



Research report

Interpersonal stress and suicidal ideation in adolescence: An indirect association through perceived burdensomeness toward others



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ABSTRACT

Background: Research has documented significant associations between life stress, especially interpersonal stress, and suicidal ideation in adolescents. Little is known about variables that explain the association between interpersonal stress and suicidal ideation.

Methods: The present study evaluated a conceptual model in which interpersonal stress (chronic and episodic) predicted suicidal ideation indirectly via thwarted belongingness and perceived burdensomeness among 180 inpatients (65.0% girls) ages 12–17 years ($M=14.72$, $SD=1.49$). Non-interpersonal stress was also examined to determine whether the model was specific to interpersonal stress or common to stress in general.

Results: Structural equation modeling identified a significant indirect effect of chronic interpersonal stress on suicidal ideation via perceived burdensomeness. Episodic interpersonal stress was significantly correlated with thwarted belongingness and suicidal ideation, but was not a significant predictor of suicidal ideation in a model that controlled for depressive and anxious symptoms. No significant associations were found between non-interpersonal stress and suicidal ideation.

Limitations: Adolescents were the sole informant source, data on psychiatric diagnoses were not available, and the optimal time interval for examining stress remains unclear. The cross-sectional study design prevents conclusions regarding directionality.

Conclusions: These findings highlight the role of chronic interpersonal stress in suicidal ideation in adolescents, as well as the potential promise of perceived burdensomeness as a target for programs designed to prevent or reduce suicidal ideation.

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1. Introduction

The prevalence of suicidal ideation increases dramatically and peaks during adolescence; 17% of high school students endorsed seriously considering a suicide attempt and 14% reported making a specific plan about how they would attempt suicide in the past 12 months (Centers for Disease Control and Prevention, 2014). Adolescence thus is a crucial period in which to examine variables indicated in the etiology of suicidal ideation. Life stress, especially life stress in interpersonal relationships, has received considerable attention in the etiology of suicidal ideation among adolescents (e.g., Heikkinen et al., 1993; Johnson et al., 2002; King and Merchant, 2008; Sandin et al., 1998).

1.1. Life stress and suicidal ideation in adolescence

A large empirical literature has demonstrated significant associations between life stress and suicidal ideation in adolescence (e.g., Overholser, 2003; Pettit et al., 2011), including episodic stress and chronic stress (Grover et al., 2009). Episodic stress includes discrete, acute events that disrupt an adolescent's life (e.g., break-up of a romantic relationship), whereas chronic stress refers to ongoing and persistent difficulties and threats (e.g., frequent arguments with parents). Global, or composite, indices of episodic stress and chronic stress have demonstrated only modest associations with suicidal ideation (Kelly et al., 2001), indicating a need for a more fine-grained examination of the associations between specific domains of stress and suicidal ideation.

Stress in interpersonal domains, meaning stress that occurs in the context of relationships with others, has consistently been identified as a significant correlate or predictor of suicidal ideation in adolescence (King and Merchant, 2008; Whitlock et al., 2014).

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For example, interpersonal events such as physical or sexual abuse, major family disruptions, and romantic break-ups were common precipitants of suicide-related behaviors in adolescence (Garber et al., 1998; Asarnow et al., 2008; Bruffaerts et al., 2010) and serious fights with family members in middle adolescence predicted risk of suicide-related behaviors into late adolescence and early adulthood (Johnson et al., 2002). Similarly, chronic, ongoing stress in interpersonal relationships was significantly associated with suicidal ideation in a sample of adolescents (Pettit et al., 2011) and ongoing difficulties in eight interpersonal domains were significantly associated with risk of suicide-related behaviors in late adolescence and early adulthood (Johnson et al., 2002). In contrast, evidence for an association between stress in non-interpersonal domains and suicide-related behavior has been less consistent, with some studies failing to find significant associations between episodic stressful events and chronic stress in non-interpersonal domains, on the one hand, and suicide-related behaviors, on the other hand (Johnson et al., 2002; Pettit et al., 2011).

