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Childhood Emotional Maltreatment as a Robust Predictor of Suicidal Ideation: A 3-Year Multi-Wave, Prospective Investigation

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Abstract Despite literature suggesting a relationship between child maltreatment and suicidal ideation, few studies have examined the prospective course of this relationship. The current study examined this relationship in a sample of 682 community youth who were followed over the course of 3 years. Repeated measures of suicidal ideation, emotional maltreatment, and depressive symptom severity were examined in multi-wave path analysis models. Overall, results suggest that emotional maltreatment over time contributes uniquely to the prospective prediction of suicidal ideation, even when controlling for age, previous suicidal ideation, biological sex, and depression symptom severity. Unlike previous studies that have only measured emotional maltreatment at one-time point, the current study demonstrates that emotional maltreatment contributes unique risk to suicidal ideation prospectively among youth. Results speak to the importance of examining emotional maltreatment and suicidal ideation within prospective models of risk and suggest that emotional maltreatment is a robust predictor of suicidal ideation, over and above history of suicidal ideation and depression.

Keywords Adolescent suicide · Emotional maltreatment · Child abuse · Suicidal thoughts

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Suicide is a major global public health safety concern. Indeed, suicide is currently the second (15–24 year olds; CDC 2012) and third (10–14 year olds; McIntosh and Drapeau 2014) leading cause of death for young people in the United States. Suicide is also the fourth leading cause of death among 15–19 year olds across 90 countries, according to the World Health Organization (Wasserman et al. 2005). Rates of suicide increase exponentially from childhood into adolescence (Kessler et al. 1999; Nock et al. 2013). Further, suicidal thoughts are some of the most common mental health emergencies among adolescents (King et al. 2009). In fact, data from US high schools in 2013 suggests that 17 % of high school students seriously considered suicide in the prior 12 months and 13.6 % made a suicide plan (Kann et al. 2014). Rates of suicidal ideation in children under the age of 11 are less well studied; however, rates of suicidal ideation in children under 11 range from 2 %–10 % (Herba et al. 2007; Whalen et al. 2015). The transition from suicidal ideation to suicide attempts occurs rapidly with about 41 % of adolescent females and 23 % of adolescent males making a suicide attempt within the first year of onset of suicidal ideation (Nock et al. 2013). Given that suicidal ideation is the strongest predictor of suicidal behavior (beyond prior suicidal behavior; Prinstein et al. 2008), the study of risk factors for suicidal ideation remains crucially important in order to prevent youth suicide.

Child maltreatment has been documented as a relatively robust risk factor for suicidal ideation. Child maltreatment is often defined as sexual, physical, or emotional maltreatment and neglect. Each of these forms of child maltreatment have been found to be significantly associated with suicidal ideation in both cross-sectional and longitudinal studies (King and Merchant 2008; Miller et al. 2013). Further, child maltreatment occurs at relatively high rates. (Finkelhor 2011) found that 1-year rates of child maltreatment ranged from 1.2 to 270 per 1000 children surveyed in the US. According to the WHO, rates of childhood abuse range from 10 %–25 % in US and international samples (Kohrt 2014; Runyan et al. 2002). While many studies have found associations with child maltreatment and suicidal ideation, very few studies have examined longitudinal associations with repeated measures of both child maltreatment and youth suicidal ideation. Extant studies typically assess child maltreatment retrospectively at one time point and do not include the possibility of examining longitudinal associations between maltreatment and suicidal ideation. To provide a more rigorous test of the longitudinal associations of child maltreatment and child and adolescent suicidal ideation, we incorporated a multi-wave, longitudinal design allowing for more exacting temporal ordering of events preceding suicidal ideation. This powerful multi-wave design allows for a more precise exploration of processes over time that is not possible with cross-sectional or two-time point studies (Curran and Willoughby 2003).

Child Emotional Maltreatment and Suicidal Ideation

As defined in the research literature, emotional maltreatment, which is one form of child maltreatment, typically includes verbal assaults to a child's sense of well-being or self-worth, or any threatening, demeaning, terrorizing, or humiliating remarks or behavior directed at a child by any older person (Glaser 2002). Child emotional maltreatment has been shown to be a powerful predictor of later internalizing psychopathology, even after accounting for other types of child maltreatment, such as physical and sexual abuse (Gibb and Abela 2007; Wright et al. 2009). From the perspective of developmental psychopathology (Cicchetti and Valentino 2006), emotional maltreatment disrupts typical socio-emotional developmental processes, which may result in maladjustment in adolescence. Indeed, victims of child emotional maltreatment have been shown to have poor cognitive flexibility (Spann et al. 2012), fewer emotion regulation skills (Romens and Pollak 2012), less prosocial behavior, more aggressive behavior (Alink et al. 2012), and increased risk of depression and anxiety (Cutuli et al. 2013).

Theories of suicide include child emotional maltreatment as an important distal risk factor for later suicidal ideation and behavior. Indeed, behavioral theorists assert that suicide stems from learned behavior rooted in adverse childhood experiences (Lester 1987). More recently, the Interpersonal Psychological Theory of Suicide (IPTS) emphasizes emotional maltreatment as an experience that contributes to both perceived burdensomeness and thwarted belongingness, which are central components of the desire for death (Joiner 2005; Van Orden et al. 2010). Others have also suggested that emotional maltreatment, in combination with other forms of childhood abuse, may increase the capacity for suicide (Stewart et al. 2015) and is theorized to convey risk for transitioning from suicidal ideation to suicide attempts (Van Orden et al. 2010). Similarly, the Three-Step Model of Suicide (3ST; Klonsky and May 2015) suggests psychological pain and hopelessness, which could be engendered by emotional maltreatment, contribute to risk for suicidal ideation. Surprisingly, very little research has measured emotional maltreatment over time in order to examine the longitudinal effects of emotional maltreatment on later risk for suicidal ideation. This is of critical importance to fully understand the relative timing of emotional maltreatment and associated sequelae.

