

## A Test of the Three-Way Interaction of the Interpersonal Theory of Suicide in an Aotearoa New Zealand University Sample

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A central hypothesis of the Interpersonal Psychological Theory of Suicide is that thwarted belonging, perceived burdensomeness, and fearlessness about death interact to predict greater risk of suicide. The current study sought to address the limited research addressing this interaction within university students. Undergraduate students ( $n = 377$ ) were invited to complete an online survey containing questions related to the study's key concepts. No evidence was found to support the three-way interaction between thwarted belonging, perceived burdensomeness, and acquired capability for suicide, on suicidal behaviour. Further research is required to validate the Interpersonal Psychological Theory of Suicide among university students.

**Keywords:** *Suicide; Interpersonal Psychological Theory of Suicide; Perceived Burdensomeness; Thwarted Belonging; Fearlessness about Death*

### Introduction

At its inception, Joiner's Interpersonal Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) was a unique approach to understanding suicide. In contrast to classical theories, Joiner proposed that both suicidal thoughts, *and* the capability to act on those thoughts, are necessary for a potentially lethal suicide attempt. As such, the factors that lead to the development of suicidal ideation were viewed as being distinct from those that facilitate the progression from ideation to attempt. This approach, now known as the ideation-to-action framework (Klonsky & May, 2014), serves as the foundation for contemporary models of suicide.

Broadly, the Interpersonal Psychological Theory of Suicide outlines three key components that contribute to an individual's suicidal thoughts and behaviours; thwarted belonging, perceived burdensomeness, and acquired capability for suicide. The combination of thwarted belonging and perceived burdensomeness is thought to lead to the emergence of suicidal ideation. On their own, however, these feelings are unlikely to result in a lethal suicide attempt. Instead, Joiner argues that the progression to a potentially lethal suicide attempt is facilitated by an acquired capability for suicide; one aspect of which is an individual's capacity to overcome the natural fear of death. Thus, subjective levels of low belonging, high burdensomeness, and high fearlessness about death are hypothesised as providing the conditions required for a suicide attempt.

Despite evidence recognising university students as a vulnerable population for suicide throughout the world (Mortier et al., 2018), only two studies, both using American undergraduates, have demonstrated the three-way interaction in a university student population (Becker et al., 2020; Davidson et al., 2010). The current study

seeks to replicate these earlier findings within Aotearoa New Zealand.

Aotearoa New Zealand's youth suicide rates are consistently identified as being the highest in the world (OECD, 2021). Annual provisional suicide statistics indicate that between July 2019 and June 2020, 119 youth aged between 15-24 died by suicide with the rate per 100,000 being greater in males, relative to females. Furthermore, the rates of suicide for Māori were 1.68, 2.86, and 2.56 times higher than those identifying as 'European and other', Pacific peoples, and Asian (Ministry of Justice, 2020). Given the clear impact of ethnicity, and therefore, the likely impact of culture, it is important to determine whether the proposed interaction holds in other countries that may have a more culturally diverse population.

Consideration regarding the influence of culture within the context of the Interpersonal Psychological Theory of Suicide is particularly important given that different cultures may have greater emphasis on core components within the model. For example, te ao Māori typically adopts a more holistic approach that acknowledges the inter-relatedness of all elements infused by *mauri* (life force). As such, the salience of concepts like thwarted belonging or perceived burdensomeness may be heightened for Māori, and, therefore, contribute to an elevated risk of suicide. The current study proposes to test the three-way interaction between thwarted belonging, perceived burdensomeness, and fearlessness about death in a general Aotearoa New Zealand university sample. In alignment with Becker et al. (2020), we hypothesise that the three-way interaction would predict significantly higher scores on a composite measure of suicide risk.

**METHODS**

**Participants**

Participants were 377 undergraduate psychology students enrolled at a New Zealand university. Participants ranged in age from 18–25 years ( $M=19.59$ ,  $SD = 1.18$ ) and predominantly identified as female ( $n = 316$ , 83.8%; 60 males, 15.9%; 1 non-binary, 0.8%). The majority of the participants self-identified as New Zealand European (75.6%;  $n = 285$ ); the remaining participants identified as New Zealand Māori ( $n = 20$ ), Samoan ( $n = 4$ ), Cook Island Māori ( $n = 1$ ), Tongan ( $n = 2$ ), Chinese ( $n = 10$ ), and Indian ( $n = 8$ ). Forty-seven (12.5%) stated specific ethnicities which generally fell into Asian or European regions.

