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The Development and Validation of the Thwarted Belongingness Scale (TBS) for Interpersonal Suicide Risk

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Abstract
Thwarted belongingness (TB) has been identified as a risk factor for the development of suicide ideation. However, measures for assessing this construct are currently limited. The present study aimed to develop and validate a new self-report measure for thwarted belongingness (TBS) against the Interpersonal Needs Questionnaire Thwarted Belongingness sub-scale (INQ TB; Van Orden et al. 2012), and provide a comparative test of the Interpersonal Psychological Theory of Suicide (IPTS; Joiner 2005). A 42-item pool underwent refinement via three consecutive stages: (1) expert feedback, (2) item selection study using a sample of community-dwelling Australian adults (Study 1, $N = 284$), and (3) validation study and test of IPTS predictions in a larger sample of community-dwelling Australian adults (Study 2, $N = 747$). Exploratory and confirmatory factor analyses supported the unidimensionality of the TBS. Item response theory analysis indicated that the TBS captured more information over a slightly narrower range than the INQ TB. Preliminary support was provided for the IPTS ideation prediction when using the TBS and INQ TB. The TBS may provide enhanced identification of TB in individuals who display moderate to high levels of this interpersonal risk factor. However, further development of additional interpersonal measures is needed to ascertain the role of TB in relation to interpersonal suicide risk and how to best approach its conceptualisation and measurement.

Keywords Thwarted belongingness · Scale · Interpersonal psychological · Suicide · Validation

Loneliness, Social Isolation, and Thwarted Belongingness

Loneliness and social isolation have been identified as increasingly significant issues worldwide, and there have been recent calls for their public health prioritisation (Holt-Lunstad 2018; Holt-Lunstad et al. 2017). Conservative estimates suggest that approximately three out of ten people experience loneliness in Australia (Baker 2012), and nearly half of adults aged 18 years and older in the United States report sometimes or always feeling alone or left out (Cigna 2018). Both loneliness and social isolation have been found to be associated with a number of physical and psychological health issues including depression, cognitive decline and dementia (Cacioppo and Cacioppo 2014), and increased risk of early mortality comparable to many leading health determinants (Holt-Lunstad et al. 2015).

Suicide research is an area that has done well in recognising the impact of loneliness and social isolation on suicide risk. According to the Interpersonal Psychological Theory of Suicide (IPTS; Joiner 2005; Van Orden et al. 2010), the need to form and maintain strong, stable interpersonal relationships is considered a fundamental psychological need that when unmet results in a state of thwarted belongingness. Thwarted belongingness (TB) is said to comprise two facets: (1) loneliness, an affectively laden cognition that one has too few social connections, and (2) the absence of reciprocal caring relationships (i.e., where individuals feel cared about and demonstrate care of another). It is viewed as a dynamic cognitive-affective state that is influenced by inter- and intra-personal factors such as experiencing family conflict, living alone, possessing few social supports, and being prone to interpret others' behaviour as rejection.

According to the IPTS, the presence of either TB or perceived burdensomeness (PB; the view that one's existence is a burden on friends, family members, and/or society) are causal,

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proximal risk factors for the development of passive suicide desire (i.e., "I wish I was dead"). However, active suicide desire (i.e., "I want to kill myself") emerges only when both TB and PB and a sense of hopelessness about these interpersonal states is experienced (i.e., interaction between TB, PB, and hopelessness). Additionally, the IPTS states that for an individual to enact a lethal suicide attempt, they have to both actively desire suicide (i.e., interaction between TB, PB, and hopelessness) and possess the capability for suicide (CS; one's ability to overcome the inherent drive for self-preservation and engage in lethal self-injury through repeated exposure and habituation to physically painful and/or fear-inducing experiences) (Van Orden et al. 2010). Thus, individuals who have high levels of all three interpersonal risk factors (TB, PB, and CS) combined with a sense of hopelessness, are said to be at highest risk for enacting a lethal suicide attempt.

The Need for Additional Measures

Available measures for screening thwarted belongingness are currently limited to one self-report assessment: the Interpersonal Needs Questionnaire thwarted belongingness subscale (INQ TB; Van Orden et al. 2012). The 25-item INQ was developed in 2009 as part of a doctoral thesis to investigate the aetiology of suicidal desire/behaviour and provide part of a risk assessment framework grounded in the IPTS (Van Orden 2009). It aims to measure beliefs about the extent to which individuals believe their need to belong is met or unmet (i.e., thwarted belongingness) and the extent to which they perceive themselves to be a burden on the people in their lives (i.e. perceived burdensomeness). There are currently six versions of the INQ (5, 10, 12, 15, 18, and 25-item). All six versions have been used in studies of the IPTS since 2009, despite psychometric validation of the 25-item scale only being conducted 3 years after its development (Van Orden et al. 2012).

Research using the INQ has shown thwarted belongingness to be linked, in conjunction with other risk factors, to elevated suicidal thoughts and behaviours (Van Orden et al. 2010). However, findings for the relationship between thwarted belongingness and suicidal thoughts/behaviours have generally been weaker or less supported in comparison to those found for perceived burdensomeness (Chu et al. 2017; Ma et al. 2016). In particular, weaker findings regarding the hypothesised relationship between thwarted belongingness and suicide ideation have raised questions around whether perceived burdensomeness is a more robust interpersonal risk factor that plays a larger role in the development of suicidal thoughts. On the other hand, recent research has also indicated that the different versions of the INQ (10, 12, 15, 18, and 25-item) are not equivalent and that differences across the versions may influence associations found between perceived burdensomeness, thwarted belongingness and suicide ideation in studies of the IPTS (Hill et al. 2015). The possibility of the INQ TB subscale not adequately capturing the thwarted belongingness construct has also been raised to account for this discrepancy (Cero et al. 2015; Ma et al. 2016). As such, the question of whether the comparatively weaker relationship identified between thwarted belongingness and suicide ideation is attributable to construct related or to measurement related issues remains an important area of investigation.

In order to expand the availability of valid measurement approaches for interpersonal risk and promote better identification of thwarted belongingness, the present study aimed to:

1) Develop a new self-report scale for thwarted belongingness (TB)
2) Test the psychometric properties of this newly developed scale, including establishing convergent validity with the INQ TB subscale (Van Orden et al. 2012) in a community-based sample, and,
3) Provide a comparative test of the IPTS (Joiner 2005; Van Orden et al. 2010) hypotheses around suicide ideation and attempt using the newly developed TB self-report scale and the original INQ TB subscale.

