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The Prospective Contribution of Childhood Maltreatment to Low Self-Worth, Low Relationship Quality, and Symptomatology Across Adolescence: A Developmental-Organizational Perspective

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Abstract

This research investigated the prospective contribution of childhood maltreatment to low self-worth, low relationship quality, and symptoms during adolescence. Further, the stability and cross-lagged effects of these sequelae of maltreatment were examined over time. History of maltreatment during childhood was obtained, and youth (407 maltreated, 228 nonmaltreated; 376 males, 259 females) completed two subsequent assessments spaced approximately two years apart during early-mid and mid-late adolescence. As anticipated, childhood maltreatment experiences predicted low self-worth, low relationship quality, and both internalizing and externalizing symptoms in early-mid adolescence. Beyond the stability paths of each outcome variable, significant cross-lagged effects were observed among low self-worth, low relationship quality, and internalizing symptoms across adolescence. In contrast, cross-lagged effects were not observed among adolescent externalizing symptoms. These findings support a developmental-organizational model in which childhood maltreatment creates multiple vulnerabilities that evince continuity and generate mutually influencing effects across adolescence.

Keywords

maltreatment; self-worth; relationship quality; adolescent psychopathology

The contribution of childhood maltreatment to diverse social, emotional, and behavioral disturbances is well-established, with associated impairments extending from early childhood into adulthood (see Cicchetti & Valentino, 2006, for review). The goal of the current study was to evaluate a developmental-organizational model (Cicchetti & Lynch, 1995; Cicchetti & Valentino, 2006; Toth, Cicchetti, Rogosch, & Sturge-Apple, 2009) of the effects child maltreatment on adaptation during the adolescent period. Within the developmental-organizational perspective, development proceeds through a series of steps in which the growing individual is confronted with a progression of stage-salient developmental tasks (e.g., formation of a secure attachment relationship, formation of an autonomous self, achievement of effective peer relationships). As each of these domains emerge, they remain lifelong organizers of adaptation, and the quality of the resolution of

the developmental challenge influences adaptation in subsequent developmental periods. Inadequate resolution of stage-salient tasks generates vulnerability in competently meeting later developmental challenges. As research reviewed below will demonstrate, children who have experienced abuse and neglect are likely to acquire a range of liabilities across early development, which pose vulnerability for successfully negotiating adolescence. Accordingly, developmental-organizational models incorporate a number of inter-related prospective processes: (1) childhood maltreatment engenders accumulating vulnerabilities in multiple developmental domains in the course of development, (2) the resulting vulnerabilities are carried forward (i.e., demonstrate stability) across maturation, and influence subsequent functioning in other developmental domains, and (3) the intermediary vulnerabilities resulting from childhood maltreatment constitute processes that account for, or mediate, the effects of childhood maltreatment on maladaptation across developmental domains. To examine this model, we specifically tested the effects of childhood maltreatment parameters on low self-worth, low quality relationships, and both internalizing and externalizing symptoms across early-mid and mid-late adolescence.

Effects of Childhood Maltreatment across Developmental Domains

Childhood maltreatment involves diverse experiences of abuse (i.e., physical, sexual, emotional) and neglect imparted by a child's caregiver or other responsible adult. Maltreatment inherently reflects a critical malfunction of the caregiving environment in that children's essential needs for security and protection are not provided, thereby communicating to children that they lack value and worth (Cicchetti & Lynch, 1995). Indeed, a variety of childhood maltreatment parameters predict low self-worth in childhood (e.g., Appleyard et al., 2010), adolescence (e.g., Burack et al., 2006), and young adulthood (Kim & Williams, 2009). In terms of interpersonal consequences, maltreatment likely engenders negative internal working models of self and others. Internal working models are theorized to represent interpersonal expectations, such as whether other people are generally caring, trustworthy, and supportive or, conversely, whether other people are generally hostile, untrustworthy, and unsupportive. Notably, compared to nonmaltreated samples, maltreatment predicts a lower likelihood of a secure attachment relationship and a higher likelihood of a disorganized attachment relationship from infancy through childhood (for a meta-analytic review, see Cyr, Euser, Bakermans-Kranenburg, & Van IJzendoorn, 2010). Moreover, the negative internal models of attachment relationships in response to maltreatment are apt to generalize to peer relationships. Indeed, when compared to nonmaltreated children, maltreated children evince maladaptive representations of mothers that are, in turn, associated with peer rejection and aggression (Shields, Ryan, & Cicchetti, 2001). Broadly, maltreated youth experience greater negative peer relationship qualities (e.g., aggression, withdrawal, rejection; Alink, Cicchetti, Kim, & Rogosch, 2012; Kim & Cicchetti, 2010) and fewer positive peer relationship qualities (e.g., prosocial and socially competent behavior; Alink et al., 2012; Rogosch, Oshri, & Cicchetti, 2010) than nonmaltreated youth.

Childhood maltreatment also confers vulnerability to both internalizing and externalizing dimensions of psychopathology in childhood and adolescence (e.g., Appleyard et al., 2010; Keiley, Howe, Dodge, Bates, & Pettit, 2001; Lewis et al., 2011; Rogosch et al., 2010). In

terms of internalizing symptoms, maltreatment predicts heightened symptoms of depression (e.g., Hankin, 2005; Shenk, Noll, & Cassarly, 2010) and anxiety (e.g., Shenk et al., 2010). In terms of externalizing symptoms, physically abused children received higher peer nominations of aggression and disruptive behavior than nonmaltreated children (Teisl & Cicchetti, 2008; Teisl, Rogosch, Oshri, & Cicchetti, 2012). In adolescent samples, maltreatment parameters are associated with delinquency (Kim, Tajima, Herrenkohl, & Huang, 2009), alcohol use (Shin, Edwards, Heeren, & Amodeo, 2009), cannabis use (Oshri, Rogosch, Burnette, & Cicchetti, 2011; Rogosch et al., 2010), and cigarette use (Lewis et al., 2011). Thus, based on this collective body of research, we anticipated that childhood maltreatment parameters would simultaneously contribute to low self-worth, low quality parent and peer relationships, and both internalizing and externalizing symptoms during adolescence.

