

The Interpersonal-Psychological Theory of Suicide and Associated Family Factors in  
Clinically Suicidal and Depressed Adolescents

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## **Abstract**

Suicide is a leading cause of death in adolescence. The mechanisms of adolescent suicidality, however, are not fully understood. Although the Interpersonal-Psychological Theory of Suicide, as assessed by the Interpersonal Needs Questionnaire-15 (INQ), may be a promising framework, systematic study of its utility during adolescence is lacking. To this end, I utilized factor analyses and hierarchical regression analyses to test the factor structure, correlates, and predictive validity of the INQ in a sample of clinically depressed and suicidal adolescents ( $N=120$ , aged 12-18, 81.9% female).

Contrary to studies including adult samples in which a two-factor solution is identified, results within this sample indicated three factors: perceived burdensomeness, thwarted belongingness, and perceived isolation. Perceived burdensomeness and the interaction between perceived burdensomeness and perceived isolation predicted suicide ideation above and beyond depression, but thwarted belongingness and perceived isolation did not. Perceived burdensomeness appears to play a role in adolescent suicidality and may be a point of intervention, yet the notable deviation from previous findings and relative weakness of two of the factors warrant further study.

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## **Study 1**

### **Introduction**

Suicide is the second leading cause of death for adolescents (McIntosh & Drapeau, 2012). In the United States, 16% of teenagers report seriously considering suicide, 13% report making a plan, and 8% report making an attempt (Centers for Disease Control & Prevention, 2017). Despite numerous studies on suicide, the rates of suicide have increased steadily over the last 15 years, especially in adolescent females (Curtin, Warner, & Hedegaard, 2016). Along with these studies, many interventions that specifically target adolescent suicide have been designed, however, the impact of these interventions has not reliably been positive (Spirito & Esposito-Smythers, 2006; Tarrier, Taylor, & Gooding, 2008).

There are a number of varied approaches have been utilized to address adolescent suicide and each approach utilizes its own theoretical assumptions about the underlying causes of suicidality. While these theoretical assumptions are not often mentioned (Frey & Hunt, 2018), they do (or should) inform decisions about when and how intervention should occur. Across the various empirically supported protocols, a number of root causes of depression and suicidality have been suggested: the symptoms of a single, neurobiological disease (medication approaches; Fried & Niese, 2015; Reardon, 2014); a lack of problem-solving, self-regulation, emotion-regulation (cognitive- and dialectical-behavioral approaches; Dimeff & Linehan, 2001; Rudd, 2011); or the result of some family and/or contextual dysfunction (Diamond, Reis, Diamond, Siqueland, & Isaacs, 2002; Frey & Cerel, 2015).

The efficacy of the varied treatment approaches and the struggle to consistently



have positive effects suggests that I may not fully understand the mechanisms of adolescent suicide (Fairweather-Schmidt, Anstey, & Mackinnon, 2009). It may also be true that these therapeutic theories do not have the needed explanatory ability to guide the investigation and treatment of adolescent suicidality. One theory with growing theoretical and empirical support to explain what makes a person suicidal is the Interpersonal-Psychological Theory of Suicide (IPTS; Joiner; 2005; Van Orden et al., 2010).

The IPTS proposes that two dimensions are necessary for a person to enact lethal means and die by suicide. First, the desire to die; second, the ability to enact lethal means (acquired capability). The desire to die dimension, according to the IPTS, is made of two distinct but correlated concepts whose interaction creates this desire—thwarted belongingness and perceived burdensomeness. Thwarted belongingness (TB) refers to feeling alone and a lack of stable supportive relationships (e.g., isolation, loneliness). Perceived burdensomeness (PB) refers to the feeling of being a liability to others and being flawed as a person (e.g., feelings of incompetence, self-hatred). The acquired capability (AC) to enact lethal means refers to the development of the ability to overcome the natural fear of death (e.g., repeated self-injury, violence, exposure to death). According to the causal pathway to suicidal thoughts and attempts proposed in Van Orden et al. (2010), either TB or PB alone would lead to passive death ideation (*I wish I was dead*). However, the simultaneous presence of both TB and PB would lead to suicide ideation (*I want to kill myself*). One of the strengths of the IPTS as a theory to guide investigation is that it has specific hypotheses that are testable. One is that PB and TB alone should not predict suicide ideation; a second being that the simultaneous presence of PB and TB (and the belief that they will not change) should predict suicide ideation.

The Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012) was designed to assess levels of PB and TB with an ability to predict suicide ideation. This measure has been tested and validated with various adult populations (cf. Ma, Batterham, Calear, & Han, 2016) and varied versions of the INQ (10-, 12-, 15-, 18-, and 25-items versions). The two studies evaluating all five-versions recommend use of the 15-item version (Hill et al., 2015; Van Orden et al., 2012). Several studies have found a significant PB by TB interaction—that is, TB is only associated with suicide ideation at high levels of PB (Van Orden et al., 2008; Horton et al., 2016; Wong, Koo, & Tran, 2011). PB was found to be a mechanism of suicidal ideation (Baams, Gross, & Russell, 2015).

Despite the examination of the IPTS and the INQ in adults, there has been little utilization of the INQ or the IPTS in adolescents (cf. Stewart et al., 2017). Of the few studies that have utilized the IPTS to study suicide-related thoughts and behaviors in adolescence, most have used proxy measures of PB and TB, such as self-esteem, involvement in youth programming, involvement in community programming (Cero & Sifers, 2013), and out-of-home placement (Kretschmar & Flanner, 2011). Some have approximated TB through perceptions of relationships with friends (Czyz et al., 2015; Wong & Maffini, 2011), peer problems (Barzilay et al., 2015), loneliness (Laskaard et al., 2011; Timmons et al., 2011), attachment (Sheftall et al., 2013), and family relationships (Sheftall et al., 2013; Wong & Maffini, 2011). Additionally, some have approximated PB through suicidal ideation (Czyz et al., 2014) and adolescent-reported difficulties (Barzilay et al., 2015). The use of proximate measures when testing a theory is potentially problematic because the proximate measures may not accurately capture the concept as proposed by the theory. This can be accomplished through tests of convergent validity.

Tests of convergent validity for the IPTS in adolescence have yet to be published. While the proxy measures that have been used to test the IPTS are likely similar to the constructs with which the PB and TB constructs would be tested for convergent and divergent validity, any of these proxy constructs is only capable of capturing part of the variability the proposed PB/TB construct represents.

A few recent studies have utilized the INQ to assess PB and TB in adolescents (e.g., Baams, Grossman, & Russell, 2015; Buitron et al., 2016; Opperman, Cyzyz, Gipson, & King, 2015; Grossman, Park & Russell, 2016; Hill et al., 2015; Kim, Moon, Lee, & Kim, 2018; Podlogar, Žiberna, Poštuvan, & Kerr, 2017). Notably, in a psychiatric inpatient sample of adolescents, only PB, and not TB, was found to be predictive of SI, and there was not a significant interaction effect (Hill et al., 2015). In general, there are methodological limitations that prevent these adolescent studies from testing the IPTS (through use of the INQ) in its entirety. First, only two studies controlled for the potential confounding role of depression (Buitron et al., 2016; Podlogar, Žiberna, Poštuvan, & Kerr, 2017). Second, only three articles (Baams, Grossman, & Russell, 2016; Grossman, Park, & Russell, 2016; Podlogar, Žiberna, Poštuvan, & Kerr, 2017) utilized both INQ subscales (PB/TB). Third, one study included youth up to age 21 (Baams, Grossman, & Russell, 2016). Finally, only one study has reported to psychometric validity or factor structure of the INQ in a sample of adolescents (Podlogar, Žiberna, Poštuvan, & Kerr, 2017); this sample was a community-based sample in Slovenia and found a two-factor solution but dropped several items. Despite these limitations for testing the assumptions of the IPTS, these studies do show the IPTS is relevant to adolescent suicidality—particularly the finding of PB functioning as a key mechanism of suicide ideation among

sexual minority youth (Baams, Grossman, & Russell, 2016).

Because there has been little investigation of theoretical fit and psychometric validity of the INQ in adolescence, it is likely that the application of the IPTS to adolescence is occurring through downward extension—in which a concept developed for adults is then applied to youth. The downward extension of the IPTS may not fit adolescents due to the fact that adolescence is a distinct developmental period that includes profound identity, neurobiological, cognitive, and emotional developmental growth (Casey, Jones, & Hare, 2008; Tamnes et al., 2013). Adolescents have more difficulty with emotion regulation and impulsiveness (Silk, Steinberg, & Morris, 2003). The identity exploration that occurs in adolescence involves testing new experiences, new roles, and relationships that shape the adolescent's identity (Erikson, 1959). In addition, adolescents tend to believe they are unique and that common difficulties and consequences do not apply to them (personal fable; Elkind, 1967). Specifically, in regards to suicide-related thoughts and behaviors, this may be manifest in how adolescents show less certainty that their actions may result in death (Parellada et al. 2008). This personal fable also means that adolescents feel that other people (especially parents) cannot possibly understand them. This personal fable has potential to intensify the feelings of liability or rejection that also influence suicide-related thoughts and behaviors. These feelings are potentially increased further as adolescents also tend to function under the assumption that their own flaws and faults are noticed by others (imaginary audience; Elkind 1967). These common adolescent experiences may combine to create an opportunity for adolescents to feel as if they do not belong or are not valued differently than adults.