Method

A pool of 42 candidate items was selected for potential inclusion in the Thwarted Belongingness Scale (TBS) (Appendix 2). Items were derived and adapted from existing belonging, loneliness, and social support scales identified in a systematic literature search. These existing scales included the Interpersonal Needs Questionnaire (INQ; Van Orden et al. 2012), UCLA loneliness scale (Russell et al. 1980; Russell et al. 1978), De Jong Gierveld Loneliness Scale (de Jong-Gierveld and Kamphuls 1985), Family subscale of the SELSA (DiTommaso and Spinner 1993), General Mattering Scale (Marcus 1991), and Self-efficacy subscales of the Spirituality Index of Wellbeing (Daaleman and Frey 2004). The selection of items into the pool was based on, and expanding upon, the definition of thwarted belongingness provided by the Interpersonal Psychological Theory of Suicide (IPTS; Joiner 2005; Van Orden et al. 2012), which highlights the role of loneliness, disconnection, meaning/mattering, contribution, additive risk factors (e.g., abuse), and social entrapment in contributing to thwarted belongingness (TB). This 42-item pool underwent item refinement via three consecutive stages: (1) expert feedback to revise and remove items, (2) item selection study of the revised item pool in a sample of community-dwelling Australian adults, with further refinement (Study 1), and (3) validation of the final scale and test

of the IPTS hypotheses in a large sample of community-dwelling Australian adults (Study 2).

Expert Panel

Email invitations were sent out to 30 Australian and international researchers and clinicians, identified by their contribution to suicide-research and/or clinical experience with suicidal behaviour, to participate in a study to develop a self-report measurement for thwarted belongingness (TB). Seven experts consented to participate and were sent an online survey to evaluate a pool of 42 items. Participants were asked to rate each item for its relevance on a scale from 1 (*irrelevant*) to 5 (*highly relevant*). They were also asked to provide comments about each item and its wording, to rate whether the items taken as a whole adequately covered the construct of TB, and provide suggestions as to whether any other items or concepts could be included in the item pool. The study received ethics approval from the relevant institutional review board.

After receiving expert feedback, items were systematically selected or eliminated from the 42-item pool based on whether a majority of experts (4 or more) rated the item as being 'quite' (4) or 'highly (5) relevant, and whether a majority of experts (4 or more) rated the item as being 'irrelevant' (1). Several items were also reworded in line with expert feedback to promote item clarity. This resulted in a 22-item TBS pool.

Study 1

Participants and Procedure

Australian adults ($N = 284$; 85% female) aged 18 years and over were recruited from the online social media website Facebook. A series of paid advertisements were placed on the website between September 2016 and January 2017, targeting Australians aged 18 years or older fluent in English. The advertisements read: "Social Support & Mental Health: Complete a 10 min survey for a PhD project on relationships, suicide, and mental health," and linked to the study's Facebook page and the survey. The Facebook page enabled participants to interact (share links, comment, like the page) and provided links to the survey and occasional messages to encourage study participation. The survey was administered online via Qualtrics. Participants were provided with a comprehensive information screen prior to commencing the survey, with informed consent and a list of mental health resources provided online. Participants were not compensated monetarily. The study received ethics approval from the relevant institutional review board.

Measures

Sociodemographic Variables Gender (male, female, other), age (18–24, 25–29, 30–39, 40–49, 50–59, 60 and over), level of education (up to high school, associate/trade degree or diploma, bachelor's degree, postgraduate degree), employment status (full-time, part-time, unemployed/seeking work, retired or not in the workforce), and marital status (married or de facto, single/never married, separated or divorced, widowed) were measured.

Interpersonal Risk Factors Thwarted belongingness (TB) and perceived burdensomeness (PB) were measured using the INQ-15 (Van Orden et al. 2012). The INQ-15 consists of nine items that assess TB and six that assess PB on a scale from 1 (*not at all true for me*) to 7 (*very true for me*), with higher ratings indicating greater TB (range 9–63) and PB (range 6–42). In comparison to other versions of the INQ, the INQ-15 has been found to more consistently demonstrate factorial validity in undergraduate and adolescent psychiatric inpatient samples (Hill et al. 2015). In this sample, the INQ-15 ($\alpha = .93$), TB subscale ($\alpha = .92$), and PB subscale ($\alpha = .91$) all had excellent internal consistency.

TB was also measured using a 22-item pilot version of the Thwarted Belongingness Scale (TBS) that assesses TB on a scale from 1 (*not at all true for me*) to 7 (*very true for me*). Higher ratings indicate greater TB (range 22–154). In this sample, the pilot version of the TBS had excellent internal consistency ($\alpha = .97$).

Analysis

The item pool selected after expert feedback consisted of 22 items. The psychometric properties of these items were initially established in a sample of community-dwelling Australian adults using Exploratory Factor Analysis (EFA, principal axis) alongside the INQ-15 9-item TB subscale to explore factor structure and identify items loading most strongly on the TB factor. Parallel Analyses with 1000 datasets specified on a permutation of the original raw data set using O'Connor (2000) SPSS syntax for parallel analysis was conducted to determine the number of factors selected. Inter-item correlations between the top TB items (≥0.78 loading) were inspected for item redundancy. Items that displayed a significant correlation of ≥0.70 with another item that measured the same sub-theme of TB (e.g., closeness to others) were systematically compared, based on their conceptual relatedness to the TB sub-theme of interest and item clarity/understandability, and removed from the final scale by the authors. The eight items that remained after these analyses formed the Thwarted Belongingness Scale (TBS). Descriptive analysis and EFA were conducted using SPSS v21 (IBM Corp 2012).

Study 2

Participants and Procedure

Sample 2 Australian adults ($N = 747$; 81% female) aged 18 years and over and fluent in English were recruited using the same Facebook recruitment methods detailed in Study 1. The only difference was the advertised length of the survey (30 min), date of placement (December 2016 to January 2017), use of page sharing through personal networks (i.e., organic snowball sampling) to further promote participant recruitment, and addition of measures for suicide ideation and attempt, history of mental health, depression and anxiety, psychological distress, self-hatred, capability for suicide, defeat and entrapment, social support, meaning in life, motivations for volunteering, wellbeing, and resilience. The study received ethics approval from the relevant institutional review board.

Measures

Sociodemographic Variables Same as Study 1.

Interpersonal Risk Factors As in study 1, thwarted belongingness (TB) and perceived burdensomeness (PB) were measured using the INQ-15 (Van Orden et al. 2012). In this sample, the INQ-15 ($\alpha = .93$), TB subscale ($\alpha = .91$), and PB subscale ($\alpha = .94$) had excellent internal consistency.

TB was also measured using the TBS, as established in Study 1 (Appendix 1). In this sample, the TBS had excellent internal consistency ($\alpha = .94$).

