's exposure to domestic violence affect parent-child attachments during adolescence is unclear. Also unclear is the extent to which dual exposure in childhood weighs more heavily on these later attachments, and whether parent-child attachments during adolescence are at all protective (from antisocial behavior for adolescents) for children who were abused and earlier exposed to violence in the home. There is limited evidence as well of the role of gender as a moderator of children's exposure to violence in relation to attachment and delinquency (Egeland, Yates, Appleyard, & van Dulmen, 2002; Morton & Browne, 1998; Styron & Janoff Bulman, 1997).

Our study examines the unique and combined effects of child abuse and children's exposure to domestic violence on parent-child attachments and antisocial behavior during adolescence, including violence perpetration, delinquency, and status offenses. We hypothesize that violence exposure will increase antisocial behavior in youth during adolescence. We also hypothesize that effects of exposure will be particularly strong for children who are doubly abused and exposed to domestic violence (dual exposure). Further, we hypothesize that dually exposed children will be least attached to their parents during adolescence and that lower parent-child attachments will increase antisocial behavior among children exposed to violence. Because so few studies have examined gender differences in outcomes of family violence, we examine gender as another possible moderator of exposure (Cullerton-Sen, et al., 2008). Findings in this case are exploratory, with no particular hypothesis about which gender is likely to be more or less vulnerable to the effects of violence exposure. In sum, this study contributes to the research literature by investigating single and dual exposures in children, attachment during adolescence, and possible gender differences in the prediction of antisocial behavior.

Method

Sample

Data are from the Lehigh Longitudinal Study (Herrenkohl, Herrenkohl, Egolf, & Wu, 1991; Herrenkohl & Herrenkohl, 2007). The study began in 1976 with children who ranged in age from 18 months to 6 years (4 years of age on average). The average age of primary parent respondents (mainly mothers) was 28. This first wave of the study included 457 children and their parents (totaling 297 families) who were recruited from child welfare programs, Head Start centers and childcare programs in a two-county area of Pennsylvania. Agency staff referred the families from the child welfare programs; the remaining children were recruited from 13 Head Start centers, 12 daycare programs, two programs for handicapped children, three Head Start programs, and eight nursery school programs.[2] The counties were urban/ suburban and rural. The original study sample (N = 457) was 54% male. The race breakdown is as follows: 80.7% (n = 369) White, 11.2% (n = 51) more than one race, 5.3% (n = 24) Black or African American, 1.3% (n = 6) American Indian/Alaska Native, 1.3% (n = 6) unknown, 0.2% (n = 1) Native Hawaiian or Other Pacific Islander. At the initial assessment, 86% of the families were from two-parent households; 63% of families had incomes below $700 per month. Parents on average had completed 12 years of schooling.

A second wave of data collection commenced approximately 4 years later when children were in elementary school were on average 8 years of age and parents were in their early 30s (avg. 33). A third assessment followed when children were adolescents, approximately 10 years after the school-age interview. At the time of the adolescent assessment, youth participants were, on average, 18 years of age. Approximately 91% of the original 457 child participants were reassessed in adolescence (n = 416).

Tests of the equality of attrition across groups in the adolescent wave of the study showed the percentage lost to attrition varied somewhat: child welfare abuse (13.9%), child welfare neglect (10.5%), Head Start (7.1%), day care (4.7%), and middle income (8.1%), although these percentages overall did not differ significantly ($\chi^2 > .05$). Further tests for comparability in attriters and nonattriters found no significant differences in childhood SES, physically abusive discipline used by parents, or childhood exposure to domestic violence. An assessment of the panel, now adults, is underway, although analyses here are limited to the first three waves of complete data.

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[2]The middle-income nursery group was added later, in 1979–1980, to increase the socioeconomic diversity of the sample.

