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Developmental effects of childhood household adversity, transitions, and relationship quality on adult outcomes of socioeconomic status: Effects of substantiated child maltreatment

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Abstract

The degree to which child maltreatment interacts with other household adversities to exacerbate risk for poor adult socioeconomic outcomes is uncertain. Moreover, the effects of residential, school, and caregiver transitions during childhood on adult outcomes are not well understood. This study examined the relation between household adversity and transitions in childhood with adult income problems, education, and unemployment in individuals with or without a childhood maltreatment history. The potential protective role of positive relationship quality in buffering these risk relationships was also tested. Data were from the Lehigh Longitudinal Study (n = 457), where subjects were assessed at preschool, elementary, adolescent, and adult ages. Multiple group path analysis tested the relationships between childhood household adversity; residential, school, and caregiver transitions; and adult socioeconomic outcomes for each group. Caregiver relationship quality was included as a moderator, and gender as a covariate. Household adversity was negatively associated with education level and positively associated with income problems for non-maltreated children only. For both groups, residential transitions was negatively associated with education level and caregiver transitions was positively associated with unemployment problems. Relationship quality was positively associated with education level only for nonmaltreated children. For children who did not experience maltreatment, reducing exposure to household adversity is an important goal for prevention. Reducing exposure to child maltreatment for all children remains an important public health priority. Results underscore the need for programs and policies that promote stable relationships and environments.

Keywords

Child maltreatment; Demographic transition; Residential mobility; Parent child relationship; Socioeconomic status; Longitudinal study

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1. Introduction

Adverse childhood experiences (ACEs), such as child maltreatment, are important public health concerns with wide-ranging and long-lasting consequences (Middlebrooks & Audage, 2008). These include adolescent and adult mental health problems, such as depression, as well as a range of health-related risks, such as substance use and obesity (Batten et al., 2004; Felitti et al., 1998; Herrenkohl et al., 2015; Middlebrooks & Audage, 2008; Molnar et al., 2001; Widom et al., 2012). Evidence also shows links of ACEs to low educational attainment, unemployment, and financial difficulties in adulthood (Font & Maguire-Jack, 2015; Merrick et al., 2013), but the extent to which early adversity relates to later socioeconomic challenges over the long term and independently of additional risk factors is poorly understood.

The family process model (Conger et al., 1992) and related research (Mersky et al., 2009; Zielinski & Bradshaw, 2006) highlight that family functioning and child outcomes, including maltreatment experiences, are impacted by financial hardships for many families. Such families include those struggling to break a cycle of poverty (Bird, 2007; Herrenkohl et al., 2018; Rumberger, 2010), which contributes to the stability of economic difficulties from childhood to adulthood and over multiple generations. Thus, an adequate understanding of child maltreatment must be sensitive to the broader context that includes the financial demands on families (Herrenkohl et al., 2018). In particular, household adversities, including financial hardship, might interact with child maltreatment to exacerbate risk for poor adult socioeconomic outcomes in vulnerable children; however, this remains to be tested. If so, then current efforts to break the cycle of poverty, which tend to emphasize educational and occupational opportunities, might attend to the unique needs of individuals who have experienced child maltreatment to build resilience against adverse long-term outcomes.

Residential, school, and caregiver transitions are associated with child maltreatment and later adult health and well-being (Herrenkohl et al., 2016). Additionally, childhood maltreatment is associated with greater residential instability and disruptions in education by adulthood (Jung et al., 2016). Further, children who experience maltreatment are more likely than those who are not maltreated to have multiple caregivers over time, either through formal arrangements made by child welfare (e.g., removal from the home) or though informal arrangements in which children are cared for by relatives or friends when the primary caregiver is unavailable or unable to parent (Herrenkohl et al., 2016). However, it is not well established whether certain types of transitions (e.g., residence changes versus school or caregiver changes) are more strongly associated with those outcomes than are others (Herrenkohl et al., 2003). For example, housing instability may increase or reflect household disorganization, including poor parenting (Evans & Wachs, 2010), which could affect students' academic performance and, ultimately, educational attainment. Likewise, school changes, when they are large in number, may reflect disruptions that make it difficult for parents to engage with schools and students to progress typically through the educational experience. Caregiver transitions likely contribution to disruptions in social support and attachment (Ellis et al., 2009); as these internal working models are carried forward into the relationships of adulthood, the types of employment opportunities that emerge from social