Capability for suicide (CS) was measured using the Acquired Capability for Suicide Fearlessness About Death scale (ACSS-FAD; Ribeiro et al. 2014) consisting of seven items that measure fearlessness about engaging in potentially lethal self-harmful behaviours on a scale from 0 (*not at all like me*) to 4 (*very much like me*). Higher scores indicate greater capability for suicide (range 0–28). In this sample, the ACSS-FAD had acceptable internal consistency ($\alpha = .79$).

Suicide Outcome Measures Suicide ideation was measured using the SIDAS (van Spijker et al. 2014), which consists of five items that measure the frequency, controllability, and distress of suicidal thoughts, closeness of making an attempt, and impact on daily functioning experienced in the past month on a scale from 0 (*never*) to 10 (*always*). Higher scores indicate more severe suicidal thoughts (range 0–50). The SIDAS has strong internal consistency and convergent validity with other measures of suicide and psychological distress (van Spijker et al. 2014). It demonstrated excellent internal consistency ($\alpha = .91$).

Suicide attempt was measured using the sixth item from the C-SSRS (Posner et al. 2011) that assesses whether the individual has done anything, started to do anything, or prepared to do anything to end their life in the past 3 months on a *yes*/*no* scale. Whilst the rationale for including preparations and interrupted/aborted attempts is to account for any intent to die given the mixed motives for engaging in suicidal behaviour, it is important to note that this C-SSRS item may not be reflective of a pure suicide attempt variable (Silverman et al. 2007) despite the C-SSRS being found to have good convergent and divergent validity with other multi-informant suicidal ideation and behaviour scales and high sensitivity and specificity for suicidal behaviour classifications (Posner et al. 2011).

Analysis

Comparisons between individuals with and without suicidal thoughts/behaviours were analysed using chi-square statistics for dichotomous variables, and independent-samples *t*-tests for continuous variables. 'Prefer not to answer' responses were treated as missing.

Uni-dimensional Confirmatory Factor Analyses (CFA) was conducted to obtain fit statistics for the previously identified EFA one-factor TB model. To ascertain how the TBS compared to the INQ TB subscale, three competing TB models were tested: the INQ TB subscale (9 items), the 8-item TBS scale, and both TB scales combined (17 items). Weighted Least Squares with Mean and Variance adjustment (WLSMV) estimation was used, with items treated as categorical given their Likert scale format. Bi-factor exploratory analyses (EFA) on the competing TB models were conducted to complement the CFA and explore whether the dataset was sufficiently unidimensional for Item Response Theory (IRT) analysis as recommended by Reise et al. (2007). Two-factor against three-factor, and three-factor against four-factor models were compared for the INQ TB subscale (9 items), the 8-item TBS scale, and both TB scales combined (17 items). WLSMV estimation and Bi-Geomin Orthogonal rotation were used, with items treated as categorical given their Likert scale format. Uni-dimensionality of the TBS and combined scales were computed using Explained Common Variance (ECV) to determine the proportion of common variance across items explained by the TB general dimension.

Model based reliability for the TBS was calculated using the Omega Hierarchical for the total score (ωH), which reflects the proportion of total score variance that can be attributed to the general factor (i.e., TB) after accounting for all additional first order factors (i.e., group factors) that may share variance. The Comparative Fit Index (CFI: >.90 acceptable, >.95 excellent; Bentler 1990), Tucker Lewis Index (TLI: >.90 acceptable, >.95 excellent; Tucker and Lewis 1973), Root Mean Square Error of Approximation (RMSEA: <.08 acceptable, <.05

excellent; Browne and Cudeck 1993), and Standardised Root Mean Square Residual (SRMR: <.08 acceptable, <.05 good; Hu and Bentler 1999; Kline 1998) goodness-of-fit indices were used in the CFA and EFA to assess degree of fit between the models and sample.

IRT analysis was conducted to compare measurement precision across the 8-item TBS and INQ TB subscale. IRT is a model-based method for describing the relationship between individual items on a scale to the construct being measured, the individual's levels on the latent trait (i.e., TB) and their response to the scale items. IRT is known for addressing practical measurement problems characteristic of classical test theory methods, providing richer and more accurate descriptions of item- and scale-level performance (Hambleton and Jones 1993). The graded response model was used to calibrate item parameter estimates for the TBS and INQ TB subscale given their ordered polytomous response format. Item fit was evaluated using polytomous extensions of the $S\text{-}\chi^2$ (Pearson's chi-square; Orlando and Thissen 2003). Individual information function curves of all the items for each scale were summed separately to create test information function curves for the two TB scales. To test the reading grade of the TBS compared to the INQ TB, The Flesch Kincaid Reading Ease test was used (Flesch 1948; score = 0–100, higher scores indicate text is easier to read). The CFA, bi-factor EFA, and IRT analyses used all available participant data on the thwarted belongingness items (pairwise deletion).

Lastly, due to the over-dispersion and the presence of excess zeros for the suicide ideation outcome (INQ TB: LR $\chi^2 = 934.75$, $df = 1$, $p < 0.01$; TBS: LR $\chi^2 = 927.10$, $df = 1$, $p < 0.01$), zero inflated negative binomial regression models were used to test the IPTS hypotheses regarding suicide ideation (past month). Logistic regression models were used to test the IPTS hypotheses regarding suicide attempt (past 3 months). Based on IPTS hypotheses, the ideation model included the main effects of TB (differentially assessed by INQ TB subscale or TBS), PB, and their two-way interaction. The suicide attempt model included the main effects of TB (differentially assessed by INQ TB subscale or TBS), PB, CS, and their two and three-way interactions. IPTS variables were standardised to have a mean of 0 and *SD* of 1 to aid interpretation. The zero inflated negative binomial and logistic regression models were conducted on participants with complete responses across the suicide and interpersonal risk factor outcomes ($n = 561$; listwise deletion). Descriptive analysis and logistic regressions were conducted using SPSS v21 (IBM Corp 2012). Zero inflated negative binomial regression models were conducted using STATA v14 (StataCorp 2015). CFA and IRT analyses were conducted using MPlus v8 (Muthén and Muthén 1998–2017) and R v2.15.2 (R Core Team 2012).

Results

Study 1

Participants

The paid Facebook advertisements reached 3029 people and resulted in 20 link clicks, suggesting that the majority of participants were recruited into the study via page sharing methods across personal networks as opposed to on the paid advertisements. Out of the 284 participants, over half reported being between the ages of 18 and 29 years old (55%), and over a third reported being between the ages of 30 to 60+ years (37%). Approximately half of the participants reported working either full or part time (48%), and over half reported having completed up to an associate/trade degree or diploma (63%) or not being in a relationship (61%) (Table 1).

