



Cognitive vulnerabilities and development of suicidal thinking in children of depressed mothers: A longitudinal investigation

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ABSTRACT

Although children of depressed parents are at heightened risk for suicidal ideation, little is known about specific risk factors. This study focused on the relation between a broad range of cognitive vulnerabilities proposed by the leading cognitive theories and the development of suicidal ideation in children. Participants were 209 mothers (aged 24–55) and their 8–14 year old children. Children of depressed mothers who had previously experienced suicidal ideation themselves reported higher levels of brooding rumination than children of depressed mothers who had not experienced suicidal ideation as well as children of never depressed mothers who had not experienced suicidal ideation. Further, among children of depressed mothers with no prior history of suicidal ideation, higher levels of hopelessness and lower global self-worth predicted first onset of suicidal ideation over a 2-year follow-up. Importantly, these results were maintained even after taking the occurrence of major depressive disorder in children during the follow-up into account. The findings highlight specific cognitive vulnerabilities that could be targeted in early suicide prevention and intervention efforts.

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1. Introduction

Suicide is the third leading cause of death for 10–14 year olds ([Centers for Disease Control and Prevention \[CDC\], 2012](#)) and thus constitutes a serious problem in childhood and adolescence. Indeed, between 11.6% and 24.5% of 6th through 8th grade students report having seriously thought about killing themselves at some point in their lives ([CDC, 2013](#)). Given that rates of self-harming thoughts and behaviors increase dramatically during the transition from childhood to adolescence (e.g., [Kessler et al., 2005](#)), understanding the factors that make children more likely to start considering suicide might aid in early suicide risk detection and prevention.

Although maternal history of depression is one of the strongest risk factors for internalizing disorders in youth ([Goodman et al., 2011](#)), few studies have examined the ways in which maternal depression may increase risk for suicidal ideation (SI) in their children. For example, there is evidence showing that children of depressed, compared to never depressed, mothers are more likely to report SI by adolescence (e.g., [Klimes-Dougan et al., 1999](#)), a link that is at least partially independent of offspring psychopathology ([Hammerton et al., 2015](#)). However, the factors that account for the

emergence of SI in these children remain unclear. In addition, despite the fact that not all children of depressed mothers experience suicidal thinking, little is known about specific factors that may differentiate those who experience suicidal thoughts from those who do not.

One potential mechanism of risk is the development of cognitive vulnerabilities that put children at risk for future suicidality. To date, the majority of research in this area has focused on cognitive vulnerability to depression and there is evidence that children of depressed mothers exhibit higher levels of different forms of these cognitive vulnerabilities than do children of never depressed mothers (for a review, see [Gotlib and Colich, 2014](#)). However, much less is known about how these cognitive styles may be associated with suicidality, particularly in children. This said, there is growing evidence from studies of adults suggesting that the various cognitive vulnerabilities featured in some of the leading cognitive theories of depression, including hopelessness theory ([Abramson et al., 1998](#)) and response styles theory ([Nolen-Hoeksema, 1991](#)), may also increase risk for suicidal ideation and attempts.

According to the hopelessness theory of suicide ([Abramson et al., 1998](#)), a negative inferential style, defined as the tendency to attribute the causes of negative events to stable and global causes and to infer negative consequences and negative self-implications from the occurrence of these events, may increase risk for suicidal thoughts and behaviors. According to the response styles theory ([Nolen-Hoeksema, 1991](#)), the tendency to ruminate in response to

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a negative mood increases risk for depression. More recent research has identified two subtypes of rumination – brooding and reflection – with evidence that brooding rumination is more strongly related to depression and suicide-relevant outcomes (e.g., Nolen-Hoeksema et al., 2008). Importantly, the vulnerabilities featured in these theories have been shown to predict prospective increases in SI in adults (e.g., Abramson et al., 1998; Beevers, and Miller, 2004; Miranda and Nolen-Hoeksema, 2007; Ranieri et al., 1987; Smith et al., 2006). We should also note that hopelessness, which is prominently featured in the hopelessness theory, is a well-known risk factor for suicidal ideation, attempts, and deaths in adults (e.g., Beck et al., 1993).