As an additional consideration, the Centers for Disease Control and Prevention's Safe, Stable, Nurturing, Relationships and Environments framework (Fortson et al., 2016) organizes the literature on social support and suggests the potential role it can play in building resilience in vulnerable children. This framework and related research highlight that positive, high quality adult-child relationships and support are critical for children's prosocial development and necessary to lessen or counteract the adverse effects of child maltreatment and toxic stress (Herrenkohl et al., 2015; Merrick et al., 2013). However, social support variables often have been analyzed only as main effect predictors and less often as moderators of risk factors, such as transitions or child maltreatment (Herrenkohl et al., 2016; Klika & Herrenkohl, 2013; Masten, 2001).

The current project uses data from a longitudinal dataset to examine predictors of socioeconomic status for adults with and without a history of child maltreatment. Specifically, we examined the extent to which education, employment, and income in adulthood are related to stressful experiences in childhood (e.g., household and school moves, caregiver changes, household strain) and whether social support from positive caregiver-child relationships moderates the path from childhood stressors to adult outcomes. Based on prior research and relevant theory (e.g., the family process model), it was expected that household adversity in childhood would predict more income problems and lower education and employment levels in adulthood, reflecting in part the stability of economic difficulties, and that these risk relationships might be stronger for maltreated versus nonmaltreated children. Transitions also were hypothesized to predict the adult socioeconomic outcomes over-and-above adversity, although specific patterns were not anticipated given the limited literature on differential prediction of multiple transition types. Finally, it was hypothesized that relationship quality would buffer the risk relationships. Because there are gender differences in the rates of different child maltreatment experiences and in the consequences of those experiences for later functioning (Herrenkohl, 2011), gender was included as a covariate. Examining the influences of childhood stressors on adult outcomes for individuals with a history of maltreatment can provide important information to help public health practitioners focus prevention programs on the children most at risk, on their families, and on those with whom the children have positive relationships.

2. Methods

2.1. Sample/procedures

Data are from the Lehigh Longitudinal Study (Herrenkohl et al., 2013), which began in 1976 with 457 children ages 18 months to 6 years of age. Data were subsequently collected when children were in elementary school (average age was 8 years), and again in adolescence (average age was 18 years, range 14–23). From 2008 to 2010, data collection was completed again when participants were an average age of 36 years (range 31–41). Parents of the study subjects were administered surveys by trained interviewers for the preschool and elementary school waves, while the participants themselves were interviewed for the adolescent and

adult waves. Study procedures were approved by the Human Subjects Division at the University of Washington and the Office of Research and Sponsored Programs at Lehigh University.

The study used a nonequivalent group design in which children from two child welfare groups (substantiated abuse, n = 144, and substantiated neglect, n = 105) were to be compared to groups sampled from other settings: Head Start (n = 70); day care (n = 64); and middle-income nursery (n = 74). The original study sample (n = 457) was 54% male and 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, and 0.2% (n = 1) Native Hawaiian or Other Pacific Islander. At the initial assessment, 86% of the families were from two parent households. About 60% of the sample would be considered poor according to the income-to-needs ratio and poverty threshold set by the United States Census Bureau in 1976 (n.d.). At the final (adult) wave of data collection, 80% (n = 357) of the original sample still living remained in the study. Tests of the adult sample showed that more of the original child welfare abuse group was lost to attrition. However, there were no significant differences between the groups in terms of gender, age, childhood SES, observer ratings of neglect, or parent-reported physically abusive discipline.