The aim for this study is to test several basic assumptions of the IPTS, as measured by the INQ, through testing its factor structure, correlates, and predictive validity in a sample of clinically depressed and suicidal adolescents. This study has three working hypotheses. First, I expect a two-factor solution of the INQ, which includes PB and TB factors. Second, I expect PB, TB, and their interaction will be associated with key suicide risk factors (i.e., suicide ideation, depression). Third, I hypothesize the INQ (PB, TB, and the PB-TB interaction) will predict suicide ideation above and beyond depressive symptoms and demographic variables.

## **Method**

### **Participants**

The sample is a subset of adolescents who participated in a randomized controlled trial examining the efficacy of Attachment-Based Family Therapy (ABFT; Diamond, Diamond, & Levy, 2014) compared to Non-Directive Supportive Therapy (Brent et al., 1996). All data for this paper comes from the baseline assessment, prior to randomization. I excluded the first nine participants from these this study because the INQ had not yet been added to the assessment battery. After this case-wise deletion, there were no missing data.

The final sample for this paper includes 120 adolescents, ages 12-18 years old ( $M = 14.87$ ,  $SD = 1.68$ ). Nearly half of the participants had made a suicide attempt prior to enrollment in the study (42%) and nearly sixty percent (57.5%) reported a history of non-suicidal self-injury. Most adolescents identified as heterosexual, with 31.8% self-identified as a sexual minority. Slightly more than half the sample identified as African-American (55%), a third of the sample as White (31.9%), about five percent American

Indian or Alaskan Native (5.2%), 1.7% Asian, .86% Native Hawaiian or Pacific Islander and 11.2% other. The sample was 81.9% female.

## **Procedure**

Participants were recruited from primary care centers, emergency departments, outpatient facilities, inpatient hospitals, schools, churches, and the general community in Philadelphia metropolitan area. The protocol was approved by the Institutional Review Boards (IRB) at the Children's Hospital of Philadelphia and Drexel University and monitored quarterly by a Data Safety and Monitoring Board at Drexel University. As all data and treatment were completed prior to the start of this study, the study was reviewed and granted exempt status from the IRB at the University of Minnesota. Parents provided informed consent for themselves and their minor children. Minor participants also provided written informed assent.

Eligibility criteria included severe suicidal ideation (Suicide Ideation Questionnaire Junior > 31), and moderate to severe depression (Beck Depression Inventory II > 20) at two consecutive pre-baseline assessment time points from two-three days apart. At least one primary caregiver was required to participate in treatments and assessment. Exclusion criteria included: (a) imminent risk of harm to self or other than could not be safely treated on an outpatient basis, (b) psychotic features (as reported on the Diagnostic Interview Schedule for Children; DISC), (c) severe cognitive impairment as evidenced by educational records, parental report and/or clinical impression), (d) no participating parent that spoke English, and (e) starting psychiatric medication less than three weeks before the initial pre-treatment assessment.

## **Measures**

**Demographics.** Demographic information (age, gender, sexual orientation, race) was gathered from participants at the baseline evaluation. Sexual orientation and racial items were dummy-coded into dichotomous variables: White as 1 , non-White as 0; straight as 0, non-straight as 1.

**Interpersonal Needs Questionnaire (INQ;** Van Orden et al., 2012). The INQ was developed to assess perceived burdensomeness (PB) and thwarted belongingness (TB) with 15 items. This scale has been disseminated across different populations, cultures and age groups (Ma et al., 2016). Items are rated via self-report on a 7-point Likert scale ranging from 1 (*Not at all true for me*) to 7 (*Very true for me*). Example items from the PB subscale 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 TB subscale include, “*These days, I feel disconnected from other people*” and “*These days, I am close to other people* (reverse scored).” The Van Orden et al., (2012) IPTS validation study (all adult participants) reported internal consistency values of ( $\alpha$ ) = .89 for PB and ( $\alpha$ ) = .85 for TB; the Slovene community-based sample with adolescents found similar values: ( $\alpha$ ) = .92 for PB and ( $\alpha$ ) = .85 for TB.

**Suicide Ideation.** Suicide ideation was measured by the Suicide Ideation Questionnaire-Junior (SIQ; Reynold & Mazza, 1999). The SIQ is a 15-item measure that assesses thoughts of suicide over the past month. Participants rated how much they thought about each of the items over the past month on a 7-point scale, ranging from 0 (*Never had this thought*) to 6 (*Almost every day*). All items are summed to create a total score. The lowest possible score on the SIQ is 0 and the highest is 90. Raw scores of 0 to

19 indicate a normative level of suicidal ideation, scores of 20 to 29 indicate an elevated level of ideation, and scores of 30 or above indicate a high level of suicidal ideation. Clinical and school-based samples utilizing the SIQ reported high internal consistency reliability, with alphas ( $\alpha$ ) between 0.93–0.96 (Reynolds & Mazza, 1999). The internal consistency of this sample was 0.84.

**Depression.** Depression scores were measured by the Beck Depression Inventory-II (BDI; Beck, Steer & Brown, 1996). The second edition of the BDI is a widely-used, 21-item self-report instrument designed to assess the severity of depressive symptoms in adults and adolescents. Each of the 21 items is composed of four statements representing increasing increments of depression severity for a specific symptom. The score for each item on the scale ranges from 0–3, with the total ranging from 0–63. Scores from 20-28 are considered moderate and scores over 28 are considered severe depression (Beck, Steer & Brown, 1996). The BDI is reported to have high internal reliability ( $\alpha = .91$ ) and is highly and positively correlated with other measures of depression (Bisconer & Gross, 2004). The internal consistency in this sample was  $\alpha = 0.85$ .

### **Data Analysis**

All data screening, exploratory factor and regression analyses were conducted in SPSS (version 25). Confirmatory factor analyses were conducted in MPlus (version 7.11). Screening and normality assessment of the item responses were assessed prior to the start of analysis, with six of the items slightly non-normal (see Table 1). As maximum-likelihood estimation factor analysis and regression are fairly robust to non-normal data I did not transform the data (Fuller & Hemmerle, 1966).



I conducted exploratory factor analysis (EFA) using maximum likelihood estimation and oblimin factor rotation. In order to determine the appropriate number of solutions for the sample, I examined the parallel analysis output (95<sup>th</sup> percentile of random eigenvalues; Horn, 1965). Items that loaded to .30 or higher were considered adequate and relevant to the factor (MacCallum, Widaman, Zhang, & Hong, 1999). Subsequently, I conducted confirmatory factor analyses (CFA) to compare model fit. I then constrained items to load each model identified and allowed them to correlate. I evaluated the models with standard model fit criteria: model chi-square, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), Akaike information criteria (AIC) and the Bayesian information criteria (BIC).

I utilized several hierarchical multiple regressions to test the associations of depression and demographic covariates with suicide ideation in step one. Demographic variables of age, gender, sexual-minority status, and racial-minority status were utilized as covariates as recommended (Buchman-Schmitt, Chiurliza, Chu, Michaels, & Joiner, 2014). In step two, I entered the PB, TB, and PI factors as individual predictors of suicide ideation respectively. In step three I tested the mean-centered interaction variables for all identified factors (PB x TB, TB x PI, and PB x PI). For significant interactions, I created simple slope plots to probe interaction effects. I also created simple slope plots to probe interaction effects.

## **Results**

### **Factor Structure of the Interpersonal Needs Questionnaire**

I estimated two factors (PB & TB) to show from the analysis. The factor

structure as proposed by Van Orden and colleagues (2012) is shown in Table 2. The first six items (1-6) were proposed to form the PB factor and the next nine items (7-15) to form the TB factor. However, scree plot analysis (see Figure 1) and factor EFA factor loadings (see Table 2) suggested a possible third factor consisting of two items (11 & 12) that I called perceived isolation (PI). After rotation, the first factor (PB) accounted for 26% of the variance, the second (TB) accounted for 16%, and the third (PI) accounted for 10%. The PB factor was shown to be strong and distinct, with all factor loadings above .60. Thwarted belongingness was also a distinct factor but only six of the nine items proposed for this factor by Van Orden and colleagues (2012) loaded sufficiently. Two items proposed to be a part of thwarted belongingness loaded strongly on the third factor (PI). The three items that did not load adequately on the TB factor are the only three items of the scale that are not reverse scored. Item 9 did not load adequately on any variation of the scale (and was removed from the models entirely). I also found excellent internal consistency for PB ( $\alpha = .92$ ) and questionable for TB ( $\alpha = .67$ ) as it was proposed (Van Orden et al., 2012). Our revised TB reliability was acceptable ( $\alpha = .78$ ).

