



Hopelessness Appraisals of Stressors and Suicidal Ideation: The Moderating Role of Girls' Expressed Vulnerability to a Close Friend Following Stressor Exposure

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Abstract

Rates of suicidal ideation and exposure to stressors both increase dramatically for girls during adolescence. As stress increases, girls' friendships become important outlets for coping with stress. The current study used a multimethod approach to examine the combined influence of stressor-related cognitions (i.e., hopelessness appraisals of personal stressors) and observationally coded behaviors during girls' interactions with a close friend as predictors of short-term risk for suicidal ideation. The sample comprised 231 youth assigned female at birth ($M_{\text{age}}=14.70$, $SD=1.36$), who completed a lab visit with a close friend. Participants underwent an in vivo stressor paradigm and then engaged in a discussion with their friend, which was coded for expressed vulnerability (i.e., negative, self-directed thoughts or emotions) and close friend support. Girls who endorsed more hopeless appraisals of current life stressors at baseline were more likely to report suicidal ideation three months later if they displayed higher levels of expressed vulnerability when discussing an acute stressor with their friend. Friend support did not moderate the association between hopeless stressor appraisals and future suicidal ideation. Findings suggest that how girls *think* about stressors may combine with how they *talk* about stressors with close friends to influence suicidal ideation risk.

Keywords Adolescence · Suicide · Hopelessness · Stress · Friend · Interpersonal

Rates of suicidal ideation increase dramatically in the transition to adolescence, which has been linked to increases in stressor exposure during this period (Liu & Miller, 2014; Miller et al., 2017; Miller & Prinstein, 2019).

Suicidal ideation is particularly prevalent among girls: by early adolescence, girls are almost twice as likely as boys to seriously consider suicide (CDC, 2023). Compared to boys, there is evidence that girls report higher levels of stress (Petersen et al., 1991; Rudolph & Hammen, 1999) and may be more likely to perceive and value peer friendships as providing psychological support and intimacy that can buffer against stress (Rudolph & Dodson, 2022). In contexts of elevated stress, examining differences in how girls talk about stressors to close friends may help to identify those girls at greatest risk for developing suicidal ideation during this period. The current study examined the combined influence of girls' appraisals of personal life stressors and observationally coded friendship behaviors following an in vivo social stressor as predictors of girls' short-term risk for suicidal ideation.

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Life Stressors, Hopeless Appraisals, and Suicidal Ideation

Adolescence is characterized by changes across multiple domains as youth navigate an increasingly complex peer environment, seek greater autonomy from parents, and face growing demands in settings like school (Brown, 2009; Steinberg & Morris, 2001). Although developmentally normative, such changes present situations that adolescents may experience as stressful, particularly as concerns about one's identity (Meeus et al., 1999; van Doeselaar et al., 2018) and future (Nurmi et al., 1994) become more salient. Indeed, youth become more likely to perceive everyday situations as stressful during the transition to adolescence (Seiffge-Krenke et al., 2009).

Certain perceptions of stressors may contribute to maladaptive thinking patterns that influence risk for suicidal thoughts. Beliefs that stressors are hard or impossible to solve, or that their intrapersonal impacts (e.g., on emotions) are overwhelming or enduring, may potentiate feelings of defeat, entrapment, or hopelessness—all of which are associated with suicidal ideation (Beck et al., 1975; Ribeiro et al., 2018; Taylor et al., 2011) and are central constructs in suicide theories (Abramson et al., 2014; Beck et al., 1975; O'Connor & Kirtley, 2018). Appraisals of stressors as difficult to solve or feel better about also capture hopelessness in the form of feelings of low self-efficacy to respond effectively to problems, and thus may be pertinent to understanding suicidal ideation risk (Beck et al., 1975). Cognitive and behavioral theories conceptualize suicidal thoughts and behaviors as resulting from problem-solving deficits (Linehan, 1993; Pollock & Williams, 1998; Wenzel & Beck, 2008), and suicidal thinking may function to provide relief or escape in the absence of perceived alternative options (Coppersmith et al., 2023; Nock et al., 2025).

Hopeless appraisals of stressors may be particularly relevant to girls' suicidal ideation risk. Compared to adolescent boys, girls' emotional functioning is more closely tied to stressors, especially interpersonal stressors (Hamilton et al., 2015; Nolen-Hoeksema & Girgus, 1994; Rudolph, 2002), and hopelessness may be more strongly related to suicidal ideation for girls than boys (Cole, 1989). Girls also may be more likely than boys to attribute negative events to fixed, versus malleable, traits (i.e., to ability rather than effort; (Bar-Tal & Frieze, 1976; Dweck & Reppucci, 1973), which may contribute to appraisals of stressors as uncontrollable in ways that potentiate suicidal ideation risk.

Yet in contrast to research implicating stressor appraisals in risk for other internalizing outcomes like depression, particularly for girls (Conway et al., 2016; Davis et al., 2025; Espejo et al., 2012; Nolen-Hoeksema & Girgus,

1994), fewer longitudinal studies have examined stressor appraisals—including hopelessness about specific stressors in one's actual life, hereafter referred to as *hopelessness appraisals*—as predictors of suicidal ideation (Burke et al., 2016). Prior cross-sectional work, across genders and largely in adults, has linked other constructs related to stressor appraisals—such as negative problem orientation (i.e., negative appraisals of problems or one's ability to solve them) and entrapment (i.e., appraising situations as inescapable)—to suicidal ideation (Heapy et al., 2024; Taylor et al., 2011). It remains to be tested how adolescents' hopelessness appraisals of personally relevant stressors relate to suicidal ideation longitudinally, particularly among girls and in interaction with interpersonal dynamics within close friendships.

