Title: Psychopathological Mechanisms of Early Neglect and Abuse on Suicidal Ideation and Self-Harm in Middle Childhood

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Abstract

Informed by diathesis-stress models of suicide risk, this longitudinal study examines the psychopathological mechanisms through which early maltreatment increases the risk for suicidal ideation and self-harm in middle childhood. The sample included 2,958 families from the Fragile Families & Child Wellbeing Study, who participated in interviews at child's ages of 3 and/or 5, and 9. Via the Child Behavior Checklist, primary caregivers reported on the child's suicidal ideation and self-harm at age 9 and on clinically elevated depressive/anxious symptoms, aggressive behaviors, attention problems, and comorbid aggression and depressive/anxious symptoms at age 5. Past-year neglect and physical/psychological abuse were measured via the Parent-Child Conflict Tactics Scale at age 3. Multivariate structural equation models indicated that early neglect had a significant indirect effect on suicidal ideation via clinically elevated depressive/anxious symptoms (OR = 1.57, 95% CI: 1.09-2.25) and comorbid symptomatology (OR = 1.28, 95% CI: 1.02-1.62), and on self-harm also via clinically elevated depressive/anxious symptoms (OR = 1.39, 95% CI: 1.04-1.84) and comorbid symptomatology (OR = 1.20, 95% CI: 1.01-1.43). Early physical/psychological abuse had a significant indirect effect on self-harm via clinically elevated attention problems (OR = 1.09, 95% CI: 1.01-1.21). Unique developmental pathways for suicidal ideation and self-harm emerged among children exposed to abuse or neglect. For those exposed to early neglect, interventions should target depressive/anxious symptoms, especially when comorbid with aggression, to prevent suicidal ideation and self-harm. For children exposed to early physical/psychological abuse, problems with attention and impulsivity may be targets for reducing the risk for self-harm.

Suicide is the second leading cause of death among youth aged 10–14 years, and its prevalence in this age group has increased by 200% in girls and 37% in boys from 2007 to 2014 in the United States [1]. Suicidal ideation in childhood (< 12 years old) poses future risk for suicidal ideation [2, 3] as well as for suicide attempts and suicide death [4, 5]. The prevalence of child-reported suicidal ideation in middle childhood is higher than often assumed and ranges from 10-15% in community samples [2, 6, 7]. Self-harm refers to intentional self-poisoning or self-injury, regardless of the presence or extent of suicidal intent [8]. Self-harming behaviors in pre-adolescents include self-poisoning, self-cutting and hanging [9]. Data on the frequency of self-harm in non-clinical child samples is scarce. In one study, 4.6% of children (M_{age} = 11.7 years) reported having engaged in suicidal/self-harming behavior [10]. Based on parent report, the lifetime prevalence of self-harming behavior among 6-9-years-old children from a large community school-based study was 1.8% [11]

Child maltreatment has been associated with both suicidal ideation and self-harm in childhood [12–14]. In a cross-sectional study of low-income children (M_{age} = 9.19 years), Cicchetti and colleagues [13] found that children with any documented type of lifetime maltreatment were significantly more likely than non-maltreated children to express any suicidal ideation (27.5% vs. 21.2%, respectively). Using more refined measures of lifetime maltreatment, another study of predominantly low-income children at risk for or who had already been maltreated linked the severity of physical abuse, multiple types of maltreatment and maltreatment chronicity with child-reported suicidal ideation at age 8 [14]. Using data from the same sample, Paul and Ortin [12] showed that by age 6, although the number of physical abuse and emotional maltreatment allegations were associated with suicidal ideation when examined separately, these associations were no longer significant when examined in multivariate models. Only the number of physical neglect allegations was independently associated with children's self-harm. Thus, the associations of child abuse and neglect with suicidal ideation and self-harm may vary with child age and the operationalization of maltreatment used.