I next compared the fit of three CFA models, a one-factor interpersonal needs model (serving as a null model), two-factor, three-factor models. Running the two-factor model, as proposed, improved the model fit compared to the one-factor model. The three-factor model (including all items) also showed improved fit compared to the two-factor model. However, the original validation study, in adult samples with the 25-item version of the INQ (Van Orden et al., 2012) and a recent community sample of adolescents (Podlogar et al., 2017) showed increased model fit through correlating errors of the negatively worded questions (items 9, 11, and 12). I attempted this variation with the

two-factor model and three-factor models but our best fits were found by dropping item 9 entirely. As shown in Table 3, I were not able to obtain good model fit; however, both the two-factor and three-factor models without item 9 (“*These days, I rarely interact with people who care about me*”) showed acceptable fit according to CFI and was closer to acceptable fit on the TLI, RSMEA, and SRMR. While balancing the recommendation to strive for parsimony (Browne, & Cudeck, 1992) and the theoretical and empirical base that shows the two-factor solution in other populations, I decided to utilize the tests of the INQ's predictive validity as additional data to help us decide between a two-factor and three-factor solution. Ultimately, I decided to extract a three factor solution.

### **Predictive Validity of the INQ**

The correlations between study variables (see Table 4) indicated that suicide ideation was positively correlated with PB ( $r = .39, p < .01$ ) and BDI ( $r = .41, p < .01$ ). I found PB was correlated with all included variables. The revised TB scale (which includes items 7, 8, 10, 13, 14, and 15) was correlated with PB ( $r = .32, p < .01$ ) and the perceived isolation (PI) scale (items 11 and 12;  $r = .27, p < .01$ ). The PI scale was also correlated with PB and depression ( $r = .36, p < .01$ ). I conducted several hierarchical regression analyses to test the hypothesis that factors of the INQ (PB, TB, and PI) and their interactions would predict suicide ideation above and beyond depressive symptoms.

The first hierarchical regression analysis tested the relationship between PB and suicide ideation while controlling for depressive symptoms (see Table 5). I first entered depression and demographic covariates in the first step of the analysis. This step was shown to account for 19% of the variation in suicide ideation. I entered PB in the second step of the regression and shown to account for an additional 5% of the variance

in suicide ideation ( $\beta = .25$ ,  $t[113] = 2.71$ ,  $p < .01$ ). This hierarchical regression analysis was then repeated but I replaced PB with TB (see Table 6) and PI (see Table 7) in the second step. I found TB did not account for additional variation of suicide ideation (.01%) when controlling for depression and demographic factors ( $\beta = -.03$ ,  $t[113] = -.38$ ,  $p = .71$ ). I also found PI did not account for additional variation of suicide ideation (.01%) when controlling for depression and demographic factors ( $\beta = .04$ ,  $t[113] = .42$ ,  $p = .68$ ). I then created interaction terms for two-way interactions of each of the identified factors: PB by TB (see Table 7; Figure 2), PB by PI (see Table 9; Figure 3), and PI by TB (see Table 10; Figure 4). The only interaction term found to be significant was the PB by PI interaction ( $\beta = .06$ ,  $t[111] = 1.97$ ,  $p = .049$ ). This interaction (see Figure 3) was shown to account for 3% of the variation in suicide ideation beyond depression, PB and PI (see Table 8). The simple slope interaction showed that at PI was significant when found also at high levels of PB. Due to the significance of this interaction in predicting suicide ideation, and the lack of significance of the TB factor or PB-TB interaction, I decided to maintain the PI as a third factor.

## **Discussion**

The objectives of this study were to examine the factor structure, correlates, and the predictive validity of the Interpersonal Needs Questionnaire (INQ) in a sample of depressed and suicidal adolescents. The results of this study as they relate to the Interpersonal-Psychological Theory of Suicide (IPTS), existing studies utilizing the INQ in adult samples, and our hypotheses are mixed. Though proposed as a two-factor solution (Van Orden et al., 2012), examinations of the eigenvalues (see Figure 1) suggested the extraction of either two or three factors; I chose to extract three factors. The

perceived burdensomeness (PB) factor loaded strongly and as theorized. However, only six of proposed nine items loaded on the thwarted belongingness (TB) factor. Upon examination of the factor loadings, there was a discernable pattern with the third factor (perceived isolation; PI)—these items were two of the three items in the TB scale that were not reverse coded. The third reverse-coded item, 9 (*These days, I rarely interact with people who care about me*) did not load sufficiently on any factor and was dropped. Another recent study with the INQ and an adolescent sample also dropped item 9 from their analyses (Podlogar et al., 2017).

Our hypothesis that PB and TB would be positively associated with depression and SI was partially supported. First, I found PB to be significantly correlated with the other INQ factors, suicide ideation (SIQ), and depression (BDI). I also found PB was predictive of suicide ideation above and depressive and demographic variables. This is consistent with the extant research of the INQ with both adults and adolescents. One recent study with sexual minority youth found PB to be one of the main mechanisms of the development of suicide ideation (Baams, Grossman, & Russell, 2015). Second, TB was not significantly correlated with any variable included in the study except for the other INQ factors. Additionally, neither TB nor any interaction including TB significantly predicted suicide ideation above and beyond depression. It is also of note that TB was not significantly correlated with depression in this study. While many studies have found TB to not predict suicide, I know of no study that has not found TB to be correlated with depression. I interpret this to be due to the challenges participants may have had with the reverse-coded questions; it also serves as evidence of the lack of convergent validity of the TB subscale in this adolescent sample. Another explanation of

the lack of TB-depression relationship may be due to the nature of the sample in which all participants were required to be above a threshold for clinical depression on the BDI (20) which functions to limit the range of the scale and possibly its correlations with other variables..

Our decision to extract a third factor is one major way that this study differs from existing studies of the INQ. While the Van Orden and colleagues (2012) study cites potential third and fourth factors in their analyses, our study differs in two major ways. First, our third factor (PI) is formed from the TB factor—their potential factors from the proposed PB factor. Second, they report these third and fourth factors were uninterpretable—our factor split is clearly aligned with reverse- and non-reverse coded questions. I did not have specific hypotheses regarding the PI factor. However, I performed the same tests as I proposed with existing and anticipated factors of the INQ. If I had the same hypotheses with PI, they would have been partially correct. I did find PI to be significantly correlated with the other INQ factors and with depression. However, it was not correlated with suicide ideation. The PI factor also did not predict suicide ideation above and beyond depression and demographic variables. The PB by PI interaction, however, did significantly predict suicide ideation above and beyond depressive symptoms—meaning that PI became significant at high levels of PB.

The fact that that PI is significantly associated with depression and the PB by PI interaction with suicide ideation (like TB in other studies) has several potential meanings. First, it is clear that there is difference in the way that the participants of this sample responded to reverse- and non-reverse-coded questions. Whether this is due to the cognitive load of the number of surveys given during the baseline assessment battery or

the fact that they were all clinically depressed and suicidal should be further investigated. This may mean that the use of reverse-coded questions may not be appropriate for the development level or cognitive load of this sample (Gotlib & Joormann, 2010). Second, it may be that the feelings of belongingness assessed through reverse-coded questions are not the same as the opposite of thwarted belongingness—one may be able to feel a sense of belongingness and a sense of not belonging at the same time and differing levels (Krosnick & Presser, 2010). Fourth, TB (as presently assessed in the INQ) does not appear to capture the concept is proposed to capture. It may be possible that a person can feel both belongingness and thwarted belongingness at the same time—perhaps this means that the feeling of belonging and not belonging are not mutually exclusive feelings. It appears that the INQ construct of TB does not represent the construct of loneliness or isolation in adolescents. Future studies should make an effort to understand how TB relates to loneliness in adolescents. The role of peer or family belongingness should also be explored. Established measures and theoretical constructs of loneliness may assist in this refining this construct (see Laursen & Hartls, 2013 for review).

### **Limitations and Future Directions**

This study also had several limitations that relate directly to the sample from which it is drawn. First, the sample size is relatively small ( $N = 120$ ) and likely a major reason I struggled to achieve good model fit (MacCallum et al., 1999). Second, all participants were required to have a restricted range of depression (BDI scores above 20) and suicide ideation (SIQ scores above 31). This range restriction may have resulted in reduced correlations between the observed variables (LeBreton, Burgess, Kaiser, Atchley, & James, 2003); however, given the normal distribution of SIQ and BDI within

their constrained range, this is likely to have not been the case. Third, the study is cross-sectional. Future studies should seek larger samples and attempt to longitudinally examine the value of the INQ as it relates to suicide ideation.

A major limitation of this study is its inability to address the impact of gender and gender-minority status sufficiently. Several recent studies suggest that TB and PB function as key mediational variables in sexual- and gender-minority youth (Baams, Grossman, & Russel, 2015; Grossman, Park, & Russel, 2016); given the theoretical role that stable caring relationships play in TB and the potential family rejection experience in sexual- and gender-minority youth, further examination of these constructs in this population is warranted.

While the majority of the respondents were female, this also tracks with existing suicide research which is almost entirely with female participants. This is likely due to the fact that approximately three times as many females as males attempt suicide (Lewinsohn et al., 2001) and with much less deadly means (Denning et al., 2000). This serves a function in helping researchers more easily study females after a suicide attempt because there are (a) more of them appearing at hospitals for treatment and (b) fewer deaths after an attempt due to the lower lethality in means. The major limitation of studying the IPTS concepts and proposed mechanisms of suicidality in a mixed-gender group (and one that is not equality balanced especially) is that it assumes that the biopsychosocial process which these concepts represent are the same across gender. There are clear biopsychosocial differences between genders, and the IPTS itself does not account for the potential that its concepts manifest differently between genders (or developmental stages). However, testing the IPTS concepts with the mixed-gender group



included in this study more appropriately follows the hypotheses of the IPTS and the existing literature that has attempted to validate its concepts.