Measures

The dichotomous child abuse variable used in this analysis consists of information gathered about severe physical disciplining from three different data sources: (a) official records of substantiated abuse cases, (b) mothers' reports of their disciplining of their preschool and school-age children, and (c) adolescents' retrospective reports of those same discipline practices used by mothers (Herrenkohl, Tajima, Whitney, & Huang, 2005). Behaviors assessed with self-reports from mothers and adolescents were biting a child; slapping a child so as to bruise; hitting a child with a stick, paddle or other hard object; or hitting a child with a strap, rope or belt. Those who were disciplined with two or more severe physical discipline practices were considered maltreated according to the self-report measure. A threshold of two or more incidents was set to eliminate isolated cases of severe physical discipline from an otherwise nonabusive parent. Individuals for whom there was agreement on the prospective parent report and retrospective adolescent reports were added to those identified as abuse victims using official records. Official record reports were used as the benchmark criterion because the severity and chronicity of the abuse leading to the filing of those reports were considered sufficient by themselves to warrant an abuse classification in our scoring. The procedure used to combine the three data sources allowed us to take advantage of the information each provides within a single measured construct, although it is unclear whether combining data sources on child abuse necessarily improves the prediction of adolescent outcomes (Smith, Ireland, Thornberry, & Elwyn, 2008). By requiring evidence of abuse on both the prospective and retrospective self-report measures before identifying a child as a victim of abuse, we aimed to lessen the potential measurement bias that might be introduced by one or the other source (Herrenkohl, et al., 2005; Tajima, Herrenkohl, Huang, & Whitney, 2004). In addition, requiring cross-informant agreement increases the likelihood that violence exposure did occur. Although this may underestimate the number of exposed children, we can be more certain that those who are included are not falsely classified. This produced 174 subjects that had experienced child abuse (42% of the analysis sample of 416). Agreement in the data sources on abuse cases was moderate (about 50% or cases cross-classified), which is consistent with other studies (Smith, et al., 2008).

The dichotomous domestic violence exposure variable includes three types of moderately severe abusive behavior by either parent: physical violence (hit, punch, kick), threats to do physical harm, and breaking things. The measure of domestic violence exposure combines reports from parents during the preschool assessment and adolescents' retrospective reports. Again, to take advantage of various data sources and to limit potential indicator bias, we required agreement between prospective parent and retrospective adolescent self-reports. In cases where parental reports and adolescent reports differed in their responses about whether domestic violence behaviors had occurred, the case was coded conservatively (i.e., no exposure), except in cases where information about domestic violence was missing in one source, where the existing data source was used as a single indicator of violence exposure. These procedures resulted in 197 cases classified as having been exposed to domestic violence (47% of the analysis sample).

Using the dichotomous child abuse and domestic violence exposure variables, the sample was then split into four mutually exclusive groups: (a) no violence exposure group (identified as no exposure in the tables) (n = 134, 32% of the analysis sample); (b) domestic violence exposure only group (DV only) (n = 96, 23% on the analysis sample); (c) child abuse only group (CA only) (n = 73, 18% of the analysis sample); and (d) exposure to domestic violence and child abuse group (dual exposure) (n = 101, 24% of the analysis sample).

Parent-child attachment—The outcome variables used in the analysis are from Armsden and Greenberg's Inventory of Parent and Peer Attachment (1987). This scale, administered in the adolescent wave of the study, consists of three subscales: parent-child communication, trust, and alienation. Answers are scored with a 5-point Likert scale that ranges from (1) almost never to never, to (5) almost always or always. Scores were computed by adding the 1 – 5 scores for all items. Questions ask about "parents" as a unit. Communication has a range of 8 – 40, with higher scores representing stronger communication between parent and child. Items include: "I like to get my parents' point of view on things I'm concerned about," "I feel like it's no use letting my feelings show," and "My parents sense when I'm upset about something." (α =.87). Trust has a range of 9 – 45, with higher scores representing more trust and understanding. Items include: "My parents respect my feelings," "I feel my parents are successful as parents," and "My parents trust my judgment" (α=.91). Alienation has a range of 11 – 55, with higher scores indicating increased alienation. Items include: "I have to rely on myself when I have a problem to solve," "Talking over my problems with my parents makes me feel ashamed or foolish," and "I don't get much attention at home." (α=.86) We also constructed a composite measure of parent-child attachment for use in our logistic regression models, as suggested by Armsden and Greenberg (1987), due to high intercorrelation among subscales. To make the composite measure, scores on the alienation subscale are subtracted from the sum of trust and communication. Our composite attachment scores ranged from −38 to 73. For the final stage of our data analysis, we dichotomized the composite variable to differentiate between those with particularly high attachment scores (the top 25%) and all others.

Antisocial Behavior—Self-reported outcomes of felony assault, minor assault, general delinquency, and status offenses were measured in the adolescent wave of the study. Each outcome is a measure of count of types of offenses. Each is a composite of several indicator variables. For each outcome, scores were again dichotomized to differentiate those in the top 25% (coded 1) of the distribution from those in the remaining 75% (coded 0), using a method similar to that of Farrington and Loeber (2000). This method allows the researcher to differentiate between low and higher frequency (or variety) offending, analyzed dichotomously to ascertain the relative probability of offending over nonoffending. In some cases the distribution of scores did not allow a cut point at precisely the 75th percentile. Here, we recoded the variable as near to that cut point as possible. We have used a similar approach in other analyses of these data and have found few differences in tested outcomes when variables are analyzed as categories or continuous scores (Tajima, et al., 2004).