**Measures**

**Thwarted Belonging & Perceived Burdensomeness:**

The 15-item Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012) measured participants’ sense of belonging and perceived burdensomeness. Participants were asked to respond to each item using a seven-point Likert scale (not at all true for me = 1 to very true for me = 7) with higher scores indicating higher levels of thwarted belonging and perceived burdensomeness (Cronbach’s  $\alpha = .88$  ( $se = .01$ ; 95%  $CI: .85-.90$ ) and  $.93$  ( $se = .01$ , 95%  $CI: .90 - .94$ ) for thwarted belonging and perceived burdensomeness, respectively).

**Fearlessness About Death:** The Acquired Capability for Suicide Scale – Fearlessness About Death (ACSS-FAD; Ribeiro et al., 2014) contains seven-items rated on a five-point scale (not at all like me = 0 to very much like me = 4). Higher scores represent greater levels of fearlessness (Cronbach’s  $\alpha = .80$ ,  $se = .02$ , 95%  $CI: .77-.83$ ).

**Suicide Risk:** The Suicidal Behaviour Questionnaire-Revised (SBQ-R; Osman et al., 2001) assesses four dimensions of suicidality (e.g. lifetime ideation/attempt

and responses can be used to identify at-risk participants with high sensitivity (93%) and specificity (95%; Osman et al., 2001). Higher scores indicate greater levels of suicide risk (Cronbach’s  $\alpha = .83$ ,  $se = .02$ , 95%  $CI: .79 - .86$ ). SBQ-R is the most commonly used composite measure of suicidality (Chu et al., 2017).

**Depression:** The seven-item depression subscale of the Depression Anxiety Stress Scales-21 (Lovibond & Lovibond, 1995) assessed depressive symptoms, rated on a four-point likert scale (never = 0 to almost always = 3). Higher scores indicate greater depressive symptoms (Cronbach’s  $\alpha = .89$ ,  $se = .01$ , 95%  $CI: .87 - .91$ ).

**Procedure**

This study was approved by the University of Otago Ethics Committee (H20/029) and the hypotheses were pre-registered with the Open Science Framework (<https://osf.io/cj2mr/>). Undergraduate psychology students were invited to participate for course credit. Students who expressed interest in taking part were emailed about the study and, if they chose to participate, were asked to complete a brief online survey through Qualtrics. Electronic consent was obtained, and every student was given the contact details for the research team, a student health facility, and emergency psychiatric services, in addition to a list of other support services and telephone helplines.

ID numbers were obtained for the purposes of being able to identify students who may be a risk to themselves. If a student met this threshold, the study PI searched the student’s ID number within the university database to associate with the name and email address of the student (this could only be done by the PI). It is important to emphasize that students were only identified if they indicated high levels of possible risk and this was clearly articulated to the students within the information sheets.

**Table 1.** Means, standard deviations, and correlations with confidence intervals

	Age	Gender	Ethnicity	Depressive Symptoms	TB	PB	FAD	SBQ-R
Gender	.04 (-.06, .14)							
Ethnicity	.20** (.10, .29)	.06 (-.04, .16)						
Depressive Symptoms	-.01 (-.11, .09)	-.02 (-.12, .08)	.07 (-.03, .17)					
TB	.02 (-.09, .12)	-.03 (-.13, .07)	.10* (.00, .20)	.68** (.62, .73)				
PB	-.04 (-.14, .06)	.04 (-.06, .14)	.05 (-.05, .15)	.64** (.58, .70)	.60** (.53, .66)			
FAD	.06 (-.04, .16)	-.13* (-.22, -.03)	-.06 (-.16, .04)	.03 (-.07, .13)	.02 (-.08, .12)	.04 (-.07, .14)		
SBQ	.05 (-.05, .15)	-.05 (-.15, .05)	.05 (-.05, .15)	.52** (.44, .59)	.47** (.38, .54)	.56** (.49, .63)	.13* (.03, .23)	
Mean	19.59			9.11	24.45	10.53	13.12	7.31
SD	1.18			8.47	9.18	5.74	6.14	3.54
Range	18 - 25			0 - 40	9 - 61	6 - 42	0 - 28	4-21

PB = Perceived Burdensomeness, TB = Thwarted Belonging, FAD = Fearlessness About Death, SBQ-R = Suicide Behaviour Questionnaire – Revised

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

**Table 2.** Multiple regression testing the three-way interaction between perceived burdensomeness, thwarted belonging, and fearlessness about death, on suicidal risk, including depressive symptoms as a covariate.

