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## Mother-daughter interpersonal processes underlying the association between child maltreatment and adolescent suicidal ideation

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### Abstract

The aim of the present study was to investigate whether mother-daughter relationship quality and mother-daughter conflict represent mechanisms underlying the association between child maltreatment and adolescent passive or active suicidal ideation. The sample included 164 socioeconomically disadvantaged depressed adolescent girls and their mothers (adolescents: mean age = 14.00 years; 66.3% African-American, 21.3% white, 14.0% Latina). Structural equation modeling was used to test three simultaneous and distinct mediating pathways linking child maltreatment to adolescent suicidal ideation: 1) mother-daughter relationship quality, 2) mother-daughter conflict, and 3) adolescent depressive symptoms. Consistent with the interpersonal-psychological theory of suicide (IPT; Joiner, 2005), both mother-daughter relationship quality and mother-daughter conflict mediated the effect of child maltreatment on adolescent suicidal ideation, over and above the significant depressive symptoms mediational pathway. These findings advance our understanding of why individuals who experienced child maltreatment are at risk for suicidal ideation and highlight the importance of relationship-based interventions for these vulnerable youths.

### Keywords

child maltreatment; suicidal ideation; interpersonal theory of suicide

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Suicide is currently the second leading cause of death among adolescents (10–24 year-olds) in the United States (CDC, 2014) and represents a significant public health concern. Approximately 17.7% of American adolescents seriously considered attempting suicide in the past year (CDC, 2015). Adolescent girls in general are more likely than their male counterparts to experience suicidal ideation (Nock et al., 2013). Moreover, among African-American youth, adolescent girls are three times more likely to report suicidal ideation than are males (Fitzpatrick, Piko, & Miller, 2008). Given evidence that the more severe and pervasive the suicidal ideation, the greater the likelihood of suicide attempt (Lewinsohn,

Rohde, & Seeley, 1996), understanding the etiology of suicidal ideation and identifying malleable processes leading to the development of suicidal ideation are critical for effective youth suicide prevention and intervention design.

Child maltreatment refers to severely adverse childrearing experiences including sexual abuse, physical abuse, emotional abuse, and neglect (Cicchetti & Toth, 2016), and is a well-established risk factor for adolescent suicidal ideation and behavior (see Miller, Esposito-Smythers, Weismore, & Renshaw, 2013 for review). For instance, among adults who experienced child sexual abuse, the odds of a suicide attempt were 2–4 times higher among women and 4–11 times higher among men, compared to individuals without childhood sexual abuse histories (Molnar, Berkman, & Buka, 2001). Moreover, among adults who experienced physical abuse, rates of suicidal ideation were approximately five times higher than among adults without a history of physical abuse (Fuller-Thomson, Baker, & Brennenstuhl, 2012). Importantly, these effects have been demonstrated over and above well-documented suicide risk factors including other adverse childhood experiences as well as adult psychosocial, physical, and mental health factors (Fuller-Thomson, Baird, Dhrodia, & Brennenstuhl, 2016), suggesting a unique effect of child maltreatment on the development of risk for suicidal ideation.

Prior research has repeatedly implicated mental health symptoms, especially depressive symptoms, as robust mediators of the child maltreatment-suicide risk link (e.g., Evans, Hawton & Rodham, 2004). Although mental health symptoms underlie this association, they do not fully explain why maltreated individuals are at risk for the development of suicidal ideation and behavior (Miller et al., 2013). The interpersonal-psychological theory of suicide (IPTS; Joiner, 2005; Van Orden et al., 2010) posits that two interpersonal processes, namely perceived burdensomeness and thwarted belongingness, coupled with an acquired capability for suicide, explain why certain individuals die by suicide. Consistent with this theory, social isolation and interpersonal conflict have been described as the most robust predictors of suicidal ideation and behavior (Bridge, Goldstein, & Brent, 2006; Van Orden et al., 2010).