Although evidence supports an association between interpersonal stress and suicidal ideation in adolescence, it remains unclear *how* interpersonal stress leads to suicidal ideation. That is, little is known about mediators of the association between interpersonal stress and suicidal ideation. The identification of mediators of the association between interpersonal stress and suicidal ideation could inform etiologic models of suicidal ideation as well as prevention strategies designed to reduce the risk of suicidal ideation following the occurrence of interpersonal stress.

1.2. The interpersonal psychological theory as an explanation of the association between interpersonal stress and suicidal ideation in adolescence

The interpersonal psychological theory of suicide (IPTs) provides a compelling framework to elucidate the relationship between interpersonal stress and suicidal ideation in adolescence. According to the IPTs, suicidal ideation results from a sense of thwarted belongingness (i.e., social disconnection) and a sense of perceived burdensomeness toward others (i.e., the belief that one is a burden or drain on others) (Joiner, 2005; Van Orden et al., 2010). Considerable evidence supports a significant association between perceived burdensomeness and suicidal ideation among adults (e.g., Hill and Pettit, 2014; Van Orden et al., 2010), and recent findings provide support for a significant association between perceived burdensomeness and suicidal ideation among adolescents (Hill et al., 2015; Venta et al., 2014). Evidence for an association between thwarted belongingness and suicidal ideation has been mixed in adults (Van Orden et al., 2012; Woodward et al., 2014; O'Keefe et al., 2014); two published studies among adolescents found a significant association between thwarted belongingness and suicidal ideation (Hill et al., 2015; Venta et al., 2014). Thus, evidence is accumulating to support perceived burdensomeness and thwarted belongingness as correlates of suicidal ideation in adolescents.

It is possible that interpersonal stress is associated with an erosion in one's relationships with others and a diminished quality and/or quantity of social interactions. The possibility of such an erosion is supported by findings that interpersonal stress is significantly associated with lower levels of social support (Auerbach et al., 2011) and higher levels of family disruption (Rudolph and Flynn, 2007) in adolescents. Erosion of relationships subsequent to interpersonal stress may be associated with a sense of social disconnection (i.e., thwarted belongingness) and a sense of social drain (i.e., perceived burdensomeness) that in turn, according to the IPTs, are associated with thoughts of suicide. Although such erosion may occur in the context of episodic, disruptive interpersonal events, it may be especially likely to occur when

interpersonal stress is chronic and ongoing. Repeated strains on interpersonal relationships, even more so than isolated events, may exert a cumulative effect on perceptions of social connectedness and social contribution.

We are not aware of published studies that have examined the associations between interpersonal stress, perceived burdensomeness, and thwarted belongingness among adolescents. However, evidence consistent with significant associations between interpersonal stress, perceived burdensomeness, and thwarted belongingness has been reported among young adults: Among 189 undergraduate students, retrospectively reported childhood emotional abuse was significantly associated with current levels of thwarted belongingness, perceived burdensomeness, and suicidal ideation (Puzia et al., 2014). Further, perceived burdensomeness, but not thwarted belongingness, significantly mediated the association between childhood emotional abuse and current suicidal ideation. These findings provide preliminary evidence that distal stress in interpersonal relationships is associated with a sense of thwarted belongingness and perceived burdensomeness, and that perceived burdensomeness may partially explain the association between distal interpersonal stress and suicidal ideation among young adults. Although they did not measure thwarted belongingness or perceived burdensomeness, Johnson et al. (2002) reported similar findings among 659 late adolescents and young adults: interpersonal difficulties in middle adolescence mediated the association between maladaptive parenting or abuse during childhood and suicide-related behaviors in late adolescence or early adulthood.