Stressor Responses within Close Friendships

As stressors increase in adolescence, many girls report high levels of emotional distress about stressors (Petersen et al., 1991; Rudolph & Hammen, 1999), but not all girls respond by thinking about suicide. Considering girls' hopelessness appraisals in the context of interpersonal coping processes (i.e., how girls talk about stressors with close friends) may begin to clarify for which girls, and perhaps how, risk for suicidal ideation is elevated. Although a handful of studies have examined coping responses to stressors that may contribute to suicidal ideation risk (Cha et al., 2019; Cheek et al., 2023), this research has most often considered the main effects of general stressor response styles as they occur *within* an individual, as assessed predominantly using self-report measures in neutral conditions.

An alternative approach is to consider how girls express their negative internal responses to an actual stressor to a friend (i.e., *expressed vulnerability*). Examining expressed vulnerability, specifically in adolescents' close friendships, is pertinent for several reasons. First, as youth become more oriented away from parents and toward peers, close friendships provide outlets for coping that impact longer-term psychological functioning in adolescence (Furman & Buhrmester, 1992; Glick & Rose, 2011; Miller-Slough & Dunsmore, 2016). Close friendships are also particularly relevant contexts for examining moderators of suicide risk among girls, who may be more likely to look to friendships to provide psychological and other self-regulatory benefits as their friendships in adolescence become more intimate and, compared to those of boys, characterized by sharing of emotions (Klimes-Dougan et al., 2014; Legerski et al., 2015; Rose et al., 2022; Rose & Rudolph, 2006).

Because girls often turn to friends to manage stressors, the way that they talk about stressors with their close

friends matters. Indeed, a necessary precondition for receiving social support from a friend may be expression of vulnerability, including one's internal negative thoughts or emotions. Considering expressed responses to stressors may therefore help to illuminate particular styles of discussing distressing experiences that magnify, or attenuate, the deleterious impact of hopelessness appraisals on girls' vulnerability for suicidal thinking. On the one hand, expressing negative, self-directed thoughts and emotions about a stressor to a friend may render this internal response more impactful or cognitively salient, particularly if elaborated on or expressed often in an interaction. Meanwhile, these expressed responses also show vulnerability that could elicit support or otherwise attenuate the deleterious psychological impact of hopelessness appraisals (e.g., via disclosure of negative thoughts or emotions to another person; Pennebaker, 2012). As girls increasingly rely on friendships to provide psychological benefits in adolescence, the extent to which they express vulnerable (i.e., negative, self-directed) thoughts and emotions to a friend following a stressor may moderate the impact of internalized, hopelessness appraisals on risk for suicidal thinking by capturing whether and how girls use close friend interactions to share their private, negative psychological responses to stressors. Given it is plausible that expressed vulnerability may either amplify or dampen associations between hopelessness appraisals and risk for suicidal thinking, the current study considers these two alternative possibilities for moderation.

Because girls are likely to talk with close friends about stressors in adolescence, another important factor is how their friends respond. In line with stress-buffering models of social support (Cohen & Wills, 1985), for girls with more hopeless views of personal life stressors, supportiveness of a close friend may also moderate risk for suicidal ideation. While general friend supportiveness may be broadly beneficial, considering the supportiveness of a friend's responses *when a girl discusses a stressor* may be more directly pertinent to her internal stressor perceptions, and thus relevant to the relation between hopelessness appraisals and risk for suicidal thinking. For girls who feel hopeless about stressors in their lives, having a close friend who is able to provide effective support statements—for example, by positively reframing the stressor, highlighting a girl's strengths, or providing reassurance and normalizing—may be protective insofar as this provides an interpersonal context that may facilitate processes (e.g., emotion regulation or cognitive restructuring; Collins & Miller, 1994; Reindl et al., 2016; Rose, 2002) that reduce vulnerability for suicidal thoughts. In contrast, less effective friend support—for example, statements that rehash or dwell on negative feelings or stressors—may amplify risk.

The Current Study

The current study used a multimethod, prospective approach to examine the association between girls' hopelessness appraisals of personal stressors and short-term risk for suicidal ideation, adjusting for earlier suicidal ideation, as well as interactive effects with interpersonal factors related to how girls and their close friends talk about stressors. We hypothesized that higher levels of hopelessness appraisals would predict greater likelihood of suicidal ideation three months later. The primary goal for this study was to examine whether this association is moderated by girls' expressed vulnerability to a friend following an acute laboratory-based social stressor, for which we considered two competing hypotheses given the novelty of this study's expressed vulnerability measure. Among girls reporting higher hopelessness appraisals, (1) risk for suicidal ideation might be *exacerbated* at higher levels of expressed vulnerability (i.e., risk effect), insofar as this may reflect higher emotional reactivity or adverse stress-related appraisals, and possibly greater salience or impact of these responses via more extended elaboration to a friend; or (2) risk for suicidal ideation might be *attenuated* at higher levels of expressed vulnerability (i.e., protective effect), insofar as willingness to disclose vulnerable feelings to a friend may facilitate intrapersonal (e.g., relief via expression of emotion; Kennedy-Moore & Watson, 2001) or interpersonal (e.g., friendship intimacy; Berndt & Hanna, 1995) benefits that buffer against risk for suicidal thinking. Additionally, the study tested whether the impact of girls' hopelessness appraisals on future suicidal ideation is attenuated by having a close friend who provides more supportive, emotionally focused responses to her sharing about a stressor.