In the US, half of abuse and neglect cases occur before the age of 3 and in the vast majority of such

cases, the perpetrator is a primary caregiver [15]. These maltreatment experiences seem to be more detrimental for children's development when occur early in life than later on [16]. However, the literature on child maltreatment and children's suicidal behaviors has been limited by a lack of attention to self-harm, the use of lifetime measures of child maltreatment and a failure to examine the psychopathological mechanisms through which maltreatment early in life may increase risk for these suicide-related outcomes. Diathesis-stress models of suicide risk offer insights as to which mechanisms may drive these associations [17]. These models posit that stressful experiences early in life interact with inherited neurobiological factors to contribute to the development of psychological and personality traits which in turn increase the risk for suicidal behavior [18]. This vulnerability is manifested in a proneness to pessimism and hopelessness, emotional dysregulation and impulsivity/aggression [19, 20]. To date however, these hypothesized relationships have not been empirically tested in child samples.

Growing evidence supports the diathesis aspect of these models and shows an association of mental health symptoms with suicidal ideation and self-harm in childhood. Parent and child reports of children's depressive symptoms and oppositional or aggressive behaviors have been linked to suicidal ideation in cross-sectional [6, 21] and longitudinal studies [2, 3, 22]. Attention deficit/hyperactivity symptoms also have shown a concurrent association with children's suicidal ideation [23]. The few studies that have focused on self-harm or suicide attempts in childhood find that depressive symptoms and conduct and attention problems are also associated with these behaviors [12, 22, 24]. Finally, children with comorbid depressive and behavioral symptoms endorse more suicidal ideation [25, 26] and suicide attempts [22] than children without depressive/behavioral symptoms and those with either depressive or behavioral symptoms. Substantial evidence also links neglect and abuse with children's mental health symptoms [27, 28]. When neglect and abuse are examined simultaneously, children exposed to abuse show higher levels of aggressiveness and impulsivity than those exposed to neglect only or who were not maltreated; whereas, those exposed to neglect report higher levels of depressive symptoms and withdrawn behaviors than those exposed to abuse or who were not maltreated [29, 30].

Although child abuse and neglect are widely cited as key risk factors for suicidal thinking and behavior [31], insufficient attention has been paid to how child abuse and neglect confer suicide risk [18]. Capitalizing on diathesis-stress models, we aim to identify the psychopathological mechanisms that increase the likelihood that children who have experienced maltreatment during the preschool years will talk about suicide and harm themselves in middle childhood. We utilize structural equation modeling (SEM) to examine the indirect effects of early neglect and abuse on children's suicidal ideation and self-harm in childhood via depressive/anxious symptoms, attention problems, aggressive behaviors, and comorbid aggression and depressive/anxious symptoms. Analyses regarding mechanisms explaining these associations are exploratory. Information generated from this first longitudinal study to examine both childhood suicidal ideation and self-harm, will elucidate the psychopathological mechanisms linking early maltreatment and suicide-related outcomes.

Method

Sample

Data were drawn from the Fragile Families and Child Wellbeing Study (FFCWS), a longitudinal birth cohort of children born to mostly unmarried parents (3:1 ratio) [32]. FFCWS participants were recruited from a sample of hospital births in 20 U.S. cities with populations larger than 200,000. Baseline interviews took place just after the child's birth between 1998 and 2000 (N = 4,898). Informed consent was obtained from all FFCWS participants.

This study is a secondary analysis of a sub-sample of FFCWS families (N = 2,958). Participants were included in the present study if primary caregivers: a) had complete data on both outcome variables (suicidal ideation and self-harm) at the child age 9 In-Home interviews (n = 3,315), and b) had participated in either the child age 3 or 5 In-Home interviews (n = 3,023). The primary caregivers were mostly biological mothers (93.2%) and the remaining were biological fathers (3.7%) or other caregivers (3.1%). A more detailed description of the sample can be found in Table 1.