1.3. Present study

The purposes of the present study were to build on those promising preliminary findings by (a) examining the associations between stress, perceived burdensomeness, thwarted belongingness, and suicidal ideation and (b) evaluating a conceptual model wherein interpersonal stress is associated with suicidal ideation via perceived burdensomeness and thwarted belongingness in a sample of psychiatric inpatient adolescents. Based on past research and the IPTs, we made three sets of hypotheses. First, we hypothesized that interpersonal stress (episodic and chronic) would be significantly and positively associated with suicidal ideation. Second, we hypothesized that interpersonal stress would be significantly and positively associated with thwarted belongingness and perceived burdensomeness. Whereas episodic interpersonal stress may strain interpersonal relationships in the short term, we tentatively expected chronic interpersonal stress would be especially likely to be associated with thwarted belongingness and perceived burdensomeness due to repeated, ongoing strains on relationships with others. Third, we hypothesized that a model of indirect effects wherein the relationship between interpersonal stress (episodic and chronic) and suicidal ideation is accounted for in part by thwarted belongingness and perceived burdensomeness would provide a good fit to the data. Findings in support of the proposed conceptual model would suggest the potential promise of thwarted belongingness and perceived burdensomeness as targets in prevention programs designed to reduce the risk of suicidal ideation among adolescents who experience high levels of interpersonal stress.

To evaluate whether the proposed conceptual model is specific to interpersonal stress or common to stress irrespective of domain, we also examined the associations between non-interpersonal stress, perceived burdensomeness, thwarted belongingness, and suicidal ideation. Based on past research findings (e.g., Johnson et al., 2002; Pettit et al., 2011), we did not expect non-interpersonal stress to be significantly associated with perceived burdensomeness, thwarted burdensomeness, and suicidal ideation.

Finally, given well documented significant associations between depressive and anxious symptoms and suicidal ideation in adolescence (e.g., Hill et al., 2011; Kandel et al., 1991), we included depressive and anxious symptoms as a covariate in statistical analyses.

2. Method

2.1. Participants and procedures

This study was conducted as approved by the appropriate institutional review boards. Adolescent participants were recruited from consecutively admitted inpatients at a university-affiliated acute-care psychiatric hospital in a large urban area. After the nature of the study was explained, 378 parents provided informed consent for their adolescent child to participate. Of those 378 adolescents with parental consent, 305 (81.4%) provided assent to participate, 41 (10.8%) declined to participate, and 32 (8.5%) were ineligible to participate due to severe psychosis and/or intellectual disability. Of the 305 who were eligible and assented, 80 (25.3%) were discharged prior to completion of the research protocol due to the acute nature of this inpatient unit and 8 (2.5%) withdrew assent/consent prior to completion of the research protocol. Of the remaining 217 adolescents, a final sample of 180 (82.9%) was included in the current study based on completion of pertinent study measures (Chronic Stress and Episodic Life Events Interview for Adolescents, Modified Scale for Suicidal Ideation, Interpersonal Needs Questionnaire, and Youth Self-Report). No significant differences were found between participants included in the final sample and adolescents who were excluded on any demographic variable.

Participants were interviewed in a private testing room on the psychiatric unit. Interviewers were advanced clinical psychology graduate students with training in the interview procedures, including practice and supervised administrations. Participants were remunerated for their time. Participants (65.0% girls) ranged in age from 12 to 17 years ($M=14.72$, $SD=1.49$) and identified themselves as Hispanic (42.7%), Caucasian (25.4%), African American (23.2%), multiracial (7.3%), or Southeast Asian (1.1%).

2.2. Measures

2.2.1. Chronic and episodic stress

The Chronic Stress and Episodic Life Events Interview for Adolescents (Hammen, 2004) is a semi-structured interview about chronic stress and episodic stress (i.e., life event stress). The interview covered interpersonal domains (close friend, social life, romantic, and family) and non-interpersonal domains (academic, finance, personal health, and family health) during the prior six months. During the interview, a narrative was written to summarize ongoing conditions and the context of each life event. A team of three to eight members, blind to participants' subjective ratings of stress severity, gave consensual severity ratings of chronic and episodic stress. Chronic stress in each domain was rated on a scale from 1 (*exceptionally high-quality circumstances*) to 5 (*extreme adverse conditions*) with behaviorally specific anchors for each value. Episodic events were rated on a scale from 1 (*no impact*) to 5 (*extremely severe impact*). Episodic events also were judged to be interpersonal (i.e., predominately involved or affected relationships with other people) or non-interpersonal (Shih et al., 2006). Reliabilities based on independent ratings of chronic stress domains and episodic events yielded correlations from 0.85 to 0.96. Consistent with past studies (e.g., Ostiguy et al., 2009; Shih et al., 2006), we computed separate stress indices for interpersonal domains and non-interpersonal domains: episodic interpersonal