In contrast to prior studies of stressors or stressor responses as predictors of suicidal outcomes, this study capitalized on measures that may better capture stressor appraisals or responses as they either personally pertain to girls' lives, or as they occur in vivo, in an *interpersonal* context, and under conditions simulating proximal stressor exposure. Most studies have assessed stressors using scales or checklists that ask adolescents about a standardized set of stressful experiences they may have experienced in a specified timeframe (e.g., Adolescent Perceived Events Scale; Compas et al., 1987), which may not necessarily reflect the most distressing, personally relevant, and/or recent stressors experienced by an adolescent. In contrast, this study used a partly open-ended format in which adolescents generated, and then rated, personal stressors in their own lives currently. Assessing adolescents' perceptions of *self-identified* stressors offers opportunity to assess girls' hopelessness appraisals about stressors that are both personally specific and may also be particularly

cognitively or emotionally salient to her (Drace, 2013). This focus is also distinct from studies that examine more general hopelessness or depressive symptoms, which may tap into similar cognitions (e.g., hopeless or pessimistic attitudes about one's life) but are broader and not necessarily specific to attitudes about the solvability of specific, current life stressors.

Finally, despite the psychological importance of girls' interactions with close friends for coping with stressors in adolescence, the way that girls discuss stressors has not yet been robustly examined in the suicide literature using ecologically valid measures beyond self-report. This study used a novel coding scheme to obtain objective, performance-based indices of adolescents' *expressed vulnerability* and *friend support* (i.e., described further below) during a dyadic discussion directly pertinent to stressors (i.e., talking about a stressor immediately following exposure).

Method

Participants

Participants were adolescent girls, ages 12–17 years, recruited from clinical and community settings to yield a sample with variability in psychiatric symptoms, including internalizing symptoms and suicidal ideation. Eligibility criteria included having received a psychiatric diagnosis in the prior two years; having received mental health treatment; or presence of clinically elevated psychiatric symptoms. To participate, girls also needed to have a same-gender, close friend within two years of their own age whom they could bring to the study. Of the 233 girls with observationally coded friendship data at baseline (i.e., *expressed vulnerability* and *friend support*), two girls were excluded due to missing data on self-reported life stressors, yielding a sample of 231 girls ($M_{\text{age}}=14.70$, $SD=1.36$), who were majority (65.4%) White (21.2% African American; 9.5% mixed/other; 1.7% Asian; 2.2% Latina). Primary analyses were prospective and used complete case analysis among the 188 girls ($M_{\text{age}}=14.64$, $SD=1.39$) with 3-month suicidal ideation data (63.8% White; 23.4% African American; 10.1% mixed/other; 1.1% Asian; 1.6% Latina). In sensitivity analyses, we repeated prospective analyses in the original data ($N=231$) using multiple imputation to account for missingness.

Procedure

Girls attended a baseline laboratory visit with a caregiver and a close friend. Girls completed self-report measures assessing life stressors, depressive symptoms,

and hopelessness, as well as a semi-structured interview assessing history of self-injurious, including suicidal, thoughts and behaviors. They then underwent an adaptation of the Trier Social Stress Test (TSST; Kirschbaum et al., 1993). Girls were given time to prepare (i.e., 1 minute) and deliver (i.e., 3 minutes) a speech that they were told was being watched by a peer audience via live video feed, while also being evaluated by a confederate who was present in the room. The confederate pretended to evaluate the speech by marking a clipboard and, as needed, prompting the girl to continue speaking for the full 3 minutes. Immediately following the TSST, girls engaged in a 4-minute discussion task with their close friend, in which they were instructed to discuss the stressor (i.e., the TSST and their performance). Girls were given questions designed to prompt discussion of self-evaluative thoughts and emotions, such as “How do you think you did on your speech?” and “How do you feel about yourself after giving your speech?” Girls' close friends were told that their friend had instructions for the activity to encourage girls' sharing at their own discretion, while minimizing direction or pressure from the friend. At 3-month follow-up, presence of suicidal ideation in the prior 3 months was assessed via telephone interview. Informed assent/consent was obtained from youth participants and their parent(s)/guardian(s). This study was approved by the Institutional Review Board of the University of North Carolina at Chapel Hill.

Measures

Hopelessness Appraisals

Life stressors (i.e., specific stressors and perceptions of them) were assessed with a questionnaire in which adolescents were prompted to generate three current stressors (“problems”) in their life and answer several questions about each. Specifically, adolescents rated how hard it would be to solve, and how hard it would be to feel better about, each problem on 5-point Likert scales (1 = Not at all hard, 5 = Very hard). These two items were strongly positively correlated ($r=.75$, $p<.01$), and a mean score of these items across each of adolescents' three reported problems was computed to capture *hopelessness appraisals*, where hopelessness was specifically conceptualized as encompassing low perceptions of both stressor solvability and self-efficacy to cope with (i.e., feel better about) personal stressors.

Other Stressor Appraisals In addition, adolescents indicated how upsetting and how important each problem was with two separate items rated on 5-point Likert scales (1 = Not at

all, 5 = Very). Two separate mean scores were computed for each of these items across adolescents' three reported problems to capture other types of stressor appraisals: *distress appraisals* and *importance appraisals*.

