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Interpersonal Trauma and Suicide Ideation: The Indirect Effects of Depressive Symptoms, Thwarted Belongingness, and Perceived Burden

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Abstract

Suicide risk is elevated among college-aged students and individuals exposed to cumulative interpersonal trauma. This study used the interpersonal theory of suicide as a framework to test the relation between cumulative interpersonal trauma and suicide ideation through the indirect effects of cumulative interpersonal trauma via depression, thwarted belongingness (TB), and perceived burdensomeness (PB), in serial. Participants were 261 college students who endorsed prior trauma and completed cross-sectional study measures online. An atemporal serial mediation model indicated that cumulative interpersonal trauma significantly and indirectly related to suicide ideation through depressive symptoms, TB, and PB. The relation between cumulative interpersonal trauma and suicide ideation was explained by greater depressive symptoms, TB, and PB, in serial. Therefore, depressive symptoms, TB, and PB may be important modifiable clinical targets for college students with a history of cumulative interpersonal trauma.

Keywords

trauma; depression; thwarted belongingness; perceived burdensomeness; suicide

In 2017, approximately 10 million individuals reported experiencing suicide ideation, and suicide is the second leading cause of death for individuals aged 10 to 34 years (Centers for Disease Control and Prevention [CDC], 2019). Previous research indicates that a history of trauma exposure is robustly related to increased suicide risk (e.g., Chesney et al., 2014; Hawton et al., 2013; Stein et al., 2010). However, with approximately 89% of adults from a national U.S. sample reporting exposure to at least one traumatic event (Kilpatrick et al., 2013) and 8% of college students reporting serious suicide ideation each year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019), it is clear that not

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everyone who is exposed to trauma will experience suicide ideation. More research is needed to better understand why some trauma survivors experience elevated suicide ideation and behaviors, whereas others do not. Previous research has indicated that sexual abuse and other forms of interpersonal traumas (e.g., physical abuse) were strongly associated with thoughts of suicide and a history of suicide attempts (Stein et al., 2010). In fact, exposure to interpersonal trauma (e.g., sexual abuse, physical abuse) is correlated with greater depressive symptoms, interpersonal risk factors (e.g., social isolation), and suicidal thoughts and behaviors (e.g., Chen et al., 2010; Dube et al., 2001; Stein et al., 2010). In addition, prior research indicates exposure to noninterpersonal traumas (e.g., national crises) might not significantly increase suicide risk or might not be as robust of a predictor as interpersonal traumas (e.g., Biller, 1977; Joiner et al., 2006). Despite these findings, more research is needed to clarify the relation between interpersonal trauma and suicide risk. To this end, the current study examined constructs from the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) to further clarify the relation between cumulative interpersonal trauma (i.e., total number of varied forms of interpersonal trauma, e.g., Cloitre et al., 2009; Hodges et al., 2013), depressive symptoms, and suicide ideation among young adults with a history of trauma exposure.

Literature indicates that psychiatric symptoms likely contribute to or partially explain the increased risk for suicide ideation and attempts among individuals reporting trauma histories (e.g., Chen et al., 2010; Oquendo et al., 2003; Overholser et al., 2012; Panagioti et al., 2011). Elevated depressive symptoms may be a particularly important link between interpersonal trauma exposure and suicidal thoughts and behaviors. For example, research suggests that individuals who have experienced interpersonal trauma (i.e., sexual abuse, physical abuse) and more than one interpersonal trauma were more likely to have a lifetime depression diagnosis and experience depressive symptoms earlier in life (Chen et al., 2010; Hodges et al., 2013). Data further indicate that men and women diagnosed with unipolar depression (irrespective of trauma exposure) die by suicide at a rate that is approximately 20 and 27 times greater, respectively, than would be expected in the general population (Ösby et al., 2001). Yet, depressive symptoms, similar to the incidence of trauma exposure (Kilpatrick et al., 2013), do not fully explain why people think about suicide or die by suicide. This suggests that exposure to cumulative interpersonal trauma and depressive symptoms are not sufficient predictors for suicidal thoughts and behaviors; therefore, more research is needed to contextualize the multifactorial nature of suicide risk among trauma survivors.

The interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) offers a parsimonious conceptualization of how risk factors (e.g., depressive symptoms, cumulative interpersonal trauma) may interrelate to increase suicidal thoughts and behaviors. This theory contends that risk factors for suicide are either distal (i.e., factors that might indirectly increase suicide risk by creating a vulnerability for or exacerbating other risk factors) or proximal (i.e., factors that directly precipitate increased suicide risk) in relation to suicidal thoughts and behaviors. This theory proposes two *proximal* risk factors for suicide ideation, feeling a lack of belonging (i.e., thwarted belongingness [TB]), and perceiving that one is a burden on others (i.e., perceived burdensomeness [PB]; Joiner, 2005; Van Orden et al., 2010). In addition, a third proximal risk factor for suicidal behaviors is the acquired capability to engage in a lethal suicide attempt. Meta-analytic research has generally

supported the interpersonal theory of suicide (Chu et al., 2017). The current study focused on TB and PB, given the primary outcome of interest is suicide ideation. The interpersonal emphasis of this theory might make it particularly relevant to understanding the relation between interpersonal trauma and suicide risk. Research from Ullman and Najdowski (2009) also support the associations between the interpersonal theory of suicide and interpersonal trauma exposure. Results indicated that reported self-blame (a facet of PB) was significantly associated with serious suicide ideation among females reporting a sexual assault history (Ullman & Najdowski, 2009). These results provide initial evidence that PB may confer risk among females with sexual assault histories. These findings are consistent with the interpersonal theory of suicide, which suggests that TB and PB are proximal risk factors for suicide and might be especially evaluated among individuals exposed to interpersonal trauma.

The interpersonal theory of suicide suggests that distal risk factors for suicide ideation (e.g., exposure to interpersonal trauma, depressive symptoms) increase suicide ideation by precipitating proximal risk factors, TB and PB (Joiner, 2005; Van Orden et al., 2010). Experiencing depressive symptoms (e.g., lacking interest in pleasurable activities, fatigue or loss of energy, depressed mood; *Diagnostic and Statistical Manual of Mental Disorders* [5th ed.; American Psychiatric Association, 2013]) may be a precursor to TB and PB. Depressive symptoms may decrease one's opportunity to receive reciprocal care, increase feelings of loneliness, and further reinforce negative interpersonal schemas, thereby increasing suicide ideation. Studies have found partial support for this temporal relation when testing the indirect effects of TB and PB in the relation between depressive symptoms and suicide ideation (e.g., Bryan et al., 2013; Davidson et al., 2011). In a prospective study of depressed undergraduate students, results indicated that symptoms of depression were significantly related to increased TB and PB, and subsequently, TB and PB significantly related to increased suicidal ideation (Kleiman et al., 2014). In addition, in a cross-sectional study, Davidson et al. (2011) found that PB, but not TB, significantly mediated the relation between depression and suicide ideation. Furthermore, literature indicates PB is a significant mediator between distal risk factors (e.g., depressive symptoms, body mass index) and increased suicide ideation (e.g., Bryan et al., 2013; Davidson et al., 2011; Dutton et al., 2013). Thus, depressive symptoms may be one antecedent to TB and PB; however, it remains unclear how cumulative interpersonal trauma may be integrated into these relations.

In an effort to further elucidate the impact of these experiences on suicide risk, it is important to explore the role of proximal risk factors (i.e., TB and PB) on suicide ideation within a multifaceted model. Previous findings are somewhat mixed (e.g., Bryan et al., 2013; Davidson et al., 2011; Dutton et al., 2013), such that TB, relative to PB, has not been a consistently robust predictor of suicide ideation (Chu et al., 2017; Ma et al., 2016), especially in the context of multiple predictor models (Mitchell et al., 2017). Thus, it is important to consider explanations that may inform our understanding of the proximal relations between TB, PB, and suicide ideation in the context of distal risk factors (i.e., cumulative interpersonal trauma and depressive symptoms).