2.2. Measures

2.2.1. Cumulative childhood household adversity—To create the cumulative adversity variable, we used 21indices from the preschool, school-age (items were reported by mother) and adolescent (items were self-report) waves. Adversity indicators include conflict with neighbors, relatives, and between parents; the break-up of a marriage/family or dissatisfaction with a marital relationship; problems with other adults in the home; child behavior problems at home or in school; insufficient income, crowding in the home, lack of home conveniences, responsibility of child care, and unemployment; trouble with police; mental or physical illness; chronic fatigue; pregnancy; unfulfilled ambitions; lack of friends; and substance problems. Each adversity indicator was coded as 0 = not endorsed, 1 = endorsed. All household adversity indicators matched across the three waves were summed for a final cumulative household adversity score, ranging from 0 to 39 (M= 14.97, SD =7.58).

2.2.2. Cumulative childhood residential transitions—In the adolescent survey, participants were asked the total number of residences they had lived in during their childhood. Answers ranged from 1 to 73 (M= 6.60, SD =62.1).

2.2.3. Cumulative childhood school transitions—The adolescent survey also asked about the total number of schools participants had attended during their childhood. These answers ranged from 2 to 20 (M = 5.45, SD =2.10).

2.2.4. Cumulative childhood caregiver transitions—At each wave of the survey, participants were asked the number and type of living situations they had been in (e.g. home with parents, with relatives, in an institution). These totals were summed across waves to create a total caregiver transitions variable, ranging from 1 to 22 (M = 4.63, SD = 3.97).

2.2.5. Relationship quality with caregivers—In the adult survey, participants were asked to think back on relationships with up to three caregivers from their childhood. These included a mother or mother-like figure, a father or father-like figure, and another adult caregiver. They were then asked to rate these caregivers on 6 relationship quality variables, asking how much of the time the caregiver "spoke to you in a warm friendly voice," "seemed emotionally cold to you" (coded negatively), "was affectionate to you," "enjoyed talking things over with you," "could make you feel better when upset," and "seemed to understand your problems/worries". These six variables were scored from a 0 = Never, to 3 =Frequently, and a sum of scores was calculated for each caregiver. To create a relationship quality variable, we averaged those sums of scores from all questions among the total number of caregivers reported on (up to 3). Scores for this variable ranged from 0-18 (M = 13.55, SD = 3.52).

2.2.6. Highest education level—From the adult survey, participants were asked to indicate their highest level of schooling completed, from 1 = 8th grade or less, up to 9 =post college or professional degree. The median response for this variable was 4 = high school graduate.

2.2.7. Unemployment problems—From the adult survey, if current employment status is unemployed, if participants indicated that they had been fired or laid off in the last year, or said that unemployment had been a stressor for their household in the last year, this outcome was coded as a 1, otherwise a 0. In this sample, 126 (27.6%) of the participants endorsed this item.

2.2.8. Income problems—In the adult survey, participants were asked about shared annual household income before taxes, which was coded from 1 = \$200,001 and over, to 18 = under \$10,000. They were also asked if they've ever received public assistance or welfare as an adult, coded as 0 = No and 1 = Yes. Finally, they were asked if insufficient income and bill collectors have been a problem in their household in the last 12 months, which were also coded 0 = No and 1 = Yes. Due to the different methods of measurement among these variables, the items were then standardized and summed for a cumulative score of income problems, ranging from -3.34-6.31 (M= -0.14, SD =2.73).

2.2.9. Maltreatment—Participants were grouped according to whether they had ever been involved in the child welfare system due to reports and substantiation of abuse and neglect. This variable was coded as 0 = not maltreated (n = 208, 45.5%) and 1 = maltreated (n = 249, 54.5%).