Intermediary Vulnerabilities as Mediators between Maltreatment and Later Maladaptation

Building on these bivariate associations between maltreatment and self-worth, difficulties with mothers and peers, and symptoms, preliminary research identifies process models linking several of these domains over time. First, interpersonal disturbances accounted for the prospective effect of physical and sexual abuse on low self-worth (Lopez & Heffer, 1998; Wind & Silvern, 1994). Second, perceived interpersonal difficulties with peers (Appleyard et al., 2010) and parents (Wind & Silvern, 1994) partially explained the association between childhood maltreatment and symptoms of psychopathology. Specifically, perceptions of loneliness and social dissatisfaction with peers mediated the contribution of maltreatment to both internalizing and externalizing symptoms in youth (Appleyard et al., 2010). In addition, perceptions of inadequate parental support accounted for the association between retrospective reports of physical and sexual childhood abuse and current depressive symptoms in adults (Wind & Silvern, 1994). Third, low self-worth mediates associations between maltreatment and symptoms in youth and young adults (Appleyard et al., 2010; Kim & Williams, 2009). Specifically, low self-esteem accounted for the effect of childhood maltreatment on both internalizing and externalizing symptoms in boys (Appleyard et al., 2010), and low self-worth accounted for the link between sexual abuse and substance use (i.e., externalizing symptoms) in college students (Kim & Williams, 2009). Although these preliminary studies illuminate relevant explanatory mechanisms, three relied upon retrospective self-reports of maltreatment in adult samples (Kim & Williams, 2009; Lopez & Heffer, 1998; Wind & Silvern, 1994), and the fourth assessed process models during early and middle childhood (Appleyard et al., 2010). Thus, our final goal was to examine nested mediational pathways that may explain the prospective contribution of childhood maltreatment parameters to low self-worth, low quality relationships, and symptoms of psychopathology. These tests of mediation build on and advance prior research by considering multiple childhood maltreatment parameters, controlling for prior levels of the outcome variables, and investigating explanatory effects during adolescence.

Measurement of Childhood Maltreatment

In the expansive body of maltreatment research, childhood maltreatment has been measured and operationalized in a variety of ways. In terms of measurement, a substantial quantity of research has relied on retrospective self-reports (e.g., Kim & Williams, 2009) or parental reports (e.g., Keiley et al., 2001); often these assessments examine specific maltreatment subtypes in isolation. To address these potentially biased methods, comprehensive assessments relying on objective information obtained from state agency records (e.g., Department of Human Services) have been developed (e.g., Barnett, Manly, & Cicchetti, 1993), which identify individual and co-occurring maltreatment subtypes and score maltreatment experiences independently from legal classifications and case dispositions.

Regarding operationalization, it is essential to consider a variety of parameters in order to capture the phenomenon of maltreatment across development. Specifically, it is important to gather information about subtypes (e.g., presence of individual subtypes, total number of subtypes) as well as timing (e.g., developmental stage of occurrence, onset, recency, chronicity). Accordingly, a comprehensive set of maltreatment parameters (i.e., individual maltreatment subtypes; total number of maltreatment subtypes; developmental period of occurrence, onset and recency; maltreatment chronicity) were included in this study.

Summary and Hypotheses

In sum, we examined the contribution of childhood maltreatment parameters to low self-worth, low quality relationships, and internalizing and externalizing symptoms in adolescence. Further, the stability and cross-lagged effects of these sequelae of maltreatment were investigated over time. Specifically, we predicted:

Hypothesis 1: Childhood maltreatment parameters will simultaneously predict low self-worth, low quality relationships with mothers and peers, and both internalizing and externalizing symptoms in early-mid adolescence.

Hypothesis 2: Low self-worth, low quality relationships, and both symptom types will display stability and elicit cross-lagged effects from early-mid to mid-late adolescence.

Hypothesis 3: The maltreatment sequelae in early-mid adolescence (i.e., low self-worth, low quality relationships, and symptoms) will partially mediate the effects of the childhood maltreatment parameters on low self-worth, low quality relationships, and both symptom types in mid-late adolescence.

Method

Participants

The participants took part in a multi-wave investigation of the developmental sequelae of childhood maltreatment. Standard procedures for the protection of human participants were followed. The youth were assessed three times, specifically, between 7 to 9 years at Wave 1 (W_1 ; i.e., childhood), 13 to 15 years at Wave 2 (W_2 ; i.e., early-mid adolescence), and 15 to 18 years at Wave 3 (W_3 ; i.e., mid-late adolescence). Parents provided written consent for complete access to family records in the Department of Human Services (DHS) that were

used to identify maltreated participants. Of those meeting criteria for substantiated maltreatment, families were randomly contacted by a DHS recruitment liaison who explained the study. Interested parents signed consent forms releasing their contact information to research staff, who subsequently recruited families for participation. The mothers of youth identified as maltreated completed the Maternal Maltreatment Classification Interview (Cicchetti, Toth, & Manly, 2003) to assess additional maltreatment that may not have been included in DHS records. The resulting sample of maltreating families was representative of the local DHS population.

Because the preponderance of maltreated youth represent low income families (Sedlak et al., 2010), demographically comparable families without maltreatment experiences were recruited through the Aid to Families with Dependent Children program. Eligible nonmaltreating families (i.e., low income families without DHS abuse and neglect investigations) were also randomly contacted by a DHS liaison and recruited in the same manner as maltreating families. Following parental consent to review DHS records, the absence of maltreatment experiences in these families was verified through DHS record searches for all information through the year following the first assessment (to confirm that all existing record information had been retrieved). Finally, the mothers of youth identified as nonmaltreated completed the Maternal Maltreatment Classification Interview (Cicchetti et al., 2003) in order to rule out other nondocumented maltreatment.

The obtained sample of 635 included both maltreated ($N = 407$) and nonmaltreated ($N = 228$) youth (376 males and 259 females) who were diverse in race (55.1% African American, 27.2% White, 17.7% other) and ethnicity (11.9% Hispanic, 88.1% non-Hispanic). Maltreated and nonmaltreated youth did not significantly differ in sex, $\chi^2(1) = .03$, *ns*, race, $\chi^2(2) = 4.51$, *ns*, ethnicity, $\chi^2(1) = .04$, *ns*, or family history of receipt of public assistance, $\chi^2(1) = .09$, *ns*. The marital status (i.e., never married; married or living with partner; no longer married [divorced, separated, widowed]) of the primary caregiver did differ across groups at the first wave in adolescence, $\chi^2(2) = 17.63$, $p < .01$, such that the caregivers of nonmaltreated youth were more likely to be married or living with partners.

Procedure

At the first assessment (W_1), children participated in a summer camp research program and family maltreatment experiences were assessed (for a detailed historical description of the camp procedures, see Cicchetti & Manly, 1990). Youth were subsequently recruited to participate at two waves during early-mid and mid-late adolescence (W_2 and W_3) spaced approximately two years apart. Adolescents were administered a battery of assessments, including self-report questionnaires of self-worth, maternal and peer relationship quality, and internalizing and externalizing symptoms.

Measures

Childhood maltreatment—Thorough searches for DHS maltreatment records were conducted, and the obtained information from families with substantiated maltreatment was coded according to the operational criteria detailed in the Maltreatment Classification System (MCS; Barnett et al., 1993). The MCS utilizes comprehensive DHS information to

categorize maltreatment experiences independently from legal classifications and case dispositions. The reliability and validity of the MCS have been established in previous research (e.g., Manly, Kim, Rogosch, & Cicchetti, 2001).

