

Does Physical Abuse in Early Childhood Predict Substance Use in Adolescence and Early Adulthood?

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Abstract

Prospective longitudinal data from 585 families were used to examine parents' reports of child physical abuse in the first 5 years of life as a predictor of substance use at ages 12, 16, and 24. Path analyses revealed that physical abuse in the first 5 years of life predicted subsequent substance use for females but not males. We found a direct effect of early physical abuse on girls' substance use at age 12 and indirect effects on substance use at age 16 and age 24 through substance use at age 12. For boys, age 12 substance use predicted age 16 substance use, and age 16 substance use predicted age 24 substance use, but physical abuse in the first 5 years of life was unrelated to subsequent substance use. These findings suggest that for females, a mechanism of influence of early physical abuse on substance use into early adulthood appears to be through precocious initiation of substance use in early adolescence.

Keywords

physical abuse, substance abuse, longitudinal research

Child maltreatment has been found to predict a wide range of negative outcomes during childhood, adolescence, and adulthood. Children who have been maltreated are at relatively high risk for internalizing problems such as depression and anxiety, externalizing problems such as aggression and delinquency, and academic problems such as poor grades and absenteeism (Stouthamer-Loeber, Loeber, Homish, & Wei, 2001). Despite evidence that child maltreatment is related to a diverse set of negative outcomes, the evidence for links between child maltreatment and substance use has been mixed. Studies of whether being maltreated predicts a child's subsequent substance use have been limited and fraught with methodological weaknesses (see Arellano, 1996 for a review). The current study used prospective, longitudinal data to examine parents' reports of physical abuse in the first 5 years of life in relation to their child's substance use at ages 12, 16, and 24.

Retrospective studies have reported links between current substance use and recollections of being maltreated during childhood (Hamburger, Leeb, & Swahn, 2008). Studies using clinical samples also often report correlations between retrospective accounts of a history of child maltreatment and current substance use (Dennis & Stevens, 2003). However, the interpretation of these findings is complicated by the possibility that current psychosocial functioning biases the recall of prior abuse and that clinical samples artificially inflate the effects of abuse by limiting the sample to those individuals whose functioning requires clinical treatment (Widom, Raphael, &

DuMont, 2004). In a direct comparison of retrospective versus prospective links between childhood maltreatment and subsequent substance use, Widom, Weiler, and Cottler (1999) found significant links between retrospectively reported childhood maltreatment and adult diagnoses of drug abuse and dependence, but no significant prospective associations between substantiated maltreatment during childhood and adult diagnoses of drug abuse and dependence.

Whether childhood abuse predicts subsequent substance use is not clear from previous research. The prospective long-term longitudinal study by Widom and her colleagues provides methodologically rigorous evidence regarding the complicated links between maltreatment during childhood and substance use in adulthood (Widom, Schuck, & White, 2006). This work suggests different impact by gender and by type of substance use. Widom, White, Czaja, and Marmorstein (2007) report that women with substantiated histories of childhood physical abuse, sexual abuse, neglect, or a combination of maltreatment

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types prior to age 11 are at higher risk than nonmaltreated women for alcohol diagnoses in early adulthood (age 29), which, in turn, mediates excessive drinking in middle adulthood (age 40). Maltreatment during childhood was unrelated to men's alcohol use in early or middle adulthood (Widom et al., 2007). Wilson and Widom (2009) found similar gender differences in relation to the use of illicit drugs. In contrast, Englund and Egeland (2009) found that maltreatment (physical abuse, sexual abuse, or neglect) from birth to age 17 was related to heavier drinking between the ages of 19 and 26, especially for males. Lo and Cheng (2007) also reported that physical abuse experienced between the ages of 10 and 17 predicted substance use in early adulthood for both men and women.