Proportions of missing data in the analytic sample varied from zero on some covariates (e.g. child gender) to 16.3% on the items from the three mental health scales. Compared to the excluded primary caregivers (n = 357), participants in the analytic sample were less likely to be Hispanic ($\chi^2 = 27.57$, $p < 0.001$), more likely to have completed at least some college at the time of the child's birth ($\chi^2 = 10.96$, $p < 0.004$), and more likely to have met criteria for Major Depressive Disorder by the time their child was 3 years old ($\chi^2 = 5.13$, $p < 0.023$). No other differences were found in any other study variables. To retain as many observations as possible, we used multiple imputations with chained equations to create 10 datasets. All results reflect averaged values over the 10 imputed datasets.

Measures

Suicidal ideation and self-harm. Primary caregivers completed the Child Behavior Checklist/6-18 (CBCL/6-18) [33] at the child age 9 interview. Primary caregivers rated the frequency of two suicide-related items within the past 6 months from: 0 (*not true*), 1 (*somewhat or sometimes true*), to 2 (*very true or often true*). The items were: "Child talks about killing self" and "Child deliberately harms self or attempts suicide". Due to the expected low number of children in the 1 and 2 categories, each item was dichotomized as absent (= 0) or present (= 1) in order to improve the reliability of model estimates. The suicide-related items from the CBCL and its youth-reported version, the Youth Self Report [34], have been used in prior studies [4, 35], providing evidence for predictive validity and clinical utility.

Child maltreatment. At the child age 3 interview, primary caregivers reported on their own physically (5 items, e.g. "shook child") and psychologically abusive (5 items, e.g. "said you would send child away or would kick child out of the house") and neglectful (5 items, e.g. " left child home alone, but thought some adult should be with (him/her)") behaviors towards the child on the Parent-Child Conflict Tactics Scale (PC-CTS) [36]. Primary caregivers rated the frequency with which they had engaged in each behavior during the past year on a scale from 0 (*never*) to 6 (*more than 20 times).* Physical and psychological abuse and neglect scores were calculated according to the instrument developers'

recommendations and as has been done in other studies by recoding responses to the midpoint of each answer and then averaging the items [36, 37]. For example, items which were endorsed "3" (3-5 times) by primary caregivers were assigned a value of 4, which is the midpoint between 3 and 5. Construct validity for the PC-CTS has been demonstrated in several studies [38]. The psychological abuse and physical abuse scales were combined due to their high inter-correlation ($r = 0.63$, $p < 0.001$). Cronbach's alphas of the physical/psychological abuse and neglect scales were 0.74 and 0.59, respectively. The correlation between these two scales was low ($r = 0.08$, $p < 0.001$).

Clinically elevated mental health symptoms. Primary caregivers reported on the child's mental health symptoms at child's age 5 via CBCL/4-18 [39] on the following subscales: depressive/anxious symptoms (14 items), aggressive behavior (20 items), and attention problems (11 items). Items were rated on a scale ranging from 0 (*not true*) to 2 (*very/often true*) within the past 6 months. The suicide-related items were not included in any of these scales. Cronbach's alphas for the depressive/anxious symptoms (0.68), aggressive behavior (0.84), and attention problems (0.71) scales were acceptable. Each scale was dichotomized by the clinical cutoff points proposed in the CBCL manual [39]. A dichotomous variable indicating comorbidity between aggression and depressive/anxious symptoms (versus children without comorbid symptoms) was also created.

Covariates. Demographics included child gender and ethnicity (based on the race/ethnicity of the biological mother and father pair) and primary caregiver's relationship status, education level, and age at the time of the child's birth. Child's low birth weight was coded as 0 ($\geq$ 2500 g) vs 1 ($<$ 2500 g). Infant spanking at the time of the child age 1 interview was measured with the question: "*In the past month, have you spanked (child) because (he/she) was misbehaving or acting up?*". Primary caregivers completed the Composite International Diagnostic Interview Short Form (CIDI-SF) [40] to assess past year Major Depressive Disorder (MDD) at the child age 1 and 3 interviews. A dichotomous variable indicating whether the primary caregiver met criteria for MDD at either of these interviews was created.