Felony assault includes being in a gang fight; hitting someone other than parents, brothers, sisters, or persons at work; having the idea of seriously hurting or killing this person; and trying to have or having had sexual relations with someone against her/his will. Minor assault includes hitting or threatening to hit a parent, supervisor, coworker, or other person. Status offenses include running away from home, being absent from school for more than a day without an excuse, drinking alcohol, and getting suspended. Delinquency includes theft, disorderly conduct, and other related behaviors.

Gender of adolescent participants (male = 1 or female = 0) was included in our final model to control for possible outcome differences for males and females. *SES* was also included as a control variable in our final model. SES is a continuous-level composite variable that is based on indicators of family income during the preschool period, mother's occupational status and education level, and total number of rooms in a family's house.

Analysis

We first examined whether patterns in the data are consistent with the hypothesis that children exposed to both abuse and domestic violence have worse outcomes in adolescence than children exposed to only one (or none) of these behaviors. Cross tabulations compared percentages on each outcome for each of the exposure groups (no exposure, DV only, CA only, and dual exposure). The next step in the analysis, a series of three-way analysis of variance (ANOVA) models, assessed the association between exposure types and the three subscales of parent-child attachment, as well as an overall parent-child attachment composite that combined the three subscales. The analysis examined interactions of gender and attachment to determine whether males and females differ with respect to exposure effects.

Finally, we conducted a series of regression models to examine the association between exposure type and the adolescent outcomes, as well as interactions of exposure and parent-child attachment in adolescence. We used only the composite measure of attachment (dichotomized to reflect high versus low attachment) to examine possible interaction effects. Analyses were run two times, once with the nonexposed group as the reference category and a second time with the dual exposure group as the reference group. Gender and SES were added as control variables in a final test of the model to determine whether the effects of exposure are maintained when these other known predictors of antisocial behavior are taken into account.

Results

Table 1 contains the results of the initial cross tabulations of exposure types (no exposure, exposure to domestic violence only, child abuse only, and dual exposure) and measures of antisocial behaviors in adolescence. Findings show that more youth with dual exposure engaged in antisocial behavior during adolescence than those who were not exposed, exposed only to domestic violence, or abused only. For example, 47.5% of dually exposed youth engaged in felony assault as compared to 41.7% who were only exposed to abuse, 36.8% who were only exposed to DV, and 24.8% who were in the no exposure group. Effects overall of exposure group are significant but modest (phi coefficients of .16–.26, p<.05).

Table 2 shows the results of a three-way analysis of variance (ANOVA) model. Test statistics are shown for the main effects of exposure type and gender. Probability values for gender-by-exposure-group interactions are also provided. On the right side of the table are group means of the attachment subscales (communication, alienation, and trust) and the composite attachment scale that combines the subscales for each abuse exposure grouping: no exposure (subscript a), DV only (subscript b), abuse only (subscript c), and dual exposure (subscript d). Subscripts of the attachment scale means shown in the four columns reflect significant differences in Bonferroni tests of group means for each scale.

As shown in Table 2, for the attachment subscale of communication, youth in the no exposure group (subscript a) differed from those in the dual exposure group (subscript d). Those in the child abuse only (CA) group (subscript c) also differed from youth in the dual exposure group. However, the child abuse only and domestic violence only (DV) groups did not significantly differ on communication (nor did they differ on the remaining attachment subscales or the overall composite measure). For alienation, the pattern was the same: means for the no exposure and CA groups were significantly lower than that of the dual exposure group. For trust, the pattern was also similar, although the DV group differed on this subscale significantly from the dual exposure group. Finally, for the overall attachment composite measure, the no exposure and CA groups differed from the dual exposure group.

However, the no exposure and DV only groups did not differ. Means of the DV only and CA only groups were also statistically indistinguishable.

Table 2 also shows tests of gender and gender-by-exposure-group interactions. For communication and the overall attachment scale, gender was a significant main effect predictor, with males reporting lower attachment than females. Tests of group-by-gender interactions were nonsignificant (p-values > .05 in each case), although for the subscale of trust, the interaction term approached statistical significance (p < .10). Effect sizes are shown in Table 2 using η^2. Effect sizes are modest, although for exposure group status, η^2 is somewhat larger (.04–.07).

