Can Meaning in Life Mitigate the Effects of Interpersonal Dimensions of Suicidality on Suicidal Ideation

Greg Edgin

Follow this and additional works at: https://digitalcommons.memphis.edu/etd

Recommended Citation

This Dissertation is brought to you for free and open access by University of Memphis Digital Commons. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of University of Memphis Digital Commons. For more information, please contact khggerty@memphis.edu.
CAN MEANING IN LIFE MITIGATE THE EFFECTS OF INTERPERSONAL DIMENSIONS OF SUICIDALITY ON SUICIDAL IDEATION?

by

Gregory Edgin

A Dissertation
Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

Major: Counseling Psychology

The University of Memphis
Abstract

Suicide is a serious and growing problem that has not been adequately explained by prior theories. The interpersonal theory of suicide (IPT) was derived to explain the progression of suicidality by positing that thwarted belongingness (TB) and perceived burdensomeness (PB), combined with hopelessness about these states (interpersonal hopelessness), lead to active suicidal ideation, which in turn leads to suicidal behaviors. However, no prospective tests of IPT hypotheses have utilized a measure of interpersonal hopelessness. Additionally, IPT neglects factors that may protect against or explain the progression of suicidality, such as meaning in life. The purpose of the current study was to extend IPT by examining the ability of the joint TB x PB x interpersonal hopelessness interaction to predict future suicidal desire, also termed active suicidal ideation. An additional purpose was to test whether meaning in life buffers the relationship between TB, PB, and interpersonal hopelessness, which would in theory stop the progression to active suicidal ideation. Exploratory analyses were also conducted to examine the alternative possibility that meaning in life mediated relationships between TB, PB, and interpersonal hopelessness or postulated relationships between other constructs in IPT. A broad sample was obtained through a university in the Southeast, social media, and Amazon Mechanical Turk (MTurk). Self-report questionnaires of all constructs were administered twice, in two waves separated by approximately 8 weeks. Because only 53 participants completed valid wave 2 measures, analyses were conducted on 285 wave 1 participants. Hierarchical multiple regression and the PROCESS macro (Hayes, 2022) were utilized to examine hypotheses and exploratory research questions. The two-way PB x interpersonal hopelessness interaction predicted increased active suicidal ideation, such that, at higher levels of PB, interpersonal hopelessness was a stronger predictor of active suicidal ideation. Other hypotheses were not
supported: Meaning in life did not buffer relationships between TB, PB, and interpersonal hopelessness; and neither the TB x interpersonal hopelessness interaction nor the TB x PB x interpersonal hopelessness interaction predicted active suicidal ideation. Lastly, exploratory research questions were not supported.
Table of Contents

Abstract ........................................................................................................................................... ii
List of Figures ................................................................................................................................... vi
Introduction ....................................................................................................................................... 1
Factors that Protect Against Suicide: Meaning in Life ................................................................. 5
Meaning in Life as Moderator in IPT Framework ............................................................................. 6
Meaning in Life as Mediator in IPT Framework ................................................................................ 7
Purpose ............................................................................................................................................... 9
Hypotheses ......................................................................................................................................... 9
Method ............................................................................................................................................... 12
Participants ......................................................................................................................................... 12
Instruments ......................................................................................................................................... 14
Interpersonal Needs Questionnaire (INQ-15; Van Orden, Cukrowicz, Witte, & Joiner, 2012) ......... 14
Meaning in Life Questionnaire (MLQ; Steger et al., 2006) .............................................................. 14
Interpersonal Hopelessness Scale (IHS; Tucker et al., 2018) .......................................................... 15
Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997; Joiner, Pfaff, & Acres, 2002) ............................................................................................................ 16
Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001) ........................................ 16
Depression, Anxiety, Stress Scales (DASS-21; Lovibond & Lovibond, 1995) ................................. 17
Procedures ......................................................................................................................................... 18
Analyses ............................................................................................................................................. 20
Preliminary Analyses .......................................................................................................................... 23
Hypotheses 1a and 1b ........................................................................................................................ 23
Hypotheses 2-4 .................................................................................................................................. 24
Depressive Symptom Index-Suicidality Subscale (DSI-SS) .............................................................. 24
Suicidal Behavioral Questionnaire-Revised (SBQ-R) ...................................................................... 27
Exploratory Questions 1-3 .................................................................................................................. 29
Suicidal Behavioral Questionnaire-Revised ..................................................................................... 30
Depressive Symptom Index-Suicidality Subscale .......................................................................... 30
Exploratory Questions 4-5 ................................................................................................................ 30
Exploratory Question 4 ...................................................................................................................... 31
Exploratory Question 5 ...................................................................................................................... 31
Implications ......................................................................................................................................... 36
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations</td>
<td>37</td>
</tr>
<tr>
<td>Conclusion</td>
<td>40</td>
</tr>
<tr>
<td>References</td>
<td>41</td>
</tr>
<tr>
<td>Appendix A</td>
<td>60</td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The interpersonal Theory of Suicide Framework</td>
<td>4</td>
</tr>
<tr>
<td>2. Hypothesis 3, Suicidal Ideation, Perceived Burdensomeness as Moderator</td>
<td>26</td>
</tr>
<tr>
<td>3. Hypothesis 3, Suicide Risk, Perceived Burdensomeness as Moderator</td>
<td>29</td>
</tr>
<tr>
<td>4. Path Diagram, Exploratory Question 4</td>
<td>31</td>
</tr>
<tr>
<td>5. Path Diagram, Exploratory Question 5</td>
<td>32</td>
</tr>
<tr>
<td>6. Hypothesis 1a: Time 1 Meaning in Life Will Buffer the Relationship between Time 1 TB and Time 2 Interpersonal Hopelessness</td>
<td>60</td>
</tr>
<tr>
<td>7. Hypothesis 1b: Time 1 Meaning in Life Will Buffer the Relationship between Time 1 PB and Time 2 Interpersonal Hopelessness</td>
<td>60</td>
</tr>
<tr>
<td>8. Hypothesis 2: The Time 1 TB x Time 1 Interpersonal Hopelessness Interaction Will Predict Higher Time 2 Active Suicidal Ideation (as Measured by the DSI-SS and SBQ-R)</td>
<td>61</td>
</tr>
<tr>
<td>9. Hypothesis 3: The Time 1 PB x Time 1 Interpersonal Hopelessness Interaction Will Predict Higher Time 2 Active Suicidal Ideation (as Measured by the DSI-SS and SBQ-R)</td>
<td>61</td>
</tr>
<tr>
<td>10. Hypothesis 4: The Time 1 TB x Time 1 PB x Time 1 Interpersonal Hopelessness Interaction Will Predict Higher Time 2 Active Suicidal Ideation (as Measured by the DSI-SS and SBQ-R)</td>
<td>61</td>
</tr>
</tbody>
</table>
Introduction

Suicide is a serious and growing problem in the US. The Centers for Disease Control (CDC, 2018) reported that suicide rates increased 33% from 1999 through 2017, and in 2017 were significantly higher across varied age ranges for males as well as females. In 2017 alone, almost 38,000 working-class adults (ages 16-64) died by suicide, an increase of 40% per 1,000 people compared to the year 2000 (CDC, 2020). *Time* magazine published data indicating that the suicide rates in the United States are the highest they have been since World War II (Ducharme, 2019). The recent coronavirus (COVID-19) may exacerbate this risk: Due to factors such as lockdowns, unemployment—a well-established suicide risk factor (Franklin et al., 2017; Pompili et al., 2014)—reached levels during the first year of the pandemic that were unmatched in the US since the Great Depression (Schwartz, 2020). Though employment numbers have improved, as of early 2022, approximately three million fewer individuals were employed than before the pandemic (CBPP, 2022); additionally, other stressors due to the period of unemployment likely still exist (e.g., being behind on rent payments and/or bills).

There are manifold risk factors for suicide. In addition to unemployment, chief among them are presence of a mental disorder, social isolation, depression, past suicide attempt(s), family conflict, and physical illness (Franklin et al., 2017). However, risk factors that predict suicide for one person may not predict for another, and an individual who exhibits such risk factors may never report suicidal ideation or attempt suicide. There is added complexity from gender, age and race differences in suicide rates. Regarding gender, females typically attempt suicide more often, whereas males typically commit suicide at higher rates (Nock et al., 2008). Further, younger individuals are more likely to engage in nonfatal suicidal behaviors (Nock et
al., 2008), whereas older individuals are likely to commit suicide (McIntosh, 1991). White individuals are more likely to commit suicide than non-White individuals (McIntosh, 1991).

Given this complexity, many theories have attempted to determine which risk factors best predict suicide. However, because many of these models are neither falsifiable nor successful in predicting suicidality (see Van Orden et al., 2010), the interpersonal theory of suicide (IPT, Joiner, 2005; Van Orden et al., 2010) was created to more accurately and specifically explain suicide.