2.2.10. Covariates—Gender (0 = female, 1 = male) was also included as a covariate. Note that age also was explored as a covariate but was unrelated to the outcomes and its inclusion did not alter the basic pattern of findings; therefore, it was excluded from the analyses reported below.

2.3. Analyses

Multiple group path analysis was conducted using Mplus 8.0 (Muthén & Muthén, 1998) to test the hypothesized model in Fig. 1. Although not depicted in the figure, correlations among the exogenous predictors and, separately, among the residuals of the three outcome variables were estimated. Parameter estimates were derived using the Weighted Least

Squares-Mean and Variance (WLSMV) adjusted estimator, which is appropriate for models with categorical outcomes (e.g., unemployment problems). In Mplus, WLSMV implements a pair-wise missing data strategy, in this case retaining the total sample size of 457. Analyses were conducted in two stages. First, an unconstrained multiple group model was estimated in which all paths were freely estimated for the maltreated and not maltreated groups. Second, a series of constrained models was tested wherein each path, one at time, was forced to take on the same value across groups and a chi-square difference test was generated using the diffeest command in Mplus. A non-significant difference test indicates that a path could be considered equal for the two groups, whereas a significant difference test reflects a group difference. In order to deal with the higher Type I error probability when running these multiple tests, the Holm-Bonferroni method was employed to adjust the significance level for determining group differences (Holm, 1979). A final model was estimated that included the optimal combination of free and constrained paths based on results from the series of Holm-Bonferonni adjusted difference tests. These two stages were then replicated after adding transitions X relationship quality and stress X relationship quality interaction terms to the model (Aiken & West, 1991).

3. Results

3.1. Descriptive statistics

Cross-tabulations and mean comparisons revealed anticipated maltreatment group differences on the indicators of adult socioeconomic status. Specifically, 45.9% of the maltreated group experienced unemployment problems, compared to 29.3% of the non-maltreated group (Chi-square = 9.81, p = .002). In terms of income problems, the mean z-score for the maltreated group was. 74, which was higher than that for the non-maltreated group, which was -0.87 (t=-5.06, p < .001). And for highest education level, the maltreated group had a mean score of 3.71 (4 = High school graduate) and the non-maltreated group had a mean of 5.95 (6= 2 year college graduate) (t=9.87, p < .001). Table 1 presents correlations among the study variables separately by maltreatment group.

3.2. Multiple group path models

An unconstrained multiple group analysis of the model in Fig. 1 was estimated. Note that this model estimated all possible paths and included no group constraints, therefore it was just identified (degrees of freedom = 0.0, chi-square = 0.0). Next, each path was tested for group moderation according to the steps outlined above. Results for the series of difference tests are not reported, but are available on request. Difference testing revealed three paths that were shown to differ across groups after Holm-Bonferroni correction: the paths from total household adversity to both highest education level and income problems, and the path from relationship quality to highest education level. A final multiple group model was

estimated in which these three paths were allowed to vary across groups and all remaining paths were constrained to equality.

The fit between the data and the final multiple group model was acceptable according to current guidelines (e.g., CFI > 0.95, RMSEA < 0.06; Hu & Bentler, 1999): Chi-square =11.59, degrees of freedom =15, n =457, p = .710; CFI =1.0, RMSEA = 0.0. Path coefficients are reported in Fig. 2 (non-maltreated group) and Fig. 3 (maltreated group). Results indicated that total household adversity had statistically significant associations with highest education level and income problems for non-maltreated children but not for maltreated children. Additionally, non-maltreated children showed a statistically significant association between relationship quality and highest education level. Turning to the remaining paths that were comparable across groups, results showed that residential transitions had a statistically significant negative association with highest education level. And caregiver transitions had a statistically significant positive association with unemployment problems. School transitions was unrelated to the three outcomes, controlling for the other two types of transitions as well as household adversity, relationship quality, and gender. Total household adversity was unrelated to unemployment problems in both groups. Finally, regarding gender as a covariate, results showed that this variable did not have a significant association with the outcomes over and above the other variables tested. Estimated R-Square values for the outcome variables are reported in Figs. 2 and 3.