As shown in Table 3, in all regression models dual exposure increased over nonexposure the odds of antisocial behavior (for felony assault, minor assault, delinquency, and status offenses). The odds of felony assault for dual exposure compared to no exposure were 2.61 times greater. For minor assault, the odds were 2.90 times greater. For delinquency, the odds were 2.43 times greater. For status offenses, odds for dual exposure compared no exposure were 5.11 times greater.

Higher odds of violence and delinquency were also shown for single forms of exposure compared to no exposure. For abuse only, the odds of felony assault were 2.19 times greater than no exposure; for minor assault, the odds were 2.67 times greater, for delinquency, 2.47 times greater, and for status offenses, 4.57 times greater. For the domestic violence only group (compared to no exposure), the odds of felony assault were 1.8 times greater, 2.58 times greater for minor assault, 1.84 times greater for delinquency, and 3.20 times greater for status offenses.

Table 4 shows the results of these same models re-estimated with dual exposure as the reference group in order to more precisely test our dual exposure hypothesis. Consistent with the results of Table 3, abuse alone and domestic violence exposure alone, although trending toward lower risk, were not significantly different from dual exposure. As hypothesized, in these two models, higher parent-adolescent attachment predicted a lower likelihood of antisocial behavior: ORs of .55 for felony assault, .53 for minor assault, .51 for delinquency, and .28 for status offenses.

Final analyses (shown in Table 5) included a re-estimation of the effects of exposure on all outcomes with the addition of gender and SES as covariates in the model. This was done to control for potential demographic confounds which might account in part or in full for the exposure effects shown in Tables 3 and 4. Here, the no exposure group served as the reference category. Results show that SES and gender are significantly related to each tested outcome, with effects in the expected direction. Dual exposure (compared to no exposure) remained predictive of minor assault (OR: 2.39), delinquency (OR: 2.07), and status offenses (OR: 3.43). Child abuse remained significantly predictive only of status offenses (OR: 2.86), although, for minor assault, the findings suggest a higher risk for child abuse only compared to no exposure or domestic violence exposure only. This is also true for domestic violence exposure for both minor assault and status offenses, where results approach significance. After accounting for gender and SES, exposure to domestic violence only significantly increased the odds of minor assault (OR: 2.04), but no other outcome. Finally, when SES and gender are added to the model, the presumed (main effect) protective effects of parent-child attachment in adolescence remain only for status offenses (OR: .33). As before, models were rerun with the dual exposure as the reference category, although results (not reported) were largely the same.

Discussion

Results of analyses, particularly the comparison of exposure groups on the various scales of attachment, provide some support for the dual exposure hypothesis, although differences in the risk of outcomes when dual exposure was compared to single exposure were not as evident as the literature might suggest. In fact, risk effects on outcomes in adolescence for the dual and single exposure groups were, by most analysis results, the same. Thus, results reported in this study differ from at least a few earlier studies that found significant increases in the likelihood of negative adolescent outcomes following a combination of abuse and domestic violence exposure (Wolfe, et al., 2003). However, regression results do show that, once gender and SES are taken into account, dual exposure (compared to no exposure) is more consistently predictive of youth behavior than are abuse or domestic violence exposure alone. Thus, while dual and single exposure risk effects may not differ enough from each other to be detected in statistical tests, dual exposure does appear to increase risk levels for antisocial behavior to a point that differences between exposure and no exposure are maintained after other all other variables in the model are taken into account.

Having shown that gender and SES account partly for the effects of single exposure on the outcomes of felony assault and delinquency, one conclusion is that these variables are more important predictors. However, more likely is that demographics and co-occurring risk factors work in a synergistic (additive or cumulative) fashion to increase children's vulnerability to later social influences that reinforce, and possibly motivate, antisocial behavior in the adolescent years (Catalano & Hawkins, 1996; Herrenkohl & Herrenkohl, 2007). Although cumulative effect models are beyond the scope of the current study, these models could be tested in future research. With so few longitudinal studies on family violence and additive risk, there remain many unanswered questions about the constellation and sequence of factors most likely to result in developmental problems of adolescence -- those examined here and in other studies (English, et al., 2005; Herrenkohl, et al., 2008).