**The Interpersonal Theory of Suicide**

IPT (see Figure 1 below) is an interpersonally-focused theory of suicide in which the interaction of constructs explains the progression of suicidality from passive ideation, to active desire, to suicidal behavior, and the decreasing frequency in suicidality across this progression (e.g., annually, approximately 3.3% of Americans experience suicidal ideation, 1.0% devise a suicide plan, and 0.6% make a suicide attempt; Kessler et al., 2005). In IPT, varied suicide risk factors are construed as antecedents to the interpersonal dimensions of thwarted belongingness (TB) and perceived burdensomeness (PB). TB stems from the broad construct of social connectedness (Berkman et al., 2000), one aspect of which is social isolation, a well-supported risk factor for suicide (CDC, 2015). The crux of TB is the need to belong, which is considered a fundamental human desire (Baumeister & Leary, 1995). According to Van Orden and colleagues (2010), it is the “specific interpersonal need involved in desire for suicide” (p. 582). TB is composed of two constructs related to interpersonal functioning: loneliness and lack of mutually caring relationships (see Figure 1 below). In contrast, PB involves the belief that one is a burden to others, and stems from the finding that family conflict, physical illness, and unemployment are robust predictors of suicide (Franklin et al., 2017; Kposowa, 2001). PB is comprised of two
constructs: perceptions of being a liability to others and feelings of self-hatred (see Figure 1 below).

IPT contains four main hypotheses. The presence of either TB or PB suffices to produce passive suicidal ideation (hypothesis 1); however, when both are present simultaneously, along with hopelessness about these states (i.e., interpersonal hopelessness), the TB x PB x interpersonal hopelessness three-way interaction leads to active suicidal ideation, or serious consideration of suicide (hypothesis 2). It should be noted, however, that the difference between passive and active suicidal ideation tends to be only theoretical—there is no measure of active suicidal ideation, and subsequent research using the IPT framework has utilized general measures of suicidal ideation (e.g., Depressive Symptom Inventory-Suicidality Subscale; Metalsky & Joiner, 1997). Theoretically, progression from passive to active suicidal ideation should be indicated by the content of the suicidal thoughts—whereas an individual experiencing passive suicidal ideation may say or think, “I would be better off dead,” someone experiencing active suicidal ideation may say or think, “I want to kill myself.” In research, however, differences between the constructs have largely been left unaddressed.
Figure 1

The Interpersonal Theory of Suicide Framework (Van Orden et al., 2010)

Active suicidal ideation becomes suicidal intent only after the evolutionarily-adaptive fear of death (Öhman & Mineka, 2001) is reduced (hypothesis 3), and suicidal intent leads to lethal or near-lethal suicide attempts only when pain tolerance is increased (hypothesis 4), which occurs through “habituation and activation of opponent processes in response to repeated exposure to physically painful and/or fear-inducing experiences” (Van Orden et al., 2010, p. 585). Together, reduced fear of death and increased pain tolerance are termed acquired capability for suicide. In short, serious suicidal behavior requires—and is most likely to occur in the simultaneous presence of—TB, PB, hopelessness about these states, reduced fear of death, and elevated physical pain tolerance.

Hypothesis 2 of IPT—that the TB x PB x hopelessness interaction predicts active suicidal desire—was in part derived from previous research in which participants who exhibited high TB only evidenced elevations in suicidal ideation when high PB was also present (Joiner et al., 2009; Van Orden et al., 2008). Van Orden and colleagues (2010) deduced the role of interpersonal
hopelessness from meta-analytic findings that scores on the Beck Hopelessness Scale (BHS; Beck et al., 1974) predicted lethal and nonlethal suicide attempts (McMillan et al., 2007).

Despite the centrality of interpersonal hopelessness and the PB x TB x interpersonal hopelessness interaction to IPT, previous tests of hopelessness-related IPT hypotheses have utilized measures of general hopelessness. These studies, therefore, are not adequate tests of IPT hypotheses that hinge on interpersonal hopelessness. Fortunately, Tucker and colleagues (2018) recently constructed a measure of this construct, and preliminary findings have been supportive of its interactive role in predicting suicidal ideation. However, research to date has been cross-sectional, and prospective tests of the role of interpersonal hopelessness in predicting later suicidal ideation are needed.

**Factors that Protect Against Suicide: Meaning in Life**

Although viable with a variety of populations (e.g., Becker et al., 2020; Van Orden et al., 2016), IPT only attempts to explain vulnerability to suicide and neglects individual factors that protect vulnerable individuals against suicidality. For example, survival and coping beliefs have been shown to negatively correlate with lifetime suicide attempts (Tillman et al., 2017). Additionally, zest for life has buffered the inverse relationship between both TB and PB and persistence in adversity (Collins et al., 2016). Another promising protective factor that has been researched over recent years is meaning in life.

Defined as the “sense made of, and significance felt regarding, the nature of one’s being and existence” (Steger et al., 2006, p. 81), meaning in life has been related to many positive constructs, such as overall mental well-being (Ho et al., 2010; McMahan & Renken, 2011), positive affect (King et al., 2006), and positive thoughts (Lightsey et al., 2014). Although not explicitly captured in Steger’s definition, meaning in life also implies a sense of purpose in one’s
life—something that pushes us forward (Aiena et al., 2016; King et al., 2006). Often, purpose is derived not from internal but from external factors, such as a marriage, a child, or one’s job. Although deriving meaning may be complex and difficult, once derived it can provide an anchoring effect—a sense of stability when faced with unexpected events in a world that may seem unpredictable or absurd (Baumeister & Vohs, 2002). Indeed, without meaning, the capriciousness and seeming chaos of the world would likely be quite taxing (Peterson, 2018). Because of its potential importance as a factor that protects against suicide, meaning in life has been examined in many studies, including several grounded in IPT.

**Meaning in Life as Moderator in IPT Framework**

In the causal model of IPT (Van Orden et al., 2010), TB and PB can lead to hopelessness about these states (interpersonal hopelessness), and the simultaneous presence and interaction of TB, PB, and interpersonal hopelessness is necessary and sufficient to produce active suicidal ideation, a precursor to suicidal intent and behavior. Indeed, the ability of the TB x PB x hopelessness (both general and interpersonal) interaction to predict greater suicidal ideation has been supported (see Chu et al., 2017 for meta-analytic results; Tucker et al., 2018), although it generally accounts for less of the variance in suicidal ideation than TB x general hopelessness and PB x general hopelessness interactions (see Chu et al., 2017).

However, IPT does not specify why TB and PB lead to hopelessness for some persons and not others. Meaning in life may offer an explanation via its role as a potential buffer of the relationship between TB, PB, and hopelessness. Since interpersonal hopelessness is considered necessary for active suicidal ideation, which is a necessary antecedent to suicidal intent and behavior, buffering TB $\rightarrow$ interpersonal hopelessness and PB $\rightarrow$ interpersonal hopelessness relationships may be a key to preventing suicide.
The ability of meaning in life to buffer these relationships appears plausible: Persons who see their lives as full of meaning are unlikely to become hopeless when they experience TB or PB or to view these states as intractable. Consistent with this contention, individuals whose meaning had been experimentally enhanced “displayed greater [task] persistence in the face of heightened perceived burdensomeness and thwarted belongingness” (Collins et al., 2018, p. 147). Relatedly, in studies that did not directly test tenets of IPT, meaning in life has buffered the relationship between risk factors for suicide and hopelessness in a variety of samples (Marco et al., 2017; Marco et al., 2016). However, no study has examined the role of meaning in life as a buffer of the relationship between TB, PB, and hopelessness about these states.

Another possibility is that meaning in life reduces the joint ability of TB x hopelessness, PB x hopelessness, and TB x PB x hopelessness to predict active suicidal ideation. Although direct evidence for these contentions is lacking, meaning in life has buffered the relationship between morally injurious experiences in combat and subsequent suicidal ideation (Corona et al., 2019). Additionally, when implemented as a suicide resilience enhancer, meaning-enhancing interventions have decreased hopelessness, loneliness, and suicide ideation (Heisel et al., 2020).

**Meaning in Life as Mediator in IPT Framework**

Instead of preexisting meaning in life altering the strength of the relationship between TB, PB, and future interpersonal hopelessness, subsequent meaning in life may mediate the relationship between preexisting TB and PB and later interpersonal hopelessness. In other words, TB and PB could increase interpersonal hopelessness by eroding meaning in life. Preconditions for this mediation (see Frazier et al., 2004) have been supported: TB and PB have been positively related to interpersonal hopelessness (Tucker et al., 2018), as they were related to general hopelessness in previous tests of IPT hypotheses (Hagan et al., 2015). TB and PB also are related
to meaning in life (Kleiman & Beaver, 2013), and baseline levels of PB have predicted lower meaning over a 2-month period in a sample of older adults (Van Orden et al., 2012). Additionally, meaning in life has been inversely related to hopelessness (Heisel & Flett, 2006; Lew et al., 2020).