## **Conclusion**

There are several important findings from this study. First, perceived burdensomeness appears to be a very useful concept that appears to represent significant and unique contribution to suicide ideation that is not captured through depressive symptoms). Second, the INQ-15 does not accurately measure the latent TB construct it proposes to measure in this sample of clinically depressed and suicidal adolescents. Third, because the non-reverse coded questions assessing thwarted belongingness (the PI factor) are correlated with depression and suicide, through its interaction with PB, I suggest that reverse-coded questions may not be appropriate for clinically depressed and suicidal adolescents. Lastly, it is particularly interesting that the correlations and factor loadings of item 9 (“*These days I rarely interact with people who care about me*”) are so poor because adolescents most likely live at home and are therefore more likely to interact with at least some family member; adults on-the-other-hand may go days or weeks without interacting with family. I suggest this study adds to the evidence that the Interpersonal-Psychological Theory of Suicide is relevant—and contributes valuable unique contribution—to adolescent suicide-related thoughts and behaviors but that more investigation of the theory and revision of the Interpersonal Needs Questionnaire for use with adolescents may be warranted.

## **Study 2**

### **Introduction**

Suicide is one of the leading causes of death in adolescence (McIntosh & Drapeau, 2012). Nearly 20% of adolescents seriously consider suicide every year (Centers for Disease Control, 2017) and 6.9% report a suicide attempt within the last year (Eaton et al., 2008). Unfortunately, the rates of suicide in adolescence have sharply increased in the last 15 years (Curtin, Warner, & Hedegaard, 2016). The question of when a therapist will encounter a suicidal teenager is not “if” but “when”.

While intensive individual treatment has long been the default treatment for adolescents considering suicide, there is a growing body of research that suggests various family factors play an important role in adolescent suicide-related thoughts and behaviors (cf. Gould, Greenberg, Velting, & Shaffer, 2003; Frey & Cerel, 2015; Wagner, Silverman, & Martin, 2003). Family conflict and cohesion have been identified as important risk and protective factors respectively (Brent et al., 2009; Chioqueta & Stiles, 2007; Halstead, Pavkov, & Hecker, 2014). Families of suicidal youth have been shown to have greater difficulty in communication, lower levels of cohesion, maladaptive control, and higher levels of conflict (Brent et al., 2008; Connor & Rueter, 2006; Garber & Flynn, 2001; Kerr, Preuss & Kind, 2006; Ursoniu, Putnoky, Vlaicu, & Vladescu, 2009). Parenting and attachment styles have been found to be associated with suicide-related thoughts and behaviors (Cruz, Narciso, Munoz, Pereira, & Sampaio, 2013; Sheftall, Mathias, Furr, & Dougherty, 2013; Sheftall, Schoppe-Sullivan, & Bridge, 2014).

The relationship between family factors and adolescent suicidality has prompted several recommendations in recent years to include the family in treatment (Broderick &

Weston, 2009; Hughes & Asarnow, 2011), and accordingly, many treatment approaches have begun to do so (cf. Ougrin, Tranah, Stahl, Moran, & Asarnow, 2015). However, family-enhanced adaptations for adolescent suicide-related behaviors have not shown superiority when compared to non-family-based treatments in most randomized controlled trials (Cottrell et al., 2018; Ougrin & Asarnow, 2018).

While the lack of robust effects in family-based treatment may seem like a grim realization, there are two key reasons why this may be the case. First, the mechanisms by which family factors are related to the underlying causes of adolescent suicidality are not understood (Lear & Pepper, 2016; Restifo & Bögels, 2009). Second, few treatment studies utilizing family therapy report change—or the lack thereof—in the family group system (Frey & Hunt, 2018), which suggests a lack of precision in treatment targets. Although a family therapy treatment modality should include, or at least propose, mechanisms of action that relate to the family group system, most have not. Even the most well-researched and evidence-based treatments are not well understood (Haynes, Kaholokula, & Yoshioka, 2008).

Beyond the lack understanding regarding treatment mechanisms, there is also very little understanding of the specific mechanisms of what makes a person suicidal (O'Connor & Nock, 2014). Despite the many studies on suicide (in adolescents or adults), the development of suicidality is still difficult to predict (Glenn et al., 2017). One of the causes of this may be that the mechanisms of suicidality are only starting to be understood (Shain, 2016). Greater and more specific understanding about the mechanisms of suicidality will help to coordinate research and intervention efforts (Patrick & Hajcak, 2016). One theory that has potential to explain the mechanisms of

what makes a depressed person suicidal is the Interpersonal-Psychological Theory of Suicide (IPTS; Joiner, 2005; Van Orden et al., 2010).

The IPTS proposes that what moves a person from being depressed into considering suicide is the simultaneous presence of two distinct but correlated constructs: perceived burdensomeness and thwarted belongingness. Perceived burdensomeness (PB) represents two feelings: of being a liability to others and of self-hatred. Thwarted belongingness (TB) is also composed of two concepts: the feeling of being disconnected from others and the lack of consistent caring relationships. This theory potentially has special relevance to relational approaches to the treatment of suicide-related thoughts and behaviors as it is grounded in the development of suicidality being an interpersonal process (Joiner & Coyne, 1999).

A recent paper (Hunt et al., in preparation) testing the IPTS in a clinical sample of adolescents identified two distinct factors within the proposed TB factor: thwarted belongingness (TB) and perceived isolation (PI). Given that TB is proposed to represent (1) the feeling of disconnection and (2) the lack of stable caring relationships, it may be that TB/PI factors proposed by Hunt and colleagues actually capture the two concepts that the larger TB factor is meant to represent. Further tests of convergent and divergent validity of these TB/PI constructs in adolescence and their relationship with caring relationships appears warranted.

While the IPTS proposes that family relationships are important ways to acquire the needed feeling of belonging (the opposite of thwarted belongingness), the theory posits that to whom a person feels like a burden does not matter (Van Orden et al., 2010). One study found that perceptions of burdensomeness on family relationships were

associated with higher levels of PB and suicide ideation than the association between burdensome on peers and PB and suicide ideation (Jahn & Cukrowicz, 2011). Concurrent support and criticism during episodes of depression have been found to predict suicide ideation (Brown & Vinokur, 2003). Interpreting these findings through a systemic lens may mean that people who need additional support from family begin to view themselves as a burden. Though the IPTS does not recognize this unique role of family relationships in the development of suicide ideation, several theories of suicide upon which the IPTS is built do. Specifically, de Cantazaro (1995) posited that a person develops suicide-related thoughts when they begin to view themselves as a burden to their family as an innate desire to increase the ability of family members to achieve fitness (inclusive fitness). Durkheim (1951) also proposed this development of suicide ideation as an altruistic suicide in which suicide may become a way to ease the burden on others.

The relationship with family factors and several theories upon which the IPTS is grounded (de Cantazaro, 1995; Durkheim, 1951; Joiner & Coyne, 1999) fits well with a systemic lens. Namely, family systems theory views pathology as a function of the system (Montgomery & Fewer, 1988). Despite several theorists that have identified the potential role of family systems in suicide (Frey & Cerel, 2015; Whitaker & Ryan, 1989), the vast majority of literature identifying family-factors related to suicide-related thoughts and behaviors is limited to empirical generalizations. Little, if any, investigation of how family factors may serve as underlying predictors of the mechanisms of suicide-related thoughts and behaviors has occurred.

The purpose of this paper is two-fold: first, to identify family factors that may predict mechanisms of adolescent suicidality (PB/TB); second, to further examine the

decision by Hunt and colleagues (in preparation) to separate TB into two distinct factors (thwarted belongingness and perceived isolation [PI]) in a sample of suicidal and depressed adolescents. Our hypotheses for this paper are: (1) that attachment anxiety/avoidance, family conflict, and negative parenting interactions will be positively associated with PB/TB/PI; (2) that family cohesion and positive parenting interactions will be negatively associated with PB/TB/PI; (3) that PB, TB, and PI will each be associated with unique family factors included in the study.

### **Method**

The sample for this paper is a subset of adolescents who participated in a randomized controlled trial comparing Attachment-Based Family Therapy (ABFT; Diamond, Diamond, & Levy, 2014) compared to Non-Directive Supportive Therapy (Brent et al., 1996). All data for this paper comes prior to randomization at the baseline assessment. I excluded 12 participants from this study due to missing data on the independent variables; there were no missing data after this case-wise deletion.

### **Participants**

The sample includes 117 participants between the ages of 12 and 17 ( $M=14.89$ ,  $SD=1.68$ ); there was no missing data. Nearly half of the participants had made a suicide attempt prior to enrollment in the study (40.2%) and nearly sixty percent (57.9%) reported a history of non-suicidal self-injury. Most adolescents identified as heterosexual, with 29% self-identified as a sexual minority. Slightly more than half the sample identified as African-American (56.4%), a third of the sample as White (31.6%), 6% percent American Indian or Alaskan Native, 1.7% Asian, .85% Native Hawaiian or Pacific Islander and 12.8% other. The sample was 83.8% female. See Table 1 for more

demographic information.