These studies suggest that the experience of abuse early in life might have an impact on later substance abuse, but this impact might vary by gender and across development. Lo, Kim, and Church (2008) found that victimization was related to more frequent substance use and that substance use generally increased in frequency from early to late adolescence and then decreased in early adulthood. However, Lo et al. defined victimization broadly in terms of being physically attacked, sexually victimized, having property destroyed, and other forms of victimization, and the perpetrators were not necessarily caregivers; our study focuses specifically on parents' physical abuse of their children. Like Widom, Marmorstein, and White (2006), the current study examines childhood abuse in relation to subsequent substance use into adulthood. The current study makes a unique contribution by examining whether associations between early physical abuse and substance use in adolescence and early adulthood can be accounted for by precocious initiation of substance use in early adolescence.

This study was guided by three questions: (a) Does physical abuse in the first 5 years of life prospectively predict substance use in adolescence and early adulthood? (b) If so, is there a significant association between early physical abuse and substance use at each time point, or is early physical abuse associated with later substance use only via earlier substance use? and (c) Do these associations differ by gender?

Method

Participants

The participants in the current investigation are part of an ongoing, multisite longitudinal study of child development (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 whether 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. The sample consisted of 585 families at the first

assessment (52% male; 81% European American, 17% African American, 2% from other ethnic groups). Families' socioeconomic status (SES) ranged from 11 to 66 using the Hollingshead Index, with a mean in the low-middle class ($M = 39.59$, $SD = 13.96$). This study includes data from follow-up assessments conducted through age 24. Ninety-one percent of the original 585 participants contributed substance use data at least once during the age 12, 16, and 24 assessments. At age 12, 427 participants provided substance use data (49% male; 84% European American, 15% African American, 1% other; $SES M (SD) = 40.69 (14.10)$). Compared to original participants who did not provide age 12 data, age 12 participants were less likely to be male, more likely to be European American, and were higher in SES. At age 16, 456 participants provided substance use data (50% male; 83% European American, 16% African American, 1% other; $SES M (SD) = 40.17 (14.28)$). Compared to original participants who did not provide age 16 data, age 16 participants were less likely to be male and more likely to be European American but did not differ in SES. At age 24, 466 participants provided substance use data (46% male; 85% European American, 14% African American, 1% other; $SES M (SD) = 40.88 (14.06)$). Compared to original participants who did not provide age 24 data, age 24 participants were less likely to be male, more likely to be European American, and were higher in SES. The ethnic and SES distribution of the sample separately by gender was consistent with the ethnic and SES distribution of the entire sample. At the age 12 and age 16 assessments, the participants from whom we had substance use data did not differ from the participants from whom we did not have substance use data in terms of childhood physical abuse; at the age 24 assessment, participants who provided substance use data were slightly less likely to have been physically abused in early childhood than were participants who did not provide age 24 substance use data (10.3% of the sample at age 24 vs. 11.8% of the sample at age 5; $\chi^2(1) = 4.92$, $p < .05$).

Procedure 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, 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–4 years and age 4–5 years) the mother was asked to 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 rate privately 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

Table 1. Descriptive Statistics and Bivariate Correlations

	1	2	3	4
1. Physical abuse Age 0–5	–	–.02	–.09	–.01
2. Substance use Age 12	.18**	–	.44***	.24**
3. Substance use Age 16	–.02	.28***	–	.47***
4. Substance use Age 24	–.08	.18*	.28***	–
% or <i>M(SD)</i> : Males	12% abused	.47 (.86)	.51 (.79)	.67 (.86)
% or <i>M(SD)</i> : Females	11% abused	.38 (.75)	.53 (.89)	.41 (.72)

Note. Correlations for females are reported below the diagonal; correlations for males are reported above the diagonal.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

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, definitely occurred, or if the authorities had been involved. Agreement between independent raters for this classification was 90% ($\kappa = .56$). Sixty-nine children (11.8% of the sample; 38 boys and 31 girls) were classified as having experienced early physical abuse.