Exploratory Factor Analysis and Inter-Item Correlations

The 22 candidate items for the Thwarted Belongingness Scale (TBS) and 9 items of the Interpersonal Needs Questionnaire thwarted belongingness subscale (INQ TB; Van Orden et al. 2012) were subjected to an Exploratory Factor Analysis (EFA), principal axis. Prior to performing the EFA, suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .96, exceeding the recommended value of .6 (Kaiser 1970, 1974), and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance, supporting the factorability of the correlation matrix. EFA revealed the presence of three factors with eigenvalues exceeding 1: 18.95, 1.41, and 1.30, explaining 61.13, 4.55, and 4.22% of the variance respectively. An inspection of the screeplot revealed a clear break after the first factor. Parallel analyses generated three eigenvalues: 18.69, 1.16, and 1.03. Based on Cattell's (1966) scree test, the presence of a primary factor with eigenvalue approximately 14 times larger than the second and third factors, and the study's aim of identifying a theoretically driven one-factor model for thwarted belongingness, one factor was retained for further investigation.

Sixteen TB items displayed a loading of ≥0.78 in the one-factor model. Out of these, a total of eight items were eliminated due to item redundancy, resulting in an 8-item self-report scale for thwarted belongingness, the TBS (Appendix 1).

Study 2

Participants

The paid Facebook advertisements reached 58,362 people and resulted in 1417 link clicks. Out of the 747 participants,

Table 1 Sample descriptives

Variable	Sample 1 ($N = 284$) F (%) or M (SD)	Sample 2 ($N = 747$) F (%) or M (SD)	Sample 2 No suicidal thoughts/ behaviours ($n = 219$) F (%) or M (SD)	Sample 2 Suicidal thoughts/ behaviours ($n = 349$) F (%) or M (SD)	χ^2 / t	p
Age					11.565	**0.04**
18–24	133 (46%)	114 (15%)	22 (10%)	62 (17%)		
25–29	24 (8%)	80 (10%)	26 (11%)	38 (10%)		
30–39	35 (12%)	108 (14%)	34 (15%)	43 (12%)		
40–49	30 (10%)	146 (19%)	40 (18%)	77 (22%)		
50–59	40 (14%)	180 (24%)	53 (24%)	83 (23%)		
60 and over	22 (7%)	119 (15%)	44 (20%)	46 (13%)		
Gender					3.947	**0.04**
Male	33 (11%)	118 (15%)	28 (12%)	68 (19%)		
Female	243 (85%)	612 (81%)	187 (85%)	273 (78%)		
Other	8 (2%)	15 (2%)	2 (0.9%)	8 (2%)		
Prefer not to answer	N/A	2 (0.3%)	2 (0.9%)			
Employment					28.007	**<0.01**
Full-time	71 (25%)	204 (27%)	77 (35%)	86 (24%)		
Part-time	67 (23%)	171 (22%)	48 (21%)	76 (21%)		
Unemployed, seeking work	17 (6%)	55 (7%)	9 (4%)	37 (10%)		
Student	90 (31%)	124 (16%)	36 (16%)	58 (16%)		
Retired	15 (5%)	77 (10%)	29 (13%)	25 (7%)		
Not in the workforce	20 (7%)	106 (14%)	17 (7%)	64 (18%)		
Prefer not to answer	4 (1%)	10 (1%)	3 (1%)	3 (0.9%)		
Education					12.826	**<0.01**
No formal education	N/A	3 (0.4%)	0 (0%)	1 (0.3%)		
Primary school	1 (.4)	3 (0.4%)	1 (.5%)	1 (0.3%)		
Some of high school	23 (8%)	52 (7%)	9 (4%)	27 (7%)		
Completed high school	92 (32%)	103 (13%)	23 (10%)	51 (14%)		
Associate/trade degree or diploma	65 (22%)	186 (24%)	50 (22%)	93 (26%)		
Bachelors degree	57 (20%)	209 (28%)	57(26%)	92 (26%)		
Postgraduate degree	44 (15%)	188 (25%)	79 (36%)	81 (23%)		
Prefer not to answer	2 (.7%)	3 (0.4%)	0 (0%)	3 (0.9%)		
Relationship status					23.916	**<0.01**
Married	50 (17%)	189 (25%)	79 (36%)	66 (18%)		
De facto	50 (17%)	109 (14%)	29 (13%)	52 (14%)		
Single, never married	128 (45%)	259 (34%)	56 (25%)	139 (39%)		
Separated or divorced	42 (14%)	152 (20%)	44 (20%)	75 (21%)		
Widowed	5 (1%)	24 (3%)	7 3%)	10 (2.9%)		
Prefer not to answer	9 (3%)	14 (1%)	4 (1%)	7 (2%)		
Thwarted belongingness						
INQ TB	32.51 (12.92)	35.77 (13.01)	28.45 (11.91)	40.34 (11.66)	-11.-726	**<0.01**
TBS	71.89 (34.20)	29.24 (14.26)	20.59 (12.41)	34.71 (12.65)	-12.-999	**<0.01**
Perceived burdensomeness (INQ PB)	13.22 (6.65)	16.20 (10.29)	9.35 (5.45)	20.26 (10.04)	-16.-718	**<0.01**
Capability for suicide (ACSS-FAD)	N/A	16.04 (6.55)	14.90 (6.59)	16.79 (6.52)	-3.3-44	**<0.01**
Suicide ideation (SIDAS)	N/A	9.94 (12.37)	N/A	16.19 (12.18)	-24.-831	**<0.01**
Suicide attempt (C-SSRS)					45.123	**<0.01**
No	N/A	499 (66%)	218 (99%)	281 (81%)		
Yes	N/A	66 (8%)	N/A	66 (18%)		

Bold values indicate $p < 0.05$ for χ^2 tests or t-tests between Study 2 no suicidality/suicidality group

approximately a quarter reported being between the ages of 18 and 29 years old (26%), and over a third between the ages of 30 to 49 years (34%) or 50 years and over (40%). Approximately half of the participants reported working either full or part time (50%) and having completed up to an associate/trade degree or diploma (46%). Over half of the participants reported not being in a relationship (58%).

Participants reporting suicidal thoughts/behaviours (n = 349) differed significantly to participants reporting no suicidal thoughts/behaviours (n = 219) in terms of younger age, gender (higher percentage of males), less employment, less education, more likely to be unmarried, and greater history of recent suicide attempt. Participants reporting suicidal thoughts/behaviours also had significantly higher levels of thwarted belongingness measured by the INQ TB (mean difference = −11.88, 95% CI: -13.88 to −9.89) and TBS (−14.11, 95% CI: -16.25 to −11.98), perceived burdensomeness (PB; mean difference = −10.91, 95% CI: -12.19 to −9.63), capability for suicide (CS; mean difference = −1.88, 95% CI: -2.99 to −0.77), and suicide ideation (past month; mean difference = −16.18, 95% CI: -17.47 to −14.90) (Table 1).