## **Procedure**

Participants were recruited from primary care centers, emergency departments, outpatient facilities, inpatient hospitals, schools, churches, and the general community in Philadelphia metropolitan area. The protocol was approved by the Institutional Review Boards (IRB) at the Children's Hospital of Philadelphia and Drexel University and monitored quarterly by a Data Safety and Monitoring Board at Drexel University. As all data and treatment were completed prior to the start of this study, the study was reviewed and granted exempt status from the IRB at the University of Minnesota. Parents provided informed consent for themselves and their minor children. Minor participants also provided written informed assent.

Eligibility criteria included severe suicidal ideation (Suicide Ideation Questionnaire Junior  $> 31$ ), and moderate to severe depression (Beck Depression Inventory II  $> 20$ ) at two consecutive pre-baseline assessment time points from two-three days apart. At least one primary caregiver was required to participate in treatments and assessment. Exclusion criteria included: (a) evidence of imminent risk of harm to self or others than could not be safely treated on an outpatient basis, (b) evidence of psychotic features (as reported on the Diagnostic Interview Schedule for Children; DISC), (c) evidence of severe cognitive impairment based on educational records, parent report and/or clinical impression (mental retardation, severe developmental disorders) as evidenced by educational records, parental report and/or clinical impression), (d) no English-speaking participating parent, and (e).starting psychiatric medication within three weeks of the initial pre-treatment assessment.

## Measures

**Perceived Burdensomeness.** Perceived burdensomeness was assessed through the six-item subscale of the Interpersonal Needs Questionnaire (Van Orden et al., 2012). A sample item is, “*These days, the people in my life would be happier without me.*” The measure is on a 7-point Likert-scale ranging from 1 (*not at all true for me*) to 7 (*very true for me*). Mean scores for these six items were created; the internal validity of this subscale was high ( $\alpha = .92$ ).

**Thwarted Belongingness.** Thwarted belongingness was assessed through a six-item variation of the thwarted belongingness subscale of the Interpersonal Needs Questionnaire proposed by Hunt and Diamond (manuscript in preparation). This variation consists of only the items marked for reverse-scoring in the scale proposed by Van Orden and colleagues (2012). A sample item is, “*These days, I am close to other people.*” The measure is on a 7-point Likert-scale ranging from 1 (*not at all true for me*) to 7 (*very true for me*). All items were then reverse scored and a mean score for these six items was created; the internal validity of this subscale was acceptable ( $\alpha = .77$ ).

**Perceived Isolation.** Perceived isolation was assessed through a two-item variation of the thwarted belongingness subscale of the Interpersonal Needs Questionnaire proposed by Hunt and colleagues (manuscript in preparation). This variation consists of two items in the original thwarted belongingness subscale proposed by Van Orden and colleagues (2012) that were not reverse scored. The two items are, “*These days, I feel disconnected from other people*” and “*These days, I often feel like an outsider in social gatherings.*” The measure is on a 7-point Likert-scale ranging from 1 (*not at all true for me*) to 7 (*very true for me*). Mean scores for these two items was



created. As Cronbach's alpha is not an acceptable rest of reliability for a two-item measure,utilized the Spearman-Brown coefficient and found acceptable reliability (.73).

**Attachment Anxiety and Avoidance.** The Experiences in Close Relationships (ECR; Fraley, Hefferman, Vicary, & Brumbaugh, 2011) measure was used to assess adolescents' attachment anxiety/avoidance to mother-like or father-like figures. The adolescent rated each parental figure on a series of 9 questions using a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Items 1, 2, 3, and 4 are reverse scored and then either relationship-specific or global scores can be calculated. The child or adolescent receives two scores, one for attachment-related avoidance and the other for attachment-related anxiety. In this study, I computed separate scores for each parental-type figure. The avoidance score was calculated by averaging items 1–6 and the anxiety score was calculated by averaging items 7 - 10. Higher scores on either of the subscales indicate higher levels of attachment-related avoidance or attachment-related anxiety. Previous research has shown the subscales exhibit good internal consistency in two separate samples (Cronbach's alpha,  $\alpha = .80$  and  $.78$  for attachment anxiety and  $\alpha = 0.80$  and  $0.78$  for attachment avoidance; Fraley et al., 2011) as well as good external validity and good retest reliability. In this sample, the measure also displayed good internal consistency for both attachment anxiety ( $\alpha = 0.84$  and  $0.89$  for mother- and father-like figure, respectively) and attachment avoidance ( $\alpha = 0.85$  and  $0.91$ , respectively) subscales.

**Family Conflict and Cohesion.** The Self-Report of Family Functioning (SRFF; Beavers & Hampson, 2000) was used to assess family conflict and cohesion. The SRFF consists of 10 items selected from a number of well-known family assessment measures

(Family Environment Scale, Family Concept Q-Sort, Family Adaptability and Cohesion Scale, and Family Assessment Measure). I examined two five-item subscales: family conflict and family cohesion. Higher scores on the conflict subscale indicate increased family conflict and higher scores on the cohesion subscale indicate increased family cohesion. The conflict subscale consists of the even-numbered items (items 2, 4, 6, 8, 10), with items 6 and 10 reversed scored, and the cohesion subscale consists of the odd-numbered items (items 1, 3, 5, 7, 9), with items 5 and 9 reversed scored. The items are rated on a 4-point Likert scale, ranging from 1 (*Never true for my family*) to 4 (*Very true for my family*). Both adolescents and parents completed the SRFF. Previous work with the SRFF has shown high internal consistency, with Cronbach's alphas ( $\alpha$ ) between 0.84 and 0.93 (Beavers & Hampson, 2000). In this study, the internal consistency was moderate, with Cronbach's alphas ( $\alpha$ ) = 0.66 and 0.78 for the conflict and cohesion subscales, respectively.

**Positive and Negative Parenting.** The Daily Event Scale (DES) was used to measure adolescent-rated experiences of positive and negative parenting. Daily Event Scale participants indicated the extent to which events occurred during the past day on a 1 (not at all) to 4 (a lot) scale. The events scale was an expanded version used in previous studies (Esposito et al. 2005) and previously utilized when studying the role of parents and peers in an adolescent's life (Herres & Kobak, 2015). The DES has in this sample had an acceptable Chronbach's alpha level ( $\alpha=0.76$ ).

### **Data Analysis**

We conducted all data screening, assessment, and analysis were in SPSS (version 25). All measures included in this study were normal (see Table 1). I found the

demographic variables of age, gender, race, and sexual identity were not significantly correlated to or associated with any outcome variable of this study; thus to enhance our power, I removed demographic variables from the regression analyses.

After examining significant correlational relationships, I created hierarchical regressions models to demonstrate the ability to significantly predict study outcome variables. Hierarchical regression analyses were selected due to the high correlations between predictor variables (Pedhazur, 1997) and the ability to better explore relationships between predictor variables in each step. I identified significant correlations for PB and then created hierarchical multiple regressions to identify a model that has the greatest ability to predict PB. I then repeated this process with similar models to predict TB and PI.

## **Results**

### **Descriptive Statistics**

Correlations and descriptive statistics are shown in Table 1. Perceived burdensomeness (PB) was significantly correlated with both TB and PI and four other variables (father attachment anxiety, mother attachment anxiety, family cohesion, and parental depression). Thwarted belongingness (TB) was also significantly correlated with four of the independent variables (mother attachment anxiety, adolescent-rated family-cohesion, parent-rated family-cohesion, and positive parent interaction). Perceived isolation (PI) was only significantly correlated with one independent variable (father attachment avoidance).

### **Regression Analyses**

**Predictors of PB.** As shown in Table 2, I first regressed PB onto adolescent-rated

family cohesion (Step 1), mother- and father-focused attachment anxiety (Step 2), and finally parental depression (Step 3). Family cohesion was entered first into the equation as it is one of the most well-established family-factors associated with suicide ideation (see Frey & Cerel, 2015 for review). Attachment-anxiety was entered in the second step to explore how they may impact the prediction of PB without parental depression. Parental depression was entered in the final step as the variable is parent-rated rather than adolescent-rated. When family cohesion was entered alone, it significantly predicted PB,  $F(1, 115) = 3.981, p = .048$ , adjusted  $R^2 = .03$ . However, as indicated by the  $R^2$ , only 3% of the variance in PB could be predicted by family cohesion. When mother- and father-attachment anxiety were added, they significantly improved the prediction,  $R^2$  change = .173,  $F(2, 113) = 12.296, p < .001$ , and family cohesion was no longer a significant predictor. When parental depression was added into the equation, the predictive ability of the entire equation improved significantly again,  $R^2$  change = .039,  $F(1, 112) = 5.749, p < .018$ . This effect size is small to medium (.245). The beta weights and significance values, presented in Table 2, indicate which variables contributed most to predicting PB.