Given that maltreated children often experience significant disruptions in secure attachment with caregivers (e.g., Cicchetti & Toth, 2016), a developmentally salient social isolation experience, this theory provides a strong framework for not only understanding the etiology of suicidal ideation and behavior more generally, but also for identifying the mechanisms of child maltreatment risk for suicide. Indeed, Smith and colleagues (2017) showed that emotional abuse affected both perceived burdensomeness and thwarted belongingness. Moreover, there is emerging evidence that aspects of the interpersonal context represent mechanisms underlying the child maltreatment-suicidal ideation/ behavior link. For example, Johnson and colleagues (2002) showed that interpersonal difficulties during middle adolescence mediated the association between maladaptive parenting or abuse in childhood and suicide attempt during late adolescence and early adulthood. Interestingly, Miller and colleagues (2014) showed that parental relationship quality and involvement during adolescence was significantly negatively affected by child maltreatment; however, results did not support a link between parent-adolescent relationship quality and suicidal ideation. Rather, their results indicated that poor friend relationship quality was a more salient predictor of suicidal ideation.

Although research is growing to support an interpersonal process underlying the effect of child maltreatment on adolescent risk for suicide and suicidal ideation, much remains unknown. For instance, which specific interpersonal processes underlie this association? Because prior research with adolescents suggests that familial social support is a stronger predictor of suicide attempt than is peer social support (Joiner et al., 2009), it is necessary to further explicate aspects of the familial context that mediate the effect of child maltreatment on youth suicide risk. Therefore, the aim of the present study was to investigate whether mother-daughter relationship quality and mother-daughter conflict represent mechanisms by which maltreated depressed adolescent girls are at risk for passive or active suicidal ideation. Given that depressive symptoms are a robust mediator of the effect of child maltreatment on youth suicidal ideation and behavior (Miller et al., 2013), we examined whether these mother-daughter interpersonal processes were distinct from one another, and whether they exist over and above the well-established depressive symptoms pathway.

## Method

### Participants

Participants included adolescent girls ( $N=164$ ) and their mothers<sup>1</sup> from an urban setting in upstate New York. Data for the present study were drawn from the baseline assessment of a larger randomized control trial (RCT) for depression treatment. Adolescent girls were on average 14.00 years old ( $SD=.85$ ) and mothers were on average 38.86 years old ( $SD=6.56$ ). The majority of adolescents (66.5%) and mothers (66.3%) were African-American, 21.3% of adolescents and 22.7% of mothers were white, and 12.2% of adolescents and 11.0% of mothers were another race. 14.0% of adolescents and 9.1% of mothers were Latina. The majority of mothers were not married (79.0%), and the average total family income was \$27,850.

### Procedures

Informed consent and assent was obtained from parents and adolescents respectively. All families had to be eligible for Temporary Assistance to Needy Families (TANF). Adolescents were recruited through a Department of Human Services (DHS) liaison and through adolescent-serving organizations. The DHS liaison contacted eligible families and explained the study. Interested parents provided signed permission for their contact information to be shared with project staff. Because the present study was part of a larger RCT for depression treatment, eligible adolescent girls also met criteria for subsyndromal or clinical depression at enrollment as assessed by the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime (K-SADS-PL; Kaufman et al, 1997). All assessments were conducted between 2011 and 2016 by trained interviewers who were unaware of the study hypotheses. Because of possible variations in reading ability and literacy, all self-report measures were read to participants while they followed along and indicated their responses. Mothers and adolescents were interviewed simultaneously in separate rooms.

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<sup>1</sup>The term “mother” is used throughout the paper; however it is worth noting that for 3.6% of the adolescents the caregiver was not a mother, but rather another female primary caregiver such as a grandmother or aunt.