Confirmatory Factor Analyses (CFA) & Bi-Factor Exploratory Analysis (EFA)

For the bi-factor EFA, the general factor with two group factors was best fitting. The Explained Common Variance (ECV) for the TBS (0.87) was greater than the recommended ECV of .85 (Stucky et al. 2013, 2014), indicating that the TBS was sufficiently uni-dimensional. Additionally, the Omega Hierarchical (ωH) for the TBS (0.94) was greater than .75, indicating that the TBS total score predominantly reflected the single general factor of TB and could be interpreted as a sufficiently reliable measure of this interpersonal risk factor (Reise et al. 2013). The combined INQ TB and TBS items yielded a ωH of 0.95, indicating that the TBS captured the same general factor as the INQ TB.

The comparative fit indices (CFI and TLI) were excellent (>.95) for the TBS scale in the uni-dimensional CFAs and for all three TB scale models in the bi-factor EFAs. For the bi-factor EFAs, the SRMR values of absolute fit were good (<.05) across all three TB models, displaying best fit for the INQ TB and TBS models. However, the parsimony corrected fit index (RMSEA) indicated poor fit (>.08) across all three TB models in both uni-dimensional CFA and bi-factor EFA analyses (Table 2).

Inspection of the residual correlation matrices indicated that for the INQ TB, two items ("These days, I feel disconnected from other people" and "These days, I often feel like an outsider in social gatherings") had a correlation of 0.28 after accounting for the correlation between items through the latent factors, suggesting these items assess similar things. All residual correlations for the TBS were below 0.20 (range = −0.06 to 0.12).

Table 2 Study 2 fit statistics across three Thwarted Belongingness (TB) models using Confirmatory Factor (CFA) and bi-factor Exploratory Analyses (EFA)

Model	CFI	TLI	RMSEA (90% CI)	SRMR
Unidimensional CFA				
INQ TB (N = 662)	0.917	0.890	0.236 (0.224–0.249)	N/A
TBS (N = 578)	0.980	0.972	0.203 (0.188–0.219)	N/A
Combined (N = 578)	0.934	0.924	0.176 (0.170–0.183)	N/A
Bi-factor EFA				
INQ TB (N = 662)	0.998	0.986	0.083 (0.057–0.112)	0.009
TBS (N = 578)	0.998	0.992	0.105 (0.079–0.133)	0.009
Combined (N = 578)	0.986	0.974	0.104 (0.096–0.112)	0.020

CFI Comparative Fit Index, *TLI* Tucker Lewis Index, *RMSEA* Root Mean Square Error of Approximation, *SRMR* Standardised Root Mean Square Residual

Item Response Theory (IRT) and Reading Grade Analysis

Table 3 displays the parameter estimates for the TBS using a graded response model. Using the polytomous extension of the $S-\chi^2$ statistic, one item (4. "I feel there is no one I can talk to") was identified as misfitting at $p < 0.05$. Test information function curves for the TBS indicated that almost double the level of information was gained along the trait region associated with Θ = −1.5 to 1.5 compared to the INQ TB. However, slightly less information was gained in regions below Θ = −1.5 and above 2, suggesting that that the TBS is good at assessing individuals with moderate to high levels of thwarted belongingness, but that the INQ TB provides slightly more information in the lower and high trait regions.

The TBS consisted of 8 sentences and 49 words. It included 3 complex words (6.12%), 6.13 average words per sentence, and 1.31 syllables per word. The Flesch Kincaid Reading Ease grade for the TBS was 90.1 out of 100, with a US school grade level of 2.2 (easily understood by 8 to 9 year olds). The INQ TB consisted of 9 sentences and 91 words. It included 9 complex words (9.89%), 10.11 average words per sentence, and 1.41 syllables per word. The Flesch Kincaid Reading Ease grade for the INQ TB was 77.6 out of 100, with a grade level of 5 (easily understood by 11 to 12 year olds).

Comparison of TB Scales in Tests of the IPTS

Zero inflated negative binomial regression models were used to assess associations of the interpersonal risk factors (TB, PB, and their two-way interaction) with severity of suicide ideation reported in the past month as differentially measured by the INQ TB subscale and the TBS. A fifth of the participants (20%) reported a SIDAS severity score in the extreme range (≥21; M = 16.19, SD = 12.18) (van Spijker et al. 2014). The zero inflated negative binomial regression model with all three predictors was significant for the INQ TB subscale (LR χ^2 =

Table 3 Study 2 parameter estimates for the Thwarted Belongingness Scale (TBS) using a graded response model ($N = 578$)

Item	*a*	*b*1	*b*2	*b*3	*b*4	*b*5	*b*6	*S*-χ^2	*p*
1. I feel isolated	3.31	−1.15	−0.69	−0.35	0.06	0.38	0.90	120.52	0.08
2. I don't matter to other people	4.43	−0.68	−0.16	0.12	0.47	0.80	1.28	90.01	0.31
3. Nobody cares about me	4.08	−0.41	0.08	0.39	0.73	1.10	1.64	107.60	0.08
4. I feel there is no one I can talk to	3.11	−0.87	−0.30	0.03	0.38	0.67	1.21	142.01	**0.03**
5. I don't fit in	2.96	−1.28	−0.85	−0.41	0.09	0.39	0.93	111.60	0.27
6. I don't play an important role in other people's lives	3.02	−0.76	−0.16	0.18	0.60	0.97	1.49	123.91	0.14
7. I am not close to anyone	2.85	−0.78	−0.20	0.16	0.60	0.87	1.57	122.24	0.20
8. I am alone in this world	3.00	−0.69	−0.19	0.10	0.44	0.77	1.31	128.35	0.17
Value ranges	[2.85, 4.43]	[− 1.28, −0.41]	[− 0.85, 0.08]	[− 0.41, 0.39]	[0.06, 0.73]	[0.38, 1.10]	[0.90, 1.64]		

a = item discrimination (how well an item can differentiate between examinees at different trait levels); b_x = item location (where the item functions best along the trait scale); $S-\chi^2$ = Pearson's chi-square; bold values indicate $p < 0.05$

165.85, $df = 3$, $p < 0.01$) and TBS (LR $\chi^2 = 165.68$, $df = 3$, $p < 0.01$). As shown in Table 4, the two-way interaction of TB and PB made a significant contribution in both INQ TB ($\beta = -0.14$, $p < 0.01$) and TBS models ($\beta = -0.14$, $p < 0.01$) (Fig. 1). Respondents who reported experiencing high levels of both TB and PB had more severe levels of suicide ideation (over the past month) compared to those who reported low levels of TB and PB. Interestingly, participants reporting high levels of PB but low levels of TB had similar severity of suicide ideation, suggesting that high levels of PB confer considerable risk irrespective of TB levels.