A compelling explanation for the mixed findings may be that TB and PB influence each other, and therefore, make it more difficult to reliably identify their unique influence on

suicide ideation, without considering their proximal relations (Kleiman et al., 2014; Mitchell et al., 2017). Literature related to cognitive vulnerability models supports this possibility (e.g., Dozois & Beck, 2008). For example, if schemas or events are highly related but distinct, as TB and PB are posited to be (Van Orden et al., 2010), then the onset of one schema or event would make the activation of the closely related schema and subsequent emotions more likely (e.g., Dozois & Beck, 2008; Seeds & Dozois, 2010). It is possible that when one experiences loneliness and lacks caring relationships (facets of TB), they may then experience lower self-esteem and think that their death is more valuable than their life (facets of PB). If this is accurate, it would suggest that experiencing TB may increase one's vulnerability to experiencing PB and vice versa. However, given that TB has not been a robust indicator of increased suicide ideation (Chu et al., 2017; Ma et al., 2016) and PB consistently mediates the association between depressive symptoms and suicide ideation (e.g., Bryan et al., 2013; Davidson et al., 2011; Dutton et al., 2013), PB may be more proximally related to suicide ideation. There is utility in examining models that better depict how TB and PB may be related and mediate the relation between empirically established risk factors (i.e., cumulative interpersonal trauma and depressive symptoms) for suicide ideation.

To summarize, it is possible that when an individual experiences a distal risk factor for suicide ideation (e.g., cumulative interpersonal trauma), their vulnerability to another distal risk factor (e.g., depressive symptoms) may increase, which then further increases their risk for proximal risk factors (e.g., TB and PB) and increases the likelihood of suicide ideation. Thus, this study proposed an atemporal serial mediation model,¹ which integrated cumulative interpersonal trauma, depressive symptoms, TB, and PB as predictors of suicide ideation. It was hypothesized that the positive relation between cumulative interpersonal trauma and suicide ideation would be explained by the indirect effects of depressive symptoms, TB, and PB, in serial. In other words, cumulative interpersonal trauma would be positively associated with depressive symptoms, then positively associated with TB, then positively associated with PB, which in turn would be positively associated with suicide ideation. Depressive symptoms were modeled as the first mediator in the series because exposure to interpersonal trauma has been related to increased depressive symptoms (e.g., Chen et al., 2010) and previous research indicates that depressive symptoms predict increased TB and PB (e.g., Bryan et al., 2013; Davidson et al., 2011; Kleiman et al., 2014; O'Keefe et al., 2016). TB was modeled as the second mediator because depressive symptoms likely decrease opportunities for reciprocal care and increase social isolation. In addition, TB has been inconsistently related to suicide ideation (Chu et al., 2017; Ma et al., 2016), indicating that additional factors may be influencing increased suicide ideation, such as PB. Finally, PB was modeled as the third mediator given consistent empirical findings that it is associated with increased suicide ideation (Chu et al., 2017; Ma et al., 2016) and consistently mediates the association between depressive symptoms on suicide ideation (e.g., Bryan et al., 2013; Davidson et al., 2011; Dutton et al., 2013), suggesting that it may be a particularly pernicious and proximal risk factor for suicide ideation.

¹·An atemporal serial mediation model is defined as a model that enters the predictor and mediating variables in a specific serial order. However, the data are cross-sectional, and the model does not imply a causal or temporal sequence of the predictor and mediating variables.

Method

Participants

Participants were 261 college students reporting a history of trauma exposure and enrolled in an introductory psychology course. The sample consisted of mostly freshmen ($n = 151$; 57.9%). These participants were recruited after initial screening if they reported exposure to at least one traumatic event of any type (e.g., sexual abuse, physical abuse, natural disaster), which was assessed using the Traumatic Events Questionnaire (TEQ; Vrana & Lauterbach, 1994; described below). Participants were 141 females (54%) and 112 males (42.9%); no participants identified as transgender, and eight participants elected not to disclose their gender ($M_{age} = 19.56$ years, $SD_{age} = 3.19$ years, range = 17–49 years). The sample consisted of individuals who identified as Caucasian ($n = 170$; 65.1%), Hispanic ($n = 62$; 23.8%), African American ($n = 22$; 8.4%), Asian ($n = 11$; 4.2%), and “other” ($n = 2$; 0.77%). Furthermore, 236 participants (90.4%) identified as heterosexual, five (1.9%) identified as gay/lesbian, eight (3.1%) identified as bisexual, three (1.1%) identified as questioning, three (1.1%) identified as unsure, and six (2.3%) elected not to disclose their sexual orientation.