Although significantly fewer studies have tested these cognitive theories in youth, there is some evidence that the findings from studies with adults generalize to children and adolescents. For example, one cross-sectional study of a large community sample of adolescents found that adolescents reporting SI, compared to those without SI, exhibited higher levels of hopelessness and a more negative attributional style (Labelle et al., 2013). Relatedly, hopelessness predicted suicide-related behaviors (i.e., suicide attempt or self-harm) in a sample of depressed children and adolescents, an effect that was at least partially independent of children's current depressive symptoms (Herrick et al., 2012). Finally, a recent prospective study found that adolescents' negative inferential styles and rumination predicted the occurrence of SI during a two-year follow-up (Burke et al., 2015).

In contrast to each of the cognitive theories described above, which were initially developed to explain depression risk in adults and then extended to examine risk in children, Cole (1991) competency-based model was developed specifically for children and focuses on children's self-perceived competence in various domains as well as more global levels of perceived self worth. Supporting this model, a number of cross-sectional and longitudinal studies have documented the relations between self-perceived competence in various domains and children's depressive symptoms (e.g., Cole et al., 1996; Dallaire et al., 2008; Uhrlau et al., 2008). There is also preliminary evidence for the link between perceived social competence and SI in youth (King et al., 2001). Further, a recent study found that self-esteem was a unique predictor of SI in children with bipolar disorder (Weinstein et al., 2015). However, it is unclear whether children's self-perceived competence in social or academic domains, or their more global levels of perceived self-worth, prospectively predicts first onsets of SI.

In summary, although there is strong support for the hypothesis that the vulnerabilities featured in leading cognitive theories of depression increase risk for depression and suicide-related outcomes in adults, and depression in children, less is known about the relation between these cognitive vulnerabilities and SI in children, and no study of which we are aware has tested the predictive validity of these vulnerabilities in children known to be at risk for depression and suicide due to a positive family history of major depressive disorder (MDD). The goal of the current study was to address this gap in the literature in two ways. First, focusing on cross-sectional analyses, we examined whether children of depressed mothers who reported a history of suicidal thinking at the baseline assessment (Mom MDD/Child SI group) would exhibit higher levels of each of the cognitive vulnerabilities compared to children of depressed mothers without a history of suicidal thinking at baseline (Mom MDD/No Child SI) and children of nondepressed mothers without a history of suicidal thinking at baseline (Controls). Second, using survival analyses, we examined whether any of the specific cognitive vulnerabilities would predict time to first onsets of SI in children of depressed mothers with no prior SI history.

This is the first study to examine the cognitions that

differentiate children of depressed mothers with and without SI as well as the first to test cognitive models regarding first onsets of SI in children. Importantly, we focus on a broad range of cognitive vulnerabilities proposed by the leading cognitive theories, which allows for a more comprehensive and fine-grained examination of these vulnerabilities. In addition, we sought to determine whether any significant findings would be maintained after statistically controlling for children's levels of depressive symptoms at the baseline assessment and for the onset of MDD during the follow-up to ensure that the effect of children's cognitions was at least partially independent of current mood and the occurrence of MDD. Finally, given a strong evidence for the familial transmission of suicidal behavior (for a review, see Brent and Melhem, 2008), we also sought to examine whether the significant findings would be maintained after statistically controlling for the maternal suicide attempt history.

2. Method

2.1. Participants

Participants were 209 mother-child pairs recruited from the community through a variety of means. To qualify for the study, mothers were required to either meet criteria for MDD during the child's lifetime ($n=115$), according to the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV)*; American Psychiatric Association, 2000), or have no lifetime diagnosis of any DSM-IV mood disorder and no current Axis I diagnosis ($n=94$). For the purposes of the current study, participants comprised three groups based on maternal history of depression and children's history of suicidal ideation: Mom MDD/Child SI ($n=37$); Mom MDD/No Child SI ($n=78$); Controls without maternal MDD and child SI ($n=94$). At baseline, the average age of the mothers was 40.47 years ($SD=6.87$, Range=24–55; 87.6% Caucasian) and the average age of the children was 10.90 years ($SD=1.93$, Range=8–14; 52.2% girls; 81.3% Caucasian). The median annual family income was \$50,001 to 55,000.