stress, episodic non-interpersonal stress, chronic interpersonal stress, and chronic non-interpersonal stress.

2.2.2. Suicidal ideation

The Modified Scale for Suicide Ideation (MSSI) is an 18-item clinician rating scale of the severity of suicidal ideation (Miller et al., 1986). Each item is rated from 0 to 3 and the total score ranges from 0 to 54 (higher scores represent greater suicidal ideation). The internal consistency, interrater reliability, and factor structure of the MSSI have been supported among adolescents (Pettit et al., 2009). Concurrent and discriminant validity have been adequately supported (Miller et al., 1986; Pettit et al., 2009). Internal consistency in the present sample was acceptable ($\alpha=0.93$).

2.2.3. Thwarted belongingness and perceived burdensomeness

The Interpersonal Needs Questionnaire-10 (INQ; Van Orden, 2009; Van Orden et al., 2012) is a 10-item measure of perceived burdensomeness (5 items) and thwarted belongingness (5 items). Participants rate the extent to which each item describes how they have felt recently, using a 7-point Likert scale. Higher scores indicate greater perceptions that one is a burden to others (perceived burdensomeness) and does not feel connected to others (thwarted belongingness). Example items on the perceived burdensomeness scale include "These days, the people in my life would be happier without me" and "These days, I think I make things worse for the people in my life". Example items from the thwarted belongingness scale include, "These days, I feel disconnected from other people" and "These days, I often feel like an outsider in social gatherings". Prior research has supported the factor structure, internal consistency, and convergent validity of the subscales among adolescents (Hill et al., 2015). Additionally, research by Silva et al. (unpublished) has supported the test-retest reliability of the subscales. Internal consistency in the present sample was $\alpha=0.86$ for perceived burdensomeness and $\alpha=0.82$ for thwarted belongingness.

2.2.4. Anxiety and depressive symptoms

The Youth Self Report (YSR) is a 112 item self-rating scale of behavior problems for children and adolescents aged 11–18 years (Achenbach, 1991). The YSR contains nine syndrome scales, including the anxious/depressed scale. For the present study, we used participants' scores on the anxious/depressed scale as a measure of depressive and anxious symptom severity. Research supports the convergent validity of the anxious/depressed scale via significant associations with diagnoses of major depressive disorder and anxiety disorders (Gomez et al., 2014; Ivarsson et al., 2002).

2.3. Data analysis

Missing data occurred at a low frequency for the MSSI (1.6%), INQ thwarted belongingness scale (0.5%), chronic stress measures (3.8%), and YSR anxious/depressed scale (11.1%). There were no missing data for the INQ perceived burdensomeness scale or the episodic stress measures. Missing data was assessed by computing a dummy variable representing the presence or absence of missing data for each variable. This dummy variable was then correlated with all other variables in the model as well as demographic variables. No significant correlations were observed, indicating no evidence of bias due to missing data. Missing data were assumed to be missing at random and an expectation maximization algorithm was used to account for missing data.

Prior to analysis, the data were evaluated for multivariate outliers by examining leverage indices for each individual and influence values for each predictor and individual. An outlier was

defined as a leverage score four times greater than the mean leverage or a $df\beta$ greater than one for any variable. One case (0.6%) was identified as a statistical outlier; identical conclusions were drawn both with and without the outlier in the analysis and the results presented include the outlier to better represent the population of interest. Due to non-normality of the data and the presence of a statistical outlier, a robust maximum likelihood estimator was used.