To date, few longitudinal studies have examined the role of emotional maltreatment in suicidal ideation (Miller et al. 2013). In a large scale longitudinal study, Thompson et al. (2012) examined the relationship between psychological maltreatment (defined as a proxy of emotional maltreatment) and suicidal ideation in a sample of 740 youth enrolled a large scale, longitudinal study. Using clinical interviewing to gather maltreatment data, they found that reported psychological maltreatment between the ages of 12–16 was associated with increased odds of suicidal ideation at age 16. Although authors did not control for depression per se, distress (a composite measure of psychological symptoms as well as previous suicidal thoughts before age 16) was controlled for in these analyses. However, these analyses did not control for previous psychological maltreatment, which precludes conclusions about importance of recent versus previous maltreatment.

Miller et al. (2014) found that child maltreatment (composite of physical, sexual, and psychological maltreatment) measured at age 12 prospectively predicted odds of age 18 suicidal ideation among 884 participants above and beyond previous suicidal thoughts. This study did not model abuse experiences that may have happened between the ages of 12 and 18. Although they did not assess emotional maltreatment, Dunn et al. (2013) examined data from the National Longitudinal Study of Adolescent Health and found that exposure to physical and sexual abuse was linked with overall higher odds of suicidal ideation at age 17, compared non-maltreated youth. While this study provides important evidence for the longitudinal association between child maltreatment and suicidal ideation, they relied on a single retrospective report of abuse across the entire childhood and adolescent time frame. Further, they assessed suicidal ideation at a single time point as opposed to multi-wave measurement.

In sum, while the above studies provide important first steps in understanding the longitudinal associations of child maltreatment and adolescent suicidal ideation, they rely on single indicators of suicidal thoughts on a self-report measure and have inconsistently accounted for symptoms of depression. Further, many prior studies examine distal vs. more proximal risk for suicidal ideation, especially in relationship to child maltreatment.

Depression as a Potential Mediator

Depression is one of the strongest and most consistent risk factors for youth suicidal ideation (Goldston et al. 2009; O'Connor et al. 2013). Further, emotional maltreatment is consistently linked with depression onset (Gibb 2002; Gibb and Abela 2007; Hankin 2005). Indeed, previous research has consistently linked emotional maltreatment with the development of depression in youth, and this process is thought to result, at least in part, from the child being supplied with the cognitive distortions that are the hallmark of the depressonogenic style (Gibb and Abela 2007; Hamilton et al. 2013; Hankin 2005; Rose and Abramson 1992). The relationship between emotional maltreatment and later depression severity has been found even after accounting for sexual and physical abuse (Gibb et al. 2007; Hankin 2005; Wright et al. 2009). Together, emotional maltreatment seems to place children at risk for more self-referential negative cognitions and later depression. Thus, it seems plausible that emotional maltreatment may confer risk to adolescent suicidal ideation via the effects of depression. To our knowledge, only one study has investigated this question. In the sample discussed above, Miller et al. (2014), found that depression at age 16 partially mediated the relationship between a child maltreatment composite at age 12 and odds of suicidal ideation at age 18.

Biological Sex as a Potential Moderator

More girls compared to boys report suicidal ideation (Nock et al. 2013) and suffer from depression (Hankin et al. 1998; Nolen-Hoeksema 2001). Further, there is some evidence that the relationship between child maltreatment and suicidal ideation may vary by biological sex. Specifically, some work has suggested child maltreatment may be more consistently linked to suicidal ideation in girls compared to boys (Anteghini et al. 2001; Darves-Bornoz et al. 1998). However, others have not found this sex difference (Brezo et al. 2008; Kaplan et al. 1999; Miller et al. 2014). It is possible that sample demographics (community vs. at risk youths; e.g., Kaplan et al. 1999) as well as methods of assessment of abuse (self-report vs. substantiated abuse; Miller et al. 2014) may explain part of these differences. Given these mixed findings, more research is necessary to examine whether the associations among child maltreatment, depression, and suicidal ideation vary by sex.

Current Study

Extant work on suicide in adolescence has typically employed cross-sectional designs with primarily retrospective data. Some longitudinal studies have identified important distal risk factors, such as mental illness (Goldston et al. 2009; King et al. 1997; Prinstein et al. 2008), for suicidal ideation. While these studies have provided important first steps towards understanding the developmental process of suicide in adolescence, a lack of multi-wave, repeated measures studies are sorely needed to further our knowledge.

Two recent studies provided information about the course of suicidal ideation as it is related to peer relationships (Giletta et al. 2015) and negative cognitive styles (Burke et al. 2015). These well-designed studies provide important information about the role of peers and cognitive styles in the course of suicidal ideation; however, prospective relationships between suicidal ideation and other notable risk factors, such as emotional maltreatment, need to be elucidated.