Meaning in life also may mediate the relationship between other links in the IPT causal model. Güngör and Uçman (2020) produced evidence that meaning in life partially mediated and also moderated the relationship between hopelessness and depression. Similarly, meaning in life could mediate the relationship between hopelessness and active suicidal ideation. Indeed, meaning in life partially mediated the relationship between PB and suicidal ideation and fully mediated the relationship between TB and suicidal ideation over 8 weeks among undergraduates (Kleiman & Beaver, 2013). More recently, Lew and colleagues (2020) found that presence of meaning in life mediated the relationship between hopelessness and suicidal behaviors among students in China.

However, Lew and colleagues (2020) used a cross-sectional design, and Kleiman and Beaver (2013) did not use optimal methods for testing mediation (e.g., either a 3-wave or a half-longitudinal design, see Maxwell & Cole, 2007; Cole & Maxwell, 2003). Additionally, both studies utilized student samples. Most importantly, the design of Lew and colleagues was not consistent with IPT, in that the joint or interactive relationship of TB, PB, and interpersonal hopelessness, rather than hopelessness alone, is necessary for active suicidal ideation (Van Orden et al., 2010). Therefore, these findings should be extended prospectively on a broader sample using a measure of interpersonal hopelessness and optimal analyses that are consistent with IPT.

In light of these arguments, an additional purpose of this study is to examine the alternative possibilities that meaning in life mediates the relationship between TB, PB, and
interpersonal hopelessness or the relationship between the joint TB x PB x interpersonal hopelessness interaction and active suicidal ideation. By examining meditational chains involving interpersonal hopelessness, this study addressed Chu and colleagues’ (2017) contention that research has largely neglected hypotheses regarding this central construct of IPT.

**Purpose**

Only one study has examined the joint or interdependent ability of TB, PB, and interpersonal hopelessness to predict active suicidal ideation, and the cross-sectional design of Tucker and colleagues’ (2018) study does not allow determination of the ability of this 3-way interaction to predict change in active suicidal ideation over time. Additionally, no studies have examined whether meaning in life buffers the relationship between this TB x PB x interpersonal hopelessness interaction (which may be construed as a compound risk factor) and active suicidal ideation. Furthermore, no study has tested the ability of meaning in life to buffer the relationship between both TB and PB and interpersonal hopelessness. Therefore, the purposes of this study were to examine (a) the ability of the TB x PB x interpersonal hopelessness interaction, as well as its constituent TB x interpersonal hopelessness and PB x interpersonal hopelessness interactions, to predict active suicide ideation prospectively using a broader sample than that of Tucker et al. (2018); (b) whether meaning in life buffers the relationship between this interaction as well as its components (TB, PB, and interpersonal hopelessness) and active suicide ideation; and (c) whether meaning in life buffers the relationship between both TB and PB and interpersonal hopelessness. Appendix A presents Figures 6-10, which graphically depict hypotheses 1-4.

**Hypotheses**

1. Time 1 meaning in life will buffer the relationship between:
a. Time 1 TB and time 2 interpersonal hopelessness.

b. Time 1 PB and time 2 interpersonal hopelessness.

2. The time 1 TB x time 1 interpersonal hopelessness interaction will predict higher time 2 active suicidal ideation (as measured by the DSI-SS and SBQ-R).

3. The time 1 PB x time 1 interpersonal hopelessness interaction will predict higher time 2 active suicidal ideation (as measured by the DSI-SS and SBQ-R).

4. The time 1 TB x time 1 PB x time 1 interpersonal hopelessness interaction will predict higher time 2 active suicidal ideation. Specifically, the time 1 TB x PB x interpersonal hopelessness interaction will account for unique variance in time 2 suicidal ideation (as measured by the DSI-SS and SBQ-R) after controlling for time 1 suicidal ideation, depression, and demographic variables (i.e., race/ethnicity, gender, age, and employment status).

We will also test the following exploratory questions:

1. Will time 1 meaning in life buffer the relationship between the time 1 TB x interpersonal hopelessness interaction and time 2 active suicidal ideation (as measured by the DSI-SS and SBQ-R)?

2. Will time 1 meaning in life buffer the relationship between the time 1 PB x interpersonal hopelessness interaction and time 2 active suicidal ideation (as measured by the DSI-SS and SBQ-R)?

3. Will time 1 meaning in life buffer the relationship between the time 1 TB x time 1 PB x time 1 interpersonal hopelessness interaction and time 2 active suicidal ideation (as measured by the DSI-SS and SBQ-R)?
4. Does time 2 meaning in life mediate the relationship between time 1 TB, time 1 PB, and time 2 interpersonal hopelessness?

5. Does time 2 meaning in life mediate the relationship between the joint time 1 TB x PB x interpersonal hopelessness interaction and active suicidal ideation (as measured by the DSI-SS and SBQ-R)?
Method

Participants

An a priori power analysis using g*power (Faul et al., 2009) determined that, with an alpha of .05 and an anticipated effect size of 0.03 for the block in which the 3-way interaction term is entered, 361 participants would be necessary to achieve a power of .80. The participant pool consisted of individuals 18 years of age or older within the United States who were recruited via Amazon Mechanical Turk (MTurk), an undergraduate class at The University of Memphis (i.e., EDPR 2111), and snowball sampling via Facebook. MTurk was used to obtain a broad sample that, relative to samples in other studies that have tested IPT hypotheses, is more representative of the US population.

There were 770 total responses to the survey; however, 35 were dropped due to no email or ID being provided to link the waves. Forty-eight participants were removed as they provided no responses to the items. One-hundred-sixty responses were removed due to careless responding (i.e., responding incorrectly to one or both embedded attention check items). Seventy-five participants were removed due to participants taking the survey more than twice. Further, 3 participants were removed because their responses were plus-or-minus 3 SD or more from the mean response time. The remaining 449 participants completed either one or both waves of the study, with 128 of those completing both waves. Eight participants were removed who completed both waves within 6 weeks of each other, leaving 120 who completed both waves. Ten responses were also removed as they did not indicate their age. After this, an additional 53 participants were removed as their IP address indicated that they were using a proxy service. Though there could have been a valid reason for participants to use a proxy service, use of such a service masks the location of the participant (which could have been from
outside the United States), and use of a proxy service has been associated with poor data quality (Dennis et al., 2020). Thirty-seven participants were removed as they were not based in the United States. This left 341 in the first wave and 53 who completed both waves. Since the two-wave data was insufficient to carry out analysis, the wave 1 data were analyzed from this point onwards.

The wave 1 sample contained 65 missing values, or 0.381% of the dataset, which was considered missing completely at random (MCAR) using Little’s MCAR Test ($\chi^2 = 1781, df = 1798, p = .603$). None of the cases were missing more than 8% of data across all scale responses. Further, no individual cases were missing more than 25% of data per instrument, and missing data on instruments ranged from .12% to .65%. Because the data were MCAR, multiple imputation was used to impute missing data (Schlomer et al., 2010). No cases with Cook’s distance and centered leverage values 3 or more $SD$ from the mean in multiple regression analyses were removed from analyses, but 19 cases with Mahalanobis distance at a probability of .001 or less were removed (Leys et al., 2018). Thirty-one cases were removed because they had standardized residuals greater than 3 $SD$ from the mean when conducting preliminary analyses. Six participants identifying as transgender or gender nonconforming were removed since the $n$ did not permit comparison of differences in the prediction equations in relation to this group. The resulting sample size was 285 (54% male, 72.6% White, 9.5% Black, 3% Asian, 3% Hispanic/Latino, 7.4% employed). The number of participants obtained from each source—MTurk, universities, and snowball sampling—was not assessed.
Instruments

**Interpersonal Needs Questionnaire (INQ-15; Van Orden, Cukrowicz, Witte, & Joiner, 2012)**

The INQ-15 is a 15-item questionnaire with two scales, Belongingness and Burdensomeness, that measure TB and PB. Items are on a Likert-type scale, ranging from 1 (“Not at all true for me”) to 7 (“Very true for me”), with higher scores reflecting greater PB and/or TB. An example of an item assessing TB (reverse-scored) is “These days other people care about me,” whereas an example of an item assessing PB is “These days I feel like a burden on the people in my life.” INQ-15 scores on both scales have demonstrated high internal consistency in a sample of undergraduate students, with coefficient alphas of 0.90 and 0.95, respectively (Tucker et al., 2018). In a sample of undergraduate students, the INQ demonstrated a test-retest reliability of .60 across a 6-week period (Kleiman, Liu, & Riskind, 2014). Additionally, both subscales have demonstrated high convergent validity in samples of both younger and older adults (Van Orden, Cukrowicz, et al., 2012). Coefficient alpha for the current study was .83 for the Belongingness subscale, and .92 for the Burdensomeness subscale.