Each maltreatment experience was coded along three dimensions: (1) the subtypes of maltreatment (i.e., sexual abuse, physical abuse, neglect, emotional maltreatment) were identified; (2) the severity of maltreatment for respective subtypes was rated on a 5-point scale (1 = *Minor*, 2 = *Moderate*, 3 = *Serious*, 4 = *Severe*, 5 = *Extremely Severe*; for details of the severity ratings for each maltreatment subtype, see Barnett et al., 1993); and (3) the developmental periods in which the maltreatment occurred, specifically infancy (i.e., birth to 18 months), toddlerhood (i.e., 19-36 months), preschool (i.e., 3-5 years), early school (i.e., 6-7 years), or later school (i.e., 8-9 years) was determined.

When deriving continuous variables, several parameters of child maltreatment are nested within the maltreated group and are applicable only for the children who experienced maltreatment. For example, among nonmaltreated children, onset and recency did not occur, and scores for nonmaltreated children do not fit on a continuum. Similarly, severity of a maltreatment subtype is relevant only for children who experienced that subtype. For each maltreatment subtype, among children who experienced a respective subtype, we determined the most severe event that had occurred. We also derived a total severity index by summing the most severe events across the four subtypes. Developmental timing scores were created including: (1) onset, or the first developmental period in which maltreatment occurred (1 = *Infancy*, 2 = *Toddlerhood*, 3 = *Preschool*, 4 = *Early School*, 5 = *Later School*); and (2) recency, or the most recent developmental period in which maltreatment occurred.

Two continuous maltreatment parameters were computed in the total sample. First, the total number of maltreatment subtypes experienced was summed in the maltreatment group; nonmaltreated youth received a corresponding score of zero. Thus, the number of maltreatment subtype scores ranged from 0 (*No Maltreatment Subtypes Experienced; i.e., nonmaltreated*), to 4 (*All Maltreatment Subtypes Experienced*). Second, the total number of developmental periods was summed in the maltreatment group; nonmaltreated youth received a corresponding score of zero. Thus, the number of developmental period scores ranged from 0 (*No Developmental Periods Experienced; i.e., nonmaltreated*), to 5 (*All Developmental Periods Experienced*).

For group comparison purposes, youth were hierarchically categorized into maltreatment subtype groups according to most the norm-violating form of maltreatment experienced: 4 = *Sexual Abuse* ($n = 67$); 3 = *Physical Abuse* without sexual abuse ($n = 125$); 2 = *Neglect* without sexual or physical abuse ($n = 137$), 1 = *Emotional Maltreatment* without other subtypes, ($n = 77$); and 0 = *Nonmaltreated* ($n = 228$). We also derived an onset/recency categorization: 0 = nonmaltreated; 1 = early onset, not recent maltreatment (onset and recency in the infancy through preschool periods; $n = 156$); 2 = early onset, recent maltreatment (onset in the infancy through preschool periods; recency in the school age years; $n = 135$); and 3 = later onset, recent maltreatment (onset and recency in the school age years; $n = 60$).

Self-Worth—The Self-Perception Profile for Adolescents (SPPA; Harter, 1988) assessed adolescents' self-worth at W_2 and W_3 . The 5-item global subscale measures holistic perceptions of one's personal value and overall competence. Adolescents selected which one of two contrasting self-evaluative statements best describes them, and indicated the extent to which they identified with that portion of the statement (*Really True of Me* versus *Sort of True of Me*). A sample item is “Some teenagers like the kind of person they are, but other teenagers often wish they were someone else.” Responses were coded on a 4-point scale; oppositely keyed items were reverse scored and a mean of the items was computed such that higher scores reflect lower self-worth. Adequate internal consistency of global self-worth was observed at both waves ($s > .74$).

Relationship Quality—The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) assessed maternal and peer relationship quality at W_2 and W_3 . This 25-item self-report questionnaire taps perceptions of cognitive and affective attributes that characterize adolescents' relationships with their primary female caregivers and close friends. For each interpersonal domain, three dimensions are measured (i.e., degree of mutual trust, quality of communication, extent of anger and alienation). A sample maternal relationship item is “I trust my mother,” and a sample peer relationship item is “My friends accept me as I am,” (1 = almost never or never true to 5 = almost always or always true). Negatively keyed questions were reverse coded and composite maternal and peer relationship means were computed as the average of the subscales. Higher scores reflect lower quality relationships with mothers and close friends. Internal consistency for both mother and peer subscales exceeded .90.

Symptomatology—The Youth Self-Report (YSR; Achenbach, 1991) assessed internalizing and externalizing symptoms at W_2 and W_3 . The YSR measures a comprehensive set of behavioral disturbances subsumed under two broadband dimensions of internalizing (i.e., anxious depressed, withdrawn, somatic complaints) and externalizing (i.e., aggressive and rule-breaking behavior) symptoms. Items ($n = 188$) were rated on a 3-point scale (0 = *Not True*, 1 = *Somewhat or Sometimes True*, 2 = *Very True or Often True*). Raw summed scores for internalizing and externalizing symptoms were transformed to T-scores based on normative data such that higher scores reflect greater symptoms. The YSR is a widely used, well-validated and reliable measure for 11- to 18-year olds (Achenbach, 1991; Achenbach & Rescorla, 2001).

Results

Maltreatment Parameters: Descriptive Information

In the sample of maltreated youth, 17% experienced sexual abuse, 41% experienced physical abuse, 70% experienced neglect, and 53% experienced emotional maltreatment. The majority of maltreated youth experienced multiple maltreatment subtypes, with 88% exposed to more than one subtype. For children who had experienced a specific maltreatment subtype, the average maximum severity score within each respective subtype was generally ‘serious’ (sexual abuse, $M = 2.57$, $SD = .94$; physical abuse, $M = 3.24$, $SD = .91$; neglect, $M = 3.32$, $SD = 1.08$; emotional maltreatment, $M = 3.44$, $SD = 1.24$). In terms of

timing, the majority experienced maltreatment during multiple developmental periods, with 57% exposed in more than one period. In addition, the predominant period of onset was during infancy (42% during infancy, 21% during toddlerhood, 20% during preschool, 9% during early school, and 9% during later school), and the predominant period of recency was during later school (37% during later school, 17% during early school, 35% during preschool, 8% during toddlerhood, and 4% during infancy).