The primary goal of this 3-year longitudinal study of community youth was to examine how emotional maltreatment predicts suicidal ideation over time in a multi-wave path analysis model (see Fig. 1). We were especially interested in emotional maltreatment as a prospective predictor of suicidal ideation at subsequent follow-up. To our knowledge, this particular pathway has not been previously examined. The secondary aim of this study was to test a competing path analysis model (see Fig. 2) that included depressive symptom severity at each time point given the strong associations between depression and both suicidal ideation and emotional maltreatment (Goldston et al. 2009; Miller et al. 2014). This allowed us to test whether emotional maltreatment may influence suicidal ideation through depressive symptom severity. We also explored whether biological sex moderated the associations among emotional maltreatment, depressive symptom severity, and suicidal ideation in the current study. Based on previous literature, our hypotheses were as follows:

1. Lifetime emotional maltreatment measured at baseline (Time 1) would longitudinally predict suicidal ideation at both follow-up time frames (18-months [Time 2] and 36-months [Time 3]) after controlling for age, prior suicidal ideation, and depressive symptom severity. Further, emotional maltreatment at Time 2 would longitudinally predict suicidal ideation at the Time 3 follow-up after accounting for age, prior suicidal ideation, depressive symptom severity, and previous emotional maltreatment. Finally, concurrent emotional maltreatment and suicidal

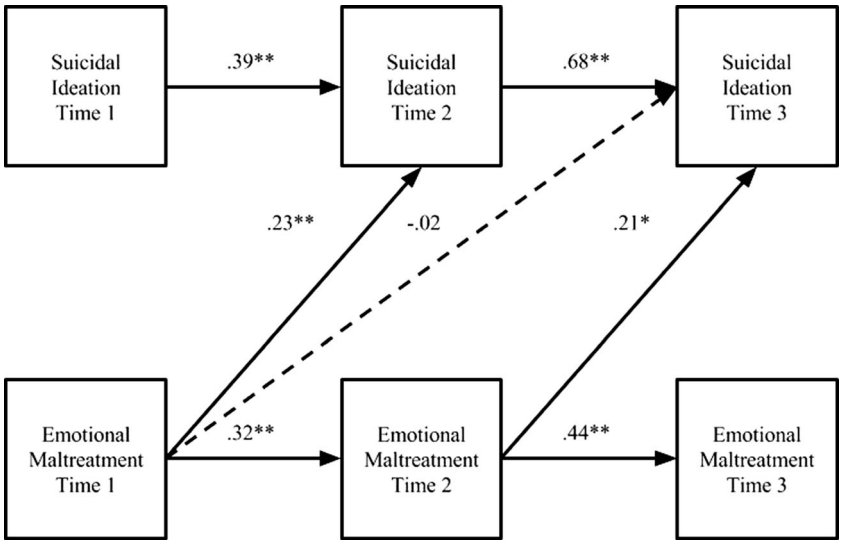

Fig. 1 Cross-lagged model with suicidal ideation and emotional maltreatment. *Note*. Non-significant paths are dashed. Not pictured are the concurrent relationships between suicidal ideation and emotional maltreatment at each respective time point. Additionally, the direct paths from suicidal ideation Time 1 and suicidal ideation Time 3 as well as emotional maltreatment at Time 1 and emotional maltreatment at Time 3 are not picture to simplify interpretation. These concurrent and direct paths were included in the statistical model and are discussed in the text

ideation would be significantly associated across all time points after controlling for for age, prior suicidal ideation, and depressive symptom severity.

2. Emotional maltreatment at Time 1 would predict depressive symptom severity at both follow-up time frames after controlling for age and previous depressive symptom severity. Depressive symptom severity at each time point would predict suicidal ideation at the subsequent time points. Finally, depressive symptom severity at Time 2 would partially mediate the relationship between Time 1 emotional maltreatment and suicidal ideation at Time 3.

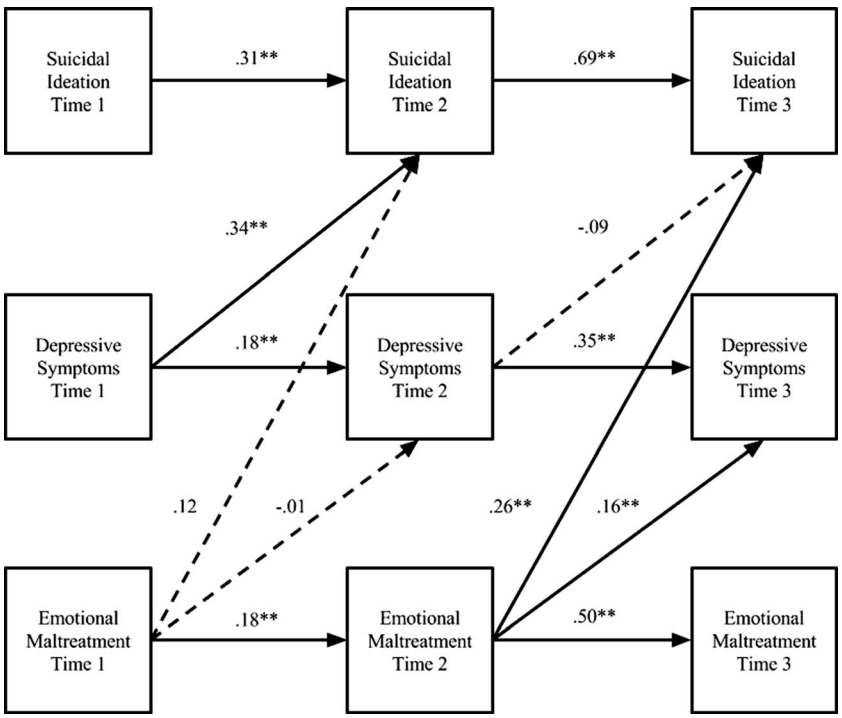

Fig. 2 Cross-lagged model with suicidal ideation, depressive symptoms, and emotional maltreatment. *Note*. Non-significant paths are dashed. Not pictured for ease of interpretation are the concurrent relationships between suicidal ideation, depressive symptoms, and emotional maltreatment at each respective time point. The following direct paths are not pictured in the figure: Suicidal Ideation Time 1 & Time 3; Depressive Symptoms Time 1 & Time 3; Emotional Maltreatment Time 1 & Time 3; Depressive Symptoms Time 1 & Suicidal Ideation Time 3; Emotional Maltreatment Time 1 & Suicidal Ideation Time 3; Emotional Maltreatment Time 1 & Depressive Symptoms Time 3. These concurrent and direct paths were included in the statistical model and are discussed in the text