**Meaning in Life Questionnaire (MLQ; Steger et al., 2006)**

The MLQ is a 10-item assessment of an individual’s perceived meaning in life, with Likert-type responses ranging from 1 (“Absolutely Untrue”) to 7 (“Absolutely True”). The MLQ is comprised of two subscales: Presence of Meaning (MLQ-P), and Search for Meaning (MLQ-S). Higher scores on both subscales signify higher presence and search for meaning, and respondents’ results can reflect specific profiles (e.g., high presence, low search). The Presence of Meaning subscale is associated with psychological health and includes items such as “I understand my life’s meaning,” and “My life has a clear sense of purpose.” The Search for Meaning subscale, on the other hand, has shown to be associated with depression, neuroticism,
and negative emotions (Hill, 2018), and includes items such as “I am looking for something that makes my life feel meaningful” and “I am always searching for something that makes my life feel significant.” Only the Presence of Meaning subscale, which is equated with meaning in life, will be utilized in analyses. Results from initial validation using a sample of university students indicated high convergent validity (.61 - .74) between the presence in meaning subscale and other measures of meaning in life. Alpha coefficients for the MLQ-P and MLQ-S “were .81 and .84 during Time 1, respectively, and .86 and .92 during Time 2” (Steger et al., 2006, p. 86). A further review of the psychometric properties can be found in Steger and Shin (2010). Coefficient alpha for the current study was .74.

**Interpersonal Hopelessness Scale (IHS; Tucker et al., 2018)**

The IHS is a 10-item Likert-type measurement of hopelessness about two constructs related to the interpersonal theory of suicide—TB and PB. Five items assess hopelessness about TB, and five assess hopelessness about perceptions of PB. Respondents’ answers range from 0 (“Definitely false”) to 4 (“Completely True”), with higher score totals indicating more hopelessness about change in one’s interpersonal relationships. Initial factor analysis suggested one common factor; therefore, items are not divided into subscales. Mandracchia, Sunderland, and To (2019) also found evidence that the IHS measured interpersonal hopelessness as a unitary construct. Coefficient alpha of IHS scores was .95 among both samples of undergraduate students (Tucker et al., 2018) and a sample more representative of the general population (Mandracchia et al., 2019); however, due to a data collection error, Mandracchia et al. were not able to provide demographic information for their sample of MTurk participants. Tucker and colleagues (2018) found initial evidence of construct validity: IHS scores were significantly correlated with scores on measures of suicide risk ($r = .44$) and ideation ($r = .46$). Additionally,
scores on the IHS were significantly related to scores of general hopelessness ($r = .72$) as measured by the Beck Hopelessness Scale (BHS; Beck et al., 1974). Mandracchia et al. (2019) found scores on the IHS significantly predicted scores of active suicidal ideation as measured by the Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997; Joiner et al., 2002), which provided preliminary evidence for external validity. Coefficient alpha for the current study was .97.

**Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997; Joiner, Pfaff, & Acres, 2002)**

The DSI-SS is a 4-item subscale of the Depressive Symptom Inventory assessing the “frequency and intensity of suicidal ideation and impulses in the past two weeks” (Joiner, Pfaff, & Acres, 2002, p. 474). Items are on a Likert-type scale, with scores ranging from 0 to 3, and higher scores indicating greater intensity of suicidal ideation. Reliability and validity of DSI-SS scores were initially demonstrated with a clinical sample of Australian adolescents and young adults (ages 15 - 24), with a coefficient alpha of .90, and construct validity evinced by correlations between scale scores and scores on multiple indices related to depression and suicidality. Further evidence for validity of DSI-SS scores with a variety of samples can be found in von Glischinski and colleagues (2016). Coefficient alpha for the current study was .93.

**Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001)**

The SBQ-R is a 4-item measure of past suicidal behavior, and is the most frequently used measure of suicide risk in IPT literature (Chu et al., 2017). The 4 items assess “lifetime ideation/attempt, frequency of ideation over the past 12 months, telling someone else about ideation, and likelihood of attempting suicide in the future” (Becker et al., 2020, p. 74). Reliability was initially demonstrated across samples of psychiatric inpatient adolescents
(coefficient alpha = .88) and adults (coefficient alpha = .87), high school students (coefficient alpha = .87), and undergraduates (coefficient alpha = .76) (Osman et al., 2001). Additionally, Osman and colleagues (2001) found evidence for construct validity, comparing the ability of the SBQ-R to predict suicidal groups within inpatient samples. A review of the SBQ-R as a suicide risk measure with college students can be found in Li et al. (2019). The SBQ-R was used in conjunction with the DSI-SS as a proxy measure of active suicidal ideation, since such a measure does not currently exist. Previous literature (e.g., Tucker et al., 2018) has used a similar means of measuring active suicidal ideation. Coefficient alpha for the current study was .87.

**Depression, Anxiety, Stress Scales (DASS-21; Lovibond & Lovibond, 1995)**

The DASS-21 is a 21-item measure of the three related negative emotional states of depression, anxiety, and stress. Items are on a Likert-type scale, with responses ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much, or most of the time”); higher scores indicate higher depression, anxiety, and/or stress over the past week. Since we are only assessing depression for the current study, only the Depression subscale was used. Using a general population sample, the DASS-21 scale scores demonstrated good discriminant and convergent validity when compared to measures of depression and anxiety (i.e., the Hospital Anxiety and Depression Scale, Zigmond & Snaith, 1983; and the Personal Disturbance Scale, Bedford & Foulds, 1978), and evinced coefficient alphas of .88 for Depression, .82 for Anxiety, .90 for Stress, and .93 for the Total scale (Henry & Crawford, 2005). In a sample of undergraduate students, coefficient alphas were .85 for the Depression scale, .81 for the Anxiety scale, and .88 for Stress scale, and scores on the three scales demonstrated construct validity by having expected relationships with both depression and anxiety measures (Osman et al., 2012). Coefficient alpha for the current study was .93.
Procedures

The lead researcher obtained approval from the University of Memphis Institutional Review Board (IRB). Upon approval, volunteers were recruited via MTurk, EDPR 2111, and snowball sampling via Facebook. With MTurk, an account was created to obtain the services of individuals who completed the survey in exchange for a set rate (i.e., 50 cents for each wave of the survey). The use of MTurk provided a wider range of demographics that typically is harder to obtain with undergraduate participants (Ross et al., 2010). Participants were least 18 years of age.

Given the uncertainty of in-person classes because of COVID-19, University of Memphis (U of M) students were requested to participate via email. Specifically, the instructor for EDPR 2111 was emailed to request permission to use the students as volunteers, then upon approval a brief description of the study and request for participants was given to students enrolled in the class. Links were provided for interested participants using U of M email correspondence and in a way that was consistent with course policies. Individuals were told they were participating in a survey examining factors related to suicide, and those who consented were assured their responses would be confidential. Given the study design, participants were requested to provide data at two different time points, approximately 8 weeks apart, as this time frame has been used previously with IPT research assessing meaning in life (e.g., Kleiman & Beaver, 2013; Van Orden, Bamonti, et al., 2012). Additionally, because of the 2-wave design, participants’ responses needed to be matched. Therefore, email addresses were obtained within the Qualtrics survey as a way of contacting participants for the second wave of data collection. Data were kept on a password-protected laptop, and only the lead researcher and data consultant had access to it. After all data were collected, they were deidentified.
Emails to participants included the Qualtrics link to the survey. Once potential participants clicked the link, they were first shown the informed consent document, which they read before either agreeing or disagreeing to participate. A demographics questionnaire was given first.

Because data collection was online and involved some participants receiving compensation, Meade and Craig (2012) recommended adding attention check items to check for mindless/careless responding. Per the authors’ recommendations, two attention check items were included, as more than one per 50-100 items may annoy respondents. Both items were instructed response items, and the response options paralleled those for the other items from the surveys in which they are embedded (e.g., “Respond with ‘Absolutely True’ for this item” embedded in the questions for the MLQ questionnaire). Participants who did not respond according to either of the two items’ directions were excluded from analyses. Additionally, Qualtrics allows users to monitor IP addresses of responses, and duplicate responses (i.e., the questionnaires completed a second time) were removed. Further, MTurk responses whose IP addresses did not come from the United States or were deemed as potentially malicious were removed. This was accomplished through use of iphub.info, which analyzes IP addresses and detects their origin, as well as if they come from a known server farm. Lastly, participants were removed if their responses were plus-or-minus 3 SD or more from the mean response time, per recommendations of Hair et al. (2019). This was done because of MTurk participants’ tendency to be “speeders,” or participants who complete surveys quickly as a means of making as much money in as short of time as possible, without regard for providing valid, genuine responses (Ford, 2017; Wood et al., 2017). Slow responders were removed because of recommendations of Hair et al. (2019).
Following collection of survey data, participants were given resources for suicide prevention, including the National Suicide Prevention Lifeline. Additionally, participants were given the contact information of the lead researcher in case any questions or concerns arose during or after completion of the survey.

**Analyses**

Mean score was used for all instruments. Upon completion of data collection, data were examined for missing data and outliers. Potential outliers were assessed using Mahalanobis distance and a scatterplot of Cook’s distance by centered leverage values, since Mahalanobis distance can become unreliable when there are multiple outliers in the dataset (Egan & Morgan, 1998; Stevens, 1984). Cases with Mahalanobis distance at a probability of .001 or less were removed from analyses (Leys et al., 2018). Assumptions of normality of residuals, linearity, homogeneity of variance, and lack of multicollinearity were also assessed.