2.2. Measures

The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1995) and the Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997) were used to assess for current and past DSM-IV Axis I disorders in mothers and their children, respectively. The SCID-I and K-SADS-L were administered at the baseline assessment and the K-SADS-L was administered again at each follow-up assessment, which was completed every 6 months for 2 years. As part of the K-SADS-PL interviews at each assessment, interviewers assessed for the presence of SI in children by asking the questions "Sometimes children who get upset or feel bad, wish they were dead or feel they'd be better off dead. Have you ever had these types of thoughts?" and "Sometimes children who get upset or feel bad think about dying or even killing themselves. Do you have these thoughts?" The initial assessment focused on children's lifetime history of SI and each follow-up assessment focused on any thoughts that had occurred since the previous interview. At baseline, 34 children answered "yes" to the first SI assessment question, 14 children answered "yes" to the second SI assessment question, and 11 children endorsed both of these items. A total of 27 children reported first onsets of SI during the study follow-up. All of these children answered "yes" to the first SI assessment question and 11 also answered "yes" to the second question.

Cognitive vulnerabilities were examined through the use of a

number of well-established self-report questionnaires. Children's inferential styles were assessed via the Children's Attributional Style Questionnaire (CASQ; Seligman et al., 1984) and the Children's Cognitive Style Questionnaire (CCSQ; Abela, 2001). The internal consistency for the CASQ was 0.46, which is similar to that obtained in previous research (e.g., Abela, 2001; Abela and Payne, 2003; Cunningham, 2003). The internal consistencies for the CCSQ-Consequences (tendency to infer negative consequences following negative events) and CCSQ-Self (tendency to infer negative self-characteristics following the occurrence of negative events) were 0.76 and 0.75, respectively. Children's levels of negative expectancies for the future were assessed using the Hopelessness Scale for Children (HSC; Kazdin et al., 1986). The internal consistency of HSC was 0.45. Levels of rumination were assessed using the Children's Response Style Scale (CRSS; Ziegert and Kistner, 2002). The consistencies for the brooding and reflection subscales were 0.69 and 0.68, respectively. The Self-Perception Profile for Children (SPPC; Harter, 1985) was used to assess children's levels of self-perceived competence. The present study focused on the global self-worth (SPPC-GSW), social acceptance (SPPC-SA), and scholastic competence (SPPC-SC) domains. The internal consistencies for these domains were 0.79, 0.77, and 0.79, respectively.

Children's symptoms of depression were assessed using the Children's Depression Inventory (CDI; Kovacs, 1981). The internal consistency for the CDI was 0.84. In order to avoid potential confounding due to the fact that SI is one of CDI symptoms, CDI total scores for all of the analyses were calculated excluding the item that assesses SI.

Maternal suicide attempt (SA) history was assessed via the Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001). Specifically, the participants who chose the response option "I attempted to kill myself, and really hoped to die" when answering the first question of this questionnaire (i.e., "Have you ever thought about or attempted to kill yourself in your lifetime?") were coded as having made a previous SA. A total of 22 mothers (10.5%) endorsed a history of SA.