While children dually exposed to child abuse and domestic violence appeared less attached to their caregivers in the years following exposure, lower attachment levels for these youth in adolescence do not appear to account for their higher risk of antisocial behavior during adolescence. Yet, in initial models, tests of attachment main effects suggest that being strongly bonded to parents in adolescence may lower the risk of delinquency, assault (violence), and status offenses apart from exposure. Thus, preventing child abuse and domestic violence exposure and improving family attachments in adolescence may independently lessen the risk of antisocial behavior during adolescence. However, building stronger attachments between parents and their adolescent children within violent households may not counter (or buffer) the negative impact of the exposure itself. Unfortunately, since the measure of attachment used in our study is based on questions about parent caregivers in general (as opposed to nonabusive caregivers in particular), results cannot establish whether parent-child attachments are protective for children exposed to violence when these attachments are with a nonabusive nurturing parent. Further refinement of the measures used here (i.e., focused questions on the nature of the parent-child relationship in relation to prior abuse) could provide a clearer understanding of parent-child attachments and their role in protection and resilience of children. One strong possibility is that protective effects of parent-child attachments would become more evident in cases where relationships were known to be free of violence or abuse in the past. It might also be that children's attachments to adults outside the home would have a buffering effect, particularly if there were ongoing violence in the family and caregivers there were unable to provide a child emotional support and guidance (Aisenberg & Herrenkohl, 2008). Indeed, research elsewhere has shown that having a close bond with a nonabusive caregiver,

particularly a maternal caregiver and siblings, can promote resilience and lessen risk for some abused children (Werner, 2005).

Effects of attachment on outcomes may also be influenced by the way scales used in this study were developed and analyzed. For example, our use of a dichotomous measure of attachment in the final series of regression models may impact the sensitivity of the measure and reduce the likelihood that significance will be achieved. Although the coding of this variable may lower the sensitivity of the measure, prior analyses of these and other data in the larger study suggest that similar results are often observed when variables are analyzed as dichotomous and continuous variables (Tajima, et al., in press). In fact, Farrington and Loeber (2000) and Tajima et al. (in press) report that this process of dichotomization typically results in little loss of information (and easier interpretation of results).

While we were able to differentiate types of violence exposure using longitudinal data, our study is also limited by the fact we did not investigate the chronicity of abuse or exposure to domestic violence, precise age of exposure, or effects of attachment over time (English, et al., 2005). Further studies are particularly needed to help establish the interaction of protective influences and chronic violence exposure in children of differing ages. Studies should include methods of differentiating protective effects for unique and overlapping forms of violence within the family. Yet, on the whole, this study helps advance understanding of the dual exposure hypothesis and the role of attachment as a potential moderator of the impact of exposure on antisocial behavior in adolescents.

Acknowledgments

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Table 1

Percent of Respondents in Each Exposure Group Reporting Antisocial Behavior in Adolescence

	No exposure n = 134	DV only n = 96	CA only n = 73	Dual exposure n = 101	χ^2	phi
Felony assault	24.8%	36.8%	41.7%	47.5%	13.98	.19
Minor assault	20.1%	37.9%	38.9%	42.6%	16.25	.20
Status offenses	10.4%	26.3%	33.3%	38.6%	27.57	.26
Delinquent behavior	16.5%	26.3%	32.4%	33.7%	10.78	.16

Note: Chi-square tests of differences in group prevalences were significant for all outcomes ($p < .05$). Average analysis sample for each chi-square comparison is 401 after accounting for missing data. Percentages are within-group totals for each outcome.

DV = Domestic Violence; CA = Child Abuse

Table 2

Test Statistics and Means for Comparisons on Subscales of Parent-child Attachment

Attachment score	Exposure group main effect	Gender main effect	Gender × group interaction effect	Type of Abuse Exposure			
				No exposure a	DV only b	CA only c	Dual exposure d
Communication	$F(3, 392) =5.94, p < .01\ \eta^2 = .042$	$F(1, 392) =8.64, p < .01\ \eta^2 = .020$	$F(3, 392) =1.18, p > .05\ \eta^2 = .008$	28.27_d	26.90	27.94_d	$24.51_{a,c}$
Alienation	$F(3, 392) =6.30, p < .001\ \eta^2 = .047$	$F(1, 392) = 1.57, p > .05\ \eta^2 = .004$	$F(3, 392) =1.51, p > .05\ \eta^2 = .011$	27.34_d	29.29	27.81_d	$32.19_{a,c}$
Trust	$F(3, 392) =10.01, p <.001\ \eta^2 = .070$	$F(1, 392) =.76, p >.05\ \eta^2 = .002$	$F(3, 392) =2.61, p >.05\ \eta^2 = .016$	35.12_d	33.87_d	34.20_d	$29.64_{a,b,c}$
Parent attachment-composite score	$F(3, 392)=7.66, p < .001\ \eta^2 = .054$	$F(1, 392)=4.27\ p < .05\ \eta^2 = .010$	$F(4, 392)=1.80\ p > .05\ \eta^2 = .013$	36.75_d	32.63	34.49_d	$25.05_{a,c}$