## Measures

**Adolescent maltreatment.**—The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) is a 25-item self-report measure that assesses retrospective accounts of child maltreatment. Adolescents rated statements reflecting experiences occurring in their lifetime on a 5-point scale with response options ranging from “Never True” to “Very True.” Examples include “I got hit so hard by someone in my family that I had to see a doctor or go to the hospital,” and “When I was growing up, I didn’t have enough to eat.” Maltreatment subtypes include emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Based on established cutoffs, the presence or absence of each subtype of maltreatment was determined (Walker et al., 1999). A summary of the number of maltreatment subtypes experienced by the adolescent was calculated and used in subsequent analyses. The CTQ has evidenced good internal consistency ( $\alpha = 0.66 - 0.92$ ; Bernstein & Fink, 1998) and convergent validity with other measures of child maltreatment (e.g., Bernstein et al., 2003).

In the current sample, 51.8% of adolescents indicated a history of at least one form of maltreatment. Of those adolescents with maltreatment histories, 45.9% met criteria for one subtype, 20.0% met criteria for two subtypes, 18.8% met criteria for three subtypes, 10.6% met criteria for four subtypes, and 4.7% met criteria for five subtypes. The mean number of subtypes experienced among adolescents with a maltreatment history was 2.08 ( $SD=1.23$ ).

**Mother-adolescent conflict.**—Current conflict in the mother-adolescent relationship was assessed by mother report using the Conflict Behavior Questionnaire (CBQ-20; Robin & Foster, 1989). The CBQ asks mothers to indicate “True” or “False” on 20 items related to their relationship in the past two weeks. Sample items include “We almost never seem to agree,” and “My daughter and I have big arguments about little things.” Scores on the CBQ-20 correlate .96 with the longer version of the CBQ (Robin & Foster, 1989), for which high internal consistency has been shown (Prinz, Foster, Kent, & O’Leary, 1979). The CBQ-20 evidenced high internal consistency for the current study ( $\alpha = .89$ ).

**Mother-adolescent relationship quality.**—Adolescent perception of the quality of the mother-adolescent relationship was measured using adolescent report on the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 2009). The IPPA includes 25 items in which the adolescents were asked to select options ranging from (1) “Almost Never or Never True,” to (5) “Almost Always or Always True” in reference to their relationship with their mother. Subscales include trust, communication, and alienation. Sample items include “My mother accepts me as I am” (trust subscale), “I tell my mother about my problems and troubles” (communication subscale), and “I get upset a lot more than my mother knows about” (alienation subscale). A mean score of all 25 items was calculated such that higher scores indicate more positive relationship quality with higher levels of trust, communication, and lower levels of alienation. For the current study, the IPPA evinced acceptable internal consistency ( $\alpha = .74$ ).

**Depressive symptoms.**—Adolescents reported on their depressive symptoms using the Beck Depression Inventory for Youth (BDI-Y; Beck et al., 2005). The BDI-Y is a widely

used self-report instrument measuring severity of current depressive symptoms. The original measure includes 20 items in which adolescents are asked to respond on a scale of (0) “Never,” to (4) “Always” regarding their depressive symptoms in the past two weeks. A summary score is calculated. Item #4 (“I wish I were dead”) was omitted from the summary score for the present study to avoid item overlap with the suicidal ideation outcome latent variable. Internal consistency (alpha) for these 19 items was high ( $\alpha = .91$ ).

**Passive or active suicidal ideation.**—Three manifest variables were indicators of the latent construct of suicidal ideation. *Indicator 1*: “Recurrent thoughts of death” (current) was drawn from adolescent report on the KSADS (Kaufman et al., 1996). *Indicator #2*: “Suicidal ideation” (current) was also drawn from the adolescent report on the KSADS (Kaufman et al., 1996). Indicators 1 and 2 were binary (yes/no) variables. *Indicator #3*: “I wish I were dead” was from the BDI-Y (Beck et al., 2005). Consistent with the BDI-Y, Indicator #3 was scored on a 4-point scale (see description above). See Table 1 for descriptive statistics and frequencies of these indicators of suicidal ideation.