Expressed Vulnerability (EV)

An index of expressed vulnerability (EV) was obtained using a novel coding scheme (see Calhoun et al., 2021) designed to quantify negative, self-directed thoughts or emotions displayed, verbally or affectively, by girls to their close friend during the discussion task immediately following the TSST. Examples of negative, self-directed thoughts included self-deprecating remarks; negative, self-directed emotions (e.g., anxiety, fear, embarrassment, guilt, sadness, self-directed anger) stated verbally or expressed nonverbally (e.g., tone of voice, facial expression, or body language). EV was rated on a 7-point scale, where higher scores indicated greater expression of negative, self-directed thoughts and emotions (i.e., 7 = "Teen expressed a high degree of negative self-directed emotional state on multiple, independent occasions AND maintained a negative, self-directed emotional state or shared negative self-perceptions throughout the majority of the discussion") and lower scores indicated fewer negative, self-directed thoughts or emotions (i.e., 1 = "Teen did not express any negative self-evaluations or negative self-directed emotions").

Friend Support (FS)

An index of close friend support (FS) was obtained using another novel coding scheme that combined elements (e.g., responsiveness) from the Peer Dyadic Mutuality Rating System (Piehler & Dishion, 2004, 2007) with new elements (see Calhoun et al., 2021). This scheme was used to assess the level of support provided by participants' close friends during the same discussion task in which expressed vulnerability was evaluated. Ratings of friend support were based on the frequency and intensity/salience of the close friend's supportive behaviors, where supportiveness was defined as the extent to which a behavior had potential to positively influence participants' emotional state. FS was rated on a 7-point scale, where higher scores indicated more supportive friend behaviors, and lower scores indicated more non-supportive friend behaviors. Specifically, a rating of '7' indicated that a close friend's behaviors appeared intended to decrease a participant's negative, self-directed thoughts/emotions or to increase her positive self-perceptions. In contrast, a rating of '1' indicated that a close friend

showed largely non-supportive behaviors (i.e., more likely to negatively influence girls' emotional state), such as inappropriately re-directing the topic of conversation, displaying affective responses that substantially mismatched those expressed by a participant (e.g., nonreciprocal affective expressions), or clear behavioral displays of criticism or negative opinions.

Interrater Reliability for Observational Coding Video recordings of the discussion task were coded (i.e., coders were unaware of participants' scores on other study measures) to obtain ratings for the macrocodes, EV and FS (see Calhoun et al., 2021 for additional details). Coders evaluated EV and FS at the same time after reviewing the entire discussion segment recording to ensure that coding of each construct considered the overall context of the friendship dynamic. Coder reliability was excellent, as evaluated using percent agreement (93% and 97%) and intraclass correlations (ICCs = 0.84 and 0.90) for EV and FS, respectively. Calculation of percent agreement allowed for 1-point discrepancies between coders, consistent with other observational coding schemes for peer dyadic interactions using 7-point scales (Piehler & Dishion, 2007).

Suicidal Ideation

Suicidal ideation (i.e., "thoughts of killing oneself") was assessed at baseline and at 3-month follow-up with the Self-Injurious Thoughts and Behaviors Interview (Nock et al., 2007), a semi-structured interview assessing presence, frequency, and characteristics of self-injurious, including suicidal, thoughts and behaviors. At baseline, this study used a dichotomous item assessing lifetime presence of suicidal ideation. Because the dichotomous item was not asked at 3-month follow-up, an item assessing suicidal ideation frequency in the past 3-months was used to create a dichotomous outcome variable (presence/absence), where presence was computed as endorsement of suicidal thinking in the prior 3 months at a frequency of "once or twice" or greater.

Covariates

Depressive Symptoms Depressive symptoms were measured using the Mood and Feelings Questionnaire (MFQ; Costello & Angold, 1988) assessing depressive symptoms in youth in the prior two weeks. A mean score was computed across all items, excluding the items assessing suicidal ideation, with higher scores indicating more severe

depressive symptoms. Internal consistency of the MFQ in the current sample was excellent ($\alpha=0.95$).

General Hopelessness General hopelessness (i.e., about the future) was assessed using the Hopelessness Scale for Children (HSC; Kazdin et al., 1986), a 17-item measure assessing feelings of hopelessness (i.e., negative expectations about) about one's future. A mean score was computed, with higher values reflecting higher levels of hopelessness about the future (i.e., hereafter referred to as 'general hopelessness'). Internal consistency of the HSC in the current sample was acceptable to good ($\alpha=0.78$).

Chronic Stress Chronic stress was assessed using the Child Chronic Strain Questionnaire (CCSQ; Rudolph et al., 2001), which asks about experiences of chronic stress in the past six months across academic (6 items; e.g., "Have you had trouble doing your homework or schoolwork?"), peer (11 items; e.g., "Do other kids have more close friends than you?"), and parental (18 items; e.g., "Do you have a hard time talking to your mom/dad?") domains. A chronic stress score was computed as the mean of items across academic ($\alpha=.89$), peer ($\alpha=.77$), and parental ($\alpha=.87$) domains, with higher scores indicating greater chronic stress.

Friendship Quality Friendship quality was assessed with items from the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985), in which participants answered questions about characteristics of their relationship with the close friend they had brought with them to participate in the study. Questions asked about both positive (e.g., "How much do you protect and look out for this person?"; "How much does this person treat you like you're admired and respected?") and negative (e.g., "How much do you and this person argue with each other?"; "How much do you and this person get on each other's nerves?") qualities on a 5-point Likert scale. Separate mean scores were computed for positive and negative friendship quality items ($\alpha=0.95$ and $\alpha=0.84$, respectively), with higher scores indicating higher levels (i.e., of positive and negative friendship quality, respectively).