A univariate analysis of variance was conducted within the maltreatment group with Onset/Recency Status as a between-subjects factor to compare the developmental timing groups on the number of maltreatment subtypes experienced. This analysis yielded a significant main effect of Onset/Recency Status, $F(2, 348) = 30.42, p < .001$. Post hoc tests revealed that the early onset/recent maltreatment group ($M = 2.53, SD = .90$) had significantly more maltreatment subtypes than both the early onset/not recent maltreatment ($M = 1.81, SD = .89$) and the later onset/recent maltreatment ($M = 1.68, SD = .83$) groups. Thus, the experience of a greater number of maltreatment subtypes corresponded with increased chronicity of maltreatment.

Comparison of Hierarchical Maltreatment Subtypes and Onset/Recency Status on Adolescent Functioning Indices

Table 1 displays the means and standard deviations for self-worth, low maternal and peer relationship quality, and both internalizing and externalizing symptoms at each wave for the (a) hierarchical maltreatment subtypes, and (b) onset/recency status. A multivariate repeated-measures analysis of variance (MANOVA) was conducted with Maltreatment Subtype as a between-subjects factor, and Wave as a within-subjects factor. This analysis yielded significant main effects of Maltreatment Subtype, $F(20, 1468) = 2.39, p < .01$ and Wave, $F(5, 364) = 3.63, p < .01$, but the Maltreatment Subtype by Wave interaction was nonsignificant, $F(20, 1468) = 1.47, ns$. Follow-up univariate analyses revealed significant main effects of Maltreatment Subtype for the average of all adolescent functioning indices across the two waves. Post hoc tests revealed significant group differences with (a) physically abused youth having lower self-worth, lower peer relationship quality, and greater internalizing symptoms than nonmaltreated youth, and (b) both sexually and physically abused youth having lower maternal relationship quality than nonmaltreated adolescents. Other contrasts were not significant. In addition, follow-up univariate analyses revealed significant main effects of Wave for self-worth, $F(1, 368) = 8.92, p < .01$, with lower self-worth at W_3 than W_2 , and for low maternal relationship quality, $F(1, 368) = 3.93, p < .05$, with worse maternal relationship quality at W_3 than W_2 .

A MANOVA was also conducted with Onset/Recency Status as a between-subjects factor, and Wave as a within-subjects factor (Table 1). This analysis yielded significant main effects of Onset/Recency Status, $F(15, 993) = 2.53, p < .01$ and Wave, $F(5, 329) = 3.93, p < .01$, as well as a significant Onset/Recency Status by Wave interaction, $F(15, 993) = 1.75, p < .05$. Follow-up univariate analyses revealed significant main effects of Onset/Recency Status for the average of every outcome variable across the two waves except externalizing symptoms. Post hoc tests revealed significant group differences with (a) adolescents in the early onset/recent maltreatment group having lower self-worth and higher internalizing

symptoms than nonmaltreated youth, and (b) adolescents in both the early onset/not recent maltreatment and early onset/recent maltreatment groups having lower maternal relationship quality and lower peer relationship quality than nonmaltreated adolescents. In addition, follow-up univariate analyses revealed significant main effects of Wave for self-worth, $F(1, 333) = 14.75, p < .01$, with lower self-worth at W_3 than W_2 . Lastly, follow-up univariate analyses revealed a significant Onset/Recency Status by Wave interaction for low maternal relationship quality, $F(3, 333) = 2.82, p < .05$, such that maternal relationship quality worsened from W_2 and W_3 for all three maltreatment onset-recency groups but improved for nonmaltreated youth.

Preliminary Analyses prior to Longitudinal Modeling

The correlations among the W_1 maltreatment parameters were examined in maltreated youth. As anticipated, a greater number of subtypes and developmental periods, earlier onset and more recent maltreatment, and higher total severity of maltreatment were positively associated with one another (mean $r = .48, ps < .01$). Notably, the number of maltreatment subtypes and developmental periods were highly positively correlated ($r = .71, p < .01$), demonstrating substantial shared variance across the two variables. However, as indicated by the size of the respective correlations, the number of maltreatment subtypes captured greater overlapping variance with the total severity of maltreatment than did the number of developmental periods ($r = .92, p < .01$ versus $r = .68, p < .01$).

Table 2 displays the descriptive information and intercorrelations among W_1 number of maltreatment subtypes, W_1 number of developmental periods, and the measures at W_2 and W_3 in the total sample. W_1 number of maltreatment subtypes was significantly positively associated with every outcome at W_2 and W_3 . W_1 number of developmental periods was significantly positively associated with W_3 low self-worth, W_2 and W_3 low maternal relationship quality, W_3 low peer relationship quality, and W_3 internalizing and W_3 externalizing symptoms, but was not significantly correlated with the remaining W_2 variables. This pattern of associations suggests that W_1 number of developmental periods was largely redundant with W_1 number of maltreatment subtypes, and that W_1 number of maltreatment subtypes was a more robust predictor of the adolescent outcomes. Accordingly, W_1 number of maltreatment subtypes, but not W_1 number of developmental periods, was included in the longitudinal path models.

As displayed in Table 4, low self-worth, low maternal relationship quality, and internalizing and externalizing symptoms were all significantly positively intercorrelated across W_2 and W_3 . W_1 number of maltreatment subtypes was not associated with W_2 low peer relationship quality; W_2 low peer relationship quality was inconsistently associated with internalizing symptoms and was not associated with externalizing symptoms across W_2 and W_3 . Although W_1 number of maltreatment subtypes was associated with W_3 low peer relationship quality, and W_3 low peer relationship quality was significantly positively associated with internalizing and externalizing symptoms across W_2 and W_3 , the inconsistent associations among W_2 low peer relationship quality and the other study variables precluded examination of low peer relationship quality in the longitudinal path models.

Path Analyses

Path analyses were conducted using Amos Version 17.0 (Arbuckle, 2008) to examine study hypotheses over time. To control for (a) sex differences in both internalizing (e.g., Hankin & Abramson, 2001) and externalizing (e.g., Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993) symptoms, and (b) the observed group differences in marital status across maltreated and nonmaltreated youth in this sample, a standardized residual score was computed by regressing W_1 number of maltreatment subtypes on sex and marital status; the W_1 maltreatment residual score was included in all path analyses. Models reflecting a 2-wave cross-lag panel design with three manifest variables (W_2 and W_3 low self-worth, W_2 and W_3 low maternal relationship quality, and W_2 and W_3 symptoms) were constructed. W_1 number of maltreatment subtypes was included as a simultaneous predictor of the three W_2 variables (see Figure 1). All of the cross-lag reciprocal paths from the three W_2 variables to the three W_3 variables were included, as were the three stability paths of each variable from W_2 to W_3 . The three manifest variables were allowed to covary at W_2 and W_3 . Missing data were estimated using Full Information Maximum Likelihood (FIML), a method that maximizes the likelihood of the model with the observed data (Arbuckle, 1996).