Method

Participants and Procedures

Participants were recruited from local school districts in New Jersey and Colorado as part of a larger study on the development of depression in youth (Hankin et al. 2015). Brief information letters were sent home directly to the participating school districts of families with a child in third, sixth, or ninth grades. Parents of 1108 children responded to the letter and called the laboratory for more information. Parent report established that both the parent and child were fluent in English, the child did not have an autism spectrum or psychotic disorder, and the child had an IQ > 70. Of the families that initially contacted the laboratory, 682 (62 %) qualified for the current study because they met criteria for the study, arrived for the first study visit, and provided complete data for the relevant study variables at baseline. Youth ranged in age from 7 to 18 years (mean = 11.83, SD = 2.42). The sample was comparable to the ethnicity and race characteristics of the community and school districts from which it was recruited (Caucasian: 62.30 %, African American: 11.30 %, Hispanic: 7.20 %, Asian/Pacific Islander: 9.90 %, and Other/Multiracial: 9.40 %). The sample was also generally comparable to the ethnicity and race characteristics of the overall population of the United States, although there were relatively fewer Hispanic participants in the current study than found in the overall population of the United States.

Youth and one caregiver visited the laboratory for an in-person, in-depth assessment at Time 1, and then again at the Time 2 (18-months after Time 1) and Time 3 (36-months after Time 1) follow-ups. Regular phone follow-up assessments took place every 6 months in between in-person visits across the entire 36-month study period. Youth completed questionnaires assessing for emotional maltreatment and depressive symptoms at the Time 1, Time 2, and Time 3 laboratory visits. Youth completed a structured clinical interview assessing for suicidal ideation at Time 1 and again at every 6-month follow-up through Time 3. The institutional review boards at both the University of Denver and Rutgers University approved all procedures. Caregivers provided informed written consent for their child's participation; youth provided written assent. Both youth and the caregiver were compensated monetarily for their participation.

Measures

Suicidal Ideation Suicidal ideation was assessed by the Self-Injurious Thoughts and Behaviors Interview (SITBI) interview (Nock et al. 2007). This is a clinician-administered interview that assesses presence and frequency (i.e., number of days) of a range of self-injurious thoughts and behaviors, including non-suicidal self-injury, suicidal ideation, suicide plans, suicide gestures, and suicide attempts. The current study focused on the item inquiring about the presence of suicidal ideation ("Have you ever had thoughts of killing yourself?"). This question resulted in a dichotomous variable indicating the presence (coded as 1) or absence (coded as 0). At baseline, youth received a score of 1 at if they endorsed current or a lifetime history of suicidal ideation. At Time 2 and Time 3, youth received a score of 1 if they endorsed suicidal ideation on any 6-month follow-up within the previous 18-month period. The SITBI has excellent inter-rater reliability and test-retest reliability (Nock et al. 2007). Prior studies show that the SITBI is a valid measure for youth ages 7–16 (Barrocas et al. 2012).

Depressive Symptoms The Children's Depression Inventory is a 27-item self-report questionnaire designed to assess youth depressive symptoms (Kovacs 2003). For this study, the single item asking about suicidality was excluded to avoid overlap between measures of depressive symptoms and suicidality. Each item of the CDI is rated on a scale from 0 to 2, with a total score possible score ranging from 0 to 52 for this study. Higher scores indicate greater depressive symptoms. The CDI has been shown to have good reliability (test–retest and internal consistency) and good convergent validity in youth (Klein et al. 2005). The CDI was administered to youth at Time 1, Time 2, and Time 3 laboratory visits, and internal consistency (α) in this sample was above .80 at all time points.

Emotional Maltreatment The emotional maltreatment subscale of the Childhood Trauma Questionnaire (CTQ-EA) was used to assess youth emotional maltreatment (Bernstein et al. 2003; Bernstein and Fink 1998). Youth reported on experiences using a 5 point Likert-type scale for each item, with response options ranging from "Never true" to "Very often true". The subscale score was calculated by summing responses to five items, with higher scores indicating higher levels of emotional maltreatment. Possible scores ranged from 0 to 20. The CTQ has demonstrated excellent psychometric properties in both clinical and nonclinical samples, including high levels of criterion related validity with therapists' ratings of abuse (Bernstein et al. 1997, 2003; Scher et al. 2001). The emotional maltreatment subscale of the CTQ in particular has demonstrated predictive validity of depressive symptoms and cognitions among children and adolescents (Gibb and Abela 2007). The CTQ-EA was gathered from the Time 1, Time 2, and Time 3 laboratory visits. Internal consistency (α) in this sample was above .77 across all time points.