### Data Analytic Plan

Descriptive data analyses and zero-order correlations were examined using SPSS 25, and the structural equation model (SEM) was estimated using Mplus Version 8 (Muthén & Muthén, 1998–2017). The SEM was specified such that adolescent maltreatment (i.e., number of maltreatment subtypes) was entered as an exogenous variable. Mediators included the two hypothesized interpersonal pathways: 1) mother-adolescent conflict and 2) mother-adolescent relationship quality. Adolescent current depressive symptoms were also modeled as a mediator to allow for examination of the mother-adolescent interpersonal processes over and above the robust depressive pathway. Each mediator was modeled to be predicted by adolescent maltreatment and each mediator in turn predicted the suicidal ideation variable. Moreover, a direct effect of adolescent maltreatment on suicidal ideation was also estimated.

The weighted least square estimator with mean and variance adjustments (WLSMV) was used because of the inclusion of two binary indicators of the suicidal ideation latent variable. WLSMV computes ordinary least squares parameter estimates for continuous outcomes and probit parameter estimates for categorical outcomes.

Model fit was evaluated using the comparative fit index (CFI), root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR) and weighted root-mean square residual (WRMR). CFI values greater than .95, RMSEA values less than .06, SRMR values less than .06, WRMR values less than .90, and a non-significant  $\chi^2$  statistic were considered evidence of good model fit (Hu & Bentler, 1999). Mediation was tested using 95% asymmetric confidence intervals (CIs) using RMediation (Tofighi & MacKinnon, 2011).

### Results

Table 1 provides the zero-order correlations among study variables and descriptive statistics. As anticipated, a greater number of maltreatment subtypes was related to higher levels of adolescent depressive symptoms ( $r=.46, p<.001$ ), higher levels of mother-adolescent conflict

( $r=.28, p<.001$ ), and lower levels of mother-adolescent relationship quality ( $r=-.54, p<.001$ ). Moreover, higher levels of child maltreatment were associated with greater suicidal ideation as measured by all three indicators ( $r_s=.32-.48, p_s<.001$ ). Poorer relationship quality and more conflict were also both related to greater adolescent suicidal ideation (relationship quality:  $r_s=-.28-.41, p<.001$ ; conflict:  $r_s=.23-.28, p_s<.001$ ).

Regarding current passive or active suicidal ideation, 35.8% of participants endorsed current recurrent thoughts of death and 19.5% endorsed current suicidal ideation. We then dichotomized child maltreatment (0=no maltreatment, 1=maltreatment) to examine differing rates of thoughts of death and suicidal ideation among this sample of depressed adolescents. Results indicated that 22.1% of nonmaltreated depressed adolescents and 48.8% of maltreated depressed adolescents reported recurrent thoughts of death ( $\chi^2(1) = 12.31, p<.001$ ). Furthermore, 11.7% of nonmaltreated depressed adolescents indicated suicidal ideation, compared to 26.8% of maltreated depressed adolescents ( $\chi^2(1) = 5.80, p=.02$ ).

### Structural Equation Model

A structural equation model (SEM) was tested as specified above. The model evidenced adequate fit to the data ( $\chi^2(10, n = 164) = 26.47, p = .003, CFI = .97, RMSEA = .10, WRMR = .78$ ). Regarding the suicidal ideation latent factor, all three indicators evidenced significant factor loadings ( $\lambda = .72 - .88, p_s<.001$ ). For the structural portion of the model, results did not support a significant direct path from child maltreatment to suicidal ideation ( $\beta = .06, p=n.s.$ ). However, higher levels of child maltreatment were related to higher levels of adolescent depressive symptoms ( $\beta = .46, p<.001$ ), more mother-adolescent conflict ( $\beta = .28, p<.001$ ), and poorer mother-adolescent relationship quality ( $\beta = -.54, p<.01$ ). Higher levels of mother-adolescent conflict and worse mother-adolescent relationship quality each uniquely predicted greater suicidal ideation ( $\beta_{\text{conflict}} = .18, p<.01, \beta_{\text{quality}} = -.28, p<.01$ ), over and above the significant effect of depressive symptoms ( $\beta = .59, p<.001$ ).