3. Results

Descriptive statistics for the study variables are presented in Table 1 and correlations among the variables are presented in Table 2. Focusing first on baseline differences between the three groups of children on the cognitive vulnerabilities and depressive symptoms, we conducted a series of one-way ANOVAs with significant results followed by Bonferroni post hoc tests. We found significant group differences in CASQ-Generality, CRSS-Brooding, HSC, SPPC-GSW, SPPC-SC, SPPC-SA, and CDI (see Table 1 for more details). To examine the robustness of the differences in children's cognitive vulnerabilities, we repeated the analyses, statistically controlling for the potential influence of children's baseline depressive symptoms. We found that children in the Mom MDD/Child SI group still exhibited significantly higher levels of CRSS-Brooding than children in the other two groups combined, $F(1, 203)=7.07, p=0.01$. In addition, children in the two mother MDD groups still reported significantly higher scores on CASQ-Generality, $F(1, 204)=4.28, p=0.04$, and HSC, $F(1, 200)=4.07, p=0.045$, and significantly lower levels of SPPC-GSW, $F(1, 195)=4.52, p=0.03$, and SPPC-SA, $F(1, 195)=4.87, p=0.03$, than children in the control group. In contrast, statistically controlling for the influence of children's depressive symptom levels, the previously significant difference between children in the mom MDD and child SI group and those in the control group on SPPC-SC was reduced to nonsignificant, $F(1, 121)=0.67, p=0.41$. Finally, even when we statistically controlled for maternal SA

Table 1
Descriptive statistics for each of the three groups.

| Measure | Mom MDD/ Child SI (n=37) | Mom MDD/No Child SI (n=78) | Controls (n=94) | F/ χ^2 |
|------------------------------------------|--------------------------------|----------------------------------|---------------------------|-------------|
| Demographics | | | | |
| Age at baseline | 10.68 (1.93) | 11.05 (2.01) | 10.87 (1.87) | 0.50 |
| Sex (% female) | 43.2% | 50.0% | 57.4% | 2.38 |
| Race (% Caucasian) | 73.0% ^a | 73.1% ^a | 91.5% ^b | 11.60** |
| Household Income (median) | \$35–40,000 ^a | \$40–45,000 ^a | \$70–75,000 ^b | 11.33*** |
| Maternal Education (% graduated college) | 30.6% | 39.5% | – | 5.79 |
| Cognitions | | | | |
| CASQ-Generality | 4.75 (2.11) ^a | 4.37 (2.39) ^a | 3.40 (1.70) ^b | 7.12** |
| CCSQ-Consequences | 12.69 (4.37) | 12.34 (5.11) | 11.00 (4.79) | 2.20 |
| CCSQ-Self Characteristics | 8.66 (4.01) | 8.56 (4.08) | 8.89 (4.20) | 0.13 |
| CRSS-Brooding | 31.61 (8.83) ^a | 27.04 (9.68) ^b | 26.16 (9.87) ^b | 3.85* |
| CRSS-Reflection | 28.78 (9.46) | 26.24 (11.10) | 24.83 (10.51) | 1.67 |
| HSC | 3.97 (2.62) ^a | 3.51 (1.60) ^a | 2.83 (1.54) ^b | 5.79** |
| SPPC-Global Self-Worth | 2.99 (0.76) ^a | 3.20 (0.65) ^a | 3.53 (0.53) ^b | 11.31*** |
| SPPC-Scholastic Competence | 2.82 (0.81) ^a | 3.07 (0.70) ^{ab} | 3.23 (0.58) ^b | 4.65* |
| SPPC-Social Acceptance | 2.66 (0.90) ^a | 2.95 (0.69) ^a | 3.24 (0.60) ^b | 9.26** |
| Symptoms | | | | |
| CDI | 8.73 (6.11) ^a | 6.04 (5.24) ^b | 3.68 (3.96) ^c | 14.82** |

Note. MDD=Major depressive disorder. SI=Suicidal ideation. CASQ=Children's Attributional Style Questionnaire. CCSQ=Children's Cognitive Style Questionnaire. CRSS=Children's Response Styles Scale. HSC=Hopelessness Scale for Children. SPPC=Self-perception Profile for Children. CDI=Children's Depression Inventory. Means of percentages with different superscripts (i.e., a, b, c) differ significantly.

* $p < 0.05$.

** $p < 0.01$.

history, the findings for CRSS-Brooding were maintained, $F(2, 204)=12.81, p < 0.01$. Table 3.