Pearson product-moment correlations were used to examine relations between study variables prior to evaluating structural equation models. Hypothesized relations between variables that were not evidenced by significant Pearson product-moment correlations were not included in the structural equation model for the sake of fitting a parsimonious structural model. All tests were two-tailed and alpha was set at 0.05. Structural equation models were evaluated using the Mplus version 6.12 statistical software package (Muthén and Muthén, 1998–2010). A robust maximum likelihood procedure was used to generate several indices of model fit in order to judge how well the model represented the data. A model that accurately represents the data should generate non-significant chi-squared values, comparative fit index (CFI) and Tucker–Lewis index (TLI) values near or greater than 0.95, a root mean square error of approximation (RMSEA) value near or less than 0.06, and a standardized root mean square residual (standardized RMR) value near or less than 0.08 (Hu and Bentler, 1999; Kline, 2011).

3. Results

3.1. Preliminary analyses

Associations between study variables and demographic factors were examined. Female adolescents reported significantly higher suicidal ideation, thwarted belongingness and episodic interpersonal stressors. Caucasian adolescents reported significantly higher levels of thwarted belongingness than both African American and Hispanic adolescents. Chronic non-interpersonal stress was significantly correlated with age. Given these significant associations, gender, race/ethnicity, and age were included as covariates in the structural equation model.

Means and standard deviations of study variables, and the

correlations between them, are presented in Table 1. Mean scores for suicidal ideation fell in the moderate to severe range, as expected in this sample of psychiatric inpatient adolescents. Suicidal ideation was significantly correlated with perceived burdensomeness, thwarted belongingness, episodic interpersonal stress, and chronic interpersonal stress. Thwarted belongingness was significantly correlated with both episodic interpersonal and chronic interpersonal stress. Perceived burdensomeness was significantly correlated with chronic interpersonal stress, but was not significantly correlated with episodic interpersonal stress; consequently, the path between episodic interpersonal stress and perceived burdensomeness was omitted from the structural equation model. Episodic non-interpersonal stress and chronic non-interpersonal stress were not significantly correlated with suicidal ideation or thwarted belongingness. Episodic non-interpersonal stress was significantly correlated with perceived burdensomeness. We thus did not include the chronic non-interpersonal stress index in the structural equation model. As episodic non-interpersonal stress was significantly associated with perceived burdensomeness, this relationship was included in the structural equation model.

3.2. Direct and indirect effects of interpersonal stress on suicidal ideation via thwarted belongingness and perceived burdensomeness

The model depicted in Fig. 1 was examined as a structural equation model. In addition to the relationships depicted in Fig. 1, the model also controlled for participant age, gender, race/ethnicity, and anxious/depressed scores. A variety of indices of model fit were evaluated and uniformly pointed toward excellent model fit: $\chi^2(3)=1.17$, $p=0.76$, RMSEA < 0.001, CFI=1.00, TLI=1.06, Standardized RMR=0.01. Fig. 1 shows the standardized parameter estimates for the coefficients (unstandardized coefficients are presented in parenthesis). Table 2 presents the 95% confidence intervals for each of the unstandardized path coefficients in the model.

The model identified significant direct paths from chronic interpersonal stress to thwarted belongingness and perceived burdensomeness, and from perceived burdensomeness to suicidal ideation. No other direct path was statistically significant.

With respect to the hypothesized indirect effects, the model identified a significant indirect path from chronic interpersonal stress to suicidal ideation via perceived burdensomeness. No other

Table 1
Means of, standard deviations of, and correlations between study variables.