Logistic regression models were used to assess associations of the interpersonal risk factors (TB, PB, CS, and their two-way and three-way interactions) with the likelihood that respondents reported suicide behaviour in the past 3 months. Sixty-six participants (11%) reported having 'done anything, started to do anything, or prepared to do anything to end their life' in the past 3 months. The full model containing all eight predictors was statistically significant for the INQ TB model, χ^2 (7, $N = 561$) = 116.79, $p < .001$, and the TBS model, χ^2 (7, $N = 561$) = 114.48, $p < 0.01$). The INQ TB model explained between 18.8% (Cox and Snell R square) to 36.5% (Nagelkerke R squared) of the variance in suicide attempt, and correctly classified 89.5% of cases. The TBS model explained between 18.5% (Cox and Snell R square) to 35.8% (Nagelkerke R squared) of the variance in suicide attempt, and correctly classified 89.7% of cases. As shown in Table 5, the three-way interaction between TB, PB and CS was not significant in the INQ TB ($\beta = -0.20$, $p = 0.28$) or TBS model ($\beta = -0.25$, $p = 0.16$).

Discussion

There is currently a need to expand the availability of valid measurement approaches for assessing interpersonal suicide risk. Theoretically, better measurement can help to inform

Table 4 Zero inflated negative binomial regression models testing the predictions of the Interpersonal-Psychological theory for suicidal ideation using the Interpersonal Needs Questionnaire thwarted belongingness subscale (INQ TB; Van Orden et al. 2012) and Thwarted Belongingness Scale (TBS)

	INQ TB model on SI ($N = 561$)			TBS model on SI ($N = 561$)		
Negative binomial regression	Estimate	Wald χ^2	*p*	Estimate	Wald χ^2	*p*
Intercept	2.41	153.00	**<0.01**	2.41	158.62	**<0.01**
TB	0.17	1.25	**<0.01**	0.19	0.60	**<0.01**
PB	0.58	52.32	**<0.01**	0.57	42.52	**<0.01**
TB × PB	−0.14	0.54	**<0.01**	−0.14	0.01	**<0.01**
Logistic regression for zero inflation						
Intercept	−1.09	N/A	**<0.01**	−1.12	N/A	**<0.01**
TB	−0.29	N/A	0.08	−0.39	N/A	**0.02**
PB	−1.64	N/A	**<0.01**	−1.54	N/A	**<0.01**
TB × PB	0.35	N/A	0.06	0.38	N/A	**0.04**

Estimates are unstandardized; *p* values are based on Wald χ^2 from negative binomial regression models; bold values indicate $p < 0.05$; *TB* Thwarted Belongingness, *PB* Perceived Burdensomeness, × = interaction, *N/A* Not applicable

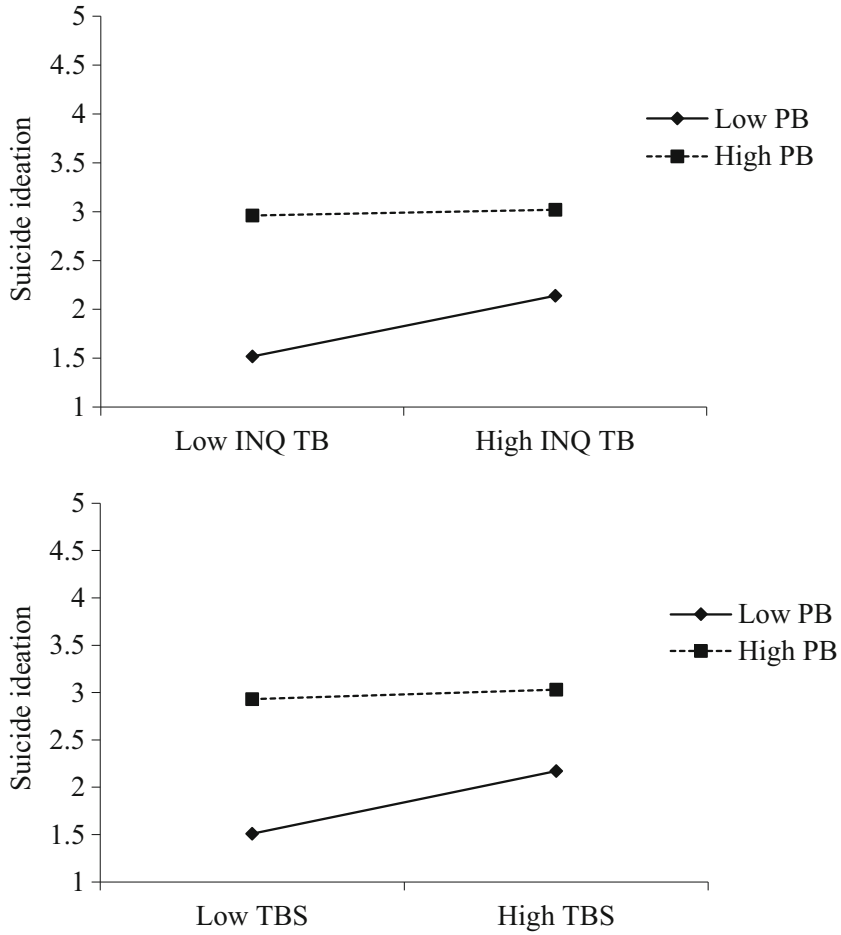

Fig. 1 Study 2 two-way interaction between thwarted belongingness (INQ TB, top; TBS, bottom) and perceived burdensomeness on suicide ideation (past month)

Table 5 Logistic regression models for suicide attempt versus no attempt using the Interpersonal Needs Questionnaire thwarted belongingness subscale (INQ TB; Van Orden et al. 2012) and Thwarted Belongingness Scale (TBS)