Data Analytic Plan

Data were prepared and descriptive and bivariate correlational analyses were conducted using SPSS Version 22.0. A path analysis was conducted using Mplus Version 7 (Muthén and

Muthén 2012) to examine the concurrent and prospective relationship between Emotional Maltreatment and Suicidal Ideation (see Fig. 1).[1] Model fit was assessed using a variety of indices. A non-significant chi-square suggests that the model fits the data. However, the chi-square statistic is sensitive to sample size, which results in more frequent rejection of models with large samples ($n > 500$) as is seen in the present study. Therefore, it is recommended that additional indices are considered to determine model fit (Hooper et al. 2008). A Root Mean Square Error of Approximation (RMSEA) value close to 0.06, a Comparative Fit Index (CFI) over 0.95 and a Weighted Root Mean Square Residual (WRMR) under 1.0 indicate close fitting models (Hu and Bentler 1999). All regression coefficients are presented as standardized simple effects (z-scores).

To account for the categorical nature of the suicidal ideation measure, models used a robust weighted least squares (WLSMV) estimator (Flora and Curran 2004). Additionally, to account for missing data, WLSMV uses a process that incorporates all available data without deleting missing data or imputing values on other items. The WLSVM approach to missing data is superior to listwise deletion, which reduces power and can result in biased parameter estimates (Asparouhov and Muthén 2010). When utilizing WLSMV, a Weighted Root Mean Square Residual (WRMR) of less than 1.0 indicates very close model fit (Finney and DiStefano 2006; Yu and Muthen 2002).

We tested the indirect effect of depressive symptom severity on the relationship between Time 1 emotional maltreatment and Time 3 suicidal ideation (see Fig. 2)[1]. This indirect effect was estimated and tested using a nonparametric bootstrapping approach with 1000 bootstrap re-samples; indirect paths are considered significant if the 95 % confidence intervals do not contain zero (Preacher and Hayes 2008). This approach makes no assumptions about the normality of the sampling distribution of the indirect effect, and has been considered superior to the Sobel test for mediation analysis (MacKinnon 2008; Sobel 1982). We separately included both age and grade as a covariate across all time points in our models with identical results. Results are presented with age as the covariate.

A multiple group analysis was conducted to examine the possible moderating role of sex in both of the estimated models. This analysis compared the fit of a model in which all paths were constrained to be equal for boys and girls (i.e., suggesting no moderation) to a model in which these paths were free to differ between boys and girls (i.e., suggesting moderation). Mplus provides an adjusted chi-square difference statistic for invariance because chi-square statistics yielded when using a WLSMV estimator do not follow a chi-square distribution, which results in the inability to use the standard difference test to assess invariance across sex (Muthén and Muthén 2012).

Results

Missing Data

Of the total 682 participants, 30 % had missing suicidal ideation data at Time 2 and 34 % had missing data at Time 3. Individuals with complete suicidal ideation data at Time 2 did not differ significantly from those with missing data across key demographic variables (e.g., sex, age, grade, and race/ethnicity; p's > .05) and all independent variables of interest, except for Depressive Symptoms at Time 1, $t(683) = 3.07$, $p = .01$, after correcting for multiple comparisons (i.e., false discovery rate correction; (Benjamini and Hochberg 1995). Individuals with complete suicidal ideation data at Time 3 did not differ significantly from those with missing data across key demographic variables (p's > .05) and all independent variables of interest, except for depressive symptoms at Time 1, $t(683) = 2.72$, $p = .05$.[2]

Descriptive Statistics

Means and standard deviations for study variables are presented at Table 1. Rates of suicidal ideation were similar across time points, with 11.4 %, 14.3 %, and 13.1 % reporting suicidal ideation at Time 1, Time 2, and Time 3, respectively. At Time 1, 10 % of third graders, 9 % of sixth graders, and 16 % of 9th graders reported suicidal ideation. At Time 2, respective rates across these groups were 12 %, 12 %, and 19 %. At Time 3, respective rates for these groups were 8 %, 13 %, and 19 %. Table 2 includes zero-order correlations among study variables included in the path analysis model.

Path Analysis Model

Model 1 The first model tested and estimated direct paths between Time 1 and Time 2 emotional maltreatment and suicidal ideation across all time points (Fig. 1). This model controlled for previous emotional maltreatment and suicidal ideation at all previous time points and controlled for age across all time points. Additionally, concurrent relationships between Time 1 emotional maltreatment and suicidal ideation were

[1] In both figures, only the direct paths specified in the model are depicted to ease interpretation. In both models, we allowed each concurrent variable (Emotional Maltreatment, Suicide, and Depression [Model 2]) to covary in order to capture the concurrent relationships among those variables.

[2] We restricted our sample to only those with valid Time 3 suicidal ideation data in order to test the sensitivity of our results. Results were identical in strength and significance patterns compared to the full sample. Results from the full sample are presented.