Child age 3 covariates included the number of people in the home (adults and children), socioeconomic status, primary caregiver impulsivity and intimate partner victimization. Socioeconomic status in the past year was measured by the ratio of total household income to the U.S. Census poverty threshold for the household size and converted to a proportion: poor (ratio < 100%), near poor (100%-200%) and not poor (> 200%). Primary caregiver impulsivity consisted of two items derived from Dickman's impulsivity scale [41] ($\alpha = 0.75$). Caregiver intimate partner victimization in the form of physical or psychological aggression was assessed by 7 items [42]. The total score was dichotomized (0 = no victimization vs 1 = one or more instances of victimization).

Statistical analyses

The prevalence of suicidal ideation and self-harm in middle childhood was first reported. Three mutually exclusive groups were defined for further analyses: a) neither suicidal ideation nor self-harm (n = 2,844; comparison group); b) suicidal ideation without self-harm (n = 42); and c) self-harm with or without suicidal ideation (n = 72). Analyses of variance (ANOVA) and chi-squared tests as appropriate compared children in the comparison group to children in each of the suicide-related outcome groups on all study variables. Next, the indirect effects of early childhood neglect and physical/psychological abuse on both suicide-related outcomes were examined with structural equation models (SEMs) in Stata [43]. Separate models were conducted for suicidal ideation and self-harm. Three models per outcome tested each of the clinically elevated symptoms as mediators: depressive/anxious symptoms (Model 1A), aggressive behaviors (Model 1B), and attention problems (Model 1C), while adjusting for statistically significant covariates ($p < .05$) and the other two clinically elevated symptoms. An additional model per outcome (Model 2) tested comorbid aggressive and depressive/anxious symptoms as mediators. The latter model only adjusted for significant covariates and excluded redundant clinical variables to minimize collinearity. Resulting coefficients were exponentiated and reported as odds ratios (ORs). Akaike's information criterion (AIC) and the Bayesian information criterion (BIC) were reported as indices of relative model fit.

Results

Primary caregivers reported that sixty-five (2.2%) 9-year old children had talked about killing themselves in the prior 6 months. Slightly more children had deliberately harmed themselves or attempted suicide (n = 72, 2.5%). Suicidal ideation and self-harm were significantly related (χ^2 = 308.54, p < .001), with 23 children having both outcomes. Cross tabulations and mean comparisons (Table 1) indicated that children with suicidal ideation (n = 42) differed from children in the comparison group (n = 2,844) on gender (higher prevalence of suicidal ideation among boys) and race/ethnicity, and greater primary caregiver impulsivity during the child's preschool years. Children with self-harm (n = 72) differed from children in the comparison group on socio-economic status, primary caregiver relationship status and age at birth, MDD from birth to age 3, and intimate partner violence and levels of impulsivity during the child's preschool years. Children with suicidal ideation or self-harm in middle childhood had significantly higher prevalence rates of each of the clinically elevated mental health symptoms and comorbid symptomatology in early childhood than their non-suicidal peers. Although children in the suicidal ideation and self-harm groups had each more frequently experienced early neglect and physical/psychological abuse than did children in the comparison group, these differences were only significant for physical/psychological abuse and self-harm.

-------Insert Table 1 here----------

Structural equation models

The multivariate SEMs for suicidal ideation (Table 2) indicated that neglect in the preschool years had a significant indirect effect on suicidal ideation in middle childhood via clinically elevated depressive/anxious symptoms (Model 1A) and comorbid aggressive and depressive/anxious symptoms (Model 2). No indirect effects of early neglect on suicidal ideation were significant in the models testing aggressive behavior (Model 1B) or attention problems (Model 1C) as mediators. The indirect effects of early physical/psychological abuse on suicidal ideation were not significant (Models 1A-C and 2).

-------Insert Table 2 here----------

The multivariate SEMs for self-harm (Table 3) showed that both neglect and physical/psychological abuse in the preschool years increase the likelihood of self-harm in middle childhood via different clinically elevated symptoms. Early neglect had a significant indirect effect on self-harm via clinically elevated depressive/anxious symptoms (Model 1A) and comorbid aggressive and depressive/anxious symptoms (Model 2). Early physical/psychological abuse had an indirect effect on self-harm via clinically elevated attention problems (Model 1C). Aggressive behavior did not mediate the association between either early neglect or physical/psychological abuse and self-harm (Model 1B).