Measures

Interpersonal Needs Questionnaire (INQ).—The INQ (Van Orden et al., 2012) is a 15-item self-report assessment of “recent” TB (nine items; e.g., “These days I feel disconnected from people”) and PB (six items; e.g., “These days I feel like a burden to the people in my life”) from the interpersonal theory of suicide. Respondents endorse items using a 7-point scale ranging from 1 (*not at all true for me*) to 7 (*very true for me*). Higher scores on the INQ reflect greater TB or PB. The INQ has demonstrated good psychometric properties among college samples (Van Orden et al., 2012). Cronbach’s alphas for the current sample were .83 for the TB subscale and .94 for the PB subscale.

TEQ.—The TEQ (Vrana & Lauterbach, 1994) is a 11-item self-report assessment of lifetime exposure to traumatic events across 10 distinct events (e.g., crime-related experiences, sexual trauma). There is one additional item on the TEQ that states, “Have you had any experiences like these that you feel you can’t tell about?” Respondents endorsed these items as *yes* (1) or *no* (0). If the participant indicated, yes, then the participant is asked a series of follow-up questions (e.g., “How many times has this happened?” “How old were you when this happened?”). Previous research has indicated that experiencing cumulative interpersonal trauma might confer a greater risk for mental health symptomatology and suicide risk (Chen et al., 2010; Dube et al., 2001; Stein et al., 2010). Given this, for the purposes of this study, cumulative interpersonal trauma was assessed with three yes/no items of the TEQ that assess the occurrence of interpersonal sexual violence or physical abuse events as a child or an adult. These three items were summed to reflect the total number of types of interpersonal trauma experienced, and the range for interpersonal traumas was zero to three (the frequencies for these scores are provided in the “Results” section). This scoring allowed us to assess the impact of cumulative interpersonal traumas rather than assuming that experiencing one or more interpersonal traumas would have the same impact on a person by collapsing these scores into a dichotomous variable. The TEQ has demonstrated good psychometric properties in previous research (e.g., Crawford et al., 2008; Vrana &

Lauterbach, 1994). The TEQ is a face-valid measure of traumatic events, and therefore the items are not necessarily expected to intercorrelate; thus, Cronbach's alpha was not calculated for this measure.

Depression Anxiety Stress Scale (DASS).—The DASS (Lovibond & Lovibond, 1995) is a 42-item self-report assessment consisting of three subscales (14 items each): depression, anxiety, and stress. While considering the past week, respondents endorse items using a 4-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). The subscales have been shown to have good reliability and validity in previous research (e.g., Crawford & Henry, 2003), including among undergraduate student samples (e.g., Mitchell et al., 2018), where higher scores reflect greater psychiatric symptomatology. For the current study, given our focus on depression as an atemporal mediating variable, only the depression subscale was used, which had Cronbach's alpha of .96.

Positive and Negative Suicide Ideation Scale (PANSI).—The PANSI (Osman et al., 1998) is a 14-item self-report assessment comprising two subscales measuring suicidal thoughts that are negative (eight items; negative thoughts related to living) and positive (six items; positive thoughts related to living). While considering the past two weeks, respondents endorse items using a 5-point scale that ranges from 1 (*none of the time*) to 5 (*most of the time*). Sample items for the negative suicide ideation subscale include “During the past two weeks, have you seriously considered killing yourself because you could not live up to the expectations of other people?” and “During the past two weeks, I felt hopeless about the future and you wondered if you should kill yourself?” The PANSI has demonstrated strong internal consistency reliability (Gutierrez & Osman, 2008), including among undergraduate student samples (Mitchell et al., 2018). Given the current study's focus on suicide ideation, rather than positive thoughts toward life, only the negative suicide ideation subscale was used, which had Cronbach's alpha of .97.

Procedures

The current study was part of a larger study that spanned approximately two years and aimed to examine trauma of different types, psychiatric symptomatology, and suicide risk. Eligibility for recruitment was determined through a prescreening of all introductory psychology students. Students who reported at least one traumatic experience of any type on the TEQ during prescreening were then invited (via an email invitation) to participate in the larger study, which produced our final sample of 261 trauma-exposed undergraduate students. There were no other inclusion or exclusion criteria. Interested and eligible participants provided informed consent and then completed the study protocol using online survey software during a single research session. The study measures were not presented in a randomized order as some measures in the larger study had to be administered in sequence. Participants received course credit for their participation. All participants received suicide crisis line information and local mental health resources upon completion of the survey. Participants' responses were confidential and anonymous. The university's institutional review board approved all procedures.