The 95% bias-corrected bootstrap method was used for mediation tests. Confidence intervals that do not include zero are statistically significant. The effect of child maltreatment on adolescent suicidal ideation was uniquely mediated by 1) mother-adolescent conflict (LCL=.003; UCL=.131), 2) mother-adolescent relationship quality (LCL=.053; UCL=.258), and 3) adolescent depressive symptoms (LCL=.175; UCL=.385).

### Discussion

The aim of the current study was to examine mother-daughter interpersonal processes underlying the effect of child maltreatment on passive or active suicidal ideation among a sample of socioeconomically disadvantaged depressed adolescent girls with and without a history of child maltreatment. First, as expected, rates of suicidal ideation and recurrent thoughts of death were higher among girls with a history of maltreatment than among girls without a history of maltreatment experiences. Furthermore, consistent with the interpersonal-psychological theory of suicide (IPT; Joiner, 2005; Van Orden et al., 2010), we found that both mother-daughter relationship quality and mother-daughter conflict independently mediated the effect of child maltreatment on adolescent suicidal ideation. Child maltreatment was associated with poorer mother-daughter relationship quality and



increased mother-daughter conflict, both of which were linked with higher levels of suicidal ideation among adolescents. Thus, we advance the extant literature by identifying two distinct familial processes that partially explain why maltreated children are at risk for developing suicidal ideation in adolescence. Importantly, we demonstrate that these interpersonal processes hold over and above the well-established depressive symptoms mechanism. Our results are consistent with the assertion by Miller and colleagues (2013) that mental health symptoms do not fully explain the child maltreatment-suicidal ideation and behavior link. Rather, we identified three distinct pathways that mediate the effect of child maltreatment on adolescent suicidal ideation: two familial interpersonal processes and a mental health process.

It is noteworthy that we found these interpersonal mechanisms using data from multiple sources, thus strengthening our assertions and indicating that our findings are not the result of shared method variance. Specifically, child maltreatment and mother-daughter relationship quality were assessed using adolescent self-report and mother-daughter conflict was measured using mother report. Therefore, we found evidence for interpersonal processes according to both mothers' and daughters' perceptions of the family context.

The interpersonal-psychological theory of suicide (IPTS) posits that both a sense of burdensomeness and low belonging contribute to a desire for death (Joiner et al., 2009). High levels of conflict within the mother-adolescent daughter relationship and poor relationship quality (as indexed by lack of trust, poor communication, and alienation) may be markers of these negative psychological states. IPTS theorizes that these cognitive states may result in suicidal ideation; however, in combination with an acquired capability for suicide, these interpersonal processes may be predictive of death by suicide. An acquired capability for suicide may develop from repeated exposure to violence and pain. Youth with maltreatment experiences represent a particularly vulnerable group given that 1) maltreatment may affect a perception of burdensomeness and low familial connection; and 2) children exposed to maltreatment may experience repeated physical injury and/or witness domestic violence. Thus, maltreated youth may be especially vulnerable to not only suicidal ideation, but also death by suicide because of these interpersonal processes and the increased likelihood for an acquired capability for suicide.

A critical next step for explicating mechanisms underlying maltreated youth risk for suicide will be an examination of the interpersonal pathways in conjunction with the measurement of capability for self-injury. Joiner and colleagues (2009) demonstrated that interpersonal processes resulted in a suicide attempt, rather than suicidal ideation, for young adults with higher levels of acquired capability for suicide. It will be important to extend these findings to the context of child maltreatment, thus allowing for a more complete test of IPTS among maltreated youth.

Results of the current study have important implications for prevention and intervention design. We found that child maltreatment negatively impacts the quality of the mother-daughter relationship and leads to higher levels of conflict within this relationship, both of which enhance risk for youth suicidal ideation. Thus, relationship-based interventions represent theoretically salient approaches to depression treatment for maltreated youth (Toth,

Gravener-Davis, Guild, & Cicchetti, 2013). For example, interpersonal psychotherapy for adolescents (IPT-A; Mufson, Dorta, Moreau, & Weissman, 2011) which focuses on the interpersonal context of depression may be particularly well-suited for this population. Moreover, attachment-based family therapy has demonstrated efficacy in reducing suicidal ideation among adolescents by strengthening family functioning and the parent-adolescent attachment relationship (Diamond et al., 2010).