Prediction of internalizing symptoms—A model was constructed including W_1 number of maltreatment subtypes and low self-worth, low maternal relationship quality, and internalizing symptoms at W_2 and W_3 . Figure 1 displays the standardized path coefficients. As anticipated, the three paths from W_1 number of maltreatment subtypes to the W_2 variables were positive and significant. In addition, the stability paths from W_2 to W_3 were significant for all three variables. Finally, all of the cross-lag reciprocal paths were positive and significant. Examination of the fit indices revealed that this model provided a strong fit to the data, $\chi^2(3) = 13.47, p < .01, \chi^2/df = 4.49, CFI = .98, IFI = .98, RMSEA = .07$.

To examine whether maltreatment during adolescence influenced the obtained pattern of findings, we conducted a path analysis identical to our original analysis, but controlled for the presence of adolescent maltreatment in addition to sex and marital status. Results revealed comparable path coefficients and model fit indices, with the exception of the path from W_1 number of maltreatment subtypes to W_2 internalizing symptoms which was reduced to marginal significance. Because the model that did not control for adolescent maltreatment more closely matched our original hypotheses, the first model was retained for subsequent analyses.

Three nested mediation analyses were conducted to test whether the W_2 intermediary variables accounted for the associations between W_1 number of maltreatment subtypes and the three W_3 outcome variables. Specifically, (1) W_2 low maternal relationship quality and W_2 internalizing symptoms were examined as mediators of the association between W_1 number of maltreatment subtypes and W_3 low self-worth, (2) W_2 low self-worth and W_2 internalizing symptoms were examined as mediators of the association between W_1 number of maltreatment subtypes and W_3 low maternal relationship quality, and (3) W_2 low self-worth and W_2 low maternal relationship quality were examined as mediators of the association between W_1 number of maltreatment subtypes and W_3 internalizing symptoms. All analyses included the stability path from the prior wave of the outcome variable. The

size and significance of the indirect effects were evaluated using the phantom model approach, a method that allows for the estimation of specific indirect effects and associated confidence intervals nested within complex path analytic models (Macho & Ledermann, 2011). The size of each specific indirect effect was computed as the product of the path between the predictor and the mediator (i.e., path *a*) and the path between the mediator and the outcome (i.e., path *b*).

Results from the first analysis revealed that W_2 internalizing symptoms ($ab = .10$, $CI = .053-.137$) but not W_2 low maternal relationship quality ($ab = .01$, $CI = -.008-.020$) mediated the association between W_1 number of maltreatment subtypes and W_3 low self-worth. Results from the second analysis revealed that both W_2 low self-worth ($ab = .04$, $CI = .010-.061$) and W_2 internalizing symptoms ($ab = .02$, $CI = .002-.042$) mediated the association between W_1 number of maltreatment subtypes and W_3 low maternal relationship quality. Results from the third analysis revealed that both W_2 low self-worth ($ab = .05$, $CI = .024-.084$) and W_2 low maternal relationship quality ($ab = .02$, $CI = 0.001-.034$) mediated the association between W_1 number of maltreatment subtypes and W_3 internalizing symptoms.

Prediction of externalizing symptoms—A parallel model was constructed including W_1 number of maltreatment subtypes and low self-worth, low maternal relationship quality, and externalizing symptoms at W_2 and W_3 (see Figure 2). As anticipated, the three paths from W_1 number of maltreatment subtypes to the W_2 variables were positive and significant. In addition, the stability paths from W_2 to W_3 were positive and significant for all three variables. In terms of the cross-lag reciprocal paths, W_2 low self-worth predicted W_3 low maternal relationship quality, but not W_3 externalizing symptoms. Similarly, W_2 low maternal relationship quality predicted W_3 low self-worth, but not W_3 externalizing symptoms. Finally, W_2 externalizing symptoms did not predict W_3 low self-worth or W_3 low maternal relationship quality. Accordingly, the four nonsignificant paths were removed from the model. Examination of the fit indices revealed that this model provided a strong fit to the data, $\chi^2(7) = 22.23$, $p < .01$, $\chi^2/df = 3.18$, $CFI = .97$, $IFI = .97$, $RMSEA = .06$.

To examine whether maltreatment during adolescence influenced these findings, we conducted an identical path analysis that controlled for adolescent maltreatment, sex, and marital status. Results revealed comparable path coefficients and model fit indices. As with the internalizing models, the first model was retained for subsequent analyses.

Based on the observed significant paths, two nested mediation analyses were conducted to test (1) whether W_2 low maternal relationship quality accounted for the association between W_1 number of maltreatment subtypes and W_3 low self-worth, and (2) whether W_2 low self-worth mediated the association between W_1 number of maltreatment subtypes and W_3 low maternal relationship quality. All analyses included the stability path from the prior wave of the outcome variable and were computed using the same methods as in the internalizing model. Similar to the model including internalizing symptoms, results revealed that (1) W_2 low maternal relationship quality did not mediate the association between W_1 number of maltreatment subtypes and W_3 low self-worth ($ab = .01$, $CI = -.004-.021$), and (2) W_2 low self-worth did mediate the association between W_1 number of maltreatment subtypes and W_3 low maternal relationship quality ($ab = .02$, $CI = .002-.041$).

Discussion

The primary aim of this research was to examine whether childhood maltreatment exerts effects in a manner consistent with a developmental-organizational framework. In particular, we examined the contribution of childhood maltreatment parameters to low self-worth, low relationship quality with mothers and peers, and symptoms of internalizing and externalizing symptoms during early-mid and mid-late adolescence. In addition, the stability and cross-lagged effects of low self-worth, low relationship quality, and both symptom types were examined using parallel path analytic panel designs. The findings revealed that the number of maltreatment subtypes simultaneously predicted low self-worth, low maternal relationship quality, and internalizing and externalizing symptoms in early-mid adolescence. Moreover, the stability paths of low self-worth, low maternal relationship quality, and both symptom types were significant from early-mid to mid-late adolescence. In terms of the cross-lagged effects between early-mid and mid-late adolescence, each path in the model including low self-worth, low maternal relationship quality, and internalizing symptoms was positive and significant. However, the parallel model including low self-worth, low maternal relationship quality, and externalizing symptoms revealed that neither low self-worth nor low maternal relationship quality predicted subsequent externalizing symptoms; similarly, externalizing symptoms did not predict low self-worth or low maternal relationship quality over time.