-------Insert Table 3 here----------

Discussion

This is the first study to empirically test the psychopathological mechanisms posited by diathesis-stress models of suicide risk that may link early child maltreatment with suicidal ideation and self-harm in childhood. Extending prior cross-sectional research on child maltreatment and suicidal behavior [12, 13], our results indicated that the pathways between early maltreatment and suicidal behavior may vary by the specific type of maltreatment to which the child is exposed. Specifically, while early neglect increased the risk for suicidal ideation via depressive/anxious symptoms and comorbid aggression and depressive/anxious symptoms; both types of maltreatment increased the risk of self-harm, but they did this via different clinically elevated mental health symptoms.

In line with our hypothesis, early physical/psychological abuse had a significant indirect effect on self-harm via attention problems. Unexpectedly, physical/psychological abuse did not have an indirect effect on suicidal ideation, nor did it increase the risk of self-harm via aggressive behavior. Parents who engage in physical and psychological abuse are characterized by high levels of impulsivity [44] and aggression [43]. Predispositions to these traits may be transmitted from parents to children and accentuated by the children's exposure to experiences of early physical/psychological abuse, such that

these traits, in the form of problems with attention and impulsivity, could heighten their risk for self-harm later on.

As expected, neglect in the preschool years had a significant indirect effect on suicidal ideation and self-harm in middle childhood via clinically elevated depressive/anxious symptoms and comorbid aggression and depressive/anxious symptoms. Given that neglect is directed at the denial of the child's basic needs for care, these findings are consistent with developmental theories of suicide risk [46, 47]. These models underscore sensitive parenting that supports children's emerging capacities to regulate emotion and develop a healthy sense of self. Indeed, suicidal children explain their desire for death as a way to cope with feeling unwanted, unloved, and to escape unbearable family situations [23, 46, 48]. It is therefore important for future studies of suicide-related outcomes involving children to inquire about neglect and consider these theoretical frameworks.

This study also provides empirical support for the psychopathological risk factors for children's suicidal ideation and self-harm. In multivariate models, clinically elevated depressive/anxious symptoms in early childhood significantly increased the risk for suicidal ideation in middle childhood, especially when comorbid with aggressive behavior. These longitudinal findings extend what has been found in cross-sectional studies regarding associations between parent-reported comorbid internalizing and externalizing symptomatology and school aged-children's reports of suicidal ideation [25, 26]. In contrast to suicidal ideation, clinically elevated attention problems in early childhood had the strongest association with self-harm four years later, followed by the comorbid symptomatology. Together, attention problems, as well as the combined presence of both internalizing and externalizing symptomatology in early childhood should be considered as markers of risk for suicidal ideation and self-harm in children.

The current study has several limitations. First, measures of physical/psychological abuse and neglect from birth to age 2, sexual abuse, and suicidal ideation and self-harm before age 9 (i.e. ages 3 and 5) were not collected by Fragile Families researchers and therefore we could not include them in the analyses.

Second, the proportions of children with suicidal ideation and/or self-harm in the current study may have been underreported, as they were assessed via parental report [49, 50]. Third, our measure of depressive symptoms also included anxious symptomatology, which precludes the generalization of our findings to children with either symptom cluster or the other. Fourth, the internal consistency of the neglect measure was low, but similar to what other Fragile Families studies have reported [51, 52]. Lower reliability coefficients are expected due to their assessment of rare events [36]. Our findings therefore require further replication. Finally, primary caregivers in the analytic sample were more likely than those excluded due to missing data to meet criteria for MDD at the child age 3 interview. Selection bias is therefore possible and results should be generalized with caution.