DV = SBQ-R	<i>b</i>	SE	<i>B</i> (95% CI)	<i>t</i>	<i>p</i>
<i>F</i> (8, 368) = 28.35, <i>p</i> < .001, <i>Adj R</i> <sup>2</sup> = .37 (95% CI: .29, .44)					
Depressive symptoms	0.10 (0.05, 0.15)	.03	0.23 (0.11, 0.35)	3.72	<.001
PB	0.14 (-0.27, 0.54)	.20	0.22 (-0.43, 0.87)	.66	.51
TB	0.02 (-0.14, 0.17)	.08	0.04 (-0.37, 0.45)	.19	.85
FAD	-0.08 (-0.34, 0.17)	.13	-0.14 (-0.59, 0.30)	-.64	.52
PB X TB	0.00 (-0.01, 0.01)	.01	0.04 (-0.84, 0.93)	.10	.92
PB X FAD	0.01 (-0.01, 0.04)	.01	0.39 (-0.43, 1.20)	.94	.35
TB X FAD	0.00 (-0.01, 0.01)	.01	0.21 (-0.38, 0.79)	.70	.49
PB X TB X FAD	-0.00 (-0.00, 0.00)	.00	-0.31 (-1.27, 0.64)	-.64	.52

PB = Perceived Burdensomeness, TB = Thwarted Belonging, FAD = Fearlessness About Death, SBQ-R = Suicide Behaviour Questionnaire – Revised

**Power Analysis and Analytic Strategy**

A simulation based on previous findings by Becker et al. (2020) was used to estimate sample size required to detect the three-way interaction between perceived burdensomeness, thwarted belonging, and fearlessness about death (estimated effect size = .07) on suicide risk. The target was at least 80% power. All analyses were conducted using R (version 4.0.0; R Core Team, 2020). The simulation revealed that a minimum sample size of *n* = 143 would yield >80% power while a minimum sample size of *n* = 333 would yield >99% power.

Initially, descriptive data and Pearson’s correlations were calculated using the psych (Revelle, 2018), MBESS (Kelley, 2020) and Hmisc (Harrell Jr, 2020) packages in R (version 4.0.0; R Core Team, 2020). Multiple linear regression using R’s lm.beta package (Behrendt, 2014)

was then used to test the three-way interaction between perceived burdensomeness, thwarted belonging, and fearlessness about death, on suicidal risk.

**RESULTS**

**Preliminary Data Analyses**

Descriptive data and Spearman’s correlations were calculated using the psych (Revelle, 2018) and Hmisc (Harrell Jr, 2020) packages in R (version 4.0.0; R Core Team, 2020). With the exception of age (kurtosis = 4.93) and perceived burdensomeness (4.26), all data were within acceptable limits of skew (<2.0) and kurtosis (< 4.0). Based on the cut-off scores for the SBQ-R total score, as outlined by Osman et al (2001), 100 (26.5%) of students met the threshold for ‘at-risk’ of suicide; this proportion is somewhat comparable to Robinson et al.,

**Table 3.** Multiple regression testing the three-way interaction between perceived burdensomeness, thwarted belonging, and fearlessness about death, on suicide risk

DV = SBQ-R	<i>B</i> (95% CI)	SE	<i>B</i> (95% CI)	<i>t</i>	<i>p</i>
<i>F</i> (7, 369) = 29.4, <i>p</i> < .001, <i>Adj R</i> <sup>2</sup> = .39 (95% CI: .27, .42)					
PB	.16 (-0.24, 0.57)	.21	0.26 (-0.39, 0.92)	.79	.43
TB	.05 (-0.11, 0.21)	.08	0.13 (-0.28, 0.55)	.62	.53
FAD	-.07 (-0.33, 0.19)	.13	-0.13 (-0.58, 0.32)	-.55	.58
PB X TB	.00 (-0.01, 0.01)	.01	0.14 (-0.76, 1.05)	.31	.75
PB X FAD	.01 (-0.01, 0.04)	.01	0.41 (-0.42, 1.23)	.97	.34
TB X FAD	.00 (-0.01, 0.01)	.01	0.21 (-0.38, 0.80)	.69	.49
PB X TB X FAD	-.00 (-0.00, 0.00)	.00	-0.39 (-1.36, 0.58)	-.79	.43