3.3. Relationship quality interaction tests

Next, transitions X relationship quality and household adversity X relationship quality interaction terms were added to the model and the two multiple group analysis stages were repeated. Results from these analyses are not reported in full, but are available on request. The fit between the data and the final multiple group interaction model was acceptable: Chi-square =19.65, degrees of freedom = 27, n =457, p = .85; CFI = 1.0, RMSEA = 0.0. Results indicated no group differences on any of the interaction effects. Also, none of the interaction effects had statistically significant associations with any of the outcome variables.

4. Discussion

This study examined the relations between household adversity, transitions, and relationship quality in childhood and adult outcomes of income problems, education, and unemployment for a cohort of individuals who did or did not experience substantiated childhood maltreatment. Results showed that total household adversity did not predict education level or income problems for adults who had experienced substantiated childhood maltreatment victimization, suggesting that the relationship between adverse childhood experiences in the household and these outcomes is stronger for those who have not had substantiated childhood maltreatment. These findings run counter to those of other studies, including those of the large retrospective Adverse Childhood Experiences (ACE) dataset (Felitti et al., 1998), that find greater risk of adverse outcomes for those with a history of child maltreatment. However, earlier studies focus on mean differences between groups, whereas the current study focused on the strength of the relationships between variables for maltreated children. Additionally, unlike previous studies (Anda et

al., 1999; Felitti et al., 1998), our analyses combined indicators of officially recorded child maltreatment with parent and child reports of other forms of adversity measured over several years and multiple waves of a large study. These differences in approach, and in the measures themselves, may account in some part for the differences between our findings and those of other studies.

Another notable finding from the current study is that the association between relationship quality and education level differed for maltreated and non-maltreated participants. For the non-maltreated group only, higher average relationship quality with caregivers was associated with attaining higher levels of education. Previous research has shown that positive relationships and secure attachments support skill development in children, increasing their self-confidence and lowering their emotional distress when challenges arise (Herrenkohl et al., 2016). Additionally, emotional support from caregivers has been shown to be related to academic success (Weiss et al., 2009). In this sample, it may be that the quality of relationships involving caregivers is complicated by the fact that some have caregivers who also contributed to the stress children experienced growing up. Disentangling the positive characteristics of relationships from other aspects that influence how an adult child recollects the warmth, affection, and support he or she received may be necessary to better establish the protective role of caregiver relationships.

Other paths in the multiple group model were consistent across the two groups. In both groups, residential transitions predicted education level, and caregiver transitions predicted unemployment. The fact that transitions of one or another type relate differently to adult income problems, education, and unemployment raises questions about their underlying mechanisms and the reasons why certain transitions matter more for particular outcomes than do others. For education level, for example, it might be that residential transitions are important because the adult mentoring related to a child's schooling and educational choices is disrupted when he or she moves homes. Housing instability may also affect children by creating household chaos, which limits parents' ability to maintain consistent discipline and parenting strategies such as bedtimes and homework schedules (Evans & Wachs, 2010). Caregiver transitions might be more strongly related to adult unemployment because these particular changes, at higher frequencies, lead not only to a breakdown in social supports and mentoring for children but also the absence of consistent role models who, by their actions, communicate the value of hard work and importance of consistent employment. Caregiver transitions might also affect the development of secure attachments. Insecure attachments could lead to poor ability to develop strong relationships (Ellis et al., 2009); in turn, relationships are a key source of employment opportunities (Wanberg, 2012). Additional research is needed to test these and other potential mechanisms by which transitions are associated with adult socioeconomic outcomes.