	1	2	3	4	5	6	7	8	Mean (SD)
1. Suicidal ideation	–								19.93 (13.37)
2. Perceived burdensomeness	0.61***	–							19.46 (9.91)
3. Thwarted belongingness	0.46***	0.61***	–						19.45 (8.18)
4. Episodic interpersonal stress	0.19*	0.12	0.15*	–					3.64 (3.51)
5. Episodic non-interpersonal stress	0.13	0.15*	0.08	0.13	–				2.60 (3.69)
6. Chronic interpersonal stress	0.18*	0.34***	0.37***	0.16*	0.18*	–			11.30 (2.90)
7. Chronic non-interpersonal stress	0.13	0.12	0.10	0.06	0.26***	0.31***	–		12.65 (2.94)
8. YSR anxious/depressed T score	0.58***	0.57***	0.50***	0.16*	0.08	0.33***	0.10	–	66.04 (11.80)

Note: N=180.

YSR=Youth Self-Report.

* $p < 0.05$.

*** $p < 0.001$.

INTERPERSONAL STRESS AND SUICIDAL IDEATION

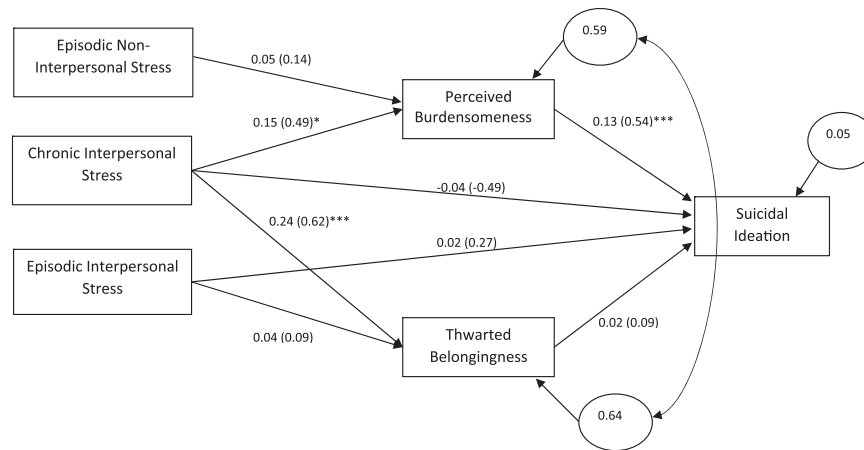


Fig. 1. Model of Indirect Effects of stress on suicidal ideation via perceived burdensomeness and thwarted belongingness. Note: All exogenous variables were assumed to be correlated; standardized path coefficients were estimated using STDYX Standardization; unstandardized path coefficients are in parentheses; model controls for participant age, gender, race/ethnicity, and Youth Self-Report anxiety and depression T score; **p* < 0.05, ****p* < 0.001.

Table 2
Point estimates and confidence intervals of unstandardized path coefficients for the Indirect Effect Model.

	Point estimate	95% Confidence interval
Direct paths		
Chronic interpersonal stress to perceived Burdensomeness	0.49*	0.06, 0.91
Chronic interpersonal stress to thwarted belongingness	0.62*	0.28, 0.96
Chronic interpersonal stress to suicidal ideation	-0.49	-0.98, 0.001
Episodic interpersonal stress to thwarted belongingness	0.09	-0.18, 0.36
Episodic interpersonal stress to suicidal ideation	0.27	-0.11, 0.65
Episodic non-interpersonal stress to perceived burdensomeness	0.14	-0.22, 0.49
Thwarted belongingness to suicidal ideation	0.09	-0.10, 0.29
Perceived burdensomeness to suicidal ideation	0.54*	0.34, 0.73
Indirect paths		
Chronic interpersonal stress to suicidal ideation via perceived burdensomeness	0.26*	0.02, 0.50
Chronic interpersonal stress to suicidal ideation via thwarted belongingness	0.06	-0.07, 0.18
Episodic interpersonal stress to suicidal ideation via thwarted belongingness	0.01	-0.02, 0.04
Episodic non-interpersonal stress to suicidal ideation via perceived burdensomeness	0.07	-0.12, 0.27

Note: N = 180.

* *p* < .05.

indirect path was statistically significant.