Clinical Implications and Conclusions

Consistent and sensitive primary caregiver responses to children early in life are necessary for the development of effective self-regulation capacities and mental well-being. Experiences of early neglect and abuse may alter the appropriate acquisition of these capacities and thereby heighten the child's risk for future suicidal ideation and self-harm [18]. Interventions that target these vulnerabilities by improving the parent-child relationship may have the potential to reduce children's risk for suicidal thoughts and behaviors. For example, interventions such as Parent-Child Interaction Therapy for clinical settings [54] and the school-based ParentCorps program [55] have shown promising results in improving self-regulation and reducing aggressive and impulsive behaviors in high-risk children by targeting the parent-child relationship. The current study paves the way for advancing our knowledge on the mechanisms through which different types of early maltreatment increase the risk for later suicidal behavior. Future research should continue investigating other potential mechanisms at the individual and familial levels as well as include other types of maltreatment relevant for suicidal behavior, such as sexual abuse.

Ethical Standards

This study was approved by the Internal Review Board of Cornell University and meets all ethical

considerations according to the 1964 Declaration of Helsinki and its later amendments. Informed written consent was obtained by FFCWS researchers from all participants prior to inclusion in the study.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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Table 1

Comparison of Covariates, Maltreatment Types, and Clinically Elevated Symptoms with Suicidal Ideation and Self-Harm in Middle Childhood

	Neither [a] (*n* = 2,844)	Suicidal ideation (*n* = 42)	Self-harm (*n* = 72)
	% or M (SE)	% or M (SE)	% or M (SE)
Child (female)	47.7	31.0*	43.1
Race/ethnicity			
Non-Hispanic White (ref.)	19.3	35.7	18.1
Non-Hispanic Black	56.5	33.3**	56.9
Hispanic/mixed race/other	24.1	31.0	25.0
Low birth weight	9.6	26.2**	9.7
Primary caregiver age, birth	25.04 (0.11)	26.50 (1.02)	23.37 (0.66)*
Primary caregiver relationship status, birth			
Neither cohabiting nor married (ref.)	40.3	34.8	48.6
Cohabiting	35.1	39.0	40.3
Married	24.6	26.2	11.1*
Primary caregiver education, birth			
Less than high school (ref.)	32.2	40.5	41.7
High school or equivalent	31.3	19.0	34.7
Some college or higher	36.5	40.5	23.6*
Primary caregiver spanking, age 1	28.2	14.3	36.1
Primary caregiver MDD, birth to age 3	27.6	35.7	46.6**
Number in household, age 3	4.37 (0.03)	4.33 (0.22)	4.36 (0.22)
Poverty ratio, age 3			
Poor (< 100%) (ref.)	42.5	40.0	61.5
Near poor (100-200%)	25.2	26.9	24.4
Not poor (> 200%)	32.2	33.3	14.0**
Primary caregiver impulsivity, age 3	1.61 (0.03)	2.04 (0.23)*	2.05 (0.18)**
Intimate partner violence, age 3	66.3	59.5	79.2*
Child maltreatment, age 3			
Physical/psychological abuse	4.11 (0.06)	4.66 (0.59)	5.31 (0.48)**
Neglect	0.15 (0.01)	0.36 (0.14)	0.21 (0.08)
Clinically elevated symptoms, age 5			
Depressive/anxious symptoms	9.7	33.3***	27.8***
Aggressive behavior	38.3	61.9**	55.6**
Attention problems	3.4	11.9**	18.1***
Comorbid aggression & dep./anx.	7.9	26.2***	22.2***

Note: *$p < .05$; **$p < .001$, ***$p < .0001$. [a] Children with neither suicidal ideation nor self-harm served as the reference group.