Because of the differences in suicidality presentation across demographics, age, gender, and race/ethnicity were controlled for. Additionally, given the stark increase in unemployment currently due to the novel coronavirus, and the risk unemployment poses for suicidality, employment status was controlled for. Lastly, because of depression’s relationship with suicide ideation (see Franklin et al., 2017), it was controlled for as well.

Hypotheses that involve moderation were tested using hierarchical multiple regression. All predictors were standardized to control for multicollinearity. In each of the regressions, the $R^2$ change, as well as the associated $F$ change and $p$ value, were examined in order to determine whether the particular hypothesis was supported. In the regression for testing hypotheses 1a and 1b, depression and demographic variables were entered in block 1, TB, PB, and meaning in life were entered in block 2, and interactions of meaning in life with TB and PB were entered in
block 3. Hypotheses 2, 3, and 4 were tested in a second regression. In this regression, depression and demographic variables were entered in block 1, TB and PB were entered in block 2, the interactions of TB and PB with interpersonal hopelessness were entered in block 3, and the 3-way TB x PB x interpersonal hopelessness interaction were entered in block 4.

Regression coefficients and associated $F$ and $p$ values were examined to ascertain which interaction was significant, and simple slopes tests generated by the PROCESS macro (Hayes, 2022) were used to examine the moderator effect. The simple slopes test “provides information regarding the significance of the relations between the predictor and outcome at different levels of the moderator” (Frazier et al., 2004, p. 122). Significant interactions were graphed using PROCESS to ascertain the meaning of results. Effect sizes for significant findings were interpreted using $f^2$. An identical procedure was used to examine the significance and meaning of the 3-way interaction. Exploratory questions 1 through 3 were tested in identical fashion.

Hypotheses involving active suicidal ideation as a dependent variable were structured in a way that addressed a particular issue within the IPT literature—that a measure of active suicidal ideation does not currently exist, so a proxy measure must be utilized. Previous literature (e.g., Tucker et al., 2018) used a combination of measures to address the issue, such as suicidal ideation (using the DSI-SS) and suicide risk (using the SBQ-R) measures. Therefore, the current research followed precedent and measured active suicidal ideation by running separate analyses using active suicidal ideation (as measured by the DSI-SS and SBQ-R).

The PROCESS SPSS macro (Hayes, 2022) was also used to test mediation (Exploratory Research Questions 4 and 5). PROCESS uses bias-corrected bootstrapping to generate 95% confidence intervals for the indirect effect. PROCESS models 4 (assessing 2-way interactions) and 12 (assessing 3-way interactions) were utilized in analyses.
Results

Data met assumptions of normality of residuals, linearity, and homogeneity of variance; however, there was an issue with multicollinearity that is discussed later in the results. For hierarchical multiple regression analyses, demographic variables were dummy coded. Race/ethnicity was dummy coded in such a way as to compare White and Black individuals (White = 0, Black = 1), then subsequently compare White with Other individuals (White = 0, Other = 1). “Other” was used to group varied reported races/ethnicities but did not contain enough cases to be used for data analysis alone (e.g., 32 participants reported some other ethnicity not presented in the survey; for example, 9 were Asian, 9 were Hispanic/Latino, 2 were Middle Eastern, and 1 was Native Hawaiian/Pacific Islander). Unemployed participants were the reference group for employment (unemployed = 0, employed = 1), and males were the reference group for gender (male = 0, female = 1). Table 1 lists means, coefficient alphas and correlations.

Table 1

Correlation Matrix, Mean, and Standard Deviation for Instrument Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\bar{x}$</th>
<th>$SD$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MIL</td>
<td>4.98</td>
<td>1.11</td>
<td></td>
<td>.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IHS</td>
<td>1.67</td>
<td>1.26</td>
<td>-.21**</td>
<td>.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. PB</td>
<td>3.48</td>
<td>2.07</td>
<td>-.15*</td>
<td>.96**</td>
<td>.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. TB</td>
<td>3.16</td>
<td>1.13</td>
<td>-.58**</td>
<td>.57**</td>
<td>.49**</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. DASS</td>
<td>1.27</td>
<td>0.85</td>
<td>-.32**</td>
<td>.89**</td>
<td>.85**</td>
<td>.60**</td>
<td>.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. SBQ</td>
<td>2.44</td>
<td>1.26</td>
<td>-.23**</td>
<td>.60**</td>
<td>.53**</td>
<td>.44**</td>
<td>.58**</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>7. DSI-SS</td>
<td>0.77</td>
<td>0.81</td>
<td>-.11</td>
<td>.76**</td>
<td>.73**</td>
<td>.41**</td>
<td>.69**</td>
<td>.77**</td>
<td>.93</td>
</tr>
</tbody>
</table>

Note. MIL: Presence of Meaning in Life; IHS: Interpersonal Hopelessness; PB: Perceived Burdensome; TB: Thwarted Belongingness; DASS: Depression; SBQ: Suicidal Behavioral Questionnaire; DSI-SS: Depressive Symptom Index-Suicidality Subscale.

*p < .05; ** $p < .001$. Cronbach’s Alpha ($\alpha$) listed on diagonal.
Correlations were in the expected direction, but the correlation between PB and IHS was unexpectedly high. After standardizing all primary predictors (scale scores), variance inflation factors (VIF) values for entry of most variables were below 10, but VIF values for entry of multiple variables were high across models: PB (VIF = 12.943), interpersonal hopelessness (VIF = 17.702), as well as the three-way TB x PB x interpersonal hopelessness interaction (VIF = 12.264). TB and PB are constructs from the same scale and were highly correlated ($r = .49, p < .001$). Further, interpersonal hopelessness was even more highly correlated with TB ($r = .57, p < .001$) and PB ($r = .96, p < .001$).

**Preliminary Analyses**

Prior to conducting the regression analyses for hypothesis tests, preliminary analyses were conducted to examine potential differences in predictors and hypothesis tests across gender, race (White vs. Black, with “other” race removed due to its likely heterogeneity and other particular races removed due to $ns$ below 10), and employment status (employed vs. unemployed). Because gender, race and employment status did not affect interactions pertinent to hypothesis tests or exploratory research questions (i.e., these interactions did not differ in their ability to predict outcomes across gender, race, or employment status), men and women, White and Black persons, and persons who were employed and unemployed were combined in primary analyses.

**Hypotheses 1a and 1b**

Hierarchical multiple regression was used to examine hypothesized relationships involving moderation (i.e., hypotheses 1a, 1b, 2, 3, and 4). All predictors were standardized to control for multicollinearity. For hypotheses 1a and 1b, depression and demographic variables were entered in block 1 and accounted for significant variance in interpersonal hopelessness ($\Delta R^2$...
Depression ($p < .001$), gender ($p < .001$), and “other” race/ethnicity ($p = .001$) contributed to the model, with White persons having higher interpersonal hopelessness than participants who described their race as “other,” and women having lower interpersonal hopelessness than men. Employment status ($p = .406$), age ($p = .904$), and black race/ethnicity ($p = .078$) were not significant. In block 2, TB ($p < .001$) and PB ($p < .001$) were significant, whereas meaning in life was not significant ($p = .083$). This block accounted for significant variance in interpersonal hopelessness ($\Delta R^2 = .11, \Delta F (3,275) = 250.23, p < .001$). In block 3, the interactions of meaning in life with TB ($p = .624$) and PB ($p = .956$) were not significant. Thus, meaning in life did not buffer the relationship between TB, PB, and interpersonal hopelessness.

**Hypotheses 2-4**

**Depressive Symptom Index-Suicidality Subscale (DSI-SS)**

Hypotheses 2, 3, and 4 were tested in a second and third regression (see Tables 2 and 3). The second regression included active suicidal ideation (as measured by the DSI-SS) as the dependent variable. Depression and demographic variables were entered in block 1 and accounted for significant variance in active suicidal ideation ($\Delta R^2 = .50, \Delta F (6,278) = 46.35, p < .001$). Gender ($p = .04$), with women having lower active suicidal ideation, and depression ($p < .001$) was significant in this block, whereas race/ethnicity—White versus Black ($p = .053$), race/ethnicity—White versus non-White ($p = .984$), and age ($p = .716$) were not significant.

Block 2 accounted for significant variance in active suicidal ideation ($\Delta R^2 = .09, \Delta F (3,275) = 19.68, p < .001$). Interpersonal hopelessness predicted higher suicidality ($p < .001$), whereas TB ($p = .546$) and PB ($p = .565$) were not significant.
Table 2

Results of Hierarchical Multiple Regression, DSI-SS, Hypotheses 2-4

<table>
<thead>
<tr>
<th>Block 4</th>
<th>B</th>
<th>SE</th>
<th>B</th>
<th>P</th>
<th>R²</th>
<th>F</th>
<th>P</th>
<th>ΔR²</th>
<th>ΔF</th>
<th>Δp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBxIHS</td>
<td>.00</td>
<td>.07</td>
<td>.00</td>
<td>.98</td>
<td>.599</td>
<td>33.86</td>
<td>&lt; .001</td>
<td>.000</td>
<td>.15</td>
<td>.699</td>
</tr>
<tr>
<td>PBxIHS</td>
<td>.17</td>
<td>.06</td>
<td>.14</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBxPBxIHS</td>
<td>-.04</td>
<td>.09</td>
<td>-.05</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 285. TB = PB = Perceived Burdensomeness, TB = Thwarted Belongingness, IHS = Interpersonal Hopelessness, x = interaction term.*

Block 3 accounted for significant variance in active suicidal ideation (ΔR² = .01, ΔF (2,273) = 3.51, p = .031). The interaction of PB with interpersonal hopelessness was significant (p = .009), whereas the interaction of TB with interpersonal hopelessness was not significant (p = .750).