	Estimate	*SE*	Odds ratio	*p*
INQ TB model on SA ($N = 561$)				
TB	0.38	0.26	1.46 [0.88, 2.44]	0.14
PB	1.27	0.22	3.56 [2.29, 5.52]	<0.01***
CS	0.59	0.24	1.81 [1.12–2.94]	0.01**
TB × PB	−0.01	0.20	0.98 [0.65–1.46]	0.93
CS × TB	−0.18	0.24	0.83 [0.51–1.35]	0.46
CS × PB	0.02	0.21	1.02 [0.67–1.54]	0.91
TB × PB × CS	−0.20	0.18	0.81 [0.56–1.18]	0.28
TBS model on SA ($N = 561$)				
TB	0.19	0.24	1.21 [0.74–1.97]	0.42
PB	1.29	0.21	3.66 [2.38–5.62]	<0.01***
CS	0.56	0.23	1.75 [1.09–2.80]	0.01**
TB × PB	0.04	0.18	1.04 [0.72–1.50]	0.80
CS × TB	0.08	0.24	1.09 [0.67–1.77]	0.72
CS × PB	−0.03	0.20	0.96 [0.64–1.43]	0.85
TB × PB × CS	−0.25	0.18	0.77 [0.54–1.10]	0.16

TB Thwarted Belongingness, *PB* Perceived Burdensomeness, *CS* Capability for Suicide, × = interaction. * $p < 0.05$ ** $p < 0.025$ *** $p < 0.01$

current models of suicide risk by addressing questions regarding the conceptualisation, role, and possible prioritisation of some interpersonal risk factors over others. Additional measures can also help provide enhanced identification of interpersonal risk and may aid suicide screening and prevention efforts. The present study aimed to develop and validate a new self-report scale for the interpersonal risk factor of thwarted belongingness (TB) in a large community population, and provide a comparative test of the Interpersonal Psychological Theory of Suicide using this scale (IPTS; Joiner 2005; Van Orden et al. 2010). From an initial pool of 42 TB items, an 8-item scale (TBS) was developed through consecutive stages of refinement via expert feedback and validation studies in Australian community-based adult samples.

Confirmatory (CFA) and bi-factor exploratory analysis (EFA) supported the uni-dimensionality of the 8-item TBS, where it was found to measure a similar underlying latent construct (i.e., TB) as the Interpersonal Needs Questionnaire thwarted belongingness subscale (INQ TB; Van Orden et al. 2012). Model fit across the CFA and EFA TB models was difficult to discern as inconsistency was observed across fit indices. In the CFA, the Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) for the TBS suggested excellent

fit compared to the INQ TB and combined INQ TB and TBS scales. In the bi-factor EFA, CFI and TLI suggested excellent fit for the TBS, the INQ TB, and combined TB scales. In addition, the Standardised Root Mean Square Residual (SRMR) measure of absolute fit was good across all the TB models in the bi-factor EFA. However, the Root Mean Square Error of Approximation (RMSEA) parsimony corrected fit index across all TB models indicated poor fit. One explanation for this inconsistency may be that the RMSEA is more sensitive to the presence of secondary dimensions, model complexity (e.g., number of items/estimated parameters) and data distribution compared to the CFI and TLI (Cook et al. 2009). As such, depending on the interpretational weight placed on the different indices, it could be concluded that the TBS either displays excellent fit in both uni-dimensional CFA and bi-factor EFA based on CFI and TLI indices, or similarly poor fit alongside all other TB models based on the RMSEA.

In regard to the range and level of information captured by the 8-item TBS compared to the INQ TB subscale, Item Response Theory (IRT) analysis indicated that the TBS captured approximately double the amount of information across moderate to high levels of TB compared to the INQ TB. However, this was at the expense of a slightly narrower range, where the TBS was found to provide marginally less information in the extreme TB trait regions. This finding is particularly interesting as the TBS consisted of one less item and was approximately half the length of the INQ TB subscale, with a Flesch Kincaid Reading Ease grade indicating that the scale could be easily understood by eight to nine year olds. This finding suggests that the TBS may be a more efficient scale for assessing TB in populations experiencing moderate to high levels of TB, with greater applicability in low literacy populations compared to the INQ TB. Future studies exploring interpersonal suicide risk may benefit from employing the TBS and INQ TB as complementary assessments to capture TB range (very low or very high levels) via the INQ TB and depth (moderate levels) via the TBS in order to better tailor assessments across different populations.

The IRT findings for the two different TB scales also suggest that in order to retain uni-dimensionality as well as capture a high amount of information, TB may require individualised items/subscales for low, moderate, and high levels of the construct. This would have implications for screening individuals on their interpersonal suicide risk, as TB measures may not be sufficiently sensitive to detect TB in the extreme ranges. Here, developing a computerised adaptive version of the larger TB item bank may be a fruitful way to capture all levels of severity with sufficient precision whilst maintaining efficiency.

Tests of the IPTS hypotheses around suicide ideation provided support for the main effects of TB, perceived burdensomeness (PB) and their two-way interaction on suicide ideation (past month) when using the INQ TB subscale and TBS. Both TB models displayed similar beta-coefficients and significance levels across variables. Additionally, both significant two-way interaction effects showed that participants who experienced high levels of TB and PB had more severe levels of ideation compared to those with low levels of TB and PB. The two-way interaction effects also indicated that participants with high levels of PB but low levels of TB had similar levels of ideation severity compared to those with high levels of TB and PB.

Tests of the IPTS hypotheses around suicide attempt provided support for the main effects of PB and capability for suicide (CS) when using the INQ TB subscale and TBS. Both models explained similar levels of variance in the suicide attempt outcome and displayed similar beta-coefficients, odds ratios, and significance levels across significant variables. Participants experiencing PB were three and a half times more likely to report a suicide attempt in the past 3 months, and those experiencing CS were over one and half times more likely to report a suicide attempt. The lack of a significant three-way interaction effect found for both the TBS and INQ models may be attributable to limitations in power. However, the effect size for the interaction was also negligible, suggesting that participants in the thousands would be required to detect such an effect (Ma et al. 2016). Taken together, these findings provide support for the role of PB as a particularly pernicious interpersonal risk factor contributing to suicide ideation and attempt risk. When experienced at high levels, PB may confer equivalent levels of ideation risk irrespective of TB levels, and contribute double the risk to suicide attempt compared to CS. Given that PB and TB are considered amenable to change, future studies comparing the weight of risk attributed to PB and TB are needed as this could have implications on the way interpersonal suicide risk is screened and targeted for intervention (e.g., targeting PB may be given prominence over TB in high risk populations). The findings also lend support to the validity of INQ TB, although it was found to be a longer scale that captured less information than the TBS, with one item of the INQ TB identified as redundant.