Independent lines of research have linked childhood maltreatment to low self-worth, low maternal relationship quality, and both internalizing and externalizing symptoms across development. However, this study was the first to examine the simultaneous prospective effects of the number of childhood maltreatment subtypes on these outcomes within a developmental-organizational framework, in which prior adversity interferes with the successful resolution of stage-salient tasks and developmental challenges, thereby generating multiple coexisting vulnerabilities across maturation (Cicchetti & Lynch, 1995; Cicchetti & Valentino, 2006; Toth et al., 2009). That is, abuse and neglect during childhood do not simply predispose youth to experience solitary forms of social and emotional liabilities. Rather, early maltreatment elicits a diverse set of contemporaneous detrimental sequelae, including feelings of worthlessness and inadequacy about the self, low quality maternal relationships (i.e., elevated anger, reduced trust, poor communication), and internalizing and externalizing symptoms during adolescence.

Also consistent with developmental-organizational frameworks (Cicchetti & Lynch, 1995; Cicchetti & Valentino, 2006; Toth et al., 2009), vulnerabilities that emerged as a result of childhood maltreatment endured from early-mid to mid-late adolescence, and, even after controlling for these stability paths, generated significant cross-lagged effects across adolescence in the model including internalizing symptoms. These findings cohere with evidence that poor self-perceptions interfere with adaptive interpersonal functioning (e.g., Park, Crocker, & Vohs, 2006) and confer risk for symptoms of depression and anxiety (e.g., Ohannessian, Lerner, Lerner, & Eye, 1999), as well as theory (Hammen, 2006) regarding the continuity and exacerbation of negative affective states across development. Notably, the significant effects of low maternal relationship quality on low self-worth and internalizing symptoms may result in part from negative intrapersonal and interpersonal representations

established by maltreatment. However, everyday interactions between maltreating mothers and their offspring are also characterized by greater insensitivity and hostility relative to mother-child dyads without maltreatment histories (for a meta-analytic review, see Wilson, Rack, Shi, & Norris, 2008), and pervasive negativity in maternal relationships is apt to jointly contribute to low self-worth and internalizing symptoms during adolescence.

In contrast, the parallel path model including externalizing symptoms revealed nonsignificant cross-lagged effects between externalizing symptoms and both low self-worth and low maternal relationship quality. Although prior research concurrently links low self-worth to externalizing symptoms in children and adults (Appleyard et al., 2010; Kim & Williams, 2009), one study did reveal a nonsignificant prospective effect of self-worth on children's externalizing symptoms (Appleyard et al., 2010). The nonsignificant effect of externalizing symptoms on low self-worth is inconsistent with the hypothesis that repeated acts of aggression and delinquency elicit negative feedback, such as disapproval and criticism, about one's value and worth from others (e.g., peers, teachers, authorities) which, in turn, diminishes youth's sense of self-worth. However, it is possible that low self-worth specifically predicts internalizing symptoms over time, and that low self-worth reflects a covariate, but not longitudinal predictor of externalizing symptoms.

The nonsignificant cross-lagged effects between low maternal relationship quality and externalizing symptoms do not cohere with research that links maladaptive parenting styles (i.e., low warmth and high rejection) to externalizing symptoms (Muris, Meesters, & van den Berg, 2003), or with research demonstrating prospective bidirectional associations between parent-child relationship disturbances and externalizing symptoms across early adolescence (Burt, McGue, Krueger, & Iacono, 2005). Collectively, these results suggest that the considerable stability of adolescent externalizing symptoms resulting from distal childhood maltreatment is unaffected by contemporaneous personal and interpersonal functioning. Alternatively, the continuity of externalizing symptoms may be attributed to factors unexamined in this research, such as impulsivity (e.g., White, Moffitt, Caspi, Bartusch, Needles, & Stouthamer-Loeber, 1994). Interestingly, as in the present research, one study revealed that dysfunctional parent-child interactions were specific to the prediction of youth internalizing, as opposed to externalizing, psychopathology (Costa, Weems, Pellerin, & Dalton, 2006). Thus, one goal of future research will be to elucidate effects between detrimental features of parent-child relationship functioning and internalizing versus externalizing symptoms across adolescence.

The final goal of this study was to examine nested mediation pathways linking childhood maltreatment to the mid-late adolescent outcomes via the early-mid adolescent intermediary variables. Notably, all explanatory models adjusted for prior (i.e., early-mid adolescent) levels of the dependent variable, thereby providing rigorous and conservative tests of mediation. With one exception that narrowly missed significance, all of the nested mediation pathways in the internalizing symptom model were significant. In general, support for the final tenet of developmental-organizational perspectives was garnered, specifically that intermediary vulnerabilities mediate the effect of prior adversity on later maladaptation across domains. In contrast, due to the lack of significant cross-lagged effects from early-mid to mid-late adolescent externalizing symptoms, only two nested mediation pathways

existed in that model. As expected, the results from these parallel pathways mirrored those observed in the internalizing symptom model. Taken together, this pattern indicates that the organizational impact of childhood maltreatment on adolescent self-worth and maternal relationship quality was specific to internalizing psychopathology.

Of the variety of childhood maltreatment parameters assessed, the number of maltreatment subtypes emerged as the most robust parameter based on correlational results with developmental timing, maltreatment severity, and the adolescent outcomes. These findings correspond to prior research indicating that early, chronic, severe, and co-occurring subtypes generate accumulating long-term personal, interpersonal, and psychological liabilities (Cicchetti & Rogosch, 2012; Kim, Cicchetti, Rogosch, & Manly, 2009).

Contrary to expectations, the number of maltreatment subtypes was associated with mid-late but not early-mid adolescent low peer relationship quality. The lack of significant association in early-mid adolescence is inconsistent with research demonstrating that maltreated youth experience a range of difficulties with peers (Alink et al., 2012; Appleyard et al., 2010; Kim & Cicchetti, 2010; Rogosch et al., 2010; Shields et al., 2001). In contrast to these studies considering broad social difficulties in peer groups, the present study assessed perceptions of mutual trust, quality of communication, and extent of anger and alienation with close friends. Thus, one explanation for our discrepant findings may pertain to differential experiences maltreated youth encounter across interactions with close friends and less familiar peers, in that maltreated youth may perceive their friendships to be uncompromised despite the presence of complications with peers at large. Maltreated youth may also identify and select friends with whom interpersonal difficulties, such as conflict or tension, are not anticipated. Yet over time, as adolescents increase their reliance on friendships (e.g., Steinberg & Silverberg, 1986), deficits in close friendships may become apparent to maltreated youth, thereby explaining the observed association between childhood maltreatment and peer relationship impairment in mid-late adolescence. It is also noteworthy that peer and maternal relationship quality were positively associated across the two adolescent waves. Thus, although maltreated youth may initially elude the effects of adverse internal working models of relationships in their early adolescent friendships, difficulties comparable to those witnessed with mothers are apt to subsequently emerge.