Data Analysis

SPSS Version 24 was used for the analysis. An atemporal serial mediation analysis (Model 6) was performed using the PROCESS macro (Hayes, 2013). This statistical approach can be used with cross-sectional data to model *possible* causal sequences (Hayes, 2013). However, this method is still based in ordinary least squares regression; therefore, results *cannot* determine causality but may provide insight into models that should be tested longitudinally in the future. The atemporal serial mediation model for this study was built using 5,000 bootstrap samples and 95% bias-corrected confidence intervals (CIs).

The statistical significance of the indirect effects was indicated by the CIs, where CIs *not* containing zero are statically significant (Hayes, 2013). With the current data analytic approach, the predictor variable does not need to be significantly related to the criterion variable to examine indirect effects (Hayes, 2013). Finally, we calculated the skew or kurtosis statistic divided by the skew or kurtosis standard error, respectively, where a value greater than 3.29 indicated significant skew and kurtosis (Tabachnick & Fidell, 2007). This calculation indicated that the variables were significantly skewed and kurtotic. Although our variables evidenced positive skew and kurtosis, this analysis does not require normal distributions (Hayes, 2013). For the analysis, we tested the relation between cumulative interpersonal trauma (predictor variable) and suicide ideation (criterion variable), and the indirect effects of cumulative interpersonal trauma via depressive symptoms (Atemporal Mediator Variable 1), TB (Atemporal Mediator Variable 2), and PB (Atemporal Mediator Variable 3), sequentially. Due to missing data, 244 out of the 261 participants were included in the atemporal serial mediation analysis.

Results

The nine identified univariate outliers were corrected to three standard deviations from the mean (Tabachnick & Fidell, 2007). Means and standard deviations for each measure are provided in Table 1. Bivariate correlations suggest that several variables were significantly correlated (Table 1), but multicollinearity was not present ($r > .80$; Katz, 2006). Furthermore, 43 participants reported exposure to one interpersonal trauma, 17 reported exposure to two interpersonal traumas, two reported exposure to three interpersonal traumas, 189 participants did not report interpersonal trauma exposure, and 10 participants had missing data on this variable; therefore, 62 participants had at least one exposure to interpersonal trauma. All 244 participants were included in the atemporal serial medial analysis. Notably, suicide ideation was not significantly associated with age ($r = -.01$, $p = .940$), gender ($r_{pb} = .02$, $p = .803$), sexual orientation (dichotomized as heterosexual and nonheterosexual; $r_{pb} = -.12$, $p = .068$), or race (dichotomized as White and non-White; $r_{pb} = -.05$, $p = .461$); therefore, these variables were not included as covariates in our model.

Findings indicated that the hypothesis was supported (Figure 1), such that the specific indirect effect of cumulative interpersonal trauma on suicide ideation through depressive symptoms, TB, and PB, in serial, was significant (indirect effect = 0.26, 95% CI = [0.08, 0.55], $F[4, 239] = 62.65$, $R^2 = .51$, $p < .001$). Notably, these variables predicted 51% of the variance in suicide ideation. Additional significant indirect effects included cumulative interpersonal trauma on suicide ideation through depressive symptoms (indirect effect =

0.61, 95% CI = [0.17, 1.35]) and cumulative interpersonal trauma on suicide ideation through depressive symptoms and PB, in serial (indirect effect = 0.31, 95% CI = [0.10, 0.68]). There were no other significant indirect effects including TB.

When examining the model paths, cumulative interpersonal trauma was significantly positively related to depressive symptoms ($b = 3.68$, 95% CI = [1.91, 5.45], $p < .001$, $F[1, 242] = 16.71$, $R^2 = .25$, $p < .001$). Depressive symptoms were then significantly positively related to TB when holding the other predictor variables in the model constant ($b = 0.64$, 95% CI = [0.53, 0.76], $p < .001$, $F[2, 241] = 63.82$, $R^2 = .35$, $p < .001$). TB was then significantly positively related to PB when holding the other predictor variables in the model constant ($b = 0.22$, 95% CI = [0.16, 0.27], $p < .001$, $F[3, 240] = 77.61$, $R^2 = .49$, $p < .001$). Finally, PB was significantly positively related to suicide ideation when holding the other predictor variables in the model constant ($b = 0.50$, 95% CI = [0.35, 0.65], $p < .001$, $F[4, 239] = 62.65$, $R^2 = .51$, $p < .001$). Notably, depressive symptoms were significantly positively associated with suicide ideation when holding the other predictor variables in the model constant ($b = 0.16$, 95% CI = [0.09, 0.24], $p < .001$). Furthermore, cumulative interpersonal trauma did not significantly directly relate to TB ($b = -1.35$, 95% CI = [-2.98, 0.29], $p = .106$), PB ($b = 0.39$, 95% CI = [-0.29, 1.09], $p = .261$) nor suicide ideation ($b = 0.46$, 95% CI = [-0.35, 1.27], $p = .26$) when holding the other predictor variables in the model constant, which is contrary to the bivariate correlations (Table 1). Similarly, TB did not significantly directly relate to suicide ideation ($b = 0.06$, 95% CI = [-0.01, 0.13], $p = .109$), which again is inconsistent with the bivariate correlation.