Analytic Plan

Descriptive analyses examined correlations between hopelessness appraisals and other types of stressor appraisals (i.e., distress appraisals and importance appraisals).

Cross-sectional analyses tested associations between hopelessness appraisals and suicidal ideation history at baseline in bivariate and then multivariate analyses. Covariates included general hopelessness, depressive symptoms, and chronic stress to examine the extent to which our specific construct of interest (i.e., *hopelessness appraisals* of personally relevant, current stressors in one's life) was related to suicidal ideation, above and beyond the potential contribution of other, more generalized negative cognitions and/or broadband chronic stress exposure.

Primary analyses were prospective and examined the association between hopelessness appraisals and 3-month suicidal ideation, controlling for baseline ideation history, and the interactive role of *expressed vulnerability* and *friend support* in two logistic regression moderation models. For significant interaction effects, variables were mean centered and used in post-hoc probing. Simple slopes were probed at 1 SD above and below, and at, the mean on the moderator, and regions of significance were calculated using the Johnson-Neyman technique (Bauer & Curran, 2005; Preacher et al., 2006). In sensitivity analyses, we re-ran moderation models controlling for specific covariates: depressive symptoms, general hopelessness, chronic stress in the moderation model with *expressed vulnerability*; and friendship-relevant covariates (i.e., self-reported positive and negative friendship quality) in the model with *friend support*.

At the lab visit, minimal data were missing for covariates (0.4–9.5% missing). At follow-up, suicidal ideation data were missing for 43 girls (18.6%) due to attrition. Little's MCAR test was not significant and missingness of follow-up suicidal ideation data was not related to hopelessness appraisals, moderator variables (i.e., expressed vulnerability, friend support), or any covariates, including suicidal ideation history at baseline (ORs=0.74–1.38, $p=.33$ – 0.98 ; $\chi^2=0.70$, $p=.40$). Analyses reported below used complete case analysis, although we conducted sensitivity analyses for prospective analyses using multiple imputation to account for missingness.

Results

Descriptive statistics and correlations among study variables are shown in Table 1. At baseline, 110 girls (47.6%) endorsed histories of suicidal ideation. At follow-up, 50 girls endorsed suicidal ideation in the prior 3 months (26.6% of sample with complete data for prospective analyses). Hopelessness appraisals were moderately, positively correlated with other types of stressor appraisals: distress appraisals ($r=.61$, $p<.01$) and importance appraisals ($r=.53$,

Table 1 Descriptive statistics and bivariate correlations among study variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Hopelessness appraisals	--										
2. Expressed vulnerability	0.07	--									
3. Close friend support	0.00	0.00	--								
4. Depressive symptoms	0.39**	0.14*	0.01	--							
5. General hopelessness	0.32**	0.08	0.01	0.57**	--						
6. Chronic stress	0.37**	0.03	-0.01	0.57**	0.39**	--					
7. SI history (baseline)	0.19**	0.01	0.01	0.43**	0.33**	0.31**	--				
8. SI (3-months)	0.21**	0.09	0.15*	0.38**	0.28**	0.26**	0.45**	--			
9. Positive friendship quality	0.06	0.12	0.02	0.03	0.06	0.05	-0.06	-0.07	--		
10. Negative friendship quality	-0.19**	-0.10	-0.11	0.02	-0.07	0.12	0.00	-0.02	0.04	--	
11. Age	0.16*	-0.05	0.18**	0.14*	0.02	0.20**	0.19**	0.27**	-0.16*	-0.15*	--
Mean	3.38	4.76	4.67	0.52	1.22	2.27	--	--	3.76	1.46	14.70
SD	0.97	1.70	1.45	0.43	0.19	0.60	--	--	0.78	0.61	1.36

SI suicidal ideation

* $p < .05$ ** $p < .01$ **Table 2** Interaction of hopelessness appraisals with expressed vulnerability in relation to suicidal ideation presence at 3-month follow-up

Variables	OR (95% CI)	p
Step 1		
Hopelessness appraisals	1.48 (0.99–2.20)	0.05
SI history at baseline	10.12 (4.20–24.38)	<0.01**
Step 2		
Expressed vulnerability	1.14 (0.91–1.41)	0.25
Step 3		
Hopelessness appraisals x Expressed vulnerability	1.26 (1.01–1.57)	0.04*

SI = suicidal ideation

* $p < .05$ ** $p < .01$

$p < .01$). At baseline, higher hopelessness appraisals were related to history of suicidal ideation [OR=1.50, 95% CI=1.13–1.99, $p < .01$], although this association was no longer significant when controlling for depressive symptoms, general hopelessness, and chronic stress [OR=0.94, 95% CI=0.66–1.33, $p = .72$].

Prospectively, hopelessness appraisals were not associated with presence of suicidal ideation three months later, above and beyond baseline suicidal ideation history [OR=1.48, 95% CI=0.99–2.20, $p = .05$]. However, there was a significant interaction of hopelessness appraisals with *expressed vulnerability* (Table 2), such that higher levels of hopelessness appraisals of salient stressors were associated with higher likelihood of 3-month suicidal ideation at average and high (mean and +1 SD, respectively), but not low (-1 SD), levels of expressed vulnerability [effects at low: OR=1.08, $p = .74$; average: OR=1.61, $p = .03$; high: OR=2.39, $p = .01$] (Fig. 1). Hopelessness appraisals were associated with greater likelihood of 3-month suicidal ideation at 0.14 SDs below the mean and higher on expressed

vulnerability.¹ This interaction was no longer significant [OR=1.21, 95% CI=0.96–1.53, $p = .10$] when controlling for additional intraindividual covariates in sensitivity analyses (Table 3). In sensitivity analyses using multiple imputation to account for missing 3-month suicidal ideation, the interaction of hopelessness appraisals with expressed vulnerability remained significant [OR=1.25, 95% CI=1.01–1.53, $p = .04$].