4. Discussion

Findings from the present study provide evidence of significant associations between interpersonal stress, perceived burdensomeness, thwarted belongingness, and suicidal ideation among 180 inpatient adolescents. Further, findings from a structural equation model provide evidence of an indirect association between chronic interpersonal stress and suicidal ideation via perceived burdensomeness toward others.

The present study adds to a growing body of research demonstrating a connection between interpersonal stress and suicide-related behaviors in adolescence (King and Merchant, 2008; Pettit et al., 2011). These findings extend prior research by empirically demonstrating that both chronic and episodic interpersonal stress were significantly associated with the severity of suicidal ideation. Acute events that disrupt an adolescent's interpersonal relationships (i.e., episodic interpersonal stress) and

ongoing interpersonal difficulties (i.e., chronic interpersonal stress) each are associated with thoughts of suicide and may represent separate risk pathways to suicide-related behaviors in adolescence (Grover et al., 2009). In contrast to the significant association between stress in interpersonal domains and suicidal ideation, no significant associations were found between stress in non-interpersonal domains and suicidal ideation. As will be elaborated below, these findings suggest case identification strategies in clinical settings and prevention strategies may prioritize interpersonal stress relative to non-interpersonal stress.

Findings on the proposed conceptual model revealed a significant indirect association for chronic interpersonal stress, such that the association between ongoing interpersonal difficulties and suicidal ideation was accounted for by a sense of burdensomeness toward others. These findings are congruent with those of Puzia et al. (2014), who reported that perceived burdensomeness mediated the association between childhood emotional abuse and suicidal ideation among college students. Adolescents who have interpersonal relationships characterized by ongoing conflict and tension (i.e., chronic stress) may come to believe that they are

a drain or a burden on other people in their lives, and this belief of being a burden on others appears to play a role in the pathway from chronic interpersonal stress to suicidal ideation.

Findings from the present study also are consistent with the possibility that ongoing stress in interpersonal relationships contributes to a sense of thwarted belongingness or social disconnection, but belongingness did not explain the association between interpersonal stress and suicidal ideation. These findings also are congruent with those of Puzia et al. (2014), who found that thwarted belongingness did not mediate the association between childhood emotional abuse and suicidal ideation. Growing evidence indicates that thwarted belongingness does not remain a statistically significant predictor of suicidal ideation after controlling for perceived burdensomeness toward others (e.g., Anestis and Joiner, 2011; Bryan et al., 2012; Monteith et al., 2013). Those findings, in conjunction with the present finding that thwarted belongingness does not account for the association between stress and suicidal ideation, suggest that social disconnection might hold lower value than perceived burdensomeness in screening and prevention approaches. Existing suicide prevention programs for adolescent suicide-related behaviors focus heavily on building social connectedness (i.e., thwarted belongingness) but do not explicitly address burdensomeness or social contribution (King et al., 2009, 2006; Carter et al., 2007). The present findings suggest a more explicit focus on social contribution (i.e., perceived burdensomeness toward others) may be a promising prevention target, especially among adolescents who experience ongoing stress in relationships with others.

Episodic interpersonal stress was significantly associated with suicidal ideation in bivariate analyses. However, no significant direct or indirect associations between episodic interpersonal stress and suicidal ideation were found in the structural equation model controlling for demographic variables and depressive and anxious symptoms. Although we did not test depressive and anxious symptoms as a mediator, the present findings are consistent with the possibility that the disruptive and acute nature of episodic stress precipitates intense psychological distress (i.e., depressive and anxiety symptoms) that cascades towards suicidal ideation (Bagge et al., 2013; Hill et al., 2012). Alternatively, it may be that shared variance between episodic interpersonal events and chronic interpersonal stress contributed to the non-significant associations between episodic interpersonal stress and suicidal ideation in the structural equation model.