Next, we examined the prospective impact of children's cognitions on time to first onsets of SI during the follow-up using a series of Cox proportional hazard regression analyses. In these analyses, we focused specifically on children of depressed mothers with no prior SI history ($n=78$) because our goal was to predict first onset of SI among these children. We found that HSC, $Wald=5.69, p=0.01, OR=1.48$, and SPPC-GSW, $Wald=5.28, p=0.01, OR=0.45$, predicted first onsets of SI over the course of the 2-year follow-up. To visually depict these findings, we repeated the analysis using upper and lower quartiles for each of the cognitive variables. The results of the analysis for HSC are presented in Fig. 1 and the results for SPPC-GSW are presented in Fig. 2. Statistically controlling for the influence of baseline depressive symptoms, the effects of HSC were maintained, $Wald=3.69, p=0.04, OR=1.38$, though the effect of SPPC-GSW was reduced to a nonsignificant trend, $Wald=3.11, p=0.06, OR=0.49$. In addition, because a number of children in our prospective analyses also developed episodes of MDD during the follow-up ($n=12$), we wanted to determine whether the impact of children's cognitions on their risk for SI would be maintained even after taking the occurrence of MDD into account. We found that the effects of both HSC, $Wald=5.13, p=0.02, OR=1.47$, and SPPC-GSW, $Wald=4.82, p=0.02, OR=0.47$, were maintained. Therefore, the predictive validity of the HSC for the first onset of SI in children was at least partially independent of current depressive symptoms and risk for MDD. Similar results were obtained for SPPC-GSW, though the effect was reduced to a nonsignificant trend ($p=0.06$) when statistically controlling for level of depressive symptoms at the baseline assessment. Finally, the effects of both HSC,

Table 2
Correlations among the study variables.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-------------------------------|---------|--------|--------|---------|---------|---------|---------|---------|---------|--------|----|
| 1. CASQ-Generality | – | | | | | | | | | | |
| 2. CCSQ-Consequences | 0.12 | – | | | | | | | | | |
| 3. CCSQ-Self Characteristics | 0.04 | 0.43** | – | | | | | | | | |
| 4. CRSS-Brooding | 0.07 | 0.25** | 0.15* | – | | | | | | | |
| 5. CRSS-Reflection | –0.01 | 0.17* | 0.21** | 0.58** | – | | | | | | |
| 6. HSC | 0.21** | 0.11 | 0.03 | 0.04 | 0.05 | – | | | | | |
| 7. SPPC-Global Self-Worth | –0.26** | –0.18* | –0.13 | –0.23** | –0.23** | –0.29** | – | | | | |
| 8. SPPC-Scholastic Competence | –0.14* | –0.15* | –0.10 | –0.13 | –0.10 | 0.30** | 0.59** | – | | | |
| 9. SPPC-Social Acceptance | –0.21** | –0.18* | –0.12 | –0.13 | –0.08 | –0.21** | 0.46** | 0.36** | – | | |
| 10. CDI | 0.29** | 0.15* | 0.13 | 0.23** | 0.22** | 0.31** | –0.64** | –0.42** | 0.46** | – | |
| 11. SI at baseline | 0.14 | 0.08 | 0.01 | 0.24** | 0.16* | 0.16* | –0.24** | –0.20** | –0.23** | 0.29** | – |

Note. CASQ=Children's Attributional Style Questionnaire. CCSQ=Children's Cognitive Style Questionnaire. CRSS=Children's Response Styles Scale. HSC=Hopelessness Scale for Children. SPPC=Self-perception Profile for Children. CDI=Children's Depression Inventory. SI=Suicidal ideation.

* $p < 0.05$.