Friend support did not moderate the association between hopelessness appraisals and prospective suicidal ideation (Table 4). There was no significant moderation effect for friend support when additionally controlling for self-reported friendship quality [OR=0.94, 95% CI=0.68–1.29, $p = .71$], nor when using multiple imputation to account for missingness [OR=0.87, 95% CI=0.64–1.18, $p = .36$].

To further understand how hopelessness appraisals, in combination with greater expressed vulnerability, may increase risk for suicidal ideation three months later, we then examined 3-month depressive symptoms as a mediator in post hoc sensitivity analyses. The association between hopelessness appraisals and 3-month suicidal ideation was mediated by 3-month depressive symptom severity (significant indirect effect=0.11, 95% CI=0.02–0.26), without considering expressed vulnerability but controlling for depressive symptom severity and suicidal ideation history at baseline. However, when testing the combination of hopelessness appraisals with expressed vulnerability, this interaction did not predict 3-month depressive symptom severity, nor was there supported for moderated mediation via 3-month depressive symptoms (nonsignificant index of moderated mediation=0.01, 95% CI=-0.04–0.09).

¹ Relation of hopelessness appraisals with 3-month SI was significant for 64.9% of sample (i.e., scores of -0.14 SD below the mean or higher on expressed vulnerability).

Fig. 1 Simple slopes of hopelessness appraisals predicting 3-month suicidal ideation at low, average, and high levels of expressed vulnerability. Note: The simple slopes of hopelessness appraisals on suicidal ideation presence at 3-month follow-up were significant at average (mean) and high (+1 SD), but not at low (-1 SD), levels of expressed vulnerability. For the y-axis, log-odds were converted to probability to facilitate interpretability. SI=suicidal ideation; SD=standard deviation.

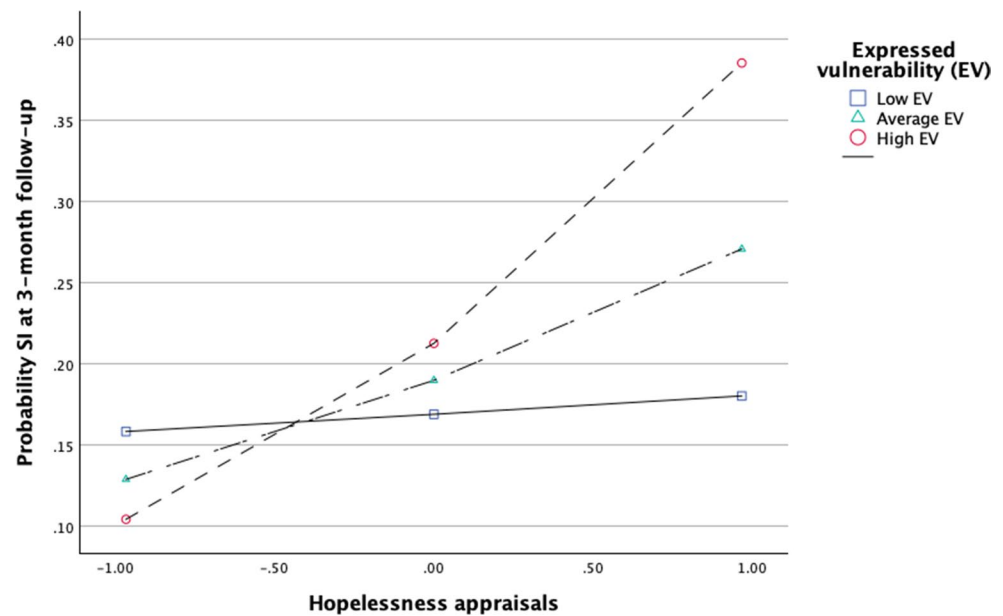


Table 3 Interaction of hopelessness appraisals with expressed vulnerability in relation to suicidal ideation presence at 3-month follow-up, with covariates

Variables	OR (95% CI)	p
<i>Clinical-psychological covariates</i>		
Step 1		
Hopelessness appraisals	1.25 (0.82–1.91)	0.31
SI history at baseline	7.24 (2.91–18.01)	<0.01**
Depressive symptoms	3.19 (1.06–9.60)	0.04*
General hopelessness	1.84 (0.18–19.09)	0.61
Step 2		
Expressed vulnerability	1.10 (0.88–1.34)	0.39
Step 3		
Hopelessness appraisals x Expressed vulnerability	1.21 (0.96–1.53)	0.10

SI = suicidal ideation

* $p < .05$

** $p < .01$

Table 4 Interaction of hopelessness appraisals with friend support in relation to suicidal ideation presence at 3-month follow-up

Variables	OR (95% CI)	p
Step 1		
Hopelessness appraisals	1.48 (0.99–2.20)	0.05
SI history at baseline	10.12 (4.20–24.38)	<0.01**
Step 2		
Friend support	1.29 (0.98–1.70)	0.07
Step 3		
Hopelessness appraisals x Friend support	0.92 (0.67–1.26)	0.60