Table 1 Descriptive statistics

	n	Mean (*SD*)	Range
T1 Emotional Maltreatment	515	7.38 (3.13)	0–20
T2 Emotional Maltreatment	522	7.01 (2.90)	0–17
T3 Emotional Maltreatment	499	6.93 (2.99)	0–20
T1 Depression	673	7.46 (5.52)	0–34
T2 Depression	563	5.84 (5.48)	0–36
T3 Depression	527	5.65 (5.21)	0–31
		%No	%Yes
T1 Suicidal Ideation	674	88.60	11.40
T2 Suicidal Ideation	495	85.70	14.30
T3 Suicidal Ideation	467	86.90	13.10

Total *n* = 695. *T1* Time 1, *T2* Time 2, *T3* Time 3

allowed to covary. Similarly, Time 2 emotional maltreatment and suicidal ideation were allowed to covary. The full path analysis model showed acceptable fit, $\chi^2(21) = 585.01$, $p < .001$; CFI = .99; RMSEA = .05; WRMR = .34, and is presented in Fig. 1. As hypothesized, the direct relationship between Time 1 emotional maltreatment and Time 2 suicidal ideation, $\beta = 0.23$, SE = 0.07, $p < .001$, remained, even when controlling for the concurrent relationship between Time 1 emotional maltreatment and Time 1 suicidal ideation, $\beta = 0.31$, SE = 0.04, $p < .001$, and associations between Time 1 suicidal ideation and Time 2 suicidal ideation, $\beta = 0.39$, SE = 0.05, $p < .001$.

Our primary hypothesis was supported when examining the full model that included emotional maltreatment and suicidal ideation at all measured time points. Specifically, Time 2 emotional maltreatment significantly predicted Time 3 suicidal ideation, $\beta = 0.21$, SE = 0.08, $p = .009$, even after controlling for emotional maltreatment and suicidal ideation at all previous time points. Finally, Time 3 emotional maltreatment was significantly associated with Time 3 suicidal ideation after accounting for previous maltreatment and previous suicidal ideation, $\beta = 0.20$, SE = 0.10, $p = 0.05$. Together, this demonstrates a robust longitudinal relationship between emotional maltreatment predicting prospective suicidal ideation. Accordingly, the full model accounted for 60 % of the variance in Time 3 suicidal ideation, $R^2 = 0.60$, $p < .001$.

Model 2 Given the strong relationship among emotional maltreatment, suicidal ideation, and depressive symptom severity, we tested a more stringent model of the prospective relationships between emotional maltreatment and suicidal ideation by including depressive symptoms across all time points (Fig. 2). This model controlled for previous emotional maltreatment, depressive symptoms, and suicidal ideation at all relevant previous time points and controlled for age across all time points. The full path analysis model showed acceptable fit, $\chi^2(36) = 1344.40$, $p < .001$; CFI = .96; RMSEA = .09; WRMR = .67. Contrary to Model 1 and hypotheses, the relationship between Time 1 emotional maltreatment and Time 2 suicidal ideation was not significant, $\beta = 0.12$, SE = 0.07, $p = .11$, with Time 1 depressive symptoms included in the model. Consistent with hypotheses, Time 1 depressive symptoms was significantly associated with Time 2 Suicidal Ideation, $\beta = 0.34$, SE = 0.07, $p < 0.001$, even when controlling for the concurrent relationship between Time 2 suicidal ideation with Time 2 emotional maltreatment, $\beta = 0.31$, SE = 0.08, $p < .001$, and with Time 2 depressive symptoms, $\beta = 0.25$, SE = 0.06, $p < 0.001$, as well as the direct associations between Time 1 emotional maltreatment and Time 1 suicidal ideation, $\beta = 0.31$, SE = 0.05, $p < .001$, on Time 2 suicidal ideation. This model accounted for 36 % of the variance in Time 2 suicidal ideation, $R^2 = 0.36$, $p < .001$.

Consistent with Model 1 and our primary hypothesis, Time 2 emotional maltreatment continued to be significantly associated with Time 3 suicidal ideation, $\beta = 0.26$, SE = 0.11, $p = .02$, when examining the full model that included depressive symptoms at all time points. This relationship was significant even when controlling for emotional maltreatment,

Table 2 Correlations of emotional maltreatment, suicidal ideation, and depression symptoms

	1	2	3	4	5	6	7	8	9
1. T1 Emo Maltreatment	-								
2. T2 Emo Maltreatment	.34**	-							
3. T3 Emo Maltreatment	.34**	.49**	-						
4. T1 Suicidal Ideation	.28**	.14*	.12**	-					
5. T2 Suicidal Ideation	.26**	.23**	.25**	.47**	-				
6. T3 Suicidal Ideation	.23**	.33**	.29**	.24**	.46**	-			
7. T1 Depression	.36**	.29**	.21**	.31**	.39**	.26**	-		
8. T2 Depression	.22**	.46**	.39**	.20**	.35**	.28**	.51**	-	
9. T3 Depression	.28**	.39**	.52**	.21**	.30**	.29**	.40**	.56**	-

T1= Time 1, *T2* Time 2, *T3* Time 3, *Emo Maltreatment* Emotional Maltreatment

*$p < .01$, **$p < .001$

depressive symptoms, and suicidal ideation at all previous time points, which demonstrates a robust relationship between changes in Emotional Maltreatment predicting prospective suicidal ideation. Contrary to hypotheses, Time 2 depressive symptoms were not significantly associated with Time 3 suicidal ideation, $\beta = -0.09$, SE = 0.10, $p = .40$. Finally, Time 3 emotional maltreatment was not significantly associated with concurrent Time 3 suicidal ideation after accounting for Time 3 depression, $\beta = 0.15$, SE = 0.11, $p = .18$. Similar to Model 1, the full model accounted for 60 % of the variance in Time 3 suicidal ideation, $p < .001$.

The indirect path was examined to test whether Time 2 depressive symptoms partially mediated the relationship between Time 1 emotional maltreatment and Time 3 suicidal ideation. Contrary to hypotheses, the indirect path from emotional maltreatment to suicidal ideation via depressive symptoms was non-significant, $\beta = 0.001$, 95 % CI [−0.01, 0.02], as the 95 % confidence interval contained zero.