Strengths and Limitations, and Clinical Implications

Strengths of this study are numerous and include the prospective longitudinal design spanning from childhood across two waves in adolescence, the inclusion of an ethnically diverse sample, and a stringent and sophisticated analytic approach in which multiple sequelae of childhood maltreatment were simultaneously examined over time. Moreover, the assessment of maltreatment based on DHS records and parent interviews was thorough, comprehensive, and systematically scored independently from legal classifications and case dispositions.

In terms of study limitations, the significant results correspond to small-to-medium effect sizes (Cohen, 1992). Additionally, although analyses controlled for sex and marital status, other unexamined demographic characteristics, such as caregiver education level and household size, may have influenced the pattern of results. Finally, the sequelae of

childhood maltreatment were assessed using self-report questionnaires and reflect youths' evaluations of their own self-worth, relationship impairment, and symptoms of psychopathology. Accordingly, replication of these findings using converging methods (i.e., behavioral observations, diagnostic interviews) and informants (i.e., parent and teacher reports, peer nominations) will be an important future goal.

Finally, this research has differential implications for clinical practice involving the alleviation of adolescent internalizing and externalizing symptoms in maltreated youth. In terms of internalizing symptoms, intervention and prevention endeavors might include cognitive restructuring to promote adaptive self-perceptions, as well as effective communication strategies and conflict resolution to foster trusting and supportive maternal relationships in maltreated youth. However, given the modest effect sizes of the cross-lagged paths in the internalizing model, such programs may be enhanced by targeting additional negative cognitions (e.g., hopelessness). In terms of externalizing symptoms, intervention and prevention efforts directed toward early risk factors associated with, or resulting from, childhood maltreatment, such as low empathy and impulsivity, may avert the stability of externalizing psychopathology across adolescence.

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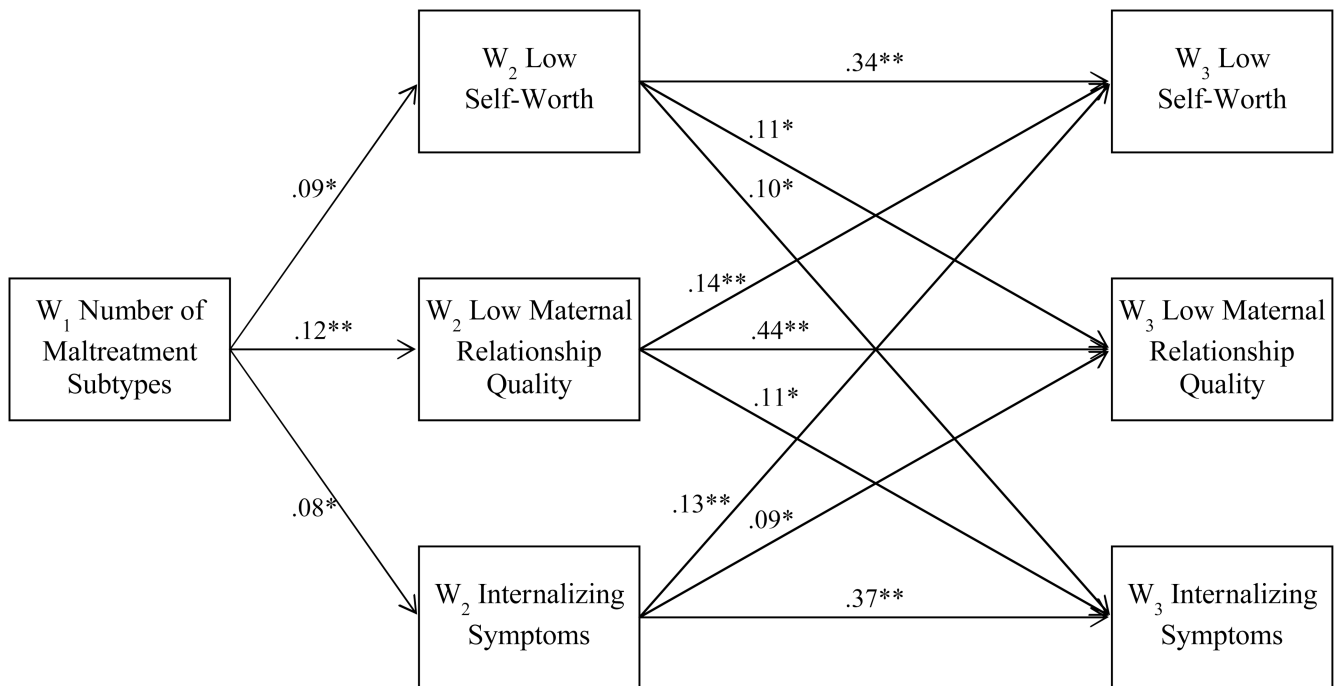


Figure 1.

Cross-lag path analytic model displaying the effects of W_1 childhood maltreatment on low self-worth, low maternal relationship quality, and internalizing symptoms at W_2 and W_3 in adolescence.