**Predictors of TB.** I first regressed TB onto parent-rated cohesion (Step 1), and then adolescent-rated cohesion (Step 2). Similarly to the regression with PB, cohesion variables were entered first into the regression equation due to their prevalence as predictors of suicide ideation. Parent-rated cohesion was entered first to allow us to determine if the adolescent-rated version of family cohesion provided any predictive validity of TB above and beyond the parent-rated version because the bivariate correlation with the parent-rated scale was smaller. This hierarchical regression is shown in Table 4. Though parent-rated family cohesion was significantly predictive of TB,  $F(1,$

115) = 4.682,  $p = .033$ , adjusted  $R^2 = .026$ , when adolescent-rated family cohesion,  $F(1,114) = 5.571$ ,  $p = .02$ , adjusted  $R^2 = .045$ , was added into the equation only adolescent-rated cohesion was significant. These two variables combine to create very small effect size (.08). No other combination of parent-rated family cohesion, adolescent-rated family cohesion, positive parenting interactions, or mother attachment anxiety was able to maintain the ability to significantly predict TB when combined into a regression, nor was there a significant  $R^2$  change in any of these multiple regression models.

**Predictors of PI.** Only one independent variable was significantly correlated with PI, father attachment avoidance, and therefore, I did not proceed with the hierarchical regression modeling.

### **Discussion**

This is one of the first studies to specifically examine family factors that may be associated with and used to predict the factors proposed by the Interpersonal-Psychological Theory of Suicide (IPTTS; Joiner, 2005). Our hypotheses were partially supported. PB was found to be significantly associated with and predicted by four items (father- and mother-related attachment anxiety, family cohesion, and parent depression). TB was also found to be significantly associated with and predicted by four items bivariately (mother-related attachment anxiety, adolescent- and parent-rated family cohesion, and positive parent interaction). PI was found to be significantly bivariately associated with father-related attachment avoidance. Our hypothesis about the different family factors playing roles in the factors of the IPTTS was also partially supported; mother-related attachment anxiety and adolescent-rated family cohesion were the only two family measures found to be significantly associated with more than one factor of the

ITPS (PB and TB). The fact that adolescent-rated family cohesion and mother-related attachment anxiety were both significantly related to PB and TB fits with the IPTS as the scales are proposed to be correlated but distinct items

Perhaps the most important finding of this paper is the fairly clear picture that parental attachment anxiety (both mother and father) and parental depression predicted perceived burdensomeness, independently and when other the other items were controlled for. Our findings relating to TB are little more difficult to interpret. While the findings do partially support what has been proposed by Van Orden and colleagues (2010)—that is, TB in adolescence includes include two parts: (1) the feeling of being lonely and (2) the lack of stable caring relationships. Maternal-attachment anxiety and family cohesion may represent the lack of stable caring relationships; the negative relationship with family cohesion may represent the feeling of being lonely in this sample of adolescents.

The findings that four family constructs were significant bivariately with TB but when entered into an equation together none were significantly predictive of TB has several potential interpretations. First, and perhaps most likely, is that the TB construct is measuring a family relationship but that family cohesion, attachment anxiety, and positive parenting interaction are also measuring this construct. This fits with one other study (Timmons, Selby, Lewinsohn, and Joiner , 2011) that has suggested that events related to parental displacement (like attachment anxiety perhaps) are related to TB. Second, this maybe be evidence that adolescence, at least in this sample, do have difficulty answering reverse-coded questions in the same manner as normally coded questions. This may explain the challenges that several recent studies using the INQ in

adolescent samples have had in creating models with good fit (Podlogar et al., 2017) or finding TB or the PB by TB interaction to be predictive of suicide ideation (Podlogar et al., 2017; Grossman, Park, & Russell, 2016). Despite these challenges, the findings do suggest family relationships have some role in the feeling of TB. This study suggests that attachment anxiety towards parents and parental depression are more relevant to an adolescent's belief of being a liability (PB) than their perceived lack of belongingness in their own family (TB).

The finding that TB and PI are not associated with any of the same variables provides some evidence that the decision made by Hunt and colleagues (in preparation) to create two factors from the one TB factor was warranted. Their correlation with one another (though significant) is relatively small, if the two factors were measuring the same construct we would expect a higher degree of correlation and some overlap of other variables with which there are correlated—as seen with TB and PB. I do see this evidence of convergent validity with PB and TB in this sample; however, there is not evidence of convergent validity of PI and TB. This findings may be a function of the restricted range of depression required for inclusion in the study or the small sample size—future studies should investigate these further investigate the PI/TB relationship.

Another interesting finding is that maternal attachment anxiety and adolescent-rated family cohesion is predictive of both PB and TB. I interpret this to show the importance of a stable caregiver and feel accepted in one's family. Unexpectedly, I found positive parenting interactions to be associated with TB. I expected negative and critical parenting to predict PB. These findings add support to the concepts of TB as an integral family concept as well. This makes sense when taking into consideration that adolescents

most likely live at home and much of their interaction is likely to come from family relationships. I did not find negative parenting interactions or family conflict to be related to any outcome variables. Only father attachment avoidance (not mother) was found to be related to any outcome variable. Future studies should investigate the parental attachment anxiety constructs and their role within the mechanisms of suicidality to further understand this relationship.

### **Limitations and Future Directions**

This study has several limitations. The most prominent of which is that the Interpersonal Needs Questionnaire (INQ) has not been well-tested with adolescents. While the PB subscale has shown strong internal validity with adolescents, the TB factor has not. As it appears that the participants of this sample did not respond to reverse-coded questions in the manner I would expect (Hunt et al., in preparation), future studies should work to determine if this measurement error or an accurate representation of the TB construct in depressed and suicidal adolescents.

Another major limitation of this study is its inability to determine to whom the adolescent feels like a burden or disconnected. While the IPTS posits that there is no difference in outcome based on whom a person feels like a burden, the results of this study suggest that family factors do have a significant role (albeit I still do not know on whom the person feels like a burden). Future studies testing the IPTS in adolescents should follow the line of investigation that has been used with testing to whom older adults feel like a burden (Jahn & Cukrowicz, 2011), in which they found that perceptions of burdensomeness were more about family relationships than peer relationships.

While this study and the extant literature on the IPTS in adolescence show clear



relevance of the theory in adolescent suicidality, the specific and causal relationships are still unclear. The results of this study suggest that family factors do play roles in PB and TB, that maternal-attachment anxiety and family cohesion may represent the lack of stable caring relationships; the negative relationship with family cohesion may represent the feeling of being lonely in this sample of adolescents. The lack of peer measures or more validity measures of loneliness in adolescents, I cannot be sure.

The methodology of these studies also serves as a limitation of this investigation due to its cross-sectional nature, despite being part of a large experimental study. Longitudinal investigation would allow antecedent-consequent questions to be answered (e.g., *does PB/TB come from family conflict or does family conflict come from PB/TB?*). Most importantly to the treatment of suicidality and PB/TB concepts is longitudinal investigation may allow researchers to further test PB/TB as mechanisms of suicide ideation.

## **Conclusion**

This study adds to the existing literature of adolescent suicidality and family therapy in several ways. First, it is the first that identifies family factors that predict PB, TB, or PI in depressed or suicidal adolescents. Second, it partially validates the *Interpersonal Needs Questionnaire*. It validates that PB and TB are distinct but correlated constructs and that both have significant relationships with family constructs. However, this study also validates the position of Hunt and colleagues (in preparation) that TB and PI are not displaying convergent validity and are likely measuring different constructs in adolescents. Third, and most importantly for the family field, is that this study provides strong evidence that perceived burdensomeness and thwarted belongingness—several key mechanisms of adolescent suicidality—are related to family concepts. Most notably that

maternal attachment anxiety and family cohesion have significant roles in both PB and TB concepts.