Replication of this regression in PROCESS indicated that the PB x interpersonal hopelessness interaction was significant (p = .009, see Figure 2). This finding is contrary to theory, however, which does not postulate two-way interactions (i.e., TB x interpersonal hopelessness and PB x interpersonal hopelessness) as causing increased active suicidal ideation. Rather, it is the *simultaneous* presence of, and interaction between, “thwarted belongingness, perceived burdensomeness, and hopelessness about one’s interpersonal connections” that is “a proximal and sufficient cause of suicidal desire” (Van Orden et al., 2010, p. 589).

Simple slopes tests in PROCESS included PB as the moderator and interpersonal hopelessness as the predictor, indicated that at low levels of PB, the regression line slope of interpersonal hopelessness predicting active suicidal ideation was significant and positive, t(274) = 2.14, B (for the simple slopes test) = .32, p = .033, 95% CI = .03, .61. At mean levels of PB,
the slope of the was significant and positive as well, $t(274) = 3.76$, $B$ (for the simple slopes test) = .48, $p < .001$, 95% CI = .23, .74. At high levels of PB, the regression line slope was significant

![Graph](image)

**Figure 2**

*Hypothesis 3, Perceived Burdensomeness as a Moderator of the Relationship between Interpersonal Hopelessness and Active Suicidal Ideation as Measured by the DSI-SS*

and positive, $t(274) = 4.74$, $B$ (for the simple slopes test) = .65, $p < .001$, 95% CI = .38, .92.

Although the relationship between interpersonal hopelessness and active suicidal ideation was significant at low, medium, and high values of PB, this relationship was stronger at high values of PB than at low values of PB.

Because interactions terms are in principle symmetric (see Hayes, 2022) and because the Figure 5 in Van Orden et al. (2010) appears to construe interpersonal hopelessness as the moderator of the relationship between the TB x PB interaction and active suicidal ideation, we also tested interpersonal hopelessness as the moderator of the relationship between PB and active suicidal ideation. PB was a nonsignificant predictor of active suicidal ideation at low, medium,
and high levels of interpersonal hopelessness but was a stronger predictor at high levels of interpersonal hopelessness ($t(273) = 1.93, p = .055$) than at low levels ($t(273) = -.58, p = .564$).

In short, we found that people high in perceived burdensomeness had greater levels of active suicidal ideation at high levels of interpersonal hopelessness, compared to persons low in perceived burdensomeness. When construing interpersonal hopelessness as the moderator, PB was a stronger predictor of active suicidal ideation at high levels of hopelessness compared to low levels, though it was not a statistically significant predictor even at high levels of hopelessness. These moderation results appear congruent with block 2 of the regression, in which interpersonal hopelessness was a strong predictor of active suicidal ideation, whereas PB was a weak and nonsignificant predictor.

Finally, in block 4, the 3-way TB x PB x interpersonal hopelessness interaction ($p = .699$) was not significant. Thus, hypothesis 3 (i.e., that the PB x interpersonal hopelessness interaction would predict increased active suicidal ideation) was supported, but hypotheses 2 (the TB x interpersonal hopelessness interaction will predict higher active suicidal ideation) and 4 (the TB x PB x interpersonal hopelessness interaction will predict higher active suicidal ideation) were not.

**Suicidal Behavioral Questionnaire-Revised (SBQ-R)**

The third regression included active suicidal ideation (as measured by the SBQ-R) as the dependent variable; Table 3 presents these results. Depression and demographic variables were entered in block 1 and accounted for significant variance in active suicidal ideation ($\Delta R^2 = .34$, $\Delta F (6,278) = 24.00, p < .001$). Only depression ($p < .001$) was significant. Block 2 accounted for significant variance in active suicidal ideation ($\Delta R^2 = .05$, $\Delta F (3,275) = 8.09, p < .001$). In block
2, PB ($p = .028$) and interpersonal hopelessness ($p < .001$) were significant, whereas TB ($p = .121$) was not significant.

**Table 3**

*Results of Hierarchical Multiple Regression, SBQ, Hypotheses 2-4*

<table>
<thead>
<tr>
<th>Block 4</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$p$</th>
<th>$\Delta R^2$</th>
<th>$\Delta F$</th>
<th>$\Delta p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBxIHS</td>
<td>.16</td>
<td>.14</td>
<td>.12</td>
<td>.25</td>
<td>.41</td>
<td>15.66</td>
<td>&lt; .001</td>
<td>.00</td>
<td>.96</td>
<td>.329</td>
</tr>
<tr>
<td>PBxIHS</td>
<td>.26</td>
<td>.12</td>
<td>.13</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBxPBxIHS</td>
<td>.18</td>
<td>.18</td>
<td>.16</td>
<td>.33</td>
<td>.65</td>
<td>4.36</td>
<td>&lt; .001</td>
<td>.01</td>
<td>.38</td>
<td>.14</td>
</tr>
</tbody>
</table>

*Note. N = 285. PB = Perceived Burdensomeness, TB = Thwarted Belongingness, IHS = Interpersonal Hopelessness, x = interaction term.*

Block 3 did not account for significant variance in active suicidal ideation, $\Delta R^2 = .01, \Delta F (2,273) = 2.72, p < .068$, but the PB x interpersonal hopelessness interaction was significant ($p = .022$, see Figure 3), and statistics for excluded variables for block 2 indicated that the PB x interpersonal hopelessness interaction would account for significant variance in active suicidal ideation if entered singly in this block, $\beta = .14, t = 2.24, p = .026$.

Replication of the PB x interpersonal hopelessness interaction in PROCESS indicated that the interaction was significant ($p = .022$, see Figure 3). Simple slopes tests using PB as the moderator and interpersonal hopelessness as the predictor indicated that at low levels of PB, the regression line slope of interpersonal hopelessness in prediction of active suicidal ideation was significant and positive, $t(274) = 2.08, B$ (for the simple slopes test) = .59, $p = .039, 95\% \text{ CI} = .03, 1.14$. At mean levels of PB, the slope of the was significant and positive as well, $t(274) = 3.52, B$ (for the simple slopes test) = .86, $p < .001, 95\% \text{ CI} = .38, 1.34$. At high levels of PB, the regression line slope was significant and positive, $t(274) = 4.36, B$ (for the simple slopes test) = 1.13, $p < .001, 95\% \text{ CI} = .62, 1.64$. In short, the association between interpersonal hopelessness
and active suicidal ideation (as measured by the SBQ-R) was significant at all levels of PB but was stronger at high than at low levels of PB.

![Graph: Perceived Burdensomeness as Moderator of the Relationship Between Interpersonal Hopelessness and Active Suicidal Ideation as Measured by the SBQ-R]

**Figure 3**

*Hypothesis 3, Perceived Burdensomeness as Moderator of the Relationship Between Interpersonal Hopelessness and Active Suicidal Ideation as Measured by the SBQ-R*

The TB x interpersonal hopelessness interaction was not significant \((p = .506)\). Finally, in block 4 the 3-way TB x PB x interpersonal hopelessness interaction \((p = .329)\) was not significant and did not contribute to the model. Thus, hypothesis 3 was again supported, but hypotheses 2 and 4 were not.

**Exploratory Questions 1-3**

To cover the full range of suicidality, regressions investing exploratory questions 1-3 were conducted twice, first with active suicidal ideation as measured by the SBQ-R as the criterion variable, then with active suicidal ideation as measured by the DSI-SS as the criterion variable. As a reminder, exploratory questions 1-3 addressed whether meaning in life would buffer the relationship between active suicidal ideation and: TB x interpersonal hopelessness (exploratory question 1), PB and interpersonal hopelessness (exploratory question 2), and TB x PB x and interpersonal hopelessness (exploratory question 3).
Suicidal Behavioral Questionnaire-Revised

As in tests for hypotheses 2-4, the PB x interpersonal hopelessness interaction was significant but the TB x interpersonal hopelessness interaction was not. Block 4 did not explain additional variance ($\Delta R^2 = .003$, $\Delta F (1,269) = 1.57$, $p = .211$), and the 3-way TB x PB x interpersonal hopelessness interaction with meaning in life was not significant ($p = .803$). Finally, block 5 was not significant ($\Delta R^2 = .000$, $\Delta F (1,268) = 0.19$, $p = .869$), and the 4-way interaction of TB, PB, interpersonal hopelessness, and meaning in life was not significant ($p = .663$). Thus, exploratory questions 1-3 were not supported—meaning in life did not buffer any of the proposed relationships.