Overall, findings from this study indicate that even with the development of an alternative measure of TB that includes independent items which capture the same underlying construct measured by the INQ TB, some questions remain regarding the significance and role of TB in relation to interpersonal suicide risk and how to best approach its measurement. While complementary use of the INQ TB and TBS may aid in capturing information about TB across different risk regions in the population, it may still be the case that neither measure adequately assesses TB in its entirety as outlined by the IPTS. Perceptions of the intractability of TB, hypothesised in the IPTS to predict the progression from passive to active suicide ideation, were not measured by the INQ TB or the TBS (despite being included in the initial item pool; Appendix 2: items 40, 41 and 42) and have generally been excluded from tests of

the IPTS as there have been no sufficient measures of interpersonal hopelessness to date. Given the above-mentioned difficulties in developing a uni-dimensional measure of TB that captures a high amount of information across all regions of TB, the development of a separate measure for intractability of the interpersonal risk factors (i.e., hopelessness about interpersonal challenges relating to both TB and PB) may help to provide the missing link in this process. For example, the interaction between TB and intractability may be more predictive of and comparative in strength to the main effect of PB on suicide ideation as evidenced in the literature.

On the other hand, the findings could also lend support to the literature regarding the stronger role of PB in contributing to interpersonal suicide risk. Here, despite using multiple measures of TB to test the IPTS hypotheses for suicide ideation and attempt outcomes in an online sample, PB was still found to be a more important interpersonal risk factor in both the ideation and attempt models. It may then be that TB as a construct (rather than how it is measured) has limited predictive value for suicide ideation, or at least less of an influence than initially theorised by the IPTS. Another possible avenue to investigate is whether TB functions as a categorical rather than dimensional risk factor that only contributes to suicide risk when experienced at a certain threshold (see Witte et al. 2017). With the anticipation of additional measures for TB and PB being developed in the near future, continuing these lines of enquiry, and in particular comparing new measures for TB and PB against the INQ, may help in terms of examining where gaps remain and whether differences in scale performance can be attributed to construct, measurement, or both construct and measurement related issues. This can, in turn, support the refinement and predictive abilities of theoretical models of suicide risk. In relation to clinical practice, following from this point, though that we cannot unequivocally recommend for the exclusion of TB assessment in resource-drained environments as the full extent of TB's clinical utility remains unknown, it may be that PB assessments serve as a more robust indicator of interpersonal suicide risk and should be prioritised during the initial risk assessment process at this point in time, whereas it may be more advantageous to incorporate the secondary targeting of TB alongside PB in follow-up/intervention sessions.

Strengths and Limitations

To our knowledge, this is the first study to provide an alternative self-report measure of TB outlined by the IPTS. As such, this study fills a much-needed gap in the IPTS and suicide literature base by providing an additional interpersonal suicide risk screening option and in doing so, contributing to discussion regarding the conceptualisation and role of TB and some next steps for furthering its measurement. Nevertheless, the findings also suggest that limitations in the measurement of TB may not be the only reason why it explains less variance in SI than PB, given the relative consistency of outcomes between the INQ and TBS. Additional strengths of the study include the recruitment of two independent community-based samples during the item refinement and validation process, as well as the use of bi-factor EFA and IRT analysis to provide a more robust assessment of uni-dimensionality and richer description of the TBS' performance compared to the INQ TB. However, the study also had several limitations. Despite recruiting community-based samples, there was an overrepresentation of females in both studies. Future studies evaluating the TBS may benefit from testing measurement invariance across relevant characteristics such as age group and gender. In addition, suicide outcomes in tests of the IPTS had relatively short time frames (past month and past 3 months). However, given their proximal nature, these outcomes may exhibit less recall bias, and time frames may be better aligned to the IPTS. Another limitation of the current study was that the suicide attempt outcome measure used included elements of suicide preparations and may not represent a pure suicide attempt measure. As such, tests of the IPTS' three-way interaction effects should be interpreted with this limitation in mind. Further validation of the TBS in other subsamples utilising validated and conceptually consistent suicide outcome measures within longitudinal/prospective study designs are needed to further explore and support the performance of the TBS. Lastly, it is important to note that though an aim in developing the TBS was to conceptually extend items to better capture TB, perceptions of intractability were not included in the final scale. Given that intractability of interpersonal states is viewed by the IPTS as being predictive of active ideation, the development and inclusion of a measure of hopelessness about interpersonal challenges is needed in order to test the theory's predictions in more detail.

Conclusions

The TBS has the potential of providing enhanced identification of the interpersonal suicide risk factor of TB, particularly in individuals who display moderate to high levels of TB. The TBS may aid in forming a robust assessment of suicide risk in conjunction with other validated interpersonal measures, with applicability in low literacy populations. However, more research is needed to build upon the findings of this study. In particular, the development of additional interpersonal measures can provide further construct and measurement points of comparison to shed more light on the role of TB in relation to interpersonal suicide risk and how to best approach its conceptualisation and measurement.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest Jennifer Ma, Philip J. Batterham, Alison L. Calear and Matthew Sunderland declare that they have no conflict of interest.

Appendix 1

Thwarted Belongingness Scale (TBS)

Please rate on the scale below, how you have been feeling recently about the following:

Not at all true for me			Somewhat True for me			True for Me
1	2	3	4	5	6	7

1. I feel isolated
2. I don't matter to other people
3. Nobody cares about me
4. I feel there is no one I can talk to
5. I don't fit in
6. I don't play an important role in other people's lives
7. I am not close to anyone
8. I am alone in this world

Scoring: Total scores are calculated as the sum of the eight items (range 8–56).

Appendix 2

Original 42-item thwarted belongingness pool

1. Nothing I do matters
2. It wouldn't make a difference to anyone or anything if I was dead, things would just go on without me
3. I don't have meaningful relationships with others
4. I don't play an important role in other people's lives
5. I don't matter to other people
6. Nobody cares about me
7. Nobody would look for me if I didn't show up
8. I am alone in this world
9. I am isolated
10. There is no one I can talk to
11. I have no one I can turn to
12. I am not close to anyone
13. I feel excluded by others
14. People shun me
15. I don't fit in
16. I wish others were more concerned about my welfare
17. People don't pay attention to me
18. I often feel rejected by others
19. Society doesn't want people like me
20. I don't get the chance to show love to others around me
21. I don't contribute to the well-being of others
22. I don't get to use my skills to make a difference in society
23. I don't contribute to something larger than myself
24. I don't contribute to anything in a meaningful way
25. Life is all around me, but I don't feel a part of it
26. I am searching for some connection, but cannot find it
27. Though there are people who care about me, they don't understand what I'm going through
28. I don't live the life I want to live with others
29. I frequently experience bullying or abuse
30. I am verbally abused by others around me
31. I am physically abused by others around me
32. I am manipulated by others around me
33. My needs are deprived by others around me
34. Others see me as worthless
35. I am belittled by others close to me
36. People in my life don't support me
37. It is too painful to be around others
38. I don't receive love from others around me
39. I don't feel welcome where I live
40. I cannot reach out and communicate with those around me
41. I cannot do much to help myself
42. I cannot do much to make a difference in my life

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