



## Research paper

# A longitudinal test of the predictions of the interpersonal-psychological theory of suicidal behaviour for passive and active suicidal ideation in a large community-based cohort



Philip J. Batterham<sup>a,\*</sup>, Jennie Walker<sup>a</sup>, Liana S. Leach<sup>b</sup>, Jennifer Ma<sup>a</sup>, Alison L. Calear<sup>a</sup>, Helen Christensen<sup>c</sup>

<sup>a</sup> Centre for Mental Health Research, Research School of Population Health, The Australian National University, Canberra, Australia

<sup>b</sup> National Centre for Epidemiology and Population Health, Research School of Population Health, The Australian National University, Canberra, Australia

<sup>c</sup> Black Dog Institute, University of New South Wales, Sydney, Australia

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## ABSTRACT

**Background:** The Interpersonal-Psychological Theory of Suicide (IPTS) aims to elucidate the key antecedents of suicide deaths. Limited research has tested the IPTS in a community setting, and very little longitudinal research has been conducted. The current study longitudinally tested the predictions of the IPTS for suicidal ideation in a large population-based sample.

**Methods:** The PATH through Life study assesses three age cohorts (20's, 40's, 60's) every four years. Two interpersonal factors were estimated at the third wave of assessment: thwarted belongingness (TB) and perceived burdensomeness (PB). The roles of these factors in suicide ideation (active and passive) four years later were estimated using logistic regression models ( $n = 4545$ ).

**Results:** A one SD increase in TB was associated with increased odds of 37% for passive ideation and 24% for active ideation. For PB, odds were increased 2.5-fold for passive ideation and 2.4-fold for active ideation. A significant negative PB  $\times$  TB interaction was found for passive but not active ideation. Effects were not consistent by age group or gender.

**Limitations:** Proxy measures were used to assess the constructs. The extended timeframe and low prevalence of suicidal ideation limited power to find effects within subgroups.

**Conclusions:** Although TB and PB were individually associated with suicidal thoughts, little evidence was found for the key predictions of the IPTS longitudinally. Further investigation of the dynamic interplay between interpersonal factors over time is needed.

Over the past ten years the suicide rate has increased in many Western countries including Australia (Australian Bureau of Statistics, 2015) and the United States (Curtin et al., 2016), with an overall increase observed worldwide (World Health Organization, 2014). Despite ongoing efforts to identify risk factors for suicide, the prediction of suicide continues to be a challenge. A recent meta-analysis noted that over the past 50 years, suicide prevention research has identified few novel risk factors for suicide with an ongoing focus on a few risk factor categories such as mental illness, previous suicidality and demographic factors (Franklin et al., 2017). Indeed, rather than increasing identification, recent risk factor research has typically explained a lower proportion of variance in suicidal ideation (thoughts about suicide) and suicidal behaviours (self-harm with intent to die) compared to research conducted 30 years ago (Franklin et al., 2017).

Grounding research in theory may better generate explanations for the development of suicidal thoughts and behaviours by providing a framework through which the key putative antecedents of suicidal thoughts and behaviours can be hypothesised and tested (Rogers, 2001). The Interpersonal-Psychological Theory of Suicide (IPTS; Joiner, 2005) aims to elucidate the contexts which increase the risk of suicide by highlighting the role interpersonal factors and cognitive interpretations of interpersonal relationships play in the development of suicidal behaviour (Van Orden et al., 2010). Specifically, Joiner (2005) hypothesised that for an individual to desire suicide, they must feel a disrupted sense of belonging to the community (thwarted belongingness, TB) and perceive themselves as a burden to others (perceived burdensomeness, PB). Individually each factor is predicted to lead to passive suicide ideation (i.e., a desire to die), but when combined with a

\* Correspondence to: Centre for Mental Health Research, Research School of Population Health, 63 Eggleston Road, The Australian National University, Acton ACT 2601 Australia.  
E-mail address: [philip.batterham@anu.edu.au](mailto:philip.batterham@anu.edu.au) (P.J. Batterham).

sense of hopelessness that the situation will not change, active suicide ideation (i.e., serious thoughts of taking one's own life) is more likely to emerge. Both perceived burdensomeness and thwarted belongingness are considered cognitive states that vary across time and situations (Van Orden et al., 2010).

A recent systematic review described the findings from 66 studies that tested the IPTS and reported mixed support for the theory (Ma et al., 2016). This review included studies with a range of research designs and population groups, although the results found an over-reliance on studies with school or university samples (40.9%) or clinical samples (30.3%), and a lack of longitudinal data testing the IPTS predictions (three studies). Testing the IPTS hypotheses using undergraduate student samples may not be reflective of the broader population context in which suicide behaviours emerge, and clinical samples are restricted only to the minority of individuals who seek care (Bruffaerts et al., 2011). Therefore, there is an important need for further research that tests the IPTS in representative community-based samples. Moreover, cross-sectional research cannot establish the direction of the associations between interpersonal factors and suicide ideation. That is, suicidal ideation may lead to increased interpersonal challenges, rather than thwarted-belongingness and perceived-burdensomeness acting as causal factors in the development of suicidality. Longitudinal research is required to establish the extent to which elevated thwarted belongingness and perceived burdensomeness are in fact antecedents of suicidal thoughts and behaviours. To our knowledge, no study has investigated Joiner's theory longitudinally in a community sample (Ma et al., 2016). Three studies have tested the IPTS in a longitudinal context, but each sampled a specific population (adolescents and university students) thus the generalisability of the findings are limited (Czyz et al., 2015; Kleiman et al., 2014a, 2014b).