Due to the cross-sectional data used for analyses, post hoc sensitivity analyses tested a possible alternative atemporal serial mediation model with PB as the second mediator and TB as the final mediator in the model. Statistical significance of this alternative model's indirect effects provided counterevidence to our hypothesized model's variable order in the serial indirect effects. In this alternative model, cumulative interpersonal trauma was indirectly related to suicide ideation via depressive symptoms (indirect effect = 0.61, 95% CI = [0.16, 1.33]). Cumulative interpersonal trauma was indirectly related to suicide ideation via depressive symptoms and PB, in serial (indirect effect = 0.56, 95% CI = [0.20, 1.15]). However, the indirect effect of cumulative interpersonal trauma to suicide ideation via depressive symptoms, PB, and TB, in serial, was not significant (indirect effect = 0.06, 95% CI = [-0.002, 0.21]). The lack of the significant atemporal serial indirect effect of the alternative model with depressive symptoms, PB, and TB as serial mediators provides further support for the original hypothesized mediator sequence.

Discussion

This study aimed to elucidate the relation between cumulative interpersonal trauma (i.e., sexual violence or physical abuse) and suicide ideation by examining the indirect effects of depressive symptoms, TB, and PB in an atemporal serial mediation analysis. In this cross-sectional study, our hypothesized model was supported, such that cumulative interpersonal trauma was related to suicide ideation through the significant indirect effects of greater depressive symptoms, TB, and PB, in serial. Surprisingly, cumulative interpersonal trauma was not significantly directly related to TB, PB, nor suicide ideation. This is an

important finding as previous research has indicated that sexual abuse and other forms of interpersonal traumas were strongly associated with thoughts of suicide and a history of suicide attempts (Stein et al., 2010). This suggests that interpersonal trauma exposure alone might not directly confer greater suicide risk, but rather the sequelae (e.g., depressive symptoms, TB, and PB), and how one responds to such sequelae that might increase risk in individuals reporting interpersonal trauma. Furthermore, depressive symptoms, as well as depressive symptoms and PB, in serial, were significant indirect pathways from cumulative interpersonal trauma to suicide ideation. There were no other significant indirect effects, and TB was only a significant mediator in the total atemporal serial mediation model. These results suggest that the combination and order of risk factors (depressive symptoms, TB, and PB) may explain why some individuals reporting a history of trauma experience elevated suicide ideation, whereas others do not. That is, individuals who survived interpersonal trauma, but who do not then experience depressive symptoms, TB, and PB, may be less likely to develop suicide ideation than individuals who do experience these additional factors.

The findings from this study are mostly in line with the interpersonal theory of suicide, such that TB and PB acted as significant proximal indicators of increased suicide ideation (e.g., Kleiman et al., 2014), compared with cumulative interpersonal trauma and depressive symptoms. These results also support previous findings indicating that PB is robustly associated with increased suicide ideation (e.g., Chu et al., 2017; Ma et al., 2016). Interestingly, in the current atemporal serial mediation model, TB did not directly and significantly relate to suicide ideation. Bivariate analyses, however, indicated that TB was significantly correlated with suicide ideation, depressive symptoms, and PB. This suggests that TB is a relevant bivariate correlate of suicide ideation; however, the statistical significance of TB (as evidenced by the strong bivariate correlation) may be masked when examined in a multiple predictor model alongside other strong correlates of suicide ideation (i.e., depressive symptoms and PB). This possibility is consistent with previous literature that has demonstrated TB is a meaningful clinical indicator of suicide ideation, although its statistical significance may be difficult to detect when more complex models are tested due to overlapping variance across multiple predictors (Mitchell et al., 2017).