There are limitations to the present study that are worth noting. First, our data are not fully prospective. Although the experience of child maltreatment preceded the measurement of the mediators, the mediators and the suicidal ideation outcome were assessed contemporaneously. Given that fully prospective models are ideal for testing mediational models, future fully longitudinal models are needed to replicate these findings. Additionally, we relied on a sample of low-income, racially and ethnically diverse adolescent girls and their mothers. Although it is a strength to examine these associations among this often understudied population, this may limit the generalizability of the findings. Finally, given the low base rates of suicide attempts, this was not a viable outcome variable in our analyses. A larger sample size or more acute samples of youth who recently attempted suicide will be useful to advance this work.

In conclusion, we sought to identify the interpersonal processes underlying the association between child maltreatment and adolescent suicidal ideation among a sample of depressed low-income, racially and ethnically diverse girls. Our results support the interpersonal-psychological theory of suicide (Joiner, 2005) by showing that high mother-daughter conflict and poor mother-daughter relationship quality mediate the effect of child maltreatment on adolescent suicidal ideation, over and above a depressive symptoms mediational pathway. These findings highlight the vulnerability of maltreated youth and call for relationship-based interventions for suicide prevention.

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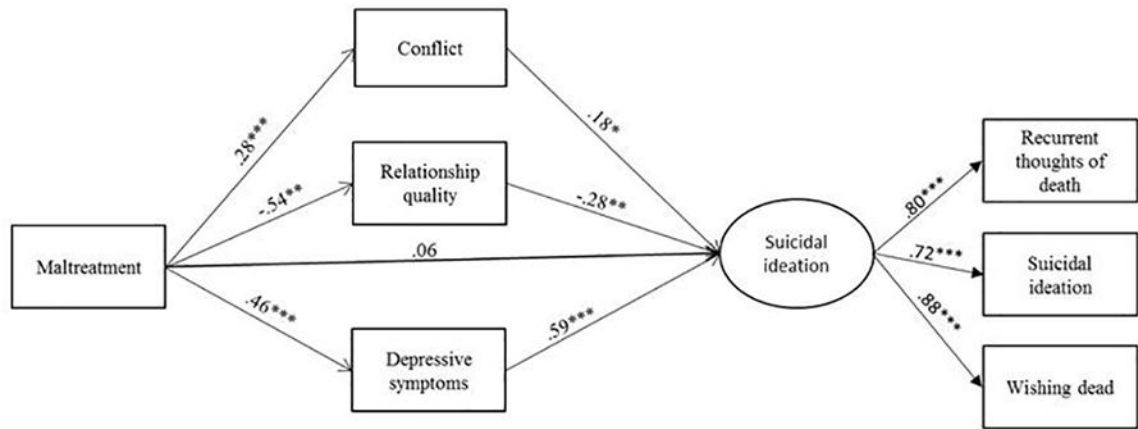
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**Figure 1.**

Results of SEM mediational model

*Notes.* Standardized path coefficients are presented. Residual covariances are not depicted for ease of interpretation. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

Table 1.

Zero-order correlations among study variables.

	1.	2.	3.	4.	5.	6.	7.	<i>M</i> ( <i>SD</i> )	%
1. Maltreatment	-							1.08 (1.37)	
2. Conflict	.28***	-						6.60 (5.37)	
3. Relationship quality	-.54***	-.28**	-					3.50 (.88)	
4. Depressive symptoms	.46***	.13	-.41***	-				13.76 (9.76)	
5. Wishing for death	.48***	.23**	-.38***	.68***	-			.34 (.69)	
6. Suicidal ideation	.32***	.28***	-.28***	.36***	.60***	-			19.5%
7. Thoughts of death	.36***	.25**	-.41***	.46***	.55***	.64***	-		35.8%

*Notes:*

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 $p < .001$ ,

\*\*

 $p < .01$