** $p < 0.01$.

Table 3

Survival analyses predicting risk for first onset of suicidal ideation in children of depressed mothers with no prior history of suicidal ideation.

| Measure | Wald | Odds ratio | 95% CI | p value |
|-------------------------------|-------------|-------------|-----------------------|-------------|
| Cognitions | | | | |
| CASQ-Generality | 0.13 | 1.04 | –0.261, 0.236 | 0.79 |
| CCSQ-Consequences | 0.001 | 1.00 | –0.098, 0.094 | 0.97 |
| CCSQ-Self Characteristics | 0.11 | 1.02 | –0.103, 0.147 | 0.76 |
| CRSS Brooding | 0.16 | 0.99 | –0.056, 0.041 | 0.67 |
| CRSS Reflection | 0.13 | 1.01 | –0.036, 0.056 | 0.74 |
| HSC | 5.69 | 1.48 | 0.034, 0.695 | 0.01 |
| SPPC-Global Self-Worth | 5.28 | 0.45 | –1.531, –0.053 | 0.01 |
| SPPC-Scholastic Competence | 1.32 | 0.67 | –1.157, 0.577 | 0.28 |
| SPPC-Social Acceptance | 1.69 | 0.61 | –1.268, 0.254 | 0.17 |
| Symptoms | | | | |
| CDI | 2.49 | 1.07 | –0.035, 0.155 | 0.11 |

Note. CASQ=Children's Attributional Style Questionnaire. CRSS=Children's Response Styles Scale. HSC=Hopelessness Scale for Children. SPPC=Self-perception Profile for Children. CDI=Children's Depression Inventory.

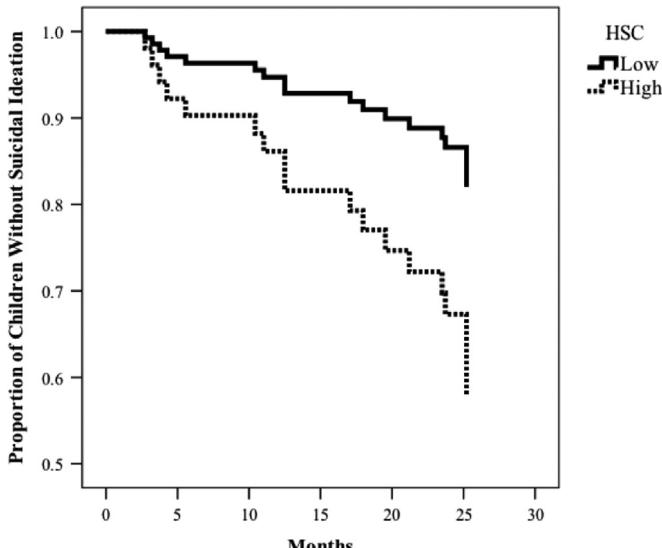
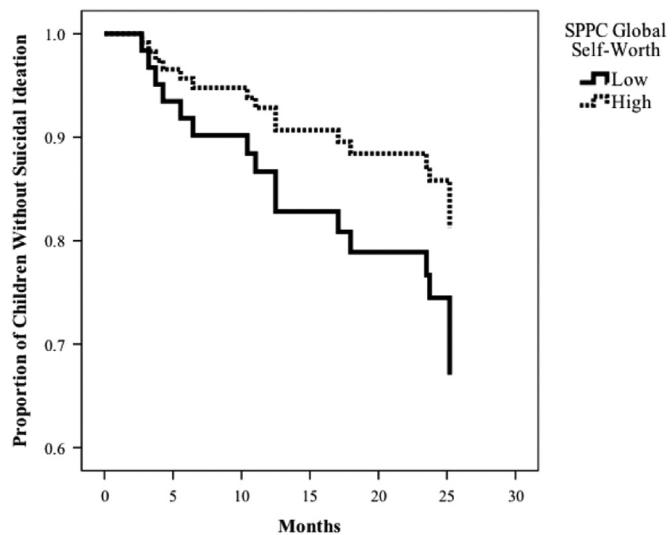


Fig. 1. Results of survival analyses predicting time to new onsets of suicidal ideation in children of depressed mothers as a function of HSC.

$Wald=5.96$, $p=0.01$, $OR=1.53$, and SPPC-GSW, $Wald=4.69$, $p=0.03$, $OR=0.47$, were maintained when we statistically controlled for the influence of mothers' histories of SA.