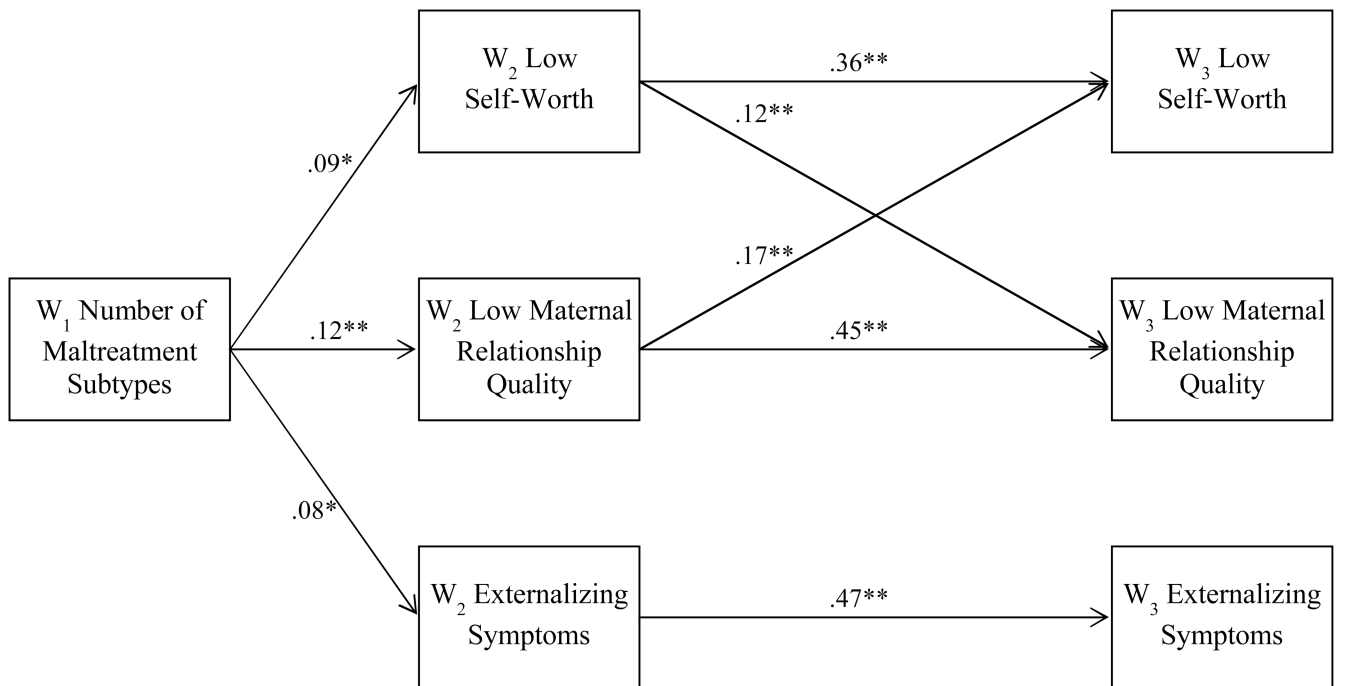


Figure 2.

Cross-lag path analytic model displaying the effects of W_1 childhood maltreatment on low self-worth, low maternal relationship quality, and externalizing symptoms at W_2 and W_3 in adolescence.

Table 1
Means and Standard Deviations of the Variables by Hierarchical Maltreatment Subtype and Onset/Recency Status

Measures	Maltreatment Status	Wave 1	Wave 2	Onset/Recency Status	Wave 1	Wave 2
Low Self-Worth	NC ^a	1.69 (.61)	1.61 (.60)	NC ^a	1.67 (.61)	1.60 (.59)
	EM	1.66 (.61)	1.65 (.59)	EO/NR	1.82 (.63)	1.64 (.59)
	PN	1.81 (.58)	1.64 (.59)	EO/R ^b	1.92 (.64)	1.80 (.65)
	PA ^b	1.98 (.69)	1.76 (.62)	LO/R	1.98 (.69)	1.70 (.54)
Low Maternal Relationship Quality	SA	1.87 (.62)	1.78 (.61)			
	NC ^a	2.08 (.68)	1.95 (.72)	NC ^a	2.07 (.65)	1.93 (.72)
	EM	1.85 (.62)	2.11 (.85)	EO/NR ^b	2.21 (.80)	2.30 (.85)
	PN	2.05 (.61)	2.13 (.69)	EO/R ^b	2.33 (.85)	2.39 (.84)
Low Peer Relationship Quality	PA ^b	2.46 (.89)	2.41 (.85)	LO/R	2.18 (.62)	2.36 (.80)
	SA ^b	2.29 (.80)	2.57 (.83)			
	NC ^a	1.89 (.62)	1.83 (.58)	NC ^a	1.90 (.62)	1.83 (.58)
	EM	1.88 (.59)	2.04 (.70)	EO/NR ^b	2.07 (.64)	2.15 (.64)
Internalizing Symptoms	PN	2.08 (.67)	2.06 (.53)	EO/R ^b	2.04 (.63)	2.09 (.64)
	PA ^b	2.07 (.58)	2.08 (2.08)	LO/R	2.11 (.66)	1.92 (.59)
	SA	2.01 (.64)	2.10 (.69)			
	NC ^a	46.76 (9.70)	45.10 (9.79)	NC ^a	46.72 (9.77)	44.86 (9.74)
Externalizing Symptoms	EM	47.36 (9.42)	47.04 (13.74)	EO/NR	48.83 (10.42)	48.08 (9.72)
	PN	48.22 (10.51)	46.93 (10.13)	EO/R ^b	50.99 (11.24)	49.06 (10.92)
	PA ^b	50.20 (11.53)	50.20 (9.83)	LO/R	47.24 (10.92)	49.73 (10.73)
	SA	51.17 (10.99)	49.26 (10.49)			
Externalizing Symptoms	NC	50.09 (11.71)	49.21 (10.96)	NC	50.01 (11.75)	49.09 (11.00)
	EM	48.22 (10.70)	48.91 (11.71)	EO/NR	49.60 (11.76)	51.53 (10.99)
	PN	47.85 (11.59)	48.34 (10.23)	EO/R	53.35	51.56 (10.58)
	PA	51.57 (12.41)	53.74 (10.23)	LO/R	46.91 (11.74)	50.18 (11.51)
	SA	54.02 (12.35)	51.93 (10.56)			

Note: For maltreatment status: NC = nonmaltreated comparisons; EM = emotional maltreatment; PN = physical neglect; PA = sexual abuse. For onset/recency status: NC = nonmaltreated comparisons; EO/NR = early onset, not recent; EO/R = early onset, recent; LO/R = later onset, recent.

Case-wise deletion was used for missing data to maintain power. For groups with different superscripts, the mean difference is significant, $p < .05$.

Table 2
Descriptive Information and Intercorrelations Among the Variables in the Total Sample

Measure	N	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1. W ₁ Number of Maltreatment Subtypes	635	1.22 (1.20)	---											
2. W ₁ Number of Developmental Periods	635	1.32 (1.34)	.83**	---										
3. W ₂ Low Self-Worth	595	1.77 (.63)	.09*	.08 [^]	---									
4. W ₃ Low Self-Worth	416	1.68 (.61)	.13**	.16**	.42**	---								
5. W ₂ Low Maternal Relationship Quality	611	2.15 (.76)	.12**	.11**	.25**	.27**	---							
6. W ₃ Low Maternal Relationship Quality	438	2.15 (.79)	.25**	.23**	.28**	.39**	.50**	---						
7. W ₂ Low Peer Relationship Quality	614	1.97 (.62)	.02	-.01	.27**	.25**	.29**	.19**	---					
8. W ₃ Low Peer Relationship Quality	436	1.97 (.63)	.16**	.14**	.22**	.34**	.15**	.32**	.45**	---				
9. W ₂ Internalizing Symptoms	629	48.62 (10.49)	.09*	.06	.26**	.25**	.28**	.25**	.16**	.15**	---			
10. W ₃ Internalizing Symptoms	458	47.10 (10.52)	.15**	.14**	.21**	.32**	.24**	.35**	.09 [^]	.21**	.41**	---		
11. W ₂ Externalizing Symptoms	629	51.24 (11.72)	.09*	.08 [^]	.13**	.19**	.34**	.23**	.07 [^]	.06	.60**	.34**	---	
12. W ₃ Externalizing Symptoms	458	50.53 (10.97)	.12*	.10*	.13**	.21**	.22**	.32**	.03	.14**	.27**	.61**	.50**	---

[^] $p < .10$.
 * $p < .05$.
 ** $p < .01$.