Substance use. At age 12, adolescents were asked how many times in the last year they engaged in each of the following behaviors: smoked or chewed tobacco, drank alcohol, smoked marijuana, and used other drugs. At ages 16 and 24, participants indicated whether they had huffed or inhaled a substance in the past 12 months; ever smoked marijuana; tried cocaine or crack; tried lysergic acid diethylamide (LSD) or heroin; or tried any other way to get high. Items were summed within years to create composites reflecting how many substances adolescents had used in the last year (range = 0–4 at age 12 and 0–5 at ages 16 and 24). Because the measured substances differ widely, it was not hypothesized that responses would be indicators of a single latent construct of indiscriminate use of substances with a high internal consistency. Rather, responses were summed into a simple index of total amount of substance use.

Results

Descriptive statistics and bivariate correlations among the measures are presented separately by gender in Table 1. As shown, for both males and females, substance use at each time point was significantly correlated with substance use at each other time point. Parents' reports of early physical abuse were significantly correlated with age 12 substance use for females but not with later substance use for females or with substance use at any time point for males. We conducted path analyses using Amos 7 to investigate direct effects of physical abuse in the first 5 years of life on substance use at age 12, substance use at age 16, and substance use at age 24 and indirect effects of early physical abuse on substance use through prior substance use (see Figure 1). We used the multiple group feature in Amos to contrast models for females and males. Missing data were handled using full information maximum likelihood estimation. The overall model fit the data well, $\chi^2(2) = 2.78$, ns ,

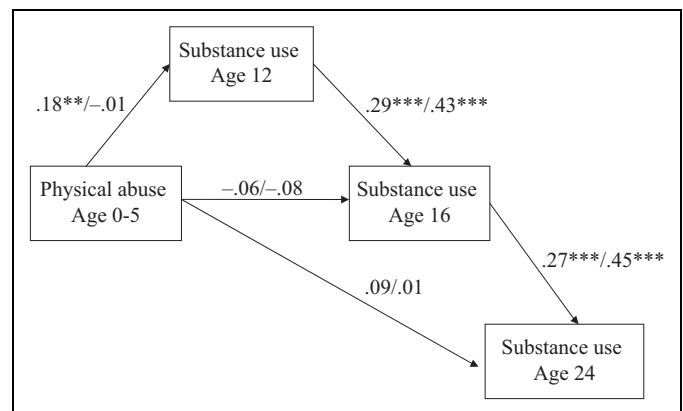


Figure 1. Standardized path coefficients from Amos model testing links among physical abuse in the first 5 years of life, substance use at age 12, substance use at age 16, and substance use at age 24. Coefficients for females are before the slash; coefficients for males are after the slash. ** $p < .01$. *** $p < .001$.

Comparative Fit Index (CFI) = .99, Root Mean Square Error of Approximation (RMSEA) = .03. A model in which the structural paths were constrained to be equal for males and females fit significantly worse than a model in which the structural paths were unconstrained across gender, $\Delta\chi^2(5) = 14.64$, $p < .05$.

As shown in Figure 1, for females there were significant paths from physical abuse in the first 5 years of life to substance use at age 12, from substance use at age 12 to substance use at age 16, and from substance use at age 16 to substance use at age 24. The direct paths from early physical abuse to substance use at age 16 and substance use at age 24 were not significant. A model that did not allow indirect effects of early physical abuse on substance use at age 16 and substance use at age 24 through substance use at age 12 fit significantly worse than the model allowing indirect effects of early physical abuse on age 16 and age 24 substance use through age 12 substance use, $\Delta\chi^2(1) = 6.62$, $p < .05$. Using the Sobel method for testing the significance of the indirect effects, the indirect effect of early physical abuse on age 16 substance use through age 12 substance use was significant, $z = 2.19$, $p < .05$, as was the indirect effect of age 12 substance use on age 24 substance use through age 16 substance use, $z = 2.96$, $p < .01$.