A previous cross-sectional analysis in the present large community sample found support for Joiner's hypotheses. Specifically, the interaction between proxy measures representing thwarted belongingness and perceived burdensomeness were found to predict suicide ideation (i.e. suicidal ideation increased when both variables were present at higher levels) (Christensen et al., 2013). Previous research has highlighted that there may be gender and/or age differences in the applicability of the IPTS (Czyz et al., 2015; Christensen et al., 2013). For example, Christensen et al. (2013) found TB to be significantly associated with suicide ideation in males and young adults only. As the theory assumes equivalent explanatory power across subgroups of the population, further examination of potential differences is necessary to test the validity of this assumption and to investigate whether more nuanced tailoring of the IPTS to different subgroups might better inform suicide prevention. Since publication of the Christensen et al. (2013) article, an additional wave of data has been collected which allows the opportunity to longitudinally investigate the IPTS across a four year period. Following on from the findings reported by Christensen et al. (2013), the current study aims to longitudinally test Joiner's hypotheses in relation to suicidal ideation in a large community sample. More specifically, the current study aimed to:

- (1) test whether the two-way interaction between measures of TB and PB was significantly associated with suicide ideation four years later,
- (2) test whether the longitudinal effects of interpersonal factors (TB and PB) on suicide ideation were consistent within gender and age groups, and,
- (3) test whether increases in interpersonal risk (TB and PB) over the four year period were associated with increased prevalence of suicidal ideation or behaviours.

Based on the IPTS predictions, it was hypothesised that the interaction terms tested in aim 1 would be significantly associated with suicidal thoughts assessed four years later. It was hypothesised that the interaction terms tested in aim 1 would be significant in all three age

cohorts assessed four years later (aim 2).

## 1. Method

### 1.1. Participants

Data were extracted from the Personality and Total Health (PATH) Through Life project, a large longitudinal cohort study that measures a range of physical health, mental health, cognitive and personality characteristics across the lifespan using three narrow-age cohorts (Anstey et al., 2011). Potential participants were selected at random from the electoral rolls of Canberra ACT and Queanbeyan NSW Australia, according to three age cohorts: 'young' aged 20–24 years, 'mid-life' aged 40–44 years, and 'older' aged 60–64 years. Data are collected at four yearly intervals and to date, four waves of data have been collected (Anstey et al., 2011). A total of 7485 invitees completed the baseline assessment representing 58.6% ( $n = 2404$ ) of the invited 20s cohort, 64.6% ( $n = 2530$ ) of the invited 40s, and 58.3% ( $n = 2551$ ) of the invited 60 s. Gender was evenly split at baseline due to a stratified sampling design: 50.9% of respondents were female ( $n = 3813$ ) and 49.1% male ( $n = 3672$ ).

The data included in the current analyses were collected at Wave 3 (2007–2010) when participants were aged 28–32 years, 48–52 years, or 68–72 years, and at Wave 4 (2011 and 2015) when participants were aged 32–36 years, 52–56 years, or 72–76 years. A total of 4650 participants completed the survey at both waves 3 and 4, but of these, 4545 completed all the necessary items for the current analyses (completers). Compared to baseline the current sample represented 50.3% ( $n = 1209$ ) of the 20s cohort, 69.2% ( $n = 1751$ ) of the 40s cohort, and 62.2% ( $n = 1585$ ) of the 60 s cohort. The 40s cohort were significantly more likely to complete all necessary items compared to the 20s ( $\chi^2 = 187.6, p \leq 0.001$ ), reflecting a shift to fully-online assessment in the 20s cohort only, and females were more likely to have completed than males ( $\chi^2 = 17.8, p \leq 0.001$ ). Compared to non-completers, participants who completed the survey reported a significantly lower baseline depression score ( $t = 7.7, p < 0.001$ ), a significantly lower anxiety score ( $t = 5.0, p < 0.001$ ), and on average had a greater number of years in education ( $t = 11.4, p < 0.001$ ). They were also less likely to report active suicide ideation at baseline ( $\chi^2 = 15.9, p \leq 0.001$ ), but were no less likely to report a suicide plan ( $\chi^2 = 3.7, p = 0.05$ ) or attempt ( $\chi^2 = 0.68, p = 0.41$ ) at baseline.

### 1.2. Procedure

Participants were typically interviewed either at their home or at a research centre within The Australian National University (ANU). As part of this interview self-report measures were completed by participants on an electronic computer using Surveycraft software, and cognitive and physical health tests were administered by trained interviewers. Participants who had moved internationally at follow-up time-points completed the questionnaire either via a paper survey returned by mail or an internet survey. The full 20s cohort completed the Wave 4 assessment exclusively online. See Anstey and colleagues (2011) for a detailed description of the PATH study procedure. The project was approved by the Human Research Ethics Committee at the ANU.

### 1.3. Measures

#### 1.3.1. Outcome variables

The outcome suicidal ideation variables were derived from three yes/no items included in the Psychiatric Symptom Frequency scale (PSF; Lindelow et al., 1997) measured at Wave 4. Suicide ideation was used to operationalise the construct of suicide desire outlined by the IPTS (Van Orden et al., 2008).

**1.3.1.1. Passive Suicide Ideation.** This outcome was assessed as a 'yes'

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