SI = suicidal ideation

* $p < .05$

** $p < .01$

Discussion

During the transition to adolescence, youth are exposed to more stressors and are more likely to perceive events in their lives as stressful (Seiffge-Krenke et al., 2009; Steinberg & Morris, 2001). Hopeless perceptions of personal stressors (i.e., *hopelessness appraisals*) may increase vulnerability for suicidal ideation, which often emerges in adolescence and is particularly prevalent among girls (Beck et al., 1975; Gaylor et al., 2023; Rudolph & Hammen, 1999). At the same time, girls' peer friendships provide important contexts for coping with stress that may moderate the impact of hopelessness appraisals on subsequent psychological functioning in adolescence (Frydenberg & Lewis, 1991; Miller-Slough & Dunsmore, 2016; Zimmer-Gembeck et al., 2025). Using a lab-based behavioral paradigm, this study examined girls' hopelessness appraisals as predictors of suicidal ideation and considered their interaction with how girls talk about stressors with close friends. This approach builds on prior literature on stressor appraisals in depression (Conway et al., 2016; Davis et al., 2025; Espejo et al., 2012; Krackow & Rudolph, 2008), extending this to suicidal ideation risk and providing a further novel contribution by considering interpersonal factors (i.e., girls' interactions with close friends, assessed objectively using observational coding) that may moderate a risk pathway that has traditionally been tested from an intrapersonal perspective.

Girls who endorsed more hopeless perceptions of salient stressors in their lives were more likely to have histories of suicidal ideation. This concurrent association

is consistent with cognitive theories of suicide, whereby feelings of hopelessness, defeat, or entrapment may be linked to desires for escape or relief in the form of suicidal thoughts (O'Connor & Kirtley, 2018; Taylor et al., 2011; Weishaar & Beck, 1992). However, more hopeless perceptions of personal stressors were not associated with suicidal ideation history when controlling for psychological and chronic stress-related covariates, nor with risk for suicidal ideation three months later above and beyond baseline ideation. Although hopelessness, broadly conceptualized, is a robust risk factor for suicidal ideation (Ribeiro et al., 2018), in this study we examined a specific facet of stressor-related hopelessness: girls' perceptions of stressor *solvability* and personal *self-efficacy to cope with* (i.e., feel better about) stressors they reported in their own lives currently. In contrast to general hopelessness—which may encompass broader, more enduring hopeless feelings about oneself and one's future—hopeless perceptions related specifically to solving and coping with immediate, specific life stressors may only elevate risk for suicidal ideation in combination with other vulnerabilities that may render the impact of these stressors more cognitively or emotionally salient, or hinder adaptive coping.

Consistent with this idea, and given girls' close friendships provide important contexts for expressing distress and talking about stressors, we hypothesized that the way girls interpersonally express their responses to stressors to a close friend (i.e., *expressed vulnerability*) following stressor exposure would moderate risk for near-term suicidal ideation among girls endorsing greater hopelessness appraisals. We found that hopelessness appraisals were associated with higher likelihood of 3-month suicidal ideation among girls who displayed average to higher levels of expressed vulnerability following the acute stressor. This finding was more consistent with the one of our two competing hypotheses positing that greater expressed vulnerability may *exacerbate* risk via increased interpersonal focus on negative emotions and cognitions in ways that potentiate them. Although we had alternatively hypothesized that expressed vulnerability could attenuate risk (i.e., insofar as emotional disclosure may facilitate coping or other self-regulatory benefits within close friendship contexts; Pennebaker & Graybeal, 2001; Vijayakumar & Pfeifer, 2020), our results suggest that our expressed vulnerability construct may be better interpreted as capturing higher stress reactivity (e.g., negative emotional or cognitive responses to stressors) that then contributes to suicidal ideation risk (Giletta et al., 2015; Miller et al., 2024; Miller & Prinstein, 2019). Further, if expressed vulnerability served to facilitate friend support, consistent with a hypothesized protective effect, we might have expected that expressed vulnerability and friend support would be positively correlated, but these constructs were

not related in our sample.² Instead, our finding suggests that any potentially beneficial effects of expressing distress to a friend following stressor exposure may have little impact on attenuating risk for girls who perceive personal stressors as more difficult to solve and who show heightened, negative internal responses to stressors.

Another interpretation of our finding is that higher expressed vulnerability, as examined in this study, may represent a behavioral (i.e., expressed verbally to a friend) manifestation of self-criticism, which amplifies risk for suicidal ideation. Self-criticism is closely linked to hopelessness, defeat, and lower self-efficacy and is a risk factor for suicidal ideation (Brott & Veilleux, 2024; O'Neill et al., 2021). If conceptualized as self-criticism, our moderation finding for expressed vulnerability lends itself to intuitive interpretations aligned with prior literature, whereby a combination of more hopeless appraisals of personal stressors, and more self-critical responses to stressors (e.g., self-directed negative thoughts or emotions), may increase risk for suicidal ideation (Brott & Veilleux, 2024; Enns et al., 2003). This may particularly be the case as we specifically operationalized hopelessness appraisals as those capturing self-focused thoughts (i.e., lower self-efficacy to feel better about and solve problems), and greater expressed vulnerability following stressor exposure may therefore further contribute to feelings of lower self-efficacy to solve problems. Indeed, suicidal ideation is widely linked to problem-solving deficits, including self-efficacy to solve problems (Heapy et al., 2024; Pollock & Williams, 1998). In sum, our finding may possibly capture a sort of 'problem-solving' risk profile characterized by reduced self-efficacy to effectively cope with stressors in adolescence, captured across both more trait-like (i.e., hopelessness appraisals of personal stressors) and state-dependent (i.e., negative, self-directed thoughts or emotions immediately following stressor exposure) indices. However, this interpretation is tempered by the fact that this effect was no longer significant after adjusting for covariates and thus may not account for suicidal ideation above and beyond the impact of general hopelessness, depressed mood, and chronic stress.