In addition, although not a primary focus of our study, we



should note that 10 children of non-depressed mothers developed SI during the follow up. Limiting our sample to control children (i.e., child of mothers with no history of depression), we found that HSC, $Wald=4.96$, $p=0.01$, $OR=1.40$, SPPC-GSW, $Wald=6.59$, $p=0.002$, $OR=0.30$, and SPPC-SA, $Wald=2.21$, $p=0.04$, $OR=0.51$ predicted first onsets of SI over the course of the 2-year follow-up, largely mirroring the effects seen in our high risk children. The findings for HSC and SPPC-SA were also maintained even after statistically controlling for the occurrence of MDD during the follow up in these children. However, given the small number of control children who developed SI during the follow-up, these results should be interpreted with caution.

4. Discussion

The first goal of the present study was to determine whether children of depressed mothers with a history SI at the baseline assessment endorsed higher levels of the cognitive vulnerabilities featured in leading cognitive theories of depression, compared to children of depressed mothers without a history of SI at baseline and to children of nondepressed mothers without a history of SI at baseline. We found that children of depressed mothers who had previously experienced SI themselves reported significantly higher levels of brooding rumination than children in either of the other

two groups. In addition, children of depressed mothers, with or without a personal history of SI reported significantly more negative inferential styles for the causes of negative events and hopelessness, and significantly lower levels of global self-worth and self-perceived scholastic competence and social acceptance compared to children of never depressed mothers. The second goal of the study was to examine whether any of the cognitive vulnerabilities examined would predict time to *first onset* of SI in children of depressed mothers with no prior history of SI. We found that higher levels of hopelessness and lower levels of global self-worth significantly predicted a shorter time to first onset of SI in these children. Importantly, these findings appeared to be independent of maternal SA history and at least partially independent of the influence of children's baseline levels of depression and the occurrence of MDD during the follow-up.

It is notable that only brooding rumination differentiated children of depressed mothers with and without a personal history of SI at the baseline assessment. This finding along with the fact that brooding did not predict first onsets of SI in our survival analyses suggest that brooding may reflect a correlate or consequence of SI in children rather than a prospective risk factor. Future research is needed to more definitely determine the temporal relation between brooding and SI in children. In contrast, hopelessness and global self-worth differentiated children of depressed mothers with and without SI from controls at the baseline assessment and predicted first onsets of suicidal ideation over the follow up. This is exactly what one would want to see in a true risk factor. That is, one would want to observe similar levels of the risk factor in children with and without prior SI and then demonstrate that this risk factor predicts first onset of SI among children with no prior history. These two cognitive vulnerabilities, therefore, may have promise in identifying which children of depressed mothers are at greatest risk for developing SI in the future. Interestingly, we also found that the same cognitive vulnerabilities predicted the first onsets of SI over the course of the 2-year follow-up in children of mothers with no history of depression (i.e., control children). Although caution should be used in interpreting these results due to the small number of these children, the findings suggest that these cognitive vulnerabilities might be important to consider in all young people. Finally, with the exception of SPPC-Social Acceptance in the control children, other cognitive vulnerabilities including negative inferential styles for the causes of negative events, self-perceived scholastic competence and self-perceived social acceptance appear to be nonspecific vulnerabilities associated with maternal history of depression, without any specificity to children's past or future SI.