4.1. Limitations

There are some noteworthy limitations to the study. Maltreatment group was selected based on reports to child protective services (CPS). It is possible that individuals who experienced maltreatment in childhood but were not reported to CPS were included in the comparison group. This would have the effect of attenuating differences in outcomes between the

maltreated and non-maltreated groups and could explain the similarities in outcomes seen with regard to housing and caregiver instability. Conceptual replication studies are needed that draw on other sources of information in defining child maltreatment status. Overall, there were relatively few statistically significant group differences, which may have been due to methodological considerations such as measurement unreliability and low statistical power. Additionally, potential restriction of range on the variables in either group could have affected the results in tests of group differences. Some of the measures were based on retrospective reports, which could be subject to recall biases. Outcome data were based on self-reports and lacked corroborating data from other sources (e.g., employment records). Household adversity was operationalized as a count of dichotomized risks, which may have been less sensitive to the detection of group differences than an approach that captures the severity of adversities; however, the count variable was identified as an important predictor of long-term outcomes, and findings contribute to the robust ACEs and cumulative contextual risk literatures (Felitti et al., 1998). Additionally, Farrington and Loeber (2000) found that dichotomizing variables in this way does not typically change the results of analyses. Although this study advances the literature by considering multiple types of transitions simultaneously, the precise timing of the transitions was unknown. Finer-grained, repeated measures studies are needed to examine the dynamic interplay among transition types and their associations with socioeconomic outcomes. Finally, the sample in this study was rather racially homogeneous compared to the larger population. The extent to which the pattern of findings shown here might hold for more diverse populations is unknown and should be tested in future research.

4.2. Conclusions

The current study has practice implications related to improving socioeconomic outcomes in adulthood, both for those who did and did not experience substantiated maltreatment in childhood. Although additional adverse childhood experiences in the household may have less of an effect on adult outcomes for those who have experienced child maltreatment substantiated by child protective services, for children not experiencing substantiated maltreatment, preventing their exposure to household adversity is just as important as preventing child maltreatment. Moreover, the relations between transitions and adult outcomes underscore the importance of policies and interventions that promote stable relationships and environments. Public health-based prevention and intervention programs aimed at reducing residential instability, increasing positive parenting, and promoting stable relationships and environments could reduce the risk of poor adult socioeconomic outcomes for children who experience adversity, not limited to maltreatment. CDC's recently released resource, Preventing Child Abuse and Neglect: A Technical Package for Policy, Norm, and Programmatic Activities, provides examples of such evidence-based programs (Fortson et al., 2016). These efforts to ensure caregiver stability and child safety within the home could positively impact adult employment. Livable wages, early/quality child care, and positive parenting can promote stability, which can reduce exposure to child maltreatment and its consequences.

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Hypothesized Model Examining Predictors of Socioeconomic Disadvantage.









Table 1.

Correlations among Study Variables for Maltreated (upper diagonal) and Non-maltreated (lower diagonal) Groups.

Variable	1	2	3	4	5	6	7	8	9
1. Total household adversity		0.29 **	0.32**	0.28**	0.06	0.08	-0.07	0.18	0.11
2. Residential transitions	0.27**		0.35 **	0.43**	-0.07	0.02	-0.24 **	0.32**	0.18*
3. School transitions	0.19**	0.53**		0.52**	0.00	0.07	-0.01	0.20*	0.16*
4. Caregiver transitions	0.40**	0.66**	0.49 **		-0.06	0.04	-0.25 **	0.30**	0.29 **
5. Relationship quality	-0.13	-0.04	0.08	-0.03		-0.05	0.08	0.06	-0.00
6. Gender (male)	0.02	-0.09	-0.05	-0.05	-0.03		-0.06	-0.09	-0.03
7. Highest education level	-0.51 **	-0.37 **	-0.14	-0.45 **	0.23 **	-0.01		-0.40 **	-0.33 **
8. Income problems	0.41 **	0.23 **	0.09	0.27**	-0.12	-0.13	-0.46**		0.43 **
9. Unemployment problems	0.13	0.09	0.02	0.16*	-0.07	-0.09	-0.29 **	0.55 **	

** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).