For males, there were no significant paths from physical abuse in the first 5 years of life to substance use at age 12, substance use at age 16, or substance use at age 24. Substance use at age 12 significantly predicted substance use at age 16, which significantly predicted substance use at age 24 (see Figure 1).

Discussion

This study found that parent-reported physical abuse in the first 5 years of life predicts subsequent child-reported substance use in early adolescence for females but not males. Furthermore, we identified a trajectory of substance use development, in which physical abuse predicted early substance use at age 12, which, in turn, led to later substance use at ages 16 and 24. For males, early adolescent substance use also predicted middle adolescent substance use, which predicted substance use in early adulthood, but physical abuse in the first 5 years of life was unrelated to subsequent substance use.

These findings are consistent with the findings in the studies of Widom and her colleagues, which have found early child maltreatment to predict subsequent alcohol use (Widom et al., 2007) and illicit substance use (Widom et al., 2006; Wilson & Widom, 2009) in middle adulthood for females but not for males. These previous studies find a gender paradox whereby men report more substance use overall, but child abuse increases the risk for substance use only in women. Our prospective longitudinal design following a community sample could account for discrepancies between our findings and those from cross-sectional studies (which have largely used retrospective reports, clinical samples, or both). Our study also examined only early childhood physical abuse; it is possible that sexual abuse and neglect may have different long-term associations with substance use and that physical abuse at later eras of life could have different effects.

For females, a mechanism of influence of early physical abuse on substance use into early adulthood appears to be through precocious initiation of substance use in early adolescence. Although boys reported using more substances at age 12 than did girls, girls' early substance use is less normative than boys' early substance use and may be linked more closely to trauma (Office of Applied Studies [OAS], 2004). These findings suggest that if interventions can prevent the early onset of substance use in girls who have been maltreated, their risk of subsequent substance use might be greatly reduced.

The findings should be considered in light of the study's limitations. First, physical abuse was assessed via in-depth interviews with parents. This has the advantage of not limiting the abused sample to those who have been brought to the attention of Child Protective Services, which is an underrepresentation of children who are actually abused. However, this method also means that our abused sample may have included cases of abuse that may not have been substantiated, had they been investigated by the authorities, and our non-abused sample may include cases of undetected abuse that was not reported by parents. Second, this work focused on physical abuse within the first 5 years of life. An important direction for future research

will be to examine physical abuse that occurs later in childhood and adolescence. Future research also would benefit from analyzing multiple factors that co-occur with abuse. Our model may have been underspecified, as previous research has identified posttraumatic stress disorder symptoms, stressful life events, and delinquent and criminal behavior as mediators of links between maltreatment during childhood and women's subsequent substance use (White & Widom, 2008). Because this study is correlational, it always remains plausible that an unidentified third variable accounts for the predictive relation between early abuse and later substance use. Finally, the measure of substance use at age 12 was not identical to the measure of substance use at ages 16 and 24. Therefore, it is possible that differences in findings across years are a function of the different measures used.

Given the vast array of other negative outcomes associated with early child maltreatment, future research should attempt to understand why there is no consistent prospective evidence linking early child maltreatment with males' subsequent substance use. It is plausible that an array of factors including conduct problems, academic problems, and deviant peer influences contribute to substance use in males, whereas early trauma more narrowly contributes to substance use in females. If so, then early physical abuse would appear as a stronger predictor of substance use problems in females than males. Further empirical studies of multiple predictors of substance use are needed to test this hypothesis. Family characteristics and child characteristics could interact with one another to create the substrate for both child abuse and later substance use problems. These same characteristics could also interact with child abuse to predict substance use, as has been found for other studies with child abuse and genes as predictors of conduct disorder outcomes (Caspi et al., 2002). Studies such as these will illuminate our understanding of the impact of physical abuse. Finally, understanding why early physical abuse does not predict males' subsequent substance use may also offer clues for preventing early initiation of substance use among females who have been maltreated.