Another possible explanation for the nonsignificant effect of TB in the atemporal serial mediation model is that TB may impact PB, and this relation makes it difficult to test their unique influence on suicide ideation in cross-sectional designs, which is also supported by the cognitive vulnerability literature (e.g., Dozois & Beck, 2008; Seeds & Dozois, 2010). If considered within the interpersonal theory of suicide, this process could present as one experiencing TB, which lowers self-esteem and increases feelings of liability on others (components of PB), thereby, increasing suicide ideation. Although we could not test these temporal or developmental trajectories, given the cross-sectional design of the current study, this is a possibility that warrants greater empirical attention using longitudinal methods, as it has the potential to inform suicide theory and impact clinical intervention.

The current findings have relevant clinical implications related to suicide risk assessment and management; however, clinicians should consider the limited diversity of our sample when attempting to generalize or apply our findings. Taken together, cumulative

interpersonal trauma, depressive symptoms, TB, and PB collectively accounted for 51% of the variance in suicide ideation (whereas individually they accounted for 4% to 42% of the variance in suicide ideation); thus, clinicians should consider the additive effect of these experiences as it relates to the severity of suicide ideation and associated suicide risk. Furthermore, standard risk assessment should include both nonmodifiable risk factors (e.g., interpersonal trauma using trauma inventories; demographic characteristics such as age, gender, and ethnicity) and modifiable indicators (e.g., worsening depressive symptoms [assessed via depression inventories], TB, and PB [assessed via the INQ]) to better estimate their acute risk for suicide. Importantly, among trauma survivors, stratifying risk across severity (i.e., low to high) and temporality (chronic or acute) will help improve risk formulation, as well as clarify targets for intervention (see Wortzel et al., 2014). Early intervention aimed at reducing depressive symptoms and/or challenging maladaptive schemas related to TB and PB (e.g., via cognitive-behavioral therapy) may prevent or reduce the additive effect of multiple risk factors, which would likely produce better mental health outcomes and reduce suicide ideation.

It is important to recognize that 49% of the variance in suicide ideation was not accounted for by the hypothesized model. This indicates that additional factors beyond those included in our model are influencing suicide ideation among those with a history of interpersonal trauma. Another contemporary theory of suicide, the three-step theory (3ST), suggests that physiological or emotional pain and hopelessness about this pain subsiding produce suicide ideation (Klonsky & May, 2015). Among those experiencing suicide ideation, the extent one is connected to others determines whether suicide ideation is moderate (connectedness is greater than pain) or strong (pain is greater than connectedness). Although the interpersonal theory and 3ST both propose that TB may contribute to suicide ideation (either development or magnitude); the interpersonal theory strongly emphasizes the role of TB and other interpersonal factors (e.g., PB) that may be more closely related to risk factors, such as interpersonal trauma. Although the current study focused on the interpersonal theory's view of TB, it is possible that additional sources of psychological pain (e.g., social isolation, negative self-perceptions), hopelessness, and connectedness, as proposed by the 3ST may serve as proximal risk factors for the development of suicide ideation among those with a history of interpersonal trauma, for which we did not account in our hypothesized model.

Similarly, although previous research has indicated that neurobiological or physiological processes may underlie suicide ideation and behaviors in those with a history of trauma exposure (e.g., Jollant et al., 2011; Mann, 2003; Mann et al., 2006), we did not examine these variables. Examining the interpersonal theory variables in conjunction with other theories such as the stress diathesis model of suicidal behavior (e.g., Mann et al., 1999; van Heeringen, 2012) may help to further elucidate risk factors related to elevated suicide ideation and behaviors among individuals with a history of interpersonal trauma exposure. For example, the life span model of suicide has been proposed in an effort to unify the interpersonal theory of suicide and Mann's stress diathesis model (Ludwig et al., 2017). Future researchers should explore distal and proximal risk indicators of suicide risk using these frameworks in an effort to enhance the identification of at-risk individuals and refine suicide intervention.