Note: Subscripts correspond to significant differences in group means ($p < .05$) using Bonferroni tests.

DV = Domestic Violence; CA = Child Abuse

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Table 3

Regression Models for Exposure Groups and Youth Outcomes (reference category is nonexposed youth)

	Felony assault (N=398)			Minor assault (N=398)			Delinquency (N=397)			Status offenses (N=398)		
	B	P-value	OR	B	P-value	OR	B	P-value	OR	B	P-value	OR
Dual exposure (ref = no exposure)	.96	.001	2.61	1.07	.000	2.90	.89	.005	2.43	1.63	.000	5.11
Abuse only (ref = no exposure)	.79	.013	2.19	0.98	.003	2.67	.90	.009	2.47	1.52	.000	4.57
DV only (ref = no exposure)	.59	.047	1.80	0.95	.002	2.58	.61	.068	1.84	1.16	.002	3.20
Parent-child attachment (composite score-dichotomized)	−.60	.022	0.55	−0.64	.019	0.53	−.67	.026	0.51	−1.26	.000	0.28
Nagelkerke R^2		.064			.079			.058			.155	
−2 Log likelihood		504.113			483.833			440.573			408.746	
log-likelihood ratio test (χ^2- value)		.001			.000			.003			.000	

DV = Domestic Violence

Table 4

Regression Models for Exposure Groups and Youth Outcomes (reference category is youth with dual exposure)

	Felony assault (N=398)			Minor assault (N=398)			Delinquency (N=397)			Status offenses (N=398)		
	B	P-value	OR	B	P-value	OR	B	P-value	OR	B	P-value	OR
No exposure (ref = dual exposure)	−.96	.001	.38	−1.07	.000	.34	−.89	.005	0.41	−1.63	.000	.20
Abuse only (ref = dual exposure)	−.17	.580	.84	−0.09	.790	.92	.02	.963	1.02	−0.11	.735	.89
DV only (ref = dual exposure)	−.37	.207	.69	−0.12	.686	.89	−.28	.376	0.76	− 0.47	.140	.63
Parent-child attachment (composite score-dichotomized)	−.60	.022	.55	−0.64	.019	.53	− .67	.026	0.51	−1.26	.000	.28
Nagelkerke R^2		.064			.079			.058			.155	
−2 Log likelihood		504.113			483.833			440.573			408.75	
log-likelihood ratio test (χ^2-value)		.001			.000			.003			.000	

DV = Domestic Violence

Table 5

Regression Models for Exposure Groups and Youth Outcomes with SES and Gender Added as Controls (reference category is nonexposed youth)

	Felony assault (N=398)			Minor assault (N=398)			Delinquency (N=397)			Status offenses (N=398)		
	B	P-value	OR	B	P-value	OR	B	P-value	OR	B	P-value	OR
SES	-0.85	.000	0.43	-.40	.020	0.67	-0.54	.006	0.59	-0.72	.001	0.49
Gender	-1.53	.000	0.22	-.95	.000	0.39	-1.74	.000	0.18	-0.82	.002	0.44
Dual exposure (ref = no exposure)	0.55	.105	1.73	.87	.010	2.39	0.73	.049	2.07	1.23	.001	3.43
Abuse only (ref = no exposure)	0.10	.770	1.11	.62	.082	1.85	0.40	.294	1.50	1.05	.010	2.86
DV only (ref = no exposure)	0.06	.860	1.06	.71	.036	2.04	0.30	.422	1.36	0.72	.068	2.08
Parent-child attachment (composite score-dichotomized)	-0.30	.304	0.74	-.45	.110	0.64	-0.38	.233	0.68	-1.10	.002	0.33
Nagelkerke R^2		.252			.149			.224			.222	
−2 Log likelihood		442.022			461.954			390.759			387.844	
log-likelihood ratio test (χ^2-value)		.000			.000			.000			.000	

DV = Domestic Violence