Acknowledgment

We are grateful to the individuals who have participated in this research.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Funding

The Child Development Project has been funded by grants MH42498, MH56961, MH57024, and MH57095 from the National Institute of Mental Health, HD30572 from the National Institute of Child Health and Human Development, and DA016903 from the National Institute on Drug Abuse. Kenneth A. Dodge is supported by Senior Scientist award 2K05 DA015226 from the National Institute on Drug Abuse.

References

- Arellano, C. M. (1996). Child maltreatment and substance use: A review of the literature. *Substance Use and Misuse, 31*, 927-935.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science, 297*, 851-854.
- Dennis, M. L., & Stevens, S. J. (2003). Maltreatment issues and outcomes of adolescents enrolled in substance abuse treatment. *Child Maltreatment, 8*, 3-6.
- Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science, 250*, 1678-1683.
- Englund, M. M., & Egeland, B. (2009, April). A prospective longitudinal examination of child maltreatment and alcohol use across early adulthood. In K. Appleyard (Chair), *Longitudinal and intergenerational relations between substance use and child maltreatment*. Symposium at the biennial meeting of the Society for Research in Child Development, Denver, CO.
- Hamburger, M. E., Leeb, R. T., & Swahn, M. H. (2008). Childhood maltreatment and early alcohol use among high-risk adolescents. *Journal of Studies on Alcohol and Drugs, 69*, 291-295.
- Lo, C. C., & Cheng, T. C. (2007). The impact of childhood maltreatment on young adults' substance abuse. *American Journal of Drug and Alcohol Abuse, 33*, 139-146.
- Lo, C. C., Kim, Y. S., & Church, W. T. (2008). The effects of victimization on drug use: A multilevel analysis. *Substance Use and Misuse, 43*, 1340-1361.
- Office of Applied Studies. (2004). *Results from the 2003 National Survey on Drug Use and Health: National findings* (DHHS Publication No. SMA 04-3964, NSDUH Series H-25). Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Stouthamer-Loeber, M., Loeber, R., Homish, D. L., & Wei, E. (2001). Maltreatment of boys and the development of disruptive and delinquent behavior. *Development and Psychopathology, 13*, 941-955.
- White, H. R., & Widom, C. S. (2008). Three potential mediators of the effects of child abuse and neglect on adulthood substance use among women. *Journal of Studies on Alcohol and Drugs, 69*, 337-347.
- Widom, C. S., Marmorstein, N. R., & White, H. R. (2006). Childhood victimization and illicit drug use in middle adulthood. *Psychology of Addictive Behaviors, 20*, 394-403.
- Widom, C. S., Raphael, K. G., & DuMont, K. A. (2004). The case for prospective longitudinal studies in child maltreatment research: Commentary on Dube, Williamson, Thompson, Felitti, and Anda (2004). *Child Abuse and Neglect, 28*, 715-722.
- Widom, C. S., Schuck, A. M., & White, H. R. (2006). An examination of pathways from childhood victimization to violence: The role of early aggression and problematic alcohol use. *Violence and Victims, 21*, 675-690.
- Widom, C. S., Weiler, B. L., & Cottler, L. B. (1999). Childhood victimization and drug abuse: A comparison of prospective and retrospective findings. *Journal of Consulting and Clinical Psychology, 67*, 867-880.
- Widom, C. S., White, H. R., Czaja, S. J., & Marmorstein, N. R. (2007). Long-term effects of child abuse and neglect on alcohol use and excessive drinking in middle adulthood. *Journal of Studies on Alcohol and Drugs, 68*, 317-326.
- Wilson, H. W., & Widom, C. S. (2009). From child abuse and neglect to illicit drug use in middle adulthood: A prospective examination of the potential mediating role of four risk factors. *Journal of Youth and Adolescence, 38*, 340-354.

Bios

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