The results from the current study should be considered in context with the limitations of the study design. First, the sample consisted of college students that identified mostly as Caucasian (65%), enrolled in an introductory psychology course, who reported at least one traumatic event during prescreening. Although 8% college students report “serious” suicide ideation (compared with 3.9% of all adults; SAMHSA, 2019), the results likely do not represent a more severe clinical sample (e.g., inpatient psychiatric patients), diverse sample, or apply to all forms of trauma exposure. Future research should consider testing these relations among more diverse samples and exploring how the chronicity, frequency, and type of exposure (e.g., combat trauma, trauma stemming from other forms of employment such as emergency responders) could impact the variables presented in the current study. Furthermore, the current study utilized self-report data that was administered online from college student volunteers, and therefore, may have been vulnerable to self-report biases, inaccurate reporting, and self-selection bias. Future research may also consider alternative measures of cumulative interpersonal trauma, depression, and suicide ideation. Although the measures that we selected have strong psychometric properties, replication with other measures would guard against possible measurement effects. This study only tested the TB and PB components of the interpersonal theory of suicide. Given that cumulative interpersonal trauma may also be relevant to suicide capability, the third component of the interpersonal theory of suicide, future research should test this association.

Another limitation is that although the current study tested potential mediators in a specific serial order, we were unable to infer causality or sequential patterns because of the cross-sectional study design. The current study was intended to offer a theory-based, intuitive, and novel empirical model upon that future longitudinal studies can replicate and extend. A critical need in suicide research is the ability to better understand the suicidal process, specifically related to acute suicide risk. Future research can expand on the current findings by examining distal and proximal risk factors for suicide over time using multi-modal methods of assessment (e.g., ecological momentary assessment [EMA], physiological indicators), with the intention to identify mechanisms that activate and increase acute suicide risk. For example, future research could use EMA to (a) better understand the activation of and shortterm changes in TB and PB in relation to cumulative interpersonal trauma and depressive symptoms, (b) causally explore whether the activation of one construct leads to the activation of another, and (c) how these constructs function as proximal predictors of worsening suicide ideation.

The current study is an important first step in understanding how empirically established risk factors for suicide may be interrelated to increased suicide ideation. The present findings suggest that it may be important for mental health providers and researchers alike to consider the additive and sequential associations between depressive symptoms, TB, and PB when assessing and managing suicide risk. Future studies should aim to build on the current study by exploring the posited temporal relations longitudinally, among more diverse samples, using modern theories that address interpersonal needs (interpersonal theory of suicide) and biophysical processes (Ludwig et al., 2017; Mann et al., 1999), and with a multimethod assessment approach (e.g., EMA, physiological indicators). Such research will likely substantially enhance our understanding of the suicidal process, specifically acute suicide risk, which will help reduce the incidence of suicide deaths.

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Figure 1.

Unstandardized path coefficients of the indirect effects of depressive symptoms, thwarted belongingness, and perceived burdensomeness in the relation between interpersonal trauma and suicide ideation from the atemporal serial mediation model.

Note. Depressive symptoms as a significant atemporal mediator in the relation between interpersonal trauma and suicide ideation: indirect effect = 0.61, 95% CI = [0.17, 1.35]. Depressive symptoms and perceived burdensomeness, in serial, as significant atemporal mediators in the relation between interpersonal trauma and suicide ideation: indirect effects = 0.31, 95% CI = [0.10, 0.68]. There are no other significant indirect effects. CI = confidence interval; *ns* = not statistically significant.

* $p < .001$.

Table 1.

Correlations and Descriptive Statistics.

Measure	1	2	3	4	5
1. Interpersonal trauma	—				
2. Depressive symptoms	.26 [*]	—			
3. Thwarted belongingness	.07	.58 [*]	—		
4. Perceived burdensomeness	.17 [*]	.60 [*]	.64 [*]	—	
5. Suicide ideation	.19 [*]	.58 [*]	.54 [*]	.65 [*]	—
<i>M</i>	—	8.73	32.36	14.87	10.81
<i>SD</i>	—	9.12	5.47	4.65	5.54
Observed range	0–3	1–42	10–55	6–34	8–40

Note. Interpersonal trauma: TEQ total score; depressive symptoms: DASS depression subscale score; perceived burdensomeness: INQ perceived burdensomeness subscale score; thwarted belongingness: INQ thwarted belongingness subscale score; suicide ideation: PANSI negative suicide ideation subscale score. TEQ = Traumatic Events Questionnaire; DASS = Depression Anxiety Stress Scale; INQ = Interpersonal Needs Questionnaire; PANSI = Positive and Negative Suicide Ideation Scale.

^{*}
p < .01.