PB = Perceived Burdensomeness, TB = Thwarted Belonging, FAD = Fearlessness About Death, SBQ-R = Suicide Behaviour Questionnaire – Revised

(2021) who found that in a large New Zealand adolescent sample, 19.3% met the clinical cut-off. Furthermore, the observed mean (7.32,  $SD = 3.54$ ) is comparable to that observed by Becker et al. (2020) in an American university sample ( $M = 5.17$ ;  $SD = 2.82$ ).

Additionally, the mean scores recorded on the depressive subscale of the DASS-21 ( $M = 9.11$ ,  $SD = 8.47$ ) correspond to the upper bounds of the “normal” range; 151 (25%) of students met the threshold for moderate depression or higher (Lovibond & Lovibond, 1995). Neither age, gender, nor ethnicity were significantly correlated with suicide risk and were not considered further. As shown in Table 1, moderate to strong correlations were found among depression, thwarted belonging, perceived burdensomeness, and suicidal risk. Additionally, fearlessness about death was weakly correlated with suicide risk.

### Primary Data Analyses

Multiple linear regression using R’s *lm.beta* package (Behrendt, 2014) was used to test the three-way interaction between perceived burdensomeness, thwarted belonging, and fearlessness about death, on suicidal risk. Given its significant relationship with suicide risk, depressive symptoms were also included in this model. Only depressive symptoms significantly predict suicidal risk; there was no evidence for the presence of a three-way interaction (see Table 2). Furthermore, no effects emerged when depression was removed from the model (see Table 3).

## DISCUSSION

In the current study, we found no evidence for a three-way interaction between thwarted belonging, perceived burdensomeness, and fearlessness about death on suicidal behaviour in Aotearoa New Zealand undergraduates. Although the interaction is a core tenet of the Interpersonal Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010), there is limited evidence regarding this interaction within university student populations outside of the US. Given evidence that cites country-specific contextual factors as a possible limitation for global multi-level interventions for suicide (Collings et al., 2018) and recognises students worldwide as a vulnerable population (Mortier et al., 2018), our failure to

replicate earlier results suggests more work is needed in this area. It is imperative, therefore, that research continues to empirically evaluate theoretical models of suicide in different populations and cultural contexts, especially given the over-representation of Māori within New Zealand’s suicide statistics

As noted above, our findings are consistent with a growing body of literature demonstrating that the interactions within the Interpersonal Psychological Theory of Suicide are somewhat tenuous (Chu et al., 2017; Ma et al., 2016). For example, in their systematic review, Ma et al. (2016) reported that only three of seven studies displayed a significant three-way interaction between thwarted belonging, perceived burdensomeness, and fearlessness about death. Moreover, only one of these studies examined university students.

The primary limitation of the current study is its cross-sectional nature, which limits possibilities for causal or temporal inferences. To address this, future studies could employ a longitudinal design similar to Forkmann et al. (2020). Additionally, while the current study is, to our knowledge, the first to explore the interactions within the Interpersonal Psychological Theory of Suicide in an Aotearoa New Zealand university context, it is important to note that our findings relate to undergraduate psychology students at a single New Zealand university, most of whom were female. Although psychology students are drawn from a number of different majors and degrees, and is one of the most popular courses at the host university, the homogeneity of the present sample limits our ability to comment on possible risk and protective factors for suicidal thoughts and behaviours, particularly for those who are most at risk (i.e. males, particularly male Māori youth). Further research that specifically recruits students from a more diverse range of genders, cultures, and academic study as well as from different universities within New Zealand is required, therefore, to advance our understanding in this area. Such scholarship would increase our understanding of factors that may lead to the emergence of suicidal thoughts and behaviours, which, in turn, may help to improve intervention and prevention strategies for suicide in Aotearoa New Zealand.

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