Depressive Symptom Index-Suicidality Subscale

Block 4 was not significant ($\Delta R^2 = .01$, $\Delta F (1,269) = 1.43$, $p = .223$), and the 3-way TB x PB x interpersonal hopelessness interaction did not account for incremental variance in active suicidal ideation. Block 5 also did not account for significant variance ($\Delta R^2 = .000$, $\Delta F (1,268) = 0.03$, $p = .663$), and 4-way interaction of TB, PB, interpersonal hopelessness, and meaning in life was not significant ($p = .663$). Thus, exploratory questions 1-3 were again unsupported, and meaning in life did not buffer the relationships between 2-way or the 3-way interaction and active suicidal ideation.

Exploratory Questions 4-5

Path analysis for cross-sectional data was utilized rather than SEM due to issues with latent variables in SEM analysis (e.g., poor model fit and difficulties with item parceling). The PROCESS macro was used for these analyses: Model 4 was used for exploratory question 4, and model 12 was used for exploratory question 5.
Assumptions of path analysis were assessed and satisfied prior to interpretation of the model. Nineteen cases with a Mahalanobis distance significant below the .001 level were removed from analyses (Leys et al., 2018).

**Exploratory Question 4**

In testing whether meaning in life mediates the relationship between TB, PB, and interpersonal hopelessness, demographic variables and depression were entered as covariates. Depression ($p < .001$) and TB ($p < .001$) were the only significant predictors of meaning in life ($R^2 = .40$, $F(8,276) = 22.62$, $p < .001$). Regarding direct relationships to interpersonal hopelessness, PB ($p < .001$), TB ($p < .001$), and depression ($p < .001$) had significant path coefficients. Meaning in life did not have a significant path coefficient to interpersonal hopelessness ($p = .083$). Since this path was not significant, the indirect path from the independent variables to interpersonal hopelessness through meaning in life was not significant (i.e., meaning in life did not mediate the relationship between TB, PB, and interpersonal hopelessness; $B = .01$, 95% CI = -.002, .02)). See Figure 4 for the path diagram.

![Path Diagram, Exploratory Question 4](image)

**Figure 4**

*Path Diagram, Exploratory Question 4: Does Meaning in Life Mediate Relationships between Thwarted Belongingness, Perceived Burdensomeness, and Interpersonal Hopelessness (Covariates Excluded from Figure)*

**Exploratory Question 5**

As described in tests for hypothesis 4, the TB x PB x interpersonal hopelessness interaction did not predict either measure of active suicidal ideation. Additionally, meaning in
life did not predict either measure of active suicidal ideation. Therefore, meaning in life did not mediate the relationship between the TB x PB x interpersonal hopelessness interaction and either measure of active suicidal ideation—the indirect effect was not significant in prediction of active suicidal ideation as measured by the DSI-SS ($B = -.0004$, 95% CI = -.01, .0048) or by the SBQ-R ($B = .001$, 95% CI = -.01, .01). See Figure 5 for the path diagram.

**Figure 5**

Path Diagram, Exploratory Question 5: Does Meaning in Life Mediate the Relationship between the Thwarted Belongingness x Perceived Burdensomeness x Interpersonal Hopelessness Interaction and Active Suicidal Ideation

**Discussion**

Suicide is a serious and growing problem that has not been adequately explained by prior theories. The interpersonal theory of suicide (IPT) has attempted to provide the suicide literature with a theory that is falsifiable and able to accurately predict suicidality. Further, IPT posits a specific type of hopelessness—interpersonal hopelessness—as the precursor to active suicidal ideation, or a desire for death. Until Tucker and colleagues (2018) created the Interpersonal Hopelessness Scale, this construct could not be measured and, therefore, IPT had not been
adequately tested. Further, IPT neglects factors that may protect against or explain the progression of suicidality, such as meaning in life. The purpose of the current study was to extend the IPT literature by examining the ability of the joint thwarted belongingness (TB) x perceived burdensomeness (PB) x interpersonal hopelessness interaction to predict active suicidal ideation. An additional purpose was to test whether meaning in life buffers the relationship between TB, PB, and interpersonal hopelessness, which would in theory stop the progression to active suicidal ideation. Exploratory analyses were also conducted to examine the alternative possibility that meaning in life mediated relationships between TB, PB, and interpersonal hopelessness or moderated postulated relationships between central interaction terms in IPT and active suicidal ideation.

Hypothesis 1—that meaning in life would moderate the relationship between TB and/or PB and interpersonal hopelessness—was not supported. Though tests of meaning in life as a moderator within the specific IPT framework have not been conducted, previous literature supports meaning in life as a buffer of the relationship between risk factors for suicide and hopelessness (Marco et al., 2017; Marco et al., 2016). Such results could at least in part be due to the multicollinearity between TB, PB, and interpersonal hopelessness, and particularly the high correlation between PB and interpersonal hopelessness ($r = .96$). Order effects may also have played a role (e.g., administration of the DSI-SS first may have affected scores on other instruments in unexpected ways). Further, hypothesis 2 (i.e., that the TB x interpersonal hopelessness interaction will predict higher active suicidal ideation) was not supported. As TB has a weaker relationship with suicidal ideation, risk, and attempt history than PB (see Chu et al., 2017, for a meta-analysis), the present study reveals that it may also be less likely than PB to
exacerbate the relationship between other risk factors such as interpersonal hopelessness and active suicidal ideation.

Hypothesis 3—that the PB x interpersonal hopelessness interaction will predict higher active suicidal ideation—was supported. This finding is consistent with previous literature, which found PB to have a significant main effect on suicidal ideation and risk (Tucker et al., 2018). However, as previously mentioned, the finding is contrary to the theory itself, which states that it is the simultaneous presence of perceived burdensomeness, thwarted belongingness, and interpersonal hopelessness that predicts active suicidal ideation, rather than only the two-way interactions. Considering the three-way interaction (Hypothesis 4, see below) was not supported, this could have implications for future suicidality research, given the consistent finding that perceived burdensomeness is a stronger predictor than thwarted belongingness of both suicidal ideation and risk.

Hypothesis 4 (i.e., that the TB x PB x interpersonal hopelessness interaction will predict higher active suicidal ideation) was not supported. Though literature specific to interpersonal hopelessness is sparse, Tucker and colleagues (2018) were able to find support for the 3-way interaction predicting suicidal ideation and risk above and beyond other interactions in the model. Reasons for nonsignificant interactions may pertain to study limitations, which will be discussed below. However, because wave 2 data could not be analyzed due the small n, the primary intended purpose of this study—to extend previous cross-sectional findings in prospective analyses—was not achieved. Prospective studies are still needed to verify hypotheses and help clarify causal directions within the interpersonal theory of suicide.

Last, each of the exploratory questions involving meaning in life was unsupported. As previously mentioned, literature has supported meaning in life as a buffer of the relationship
between risk factors for suicide and hopelessness (Marco et al., 2017; Marco et al., 2016). Unfortunately, those results did not extend to the current study, as meaning in life did not buffer relationships between TB, PB, and interpersonal hopelessness or between any of the interactions of TB, PB, and interpersonal hopelessness and active suicidal ideation. Meaning in life also did not mediate relationships between TB, PB, and interpersonal hopelessness or between the TB x PB x interpersonal hopelessness interaction and active suicidal ideation. Although this was the first study to examine meaning in life as a mediator using a measure of interpersonal hopelessness, previous research has found meaning in life to mediate relationships between TB and suicidal ideation, as well as PB and suicidal ideation (Kleiman & Beaver, 2013). As Franklin et al. (2018) opined, there continues to be a need for research into protective factors within the suicide literature. Although the current study did not find meaning in life to be protective, other potential protective factors such as mindfulness, positive beliefs and affect, and self-efficacy should be examined in future studies.

Given the lack of significant findings pertaining to meaning in life as a protective factor within the IPT framework, there is still a need for research to address the decreasing frequency between individuals who passively think about suicide and individuals who are at a point where they devise a plan. Further, as previous research has borne out (see Chu et al., 2017 for a meta-analysis), the current study demonstrated the relative importance of PB as a construct in the IPT framework—it has consistently been shown to be a stronger predictor than TB of suicidal ideation and risk, as it was in the current study. Last, the gap between cross-sectional and prospective studies within the suicide literature still remains.
Implications

Findings from the current research have implications for the treatment of suicidality. Given the relationship between feeling as if one is a burden on others, hopelessness about the feeling, and active suicidal ideation, interventions focused on an individual’s felt sense of burdensomeness could be greatly beneficial for clients struggling with suicidality. Particularly, the sense of feeling as a burden could be a focal point for clinicians in a therapeutic setting, given the strong association it has with suicidal ideation. Though literature pertaining to interventions within the interpersonal theory of suicide is sparse, there appears to be promise of reducing suicidality through reducing perceptions of burdensomeness. Short et al. (2019) found a computerized intervention aimed at reducing both perceived burdensomeness and thwarted belongingness to be effective at reducing suicidal ideation. Additionally, Allan et al. (2018) found support for an intervention focused on reducing perceptions of burdensomeness through cognitive bias modification and psychoeducation. The intervention was effective at reducing suicidal thoughts through the reduction of perceptions of burdensomeness.