Despite strong evidence for the predictive validity of hopelessness in this study, we should note that HSC demonstrated low internal consistency in our sample. There are several potential explanations for this. First, HSC has been shown to exhibit lower internal consistency when utilized with nonclinical samples, compared to clinical samples (e.g., Prinstein et al., 2008; Spirito et al., 1988). Second, a comparison of the studies that utilized HSC in child versus adolescent samples reveals a generally lower internal consistency of the scale in children (e.g., Weinstein et al., 2015), compared to adolescents (e.g., Prinstein et al., 2008). Finally, a surprisingly large number of studies that have utilized HSC have not reported the internal consistency of the measure in their sample (e.g., Aglan et al., 2008; Hetrick et al., 2012; Yilmaz and Turkum, 2008). It will be important for future research, therefore, to (i) report the internal consistency of the scale in their sample, which will allow a better understanding of the types of samples and conditions that lead to higher versus lower internal consistency of the scale and (ii) consider the development of alternate measures of hopelessness in children that would have stronger internal consistency. Finally, we should note that hopelessness is a

fairly abstract construct and it may simply be that it is not well enough developed in children to exhibit strong internal consistency despite the fact that it displays strong predictive validity.

The present study had a number of strengths, including the multi-wave prospective design, the focus on a high-risk sample, and the use of structured interviews with multiple informants (i.e., parent and child reports) to assess the presence of SI in children. Importantly, the current study is the first to our knowledge to comprehensively examine the cognitions that differentiate children of depressed mothers with and without SI as well as to test some of the leading cognitive models with regard to first onsets of SI in these children. This said, the study also exhibited some limitations that might provide directions for future studies. First, only the presence or absence of SI in children was assessed. Future research should examine how specific cognitive vulnerabilities relate to characteristics of SI, including its content, frequency, duration, severity, and controllability. Second, the cross-sectional analyses focused on children's lifetime history of SI whereas the assessment of cognitive vulnerabilities focused on the current levels of each variable. Therefore, it is possible that stronger relations would have been observed for other cognitive vulnerabilities if we had been able to focus on concurrent levels of SI (e.g., specifically recruiting children with and without current SI). Third, due to the demographics of the recruitment area, our sample was racially/ethnically homogenous, which might limit the generalizability of our findings to other populations and geographic areas. Fourth, due to the low internal consistency of HSC in our sample, additional studies are needed in order to replicate our findings with regard. We should also note that the reliability of the CASQ was also low, which, although consistent with other research (e.g., Abela, 2001; Abela and Payne, 2003; Cunningham, 2003), may have reduced our power to detect significant effects with this measure. Fourth, we specifically chose to focus on cognitive vulnerabilities featured in each of the leading cognitive theories, which increased the overall number of analyses and could have increased our risk of Type 1 error. Future studies, therefore, are necessary to replicate the current findings before any firm conclusions can be drawn. Finally, the relatively small sample size available for the prospective analyses limited the statistical power of our exploratory moderation analyses; future studies, therefore, are needed to determine whether the predictive validity of the cognitive vulnerabilities may differ based on child age and/or sex.

In summary, the present study makes several important contributions to the literature. Specifically, whereas extant research on cognitive vulnerabilities has focused primarily on risk for depression and suicidality in adults and depression in children, the current study focused on a broad range of cognitive vulnerabilities proposed by a number of leading cognitive theories of depression and their relation to both the lifetime history and the emergence of SI in children. Our findings extend the literature by suggesting that children of depressed mothers who have thought about suicide exhibit higher levels of brooding rumination than children of depressed or nondepressed mothers who have never thought about suicide. Importantly, hopelessness and global self-worth might constitute specific forms of cognitive vulnerability that prospectively predict first onset of SI in children at-risk by virtue of maternal depression history. These findings might have important implications for early suicide prevention in these children, suggesting that targeting their levels of brooding, hopelessness, and perception of self-worth might attenuate children's risk for suicidality. More specifically, although originally developed for adults, children at risk for SI might also benefit from the interventions that target self-esteem, such as Child- and Family-Focused Cognitive Behavioral Therapy (West et al., 2014) and brooding rumination, such as Rumination-Focused Cognitive Behavioral Therapy (Watkins et al., 2011) and Mindfulness-Based

Cognitive Therapy (Segal et al., 2012). Importantly, treatments that target maternal depression might also improve the functioning of their children across multiple domains, including perceived academic and behavioral competence and depressive symptoms (e.g., Garber et al., 2011), which might decrease the levels of brooding, hopelessness, and perception of self-worth in these children.

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