Sex Moderation To examine sex as a moderator of both Model 1 and Model 2, a multi-group analysis was conducted. This procedure assesses whether each path coefficient estimated differs between boys and girls. Thus a model in which all paths were free to vary by sex was compared to a model in which each of these paths was held equal for boys and girls within both Model 1 and Model 2. The unconstrained and fully constrained models did not differ significantly in Model 1, $\chi^2(18) = 27.76$, $p > .05$, suggesting that the relationship between emotional maltreatment and suicidal ideation did not differ between boys and girls. In our competing Model 2, the unconstrained and fully constrained models significantly differed, $\chi^2(2) = 13.22$, $p < .01$, suggesting that boys and girls differed in the strength or direction of relationships for at least one path. Examination of the parameter estimates for boys and girls revealed that the association between Time 1 emotional maltreatment and Time 3 depressive symptoms as well as the path between Time 2 emotional maltreatment and Time 3 depressive symptoms differed by sex. Allowing these two paths to vary by sex resulted in the greatest improvement in model fit, $\chi^2(2) = 13.22$, $p < .01$, and resulted in a model that did not differ from a model where all paths were free to vary, $\chi^2(33) = 47.52$, $p = .05$. Specifically, the association between Time 2 emotional maltreatment and Time 3 depression symptoms was stronger for girls, $\beta = 0.29$, SE = 0.05, $p < .001$, compared to boys, $\beta = 0.13$, SE = 0.06, $p = .05$. Although the paths between Time 1 emotional maltreatment and Time 3 depression varied significantly by sex, they were not statistically significant for either sex (p's > .05). Additionally, the specifically hypothesized indirect path of Time 2 depressive symptoms partially mediating the relationship between Time 1 emotional maltreatment and Time 3 suicidal ideation did not differ by sex ($p > .05$) and remained nonsignificant ($p > .05$).

Discussion

Despite knowing that there is a robust concurrent relationship between child maltreatment and youth suicidal ideation, research studies to date have not examined how these two phenomena relate over the course of time. Drawing on previous developmental psychopathology research and suicide theory, the main purpose of our study was to examine the effect of emotional maltreatment on risk for suicidal ideation in a large, community sample of children and adolescents followed for 3 years. We were especially interested in the prospective associations between multiple measurements of emotional maltreatment and subsequent risk for suicidal ideation at later time points over and above previous suicidal ideation and depression. This study also examined depressive symptoms as a mediator of the relationship between emotional maltreatment and suicidal ideation in a competing model given the strength of the relationship between child maltreatment and depression as well as depression and suicide. Finally, we explored the strength of the associations in our models in females compared to males. As hypothesized, emotional maltreatment at each measured time point was associated with increased risk for suicidal ideation at concurrent time points and at Time 3. Importantly, emotional maltreatment from Time 1 to Time 2 was associated with risk for suicidal ideation at Time 3 even after controlling for previous suicidal ideation and age. Moreover, the prospective relationship between emotional maltreatment and suicidal ideation was robust when modeled with depressive symptom severity as a predictor of suicidal ideation. Finally, the concurrent relationship between Time 3 emotional maltreatment and Time 3 suicidal ideation was initially significant, but reduced to non-significance after accounting for depression. Overall, our results are generally consistent with previous research which suggests that emotional maltreatment, as well as other forms of child maltreatment, increase risk for suicidal ideation in youth (King and Merchant 2008; Miller et al. 2014; Thompson et al. 2012). Additionally, this study extends previous research in at least three important ways.

First, whereas most previous research examines child maltreatment at one single time point, the current study assessed emotional maltreatment at three points across 36-months. Importantly, the longitudinal relationship of emotional maltreatment has not been previously examined in relation to suicidal ideation (Brezo et al. 2008; King and Merchant 2008). This unique approach allowed us to examine the longitudinal contribution of emotional maltreatment, which likely has deleterious consequences for developmental processes such as stress responses, interpersonal relationships, and sense of belonging. As is clear from the current study, emotional maltreatment contributes unique, prospective risk to suicidal ideation suggesting that repeated threat and verbal insults continue to have destructive effects for some youth. As posited

from a developmental psychopathology perspective of child maltreatment (Cicchetti and Valentino 2006), adversity affects multiple facets of development, including influencing biological systems that partly augment response to stress (Giletta et al. 2014). The timing of emotional maltreatment as these systems are developing may be especially important to understanding later risk. Although some studies have measured child maltreatment by asking adolescents to report on their whole childhood (including teenage years; (Mossige et al. 2014), few studies have prospectively examined child maltreatment as it relates to risk for suicidal ideation. By using a measure of recent emotional maltreatment within the past 18 months, the current study represents a significant improvement over studies where the individual is asked to remember maltreatment experiences over their entire lifetime. Our results suggest that emotional maltreatment is important for understanding concurrent and prospective risk for suicidal ideation even after accounting for prior suicidal ideation, prior emotional maltreatment, current and prior depressive symptoms, and age.

Findings from this study could be seen as supporting some of the current theories of suicide that were developed and tested in adult samples, especially the IPTS (Van Orden et al. 2010) and the more recent Three-Step Model of Suicide (3ST; Klonsky and May 2015). Across both theories, environments that include interpersonal threat, emotional and physical pain, and a sense of helplessness or hopelessness engender risk for suicide. However, the exact mechanisms wherein child maltreatment conveys risk for suicidal ideation are not fully understood. One promising area of future research may include integrating theory from the behavioral neuroscience literature. Theories proposed in this literature suggest that environments characterized by verbal or physical threat lead to a host of negative developmental outcomes (e.g., psychopathology) that is explained, at least in part, by changes in brain structure and function (McLaughlin et al. 2014). Studies integrating a multi-level approach of assessment (e.g., behavioral and neural) will be important to extend findings from the current study.