Table 2

Models Testing the Direct and Indirect Pathways from Early Maltreatment to Suicidal Ideation in Middle Childhood

	Clinically elevated symptoms			
	Model 1A	Model 1B	Model 1C	Model 2
	Depressive/ anxious symptoms	Aggressive behavior	Attention problems	Comorbid aggression & dep./anx.
Direct paths, OR (95% CI)				
Neglect→ SI	**1.73 (1.19- 2.53)**	1.15 (0.93-1.43)	1.14 (0.90-1.43)	**1.45 (1.08-1.89)**
Neglect → CES	**1.51 (1.30-1.74)**	1.09 (0.98-1.22)	1.14 (0.99-1.13)	**1.22 (1.06-1.41)**
Abuse → SI	1.04 (0.94-1.15)	1.09 (0.99-1.22)	1.06 (0.94-1.19)	1.06 (0.96-1.17)
Abuse → CES	1.00 (0.97-1.04)	**1.11 (1.08-1.13)**	**1.07 (1.02-1.13)**	1.01 (0.97-1.05)
CES → SI	**3.00 (1.38-6.54)**	1.70 (0.83-3.47)	1.28 (0.44-3.75)	**3.44 (1.64-7.20)**
Indirect paths, OR (95% CI)				
Neglect → CES → SI	**1.57 (1.09- 2.25)**	1.05 (0.96-1.13)	1.03 (0.89-1.19)	**1.28 (1.02-1.62)**
Abuse → CES → SI	1.00 (0.96-1.04)	1.05 (0.98-1.13)	1.02 (0.94-1.09)	1.01 (0.97-1.06)
Fit statistics				
AIC	2368.47	4283.34	1372.58	2133.06
BIC	2452.36	4367.23	1456.48	2204.97
df	14	14	14	12

Note: Bold indicates $p < .05$. SI = suicidal ideation; CES = clinically elevated symptoms; OR = odds ratio; CI = confidence interval; AIC = Akaike's information criterion; BIC = Bayesian information criterion; df = degrees of freedom. Children with neither suicidal ideation nor self-harm served as the reference group. Models were adjusted for child's gender and ethnicity, and primary caregiver impulsivity. Models 1A-C were further adjusted for the three clinically elevated symptoms.

Table 3

Models Testing the Direct and Indirect Pathways from Early Maltreatment to Self-Harm in Middle Childhood

	Clinically elevated symptoms			
	Model 1A	Model 1B	Model 1C	Model 2
	Depressive/ anxious symptoms	Aggressive behavior	Attention problems	Comorbid aggression & dep./anx.
Direct paths, OR (95% CI)				
Neglect→ Self-harm	1.27 (0.83-1.93)	0.91 (0.64-1.30)	1.07 (0.73-1.58)	1.16 (0.81-1.68)
Neglect → CES	**1.51 (1.30-1.74)**	0.98 (0.57-1.68)	1.14 (0.99-1.30)	**1.22 (1.06-1.41)**
Abuse → Self-harm	1.07 (1.00-1.15)	1.06 (0.98-1.15)	**1.16 (1.05-1.28)**	**1.07 (1.00-1.17)**
Abuse → CES	1.00 (0.97-1.04)	**1.11 (1.08-1.13)**	**1.07 (1.02-1.13)**	1.01 (0.97-1.05)
CES →Self-harm	**2.21 (1.18-4.15)**	1.09 (0.98-1.22)	**3.45 (1.68-7.10)**	**2.51 (1.38-4.56)**
Indirect paths, OR (95% CI)				
Neglect → CES → Self-harm	**1.39 (1.04-1.84)**	1.00 (0.95-1.04)	1.17 (0.97-1.40)	**1.20 (1.01-1.43)**
Abuse → CES → Self-harm	1.00 (0.97-1.03)	1.00 (0.94-1.05)	**1.09 (1.01-1.21)**	1.01 (0.97-1.04)
Fit statistics				
AIC	2606.87	4521.75	1610.99	2379.30
BIC	2714.73	4629.61	1717.85	2475.18
df	18	18	18	16

Note: Bold indicates $p < .05$. OR = odds ratio; CI = confidence interval; CES = clinically elevated symptoms; AIC = Akaike's information criterion; BIC = Bayesian information criterion; df = degrees of freedom. Children with neither suicidal ideation nor self-harm served as the reference group. Models were adjusted for primary caregiver age at child's birth, education at birth, relationship status at birth, spanking at age 1, MDD from birth to age 3, impulsivity at age 3, intimate partner violence, and family poverty. Models 1A-C were further adjusted for the three clinically elevated symptoms.