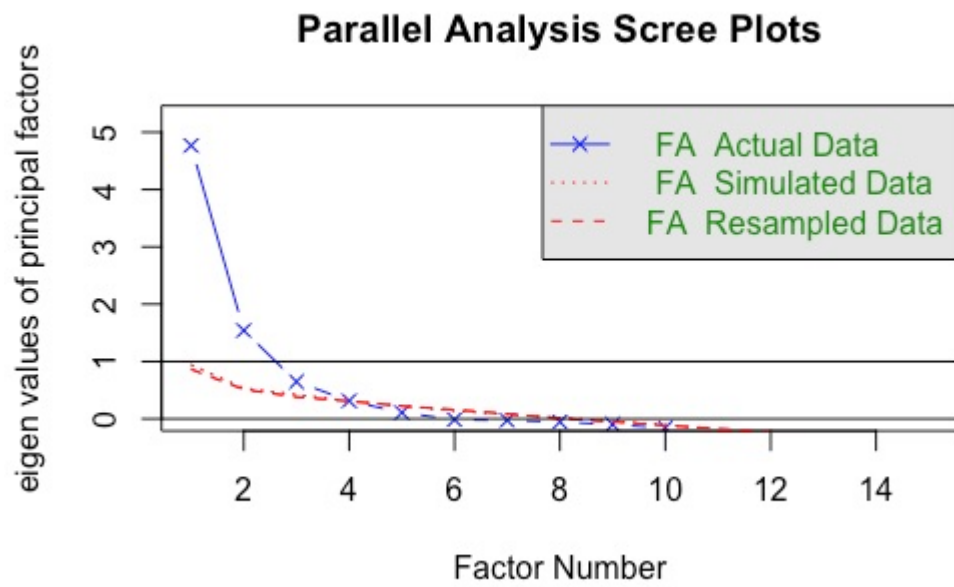


Figure 1.  
Eigenvalues from Parallel Analysis

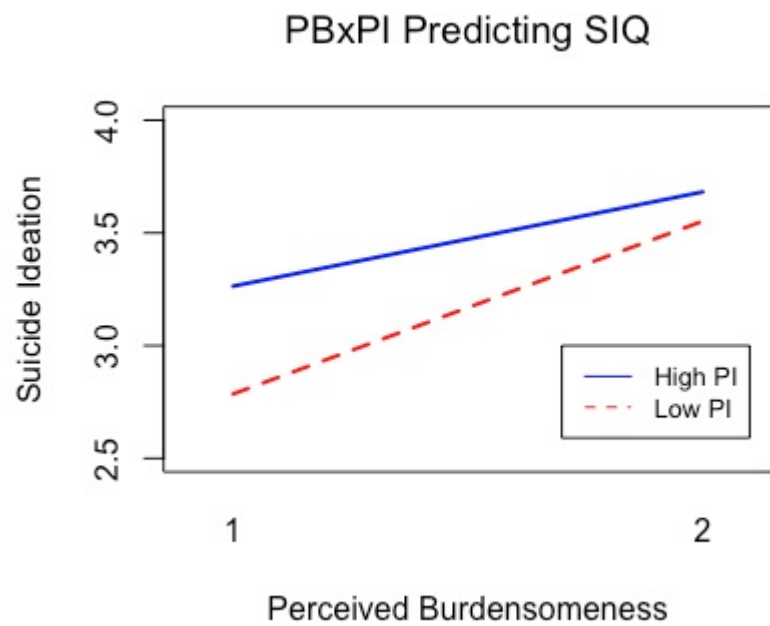


Figure 2.  
Perceived Burdensomeness by Perceived Isolation predicting Suicide Ideation  
*Note:* For Perceived Burdensomeness 1=low 2=high

Table 1.

*Correlations, Mean, SD, Skewness, and Kurtosis Across INQ, Past Month Suicide Ideation, Depression*

	INQ-1	INQ-2	INQ-3	INQ-4	INQ-5	INQ-6	INQ-7	INQ-8	INQ-9	INQ-10	INQ-11	INQ-12	INQ-13	INQ-14	INQ-15	SIQ	BDI
INQ-1	1.00																
INQ-2	0.89**	1.00															
INQ-3	0.53**	0.57**	1.00														
INQ-4	0.77**	0.77**	0.61**	1.00													
INQ-5	0.67**	0.75**	0.51**	0.71**	1.00												
INQ-6	0.57**	0.61**	0.55**	0.61**	0.61**	1.00											
INQ-7	-0.33**	-0.33**	-0.03**	-0.37**	-0.34**	-0.28**	1.00										
INQ-8	-0.27**	-0.21**	-0.22**	-0.27**	-0.19**	-0.34**	0.29**	1.00									
INQ-9	0.19	0.17	0.07	0.15	0.17	0.19	-0.19*	0.12	1.00								
INQ-10	-0.18**	-0.14**	-0.14**	-0.16**	-0.17**	-0.08**	0.41**	0.31**	0.02	1.00							
INQ-11	0.25*	0.22*	0.39**	0.29*	0.23*	0.38**	-0.12*	-0.25**	0.29*	-0.16**	1.00						
INQ-12	0.15	0.20	0.33*	0.26*	0.27*	0.24*	-0.17*	-0.21**	0.20	-0.04*	0.58**	1.00					
INQ-13	-0.23**	-0.24**	-0.22**	-0.29**	-0.23**	-0.26**	0.40**	0.38**	-0.29**	0.43**	-0.26**	-0.12**	1.00				
INQ-14	-0.20**	-0.20**	-0.11**	-0.25**	-0.16**	-0.12**	0.37**	0.34**	-0.23**	0.54**	-0.21**	-0.13**	0.63**	1.00			
INQ-15	-0.05*	-0.01*	-0.06*	-0.05*	0.03*	-0.09*	0.13*	0.27*	-0.17*	0.22*	-0.28**	-0.10*	0.42**	0.42**	1.00		
SIQ	0.32*	0.37**	0.36**	0.30*	0.37**	0.25*	-0.13*	-0.08*	0.05	-0.11**	0.13	0.14	0.02*	-0.12*	-0.05*	1.00	
BDI	0.32**	0.34**	0.38**	0.37**	0.40**	0.40**	-0.31**	-0.08**	0.14	-0.04**	0.28*	0.37*	0.08**	0.11**	-0.11*	0.41**	1.00
Mean	3.9	3.65	3.99	3.70	3.65	4.70	4.7	3.09	3.53	4.67	4.60	4.53	4.38	4.02	4.0	2.38	1.69
SD	1.69	1.75	1.91	1.90	1.97	1.86	1.72	1.49	1.89	1.88	1.84	1.94	1.63	1.79	1.81	1.31	0.45
Skew	0.08	0.32	0.0	0.25	0.21	-0.37	0.33	-0.56	-0.31	0.36	-0.38	-0.25	0.16	0.01	-0.15	0.60	0.26
Kurtosis	-0.76	-0.81	-1.18	-1.09	-1.12	-0.91	-0.92	-0.01	-1.00	-1.03	-1.08	-1.21	-0.86	-1.24	-1.06	-0.50	-0.36

Note. \*  $p < .05$ . \*\*  $p < .01$

Table 2.

*Factor Structure of the Interpersonal Needs Questionnaire-15*

Item	Question	One-Factor	Two-Factor		Three-Factor		
		Needs	PB	TB	PB	TB	PI
<b>Perceived Burdensomeness Factor</b>							
INQ-1	These days the people in my life would be better off if I were gone	<b>0.91</b>	<u><b>0.92</b></u>	-0.02	<u><b>0.94</b></u>	0.02	-0.07
INQ-2	These days the people in my life would be happier without me	<b>0.93</b>	<u><b>0.96</b></u>	-0.05	<u><b>0.98</b></u>	-0.01	-0.08
INQ-3	These days I think I am a burden on society	<b>0.64</b>	<u><b>0.63</b></u>	0.03	<u><b>0.54</b></u>	-0.07	<b>0.33</b>
INQ-4	These days I think my death would be a relief to the people in my life	<b>0.86</b>	<u><b>0.83</b></u>	0.07	<u><b>0.80</b></u>	0.06	0.08
INQ-5	These days I think the people in my life wish they could be rid of me	<b>0.80</b>	<u><b>0.80</b></u>	0.00	<u><b>0.78</b></u>	-0.01	0.06
INQ-6	These days I think I make things worse for the people in my life	<b>0.69</b>	<u><b>0.66</b></u>	0.07	<u><b>0.59</b></u>	-0.01	0.26
<b>Thwarted Belongingness Factor</b>							
INQ-7	These days, other people care about me	<b>0.40</b>	0.25	<b>0.42</b>	0.28	<b>0.44</b>	-0.07
INQ-8	These days, I feel like I belong	<b>0.32</b>	0.16	<u><b>0.43</b></u>	0.13	<u><b>0.37</b></u>	0.16
INQ-9	These days, I rarely interact with people who care about me	0.22	-0.14	-0.23	-0.08	-0.17	-0.23
INQ-10	These days, I am fortunate to have many caring and supportive friends	0.21	-0.01	<u><b>0.61</b></u>	0.01	<u><b>0.63</b></u>	-0.06
INQ-11	These days, I feel disconnected from other people	<b>0.34</b>	0.22	0.29	-0.00	0.06	<u><b>0.82</b></u>
INQ-12	These days, I often feel like an outsider in social gatherings	0.28	0.20	0.16	0.03	-0.04	<u><b>0.67</b></u>
INQ-13	These days, I feel that there are people I can turn to in times of need	<b>0.32</b>	0.05	<u><b>0.77</b></u>	0.05	<u><b>0.74</b></u>	0.07
INQ-14	These days, I am close to other people	0.24	-0.04	<u><b>0.80</b></u>	-0.02	<u><b>0.83</b></u>	-0.04
INQ-15	These days, I have at least one satisfying interaction every day	0.07	-0.14	<b>0.56</b>	-0.18	<u><b>0.50</b></u>	0.20

*Note:* Factor loadings above |.3| are in boldface. Factor loadings more than 2 times larger than other loadings are underlined.

Table 3.