Second, this study extends previous studies by examining a competing model with depressive symptom severity included as a potential explanatory variable at each time point. We were especially interested in depressive symptom severity as a potential mediator of the relationship between emotional maltreatment at Time 1 and Time 3 risk for suicidal ideation, and whether or not our findings with emotional maltreatment held over and above depressive symptom severity. In the current study, depressive symptom severity did not mediate these relationships. The lack of mediation is inconsistent with the previous study by Miller et al. (2014). This difference may reflect the nature of the samples. The current sample was comprised of community youth whereas the LONGSCAN sample is overly represented by youth at risk for maltreatment. Further, the previous study by Miller et al. (2014) examined child physical and sexual abuse in addition to emotional maltreatment as opposed to isolating the specific effects of emotional maltreatment on suicidal ideation. Both Model 1 and Model 2 accounted for the same amount of variance in suicidal ideation at Time 3, which suggests that the majority of the variance in suicidal ideation is accounted for by previous suicidal ideation and emotional maltreatment. Although depressive symptom severity was related to risk for suicidal ideation over time as seen in previous research (Nock et al. 2013), our findings highlight emotional maltreatment as a robust, longitudinal predictor of suicidal ideation above and beyond the risk conveyed by depressive symptom severity.

Third, the present study examined risk for suicidal ideation across a wide range of development and followed these youths for 3 years. Emotional maltreatment likely has important effects at different stages of development, and the precise negative effect may differ depending on the developmental age (Dunn et al. 2013). However, we did not see evidence for a change in the associations in our models after covarying for age. Future work with multiple levels of analysis, including pubertal development and other biological markers of stress reactivity such as cortisol, would significantly improve our understanding of the relationship between child maltreatment and suicidal ideation.

Interestingly, our study did not find differences in the strength of the association between emotional maltreatment and risk for suicidal ideation by sex. However, partial evidence for sex differences in the association between child maltreatment and depressive symptoms emerged. Specifically, the strength of the association with Time 2 emotional maltreatment and Time 3 depressive symptoms severity was stronger for girls compared to boys. These results are in line with work which has suggested that girls have greater reactivity in the face of interpersonal stress (Hankin et al. 2007; Prinstein et al. 2001). However, Hamilton et al. (2013) did not find evidence for sex differences in the relationship between child maltreatment and depressive symptoms in a study with a smaller sample. Future studies will help elucidate whether this finding is replicable and reflects true developmental differences by sex.

Although this study has several strengths, including the three-year longitudinal design, the use of repeated, well-validated measures, the stringent analytic strategy, and large sample size, results should be interpreted within the context of study limitations. First, we only examined emotional maltreatment and not other types of abuse. However, co-occurrence of different forms of abuse is quite high (Arata et al. 2007; Dong et al. 2004). Unfortunately, we did not administer the other subscales from the CTQ, which includes sexual or physical abuse and neglect. An important area for future research is to carefully examine whether risk for suicidal ideation is better

predicted by specific forms of maltreatment. It would be especially interesting to examine temporal change with even more assessment points in multiple types of maltreatment to tease apart differential risk. Further, repeating this same study design with a more clinically enriched sample may lend stronger support for study hypotheses. Second, this study focused exclusively on suicidal ideation. It is unclear whether or not emotional maltreatment may confer risk for suicide attempts. Importantly the 3ST and IPTS both suggest that the desire for death alone is not enough for attempting suicide. Thus, it is possible that some other facet of adversity, such as physical threat or insult may lead to acquired capability and subsequent suicide attempts (Van Orden et al. 2010). Unfortunately, due to the very small number of individuals in the current study who endorsed suicide attempts and the lack of information about other forms of maltreatment, we were unable to examine these hypotheses. Third, although the current study employed a longitudinal design, the maltreatment measure was retrospective, and self-report. Future research is warranted using multi-method approaches, including multi-informant reports of maltreatment as well as potential biological markers of distress following emotional maltreatment experiences. Although a certain amount of attrition was anticipated in a three-year longitudinal study, it is also possible that missing data affected our results. However, participants with complete suicidal ideation data did not differ on key demographic characteristics compared to those without complete suicidal ideation data. Additionally, we used a widely recommended statistical approach for dealing with missing data. Finally, we restricted our model to only those with complete suicidal ideation data at Time 3, and our models were identical. Lastly, these results should also be interpreted in the context of a vast literature which suggests that the majority of youth are resilient to child adversity (Masten et al. 1990). It is imperative for future research to investigate why some children and adolescents continue to be affected by emotional maltreatment, while others remain buffered from suicidal ideation.

Despite these limitations, this study is among the first to used repeated measures of emotional maltreatment to predict risk for suicidal ideation in a multi-wave, prospective study of community youth. Clinically, our results suggest that in addition to addressing depression symptom severity in the context of treatment for suicidal ideation, periodic and ongoing assessment of emotional maltreatment across a wide range of ages is warranted. Taken together, findings suggest that emotional maltreatment contributes unique, prospective risk for suicidal ideation over a three-year period above and beyond previous suicidal ideation, depression, age, and biological sex.

Compliance with Ethical Standards

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Conflict of Interest Authors Miller, Jenness, Oppenheimer, Gottleid, Young, and Hankin declare that they have no conflicts of interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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