To further understand the role of depressed mood, we conducted post hoc sensitivity analyses to explore whether hopelessness appraisals, and their combination with expressed vulnerability, may increase future suicidal ideation risk via higher levels of depressive symptoms three months later. While the effect of hopelessness appraisals on suicidal ideation risk could be explained by elevated depressive symptoms at 3-month follow-up, depressive symptoms did not appear to fully account for the particular

² The study was underpowered to test the interaction of hopelessness appraisals and expressed vulnerability by level of friend support (i.e., three-way interaction).

combination of hopelessness appraisals and expressed vulnerability on suicidal ideation risk (i.e., no moderated mediation effect). Further, the interaction of hopelessness appraisals and expressed vulnerability was not related to 3-month depressive symptom severity, controlling for baseline depressive symptoms. The combination of greater hopelessness appraisals and higher expressed vulnerability may be relatively specific to suicidal ideation risk, rather than risk for internalizing symptoms more generally.

Meanwhile, *friend support* did not moderate the prospective association between hopelessness appraisals and suicidal ideation. It is possible that for girls with more hopeless mindsets about personal stressors, even supportive responses from a friend following stressor exposure may be experienced as ineffective or even alienating, particularly if ego-dystonic. If so, close friend support may have little impact on attenuating the potentially deleterious impact of hopeless perceptions of stressors in one's life. Any interactive effects of close friend support also likely depend on the extent to which a girl actually seeks close friend support following a stressor, and girls who perceive stressors as more insurmountable and difficult to solve in the first place may be less likely to actually talk with or seek support from friends in coping with stressors (Deane et al., 2001; Wilson & Deane, 2010). Future studies might examine how friend support interacts with girls' actual support-seeking behaviors to influence suicidal risk for youth endorsing higher levels of hopelessness appraisals.

This study had several limitations that deserve attention in future research. While the TSST is a widely used stressor paradigm, it does not necessarily mirror the variety of stressors that adolescents encounter in their actual lives. While methods like ecological momentary assessment may be better positioned to assess girls' responses to stressors as they occur in real life and/or real time, our lab-based design offered several unique advantages not afforded by such methods, including objective assessment of stressor responses and friendship interactions using observational coding. Second, expressed vulnerability may be influenced by sociodemographic factors, such as cultural norms regarding emotional expressivity and disclosure (Burleson, 2003; Mesquita & Walker, 2003), and thus the impact of sociodemographic or other identity-related factors on girls' coping (e.g., disclosing internal states) within close friendships warrants further consideration. Third, there were additional factors that may plausibly impact the extent to which close friend support might be expected to impact girls, such as girls' expectations or feelings about a friend's support, and thus the extent to which she may be receptive to and internalize a friend's responses. Future studies might consider factors like these by assessing, for example, the extent to which a girl is positively impacted by friend support (e.g.,

change in mood) or engages in adaptive coping (e.g., considers or implements problem-solving behaviors).

Despite these limitations, this study benefited from use of a performance-based paradigm and novel coding scheme to objectively capture aspects of girls' interactions with close friends following a stressor, which were tested as moderators of the association between girls' perceptions of personally salient stressors and future risk for suicidal ideation. Findings demonstrate that girls who perceive personal stressors as particularly difficult to overcome (i.e., to solve and feel better about), and who express more self-focused distress to a close friend following stressor exposure, may be at greater risk for suicidal ideation in the short-term. In light of these findings, interventions that build hopefulness and problem-solving self-efficacy may be promising for reducing suicidal ideation risk in adolescence. Given that risk was elevated among those girls who also expressed greater negative, self-focused responses to a stressor, treatments that target negative cognitions may be fruitful, such as cognitive-behavioral approaches for challenging self-critical thoughts. Alternatively, compassion-based interventions (e.g., compassion-focused therapy, Gilbert & Procter, 2006; mindful self-compassion therapy; Neff & Germer, 2013), may be protective by boosting positive self-regard, while third-wave approaches such as DBT may be well-suited to target self-focused reactivity in contexts of stress through an integration of mindfulness with distress tolerance and emotion regulation skills. The present study suggests that emphasizing treatment elements aimed at improving self-esteem and hope, particularly in contexts of stress, may be protective for adolescent girls.

Author Contributions MJP and MKN designed and obtained grant funding for the larger study from which the present data come. KDR, PDH, and MKN assisted in study conceptualization and data curation. CDC conceived of observational coding scheme and oversaw coding for key behavioral variables in the present study. OHP and CDC conceived of the present analyses. OHP wrote the manuscript. CDC, MJP, and KDR edited the manuscript. All authors approved the manuscript.

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Data Availability Materials are available from the authors upon request.

Declarations

Ethical Approval Study approval was obtained from The University of North Carolina at Chapel Hill Institutional Review Board. Informed assent/consent was obtained from adolescent participants and their parent(s)/guardian(s).

Conflict of Interest The authors have no relevant conflicts of interest to disclose.

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