A further implication for the current study is the relationship between interpersonal hopelessness and active suicidal ideation. Risk factors for suicidality are numerous, and the current findings demonstrate that a particular type of hopelessness – interpersonal hopelessness – is salient for suicidal clients and should be a focus of mental health interventions. Though our country has slowly moved back to increased social contact, the COVID-19 pandemic has certainly caused a dearth of social contact, and a feeling of social disconnect (thwarted belongingness) could be a source of increased suicidality, as feelings of isolation are a well-established suicide risk factor (Franklin et al., 2018). Probing for a client’s perceived level of social connectedness could help guide treatment.
Limitations

Most hypotheses and exploratory questions were not supported. One reason for this could be the relatively small sample size ($N = 285$). Because of the relatively low percentage of individuals in the United States who endorse suicidality at any one time (Kessler et al., 2005), a great deal of oversampling was necessary to obtain sufficient power for the proposed interactions, for which attrition can also be a salient factor in generalizability of results. Participants in our study endorsed similar levels of suicidal ideation ($M = 0.77$) than in demographically similar, previous studies (e.g., Hagan (2016, $M = 0.54$); Tucker et al. (2018, $M = 1.01$). Further, the suicidal measures were moderately skewed—the majority of participants did not endorse suicidality, which made it difficult to test hypotheses. According to Gustavson and colleagues (2012), attrition rates for longitudinal research can exceed 70%, and this percentage can vary dramatically depending on the source of participants. Within the IPT suicide literature, attrition rates in prospective studies have been reported to be approximately 30% (Kleiman et al., 2014). Interestingly, some prospective studies did not report attrition (Czyz, Berona, & King, 2014). Given this study’s large proportion of participants taken from MTurk (greater than 50%), and previous studies’ findings that online participant sources can have high attrition rates (Zhou & Fishbach, 2016), oversampling in the current study was underutilized, and future studies should take this into consideration.

A second limitation—timing of the research recruitment—particularly affected the sample size derived from university students. A considerable proportion (approximately 30%) of the sample comprised students from The University of Memphis, and many of them likely would have completed both waves of the study if the study had been approved earlier in the semester with more time to recruit more student participants. Improved timing in relation to the academic
year might have improved the overall attrition rate, given Zhou and Fishbach’s (2016) finding that lab participants’ attrition rates are far lower than those from online means such as MTurk.

Online data collection using services such as MTurk can be beneficial for researchers, given their users’ more diverse demographic makeup relative to most university-derived samples. Additionally, it is easy to bolster sample size: All that is needed is willingness to increase the study’s budget to obtain more participants. However, online participants come with their own limitations, and it has become increasingly difficult to obtain valid responses from participants through services such as MTurk (Kennedy et al., 2020). As such, the current study was affected in multiple ways, in addition to the previously mentioned MTurk attrition limitation. First, the prevalence of online forums for MTurk responders (e.g., reddit.com/r/MTurk, turkopticon) makes the use of manipulation check items more difficult, as respondents discuss how they should respond to get paid (Arndt et al., 2021). This can be compounded by the presences of “bot farms,” or computers that complete MTurk tasks instead of humans, as a way of obtaining money for individuals (Chmielewski & Kucker, 2019). As such, more robust manipulation check items (e.g., open-ended items) may help reduce careless responding (Dennis, Goodson, & Pearson, 2020), and should be considered for future research using MTurk respondents.

Second, MTurk workers have become more adept at circumventing IP address detection. This causes a problem in data collection because often researchers will limit their respondents to only MTurk workers within the United States, at the very least as a way of only obtaining workers who are proficient in English. However, the prevalence of virtual private networks (VPNs) within the United States has allowed MTurk workers outside the United States to give the false impression they are working inside the country. In the current study, participants who
used a proxy server were removed; however, future studies could run analyses to ascertain differences between such participants and those who did not use a proxy server, as use of such a server does not automatically denote poor data quality. Further, VPNs can allow the same MTurk responder to give multiple responses to the same survey yet to have these multiple responses remain undetected (Arndt et al., 2021). In fact, Wessling, Huber, and Netzer (2017) found across five studies that a large proportion of MTurk participants misrepresented themselves in a variety of ways (e.g., their identities and activities they engage in) in order to qualify for studies.

A further limitation of the study was not being able to assess order effects due to failure to counterbalance order of questionnaires. Additionally, PB and interpersonal hopelessness were very highly correlated, resulting in unacceptably high multicollinearity in some analyses. Because of this, tests of the PB x interpersonal hopelessness interaction and the TB x PB x interpersonal hopelessness interaction may not be accurate. Such high VIFs are at least in part due to the construction of the Interpersonal Hopelessness Scale: Items were formed using items from which PB is derived; however, although previous research has reported high correlations between PB and interpersonal hopelessness (e.g., .52, Naidoo & Collings, 2019; .75, Tucker et al., 2018), no previous study found by the authors has reported a correlation approaching .96, which we found between these two variables. This high correlation could also be due to response consistency, a form of careless responding in which a participant selects items in a highly similar manner (e.g., selecting “Definitely True” for each item). Wood and colleagues (2017) found response consistency to be a problem among MTurk workers. Future studies should screen for response consistency within samples as a means of removing careless responders.

Another possibility is the inherent overlap among PB, TB, and hopelessness. In this regard, Roeder and Cole (2019) found that, although each variable predicted subsequent suicidal
ideation when examined separately, none predicted suicidal ideation when examined together. Additionally, TB, PB, and hopelessness strongly loaded on a latent variable that predicted subsequent suicidal ideation, suggesting that a common factor underlies these three variables.

Finally, construing PB as a moderator of the relationship between interpersonal hopelessness and active suicidal ideation may be construed as contrary to the interpersonal theory of suicide, since only the 3-way TB x PB x interpersonal hopeless interaction suffices to produce active suicidal ideation and since hopelessness is construed as the apparent moderator in Figure 5 of Van Orden et al. (2010), although not in the narrative.

However, subsequent research did not find that interpersonal hopelessness moderated the relationship between the TB x PB interaction and either suicidal ideation or suicide risk. Instead, the TB x PB x hopelessness interaction predicted higher suicidal ideation and suicide risk only when all three of its components were high (Tucker et al., 2018). Therefore, selecting PB or interpersonal hopelessness as the moderator in this theoretically incongruent 2-way interaction appears arbitrary.

**Conclusion**

The two-way PB x interpersonal hopelessness interaction predicted increased active suicidal ideation, such that, at higher levels of PB, interpersonal hopelessness was a stronger predictor of active suicidal ideation. This has been reflected in the literature to a degree, as PB has been shown to have a stronger relationship with suicidal ideation and risk than did TB (see Chu et al., 2017, for a meta-analysis). Other hypothesized relationships were unsupported, suggesting PB may be a more fruitful area of emphasis for future researchers and clinicians alike, given the continued support for PB’s relationship to suicidality over the years.
References


Centers for Disease Control and Prevention:
https://www.cdc.gov/nchs/products/databriefs/db330.htm

Centers for Disease Control and Prevention:
https://www.cdc.gov/mmwr/volumes/69/wr/mm6903a1.htm?s_cid=mm6903a1_w

Centers for Disease Control and Prevention:
https://webappa.cdc.gov/sasweb/ncipc/leadcause.html

Center on Budget and Policy Priorities (2022). Retrieved from:

and#:~:text=The%20unemployment%2orate%20jumped%20in,%2C%20moreover%2C%20understated%20job%20losses.

https://doi.org/10.1177%2F1948550619875149

43


http://dx.doi.org/10.1016/j.jagp.2015.08.007


http://dx.doi.org/10.1093/epirev/mxn002


http://dx.doi.org/10.1177/107319110100800409


Appendix A

Figures for Hypotheses

Figure 6

*Hypothesis 1a: Time 1 Meaning in Life will Buffer the Relationship between Time 1 TB and Time 2 Interpersonal Hopelessness*

Figure 7

*Hypothesis 1b: Time 1 Meaning in Life will Buffer the Relationship between Time 1 PB and Time 2 Interpersonal Hopelessness*
Figure 8

Hypothesis 2: The Time 1 TB x Time 1 Interpersonal Hopelessness Interaction will Predict Higher Time 2 Active Suicidal Ideation (as measured by the DSI-SS and SBQ-R)

Figure 9

Hypothesis 3: The Time 1 PB X Time 1 Interpersonal Hopelessness Interaction will Predict Higher Time 2 Active Suicidal Ideation (as measured by the DSI-SS and SBQ-R)

Figure 10

Hypothesis 4: The Time 1 TB x Time 1 PB x Time 1 Interpersonal Hopelessness Interaction will Predict Higher Time 2 Active Suicidal Ideation (as measured by the DSI-SS and SBQ-R)