The present study focused on proximal contextual (i.e., life stress) and cognitive variables (i.e., perceptions of belongingness and burdensomeness) associated with suicidal ideation in adolescence. These proximal variables are likely influenced by extensive learning histories and occur within broader developmental contexts. Early learning experiences with caregivers lead to the formation of attachment-related schema through which individuals process social information (Dykas and Cassidy, 2011). Insecure attachment-related schema may lead adolescents to process stressful social interactions as signs that they are a drain on others or they do not connect with others (cf. Venta et al., 2014). The influence of early learning histories and insecure attachments likely plays out in the context of familial relationships, as family relationship quality is a significant predictor of emotional well-being (e.g., Stice et al., 2004) and suicidal ideation (e.g., Lipschitz et al., 2012) during adolescence. Early learning histories may also influence social functioning in peer and romantic relationships, which are characterized by increasing complexity and importance during adolescence. Now that this study has documented an indirect association between chronic interpersonal stress and suicidal ideation via perceived burdensomeness toward others, important next steps will be to identify specific interpersonal contexts (e.g., family, friend, romantic) in which ongoing stress

and perceptions of burdensomeness are most likely to promote suicidal ideation during adolescence and to disentangle the influences of distal (e.g., attachment-related schema) and proximal processes (e.g., interpersonal stress) on suicidal ideation in adolescence.

The findings should be interpreted in light of the study's limitations. First, although suicidal ideation and stress were assessed using semi-structured interviews and stress ratings were made by an independent team, adolescents were the sole informant source. Collection of data from an additional source, such as parents, could corroborate the occurrence of life events and behaviors reported by adolescents. Second, the optimal time interval for evaluating the associations between stress and constructs such as perceived burdensomeness, thwarted belongingness, and suicidal ideation remains unclear. It is possible that stress, especially episodic stress, may exert short term influences on interpersonal functioning and suicidal ideation that were not adequately captured in the six month measurement period of this study. Third, the high racial/ethnic minority composition and clinical severity of this inpatient sample may limit the generalizability of these findings to adolescents in other settings. Fourth, although depressive and anxious symptoms were statistically controlled, data on psychiatric diagnoses were not available.

The cross-sectional design prevented examination of the temporal duration or persistence of thwarted belongingness and perceived burdensomeness. It is possible that indirect associations between interpersonal stress and suicidal ideation are stronger when stress leads to prolonged as opposed to transient cognitions of thwarted belongingness and burdensomeness (cf. Van Orden et al., 2010). The cross-sectional design also prevents conclusions regarding the directions of associations. Guided by theory, we have discussed findings in terms of a model wherein interpersonal stress predicts suicidal ideation at least in part via perceived burdensomeness. In light of the cross-sectional study design, however, we cannot rule out alternative directional paths. For example, it is possible that perceptions of social disconnection or of being a burden on others may promote behaviors that unintentionally generate stress in interpersonal relationships (i.e., stress generation; Hammen, 1991). It also is possible that chronic stress in relationships with others gives rise to acute, episodic stress in relationships. We encourage future studies to examine such possibilities and to test the theoretical model presented in this study using prospective, longitudinal designs.

5. Implications for research, policy, and practice

The current findings may be used to inform case identification, prevention strategies, risk monitoring for adolescents at risk of suicidal ideation. With regards to case identification, the findings suggest distinguishing between interpersonal and non-interpersonal stress may lead to more accurate identification of adolescents at risk for high levels for suicidal ideation in clinical settings. Not all types of stress are equal in terms of their association with suicidal ideation; interpersonal stress relative to non-interpersonal stress may hold greater utility for clinicians in identifying adolescents at high risk. With regard to prevention strategies, the present findings suggest social contribution and perceptions of being a burden on others hold promise as potential targets for preventing or reducing suicidal ideation, especially among adolescents who experience ongoing stress in interpersonal relationships. We are currently evaluating such a prevention program that explicitly targets social contribution in adolescence. Finally, with regard to risk monitoring among adolescents who are already receiving mental health services, routine monitoring of the presence and level of interpersonal stress could be embedded within

current suicide risk assessment strategies. Further, the occurrence of stress in interpersonal relationships and/or thoughts of being a burden on others could be identified as a warning sign to cue adolescents to use a safety plan (Stanley and Brown, 2012).

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