*Fit Statistics for INQ Versions, Including INQ-15 and Two Modifications*

INQ Version	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA	SRMR	AIC	BIC
One-factor (Interpersonal Needs)	374.527	90	.680	.626	.162 90% CI[.145 –.179]	.135	6750.767	6876.578
Two-factor (as proposed by IPTS)	234.820	89	.836	.806	.116 90% CI[.098 –.135]	.092	6613.060	6741.666
Two-factor (11/12 correlated error)	190.581	88	.885	.862	.098 90% CI[.079 –.117]	.099	6570.822	6702.224
Three-factor (including all items)	185.015	87	.89	.867	.096 90% CI[.077 –.116]	.084	6567.255	6701.453
Two-factor (11/12 correlated) w/o 9	152.504	75	.910 <sup>a</sup>	.890	.092 90% CI[.071 –.113]	.097	6075.486	6198.501
Three-factor (without item 9)	146.588	74	.915 <sup>a</sup>	.896	.090 90% CI[.068 –.111]	.078	6071.570	6197.380

*Note.* <sup>a</sup> = fit index within acceptable limits

Table 4  
*Means, Standard Deviations, Correlations, and Alphas of Observed Variables*

	PB	TB-revised	PI	SIQ	BDI
PB	1.00				
TB-revised	.32**	1.00			
PI	.36**	.27**	1.00		
SIQ	.39**	.12	.15	1.00	
BDI	.44**	.18	.36**	.41**	1.00
Mean	3.92	4.14	4.57	3.30	1.69
SD	1.55	1.19	1.68	.99	.45
Skewness	.22	-.20	-.36	.54	.27
Kurtosis	-.63	-.40	-.83	-.67	-.28
Alpha	.92	.78	.73	.84	.85

Note. \*\* = Significant at .05 level. PB = Perceived Burdensomeness. TB-revised = revised thwarted belongingness. PI = perceived isolation.

Table 5  
*Hierarchical Regression of Demographic Variables, Depression, and Perceived Burdensomeness as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.192	5, 114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	4.88**	.00
Step 2	.05	1, 113	7.36			
PB				.25	2.71*	.00

Note. PB = Perceived Burdensomeness. \* $p < .01$ . \*\* $p < .001$

Table 6  
*Hierarchical Regression of Demographic Variables, Depression, and Thwarted Belongingness as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.192	5, 114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	4.88**	.00
Step 2	.001	1, 113	.143			
TB-rev				.03	.38	.71

Note. TB-rev = Revised Thwarted Belongingness. \* $p < .05$ . \*\* $p < .001$



Table 7  
*Hierarchical Regression of Demographic Variables, Depression, and Perceived Burdensomeness X Thwarted Belongingness-Revised Interaction as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.192	5,114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	.488**	.000
Step 2	.05	2,112	3.70			
PB				.26	2.67*	.009
TB-rev				.28	.28	.784
Step 3	.015	1,111	2.32			
PBxTB-rev				.14	1.52	.130

Note. TB-rev = Revised Thwarted Belongingness. \* $p < .05$ . \*\* $p < .001$

Table 8  
*Hierarchical Regression of Demographic Variables, Depression, and Perceived Isolation as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.192	5, 114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	4.88**	.00
Step 2	.001	1, 113	.177			
PI				.04	.42	.68

Note. PI = Perceived Isolation. \* $p < .05$ . \*\* $p < .001$

Table 9

*Hierarchical Regression of Demographic Variables, Depression, and Perceived Burdensomeness X Perceived Isolation Interaction as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i> (value)
Step 1	.192	5,114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	.488**	.00
Step 2	.05	2,112	3.686			
PB				.26	2.68*	.00
PI				-.03	-.27	.79
Step 3	.03	1,111	3.868			
PBxPI				.06	1.97*	.049

*Note.* PB = perceived burdensomeness. PI= perceived isolation.

\* $p < .05$ . \*\* $p < .001$

Table 10

*Hierarchical Regression of Demographic Variables, Depression, and Revised Thwarted Belongingness X Perceived Isolation Interaction as Predictors of Suicidal Ideation*

	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.192	5,114	5.42			
Age				-.047	-.553	.58
Gender				.05	.569	.57
LGBQ				-.002	-.026	.98
White				-.145	-1.691	.09
BDI				.438	.488**	.000
Step 2	.002	2,112	.129			
TB-rev				.026	.286	.75
PI				.033	.340	.74
Step 3	.000	1,111	.018			
PIxTB-rev				.013	.135	.893

*Note.* TB = perceived burdensomeness. PI= perceived isolation.

\* $p < .05$ . \*\* $p < .001$

Table 11.

*Frequencies for Adolescent Demographic Characteristics*

Variable	Frequency	%
<b>Race</b>		
American Indian/Alaskan Native	7	(6.0)
Asian	2	(1.7)
White	37	(31.6)
African American	66	(56.4)
Native Hawaiian/Pacific Islander	1	(0.9)
Other	15	(12.8)
Hispanic	18	(15.4)
<b>Religion</b>		
Catholic	25	(21.4)
Other Christian	41	(35.0)
Jewish	2	(1.7)
Muslim	4	(3.4)
Buddhist	2	(1.7)
Hindu	1	(0.9)
Atheist	15	(12.8)
Other	27	(23.1)
<b>Gender</b>		
Female	98	(83.8)
Male	19	(16.2)
<b>Sexual Orientation</b>		
Heterosexual	83	(70.9)
Lesbian/Gay	8	(6.8)
Bisexual	18	(15.4)
Questioning	8	(6.8)

*Note.* Race is reported as non-exclusive categories.

Adolescent-rated scales	1	2	3	4	5	6	7	8	9	10	11	12
1. Perceived Burdensomeness	1.000											
2. Thwarted Belongingness	.317**	1.000										
3. Perceived Isolation	.352**	.278**	1.000									
4. Father Attachment Anxiety	.399**	.116	.166	1.000								
5. Mother Attachment Anxiety	.361**	.236*	.168	.438**	1.000							
6. Father Attachment Avoidance	.068	.112	.231*	.577**	.131	1.000						
7. Mother Attachment Avoidance	.056	.179	.138	.256**	.402**	.345**	1.000					
8. Family Cohesion	-.183*	-.276**	-.130	-.365**	-.366**	-.326**	-.437**	1.000				
9. Family Conflict	.118	.110	.080	.180	.286**	.182*	.238**	-.605**	1.000			
<b>Parent-rated scales</b>												
10. Family Cohesion	.100	.162	.066	.103	.267**	.028	.184*	-.286**	.371**	1.000		
11. Family Conflict	-.119	-.198*	-.082	-.149	-.127	-.053	-.085	.435**	-.399**	-.462**	1.000	
12. Parent Depression	.239**	.133	.139	.044	.181	-.052	.016	-.249**	.231*	.375**	-.524**	1.000
Mean	3.901	3.901	4.538	3.506	2.623	4.708	3.682	2.902	2.174	2.137	3.070	.594
Standard Deviation	1.551	1.190	1.683	1.998	1.573	1.794	1.558	.677	.670	.448	.321	.489
Skewness	.236	.211	-.328	.258	.827	-.216	.236	-.331	.508	.355	-.350	.991
Kurtosis	-.610	-.382	-.837	-1.192	-.272	-1.012	-.715	-.469	.159	1.369	-.380	.275

Table 13  
*Hierarchical Regression of Predictors of Perceived Burdensomeness*

	$R^2$	$\Delta R^2$	<i>df</i>	<i>F</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	.03	.033	1, 115	3.981*			
Family Cohesion (Adolescent-rated)					-.183	-1.995*	.048
Step 2	.19	.173	2, 113	12.296**			
Family Cohesion (Adolescent-rated)					.015	.162	.872
Mother Attachment Anxiety					.218	2.244*	.027
Father Attachment Anxiety					.317	3.254**	.002
Step 3	.22	.039	1, 112	5.749*			
Family Cohesion (Adolescent-rated)					.064	.683	.496
Mother Attachment Anxiety					.188	1.961	.052
Father Attachment Anxiety					.340	3.542*	.001
Parental Depression (Parent-rated)					.205	2.398*	.018

*Note.* \* $p < .05$ . \*\* $p < .001$

Table 14  
*Hierarchical Regression of Predictors of of Thwarted Belongingness*

	R <sup>2</sup>	ΔR <sup>2</sup>	df	F	β	t	p
Step 1	.039	.039	1, 115	4.682*			
Family Cohesion (Parent-Rated)					-.198	-2.164*	.033
Step 2	.084	.045	1, 114	5.571*			
Family Cohesion (Parent-Rated)					-.096	-.960	.339
Family Cohesion (Adolescent-Rated)					-.235	-2.360*	.020
Step 3 (with Positive Parenting)	.101	.078	1, 113	2.205			
Family Cohesion (Parent-Rated)					-.100	-1.007	.316
Family Cohesion (Adolescent-Rated)					-.165	-1.502	.136
Positive Parenting					-.149	-1.485	.140
Step 3 (with Mother Attachment Anxiety)	.107	.083	1, 113	2.864			
Family Cohesion (Parent-Rated)					-.102	-1.030	.305
Family Cohesion (Adolescent-Rated)					-.173	-1.647	.102
Mother Attachment Anxiety					.162	1.692	.093
Step 4	.116	.032	2, 112	2.035			
Family Cohesion (Parent-Rated)					-.104	-1.053	.295
Family Cohesion (Adolescent-Rated)					-.130	-1.163	.247
Mother Attachment Anxiety					.134	1.360	.177
Positive Parenting Interactions					-.113	-1.096	.275

Note. \* $p < .05$ . \*\* $p < .001$

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