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Belongingness and Burdensomeness in Adolescents: Slovene Translation and Validation of the Interpersonal Needs Questionnaire

Tina Podlogar, BCs, Janina Žiberna, BCs, Vita Poštuvan, PhD, and David C. R. Kerr, PhD

The Interpersonal Needs Questionnaire (INQ) for assessing thwarted belongingness (TB) and perceived burdensomeness (PB) has not been validated with community adolescents. We translated and administered the INQ to 307 Slovenian adolescents twice over 2–3 months and found that the 15-item version (INQ-15) did not fit without modification. TB and PB scales correlated with concurrent and later suicide ideation and lifetime suicide attempt history. The latent PB factor was associated with concurrent and later ideation controlling for TB, age, gender, depressive symptoms, binge drinking, and peer victimization. Suicide ideation and binge drinking were independently related to attempt history. Assessing and intervening on PB and binge drinking may be promising approaches to suicide prevention with community adolescents.

Suicide is a leading cause of death among young people (e.g., second leading cause among 10- to 24-year-old Americans; Sullivan, Annest, Simon, Luo, & Dahlberg, 2015). Suicidal thoughts and attempts by adolescents indicate a risk for suicide (Bridge, Goldstein, & Brent, 2006). Given that they also are linked with a multitude of other negative life consequences (Carli et al., 2014; Fergusson, Horwood, Ridder, & Beautrais, 2005), these risk factors should be considered significant public health problems in their own right. To prevent suicide and negative life outcomes, it is necessary to identify modifiable risk factors for suicidal thoughts and behaviors. Furthermore, the presence of serious suicidal thinking or a history of suicide attempt indicates some progression of risk already has occurred. Therefore, there is value in identifying and disrupting risk processes that are even more distal or "upstream" from suicide.

Tina Podlogar, Janina Žiberna, and Vita Poštuvan, Andrej Marušič Institute, Slovene Centre for Suicide Research, University of Primorska, Koper, Slovenia; David C. R. Kerr, School of Psychological Science, Oregon State University, Corvallis, OR, USA.

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Address correspondence to Tina Podlogar, Andrej Marušič Institute, Slovene Centre for Suicide Research, University of Primorska, Muzejski trg 2, 6000 Koper, Slovenia; E-mail: tina.podlogar@upr.si

The interpersonal theory of suicide suggests several such risk processes. Although the theory was developed to describe states that confer imminent risk for death, it also has been used to identify predictors of suicidal thoughts and behaviors (Van Orden et al., 2010) and to make hypotheses about prevention targets (Joiner, 2009). According to the theory, people must meet two key criteria in order to die by suicide: suicidal desire and acquired capability. *Suicidal desire* is a cognitive-emotional state that arises from unmet interpersonal needs, but is also affected by intrapersonal factors. It develops on the basis of two related but distinct psychological states: thwarted belongingness (TB) and perceived burdensomeness (PB). TB refers to feelings of loneliness and social isolation. PB is the belief that one is so incompetent or difficult as to be a burden on others; this condition is reflected in the sense that others "would be better off without me" (Van Orden et al., 2010). Both constructs have been found to be associated with suicide ideation in studies of adults (Brown, Dahlen, Mills, Rick, & Biblarz, 1999; Van Orden et al., 2010). Several studies indicate that active suicidal desire (vs. passive thoughts) develops if both of the described psychological states are present (Christensen, Batterham, Mackinnon, Donker, & Soubelet, 2014; Christensen, Batterham, Soubelet, & Mackinnon, 2013; Joiner et al., 2009; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Although the constructs are associated with depression (Kleiman, Liu, & Riskind, 2013), they predict suicide ideation beyond depression indices (Joiner et al., 2009) and are thus unique in their predictive utility.

The third interpersonal theory of suicide construct, acquired capability for suicide, distinguishes those who desire suicide from those who die by suicide. Acquired capability can develop from a painful and provocative experience in an individual's life (Van Orden et al., 2010) that desensitizes that person to the innate fear of pain and death. Other traits (e.g., impulsive aggression) and states (e.g., intoxication) may also confer capacity to enact lethal self-harm (Anestis, Soberay, Gutierrez, Hernández, & Joiner, 2014; Wolford-Clevenger et al., 2015). The theory posits that all three factors have to be present for serious suicidal behavior to occur (Ribeiro & Joiner, 2011).

Suicidal desire constructs have been extensively studied using the recently developed Interpersonal Needs Questionnaire (INQ; Van Orden, Cukrowicz, Witte, & Joiner, 2012; Van Orden, Witte, Gordon, et al., 2008). Researchers have primarily considered nonclinical adult samples, mostly young adults or college students (e.g., Anestis, Bagge, Tull, & Joiner, 2011; DeShong, Tucker, O'Keefe, Mullins-Sweatt, & Wingate, 2015; Freedenthal, Lamis, Osman, Kahlo, & Gutierrez, 2011; Joiner et al., 2009; Kleiman et al., 2013; Ploskonka & Servaty-Seib, 2015; Van Orden, Witte, Gordon, et al., 2008; Van Orden, Witte, James, et al., 2008; Van Orden et al., 2012), but also older adults (e.g., Cukrowicz, Cheavens, Van Orden, Ragain, & Cook, 2011; Marty, Segal, Coolidge, & Klebe, 2012; Van Orden et al., 2012), and in one study, adolescent inpatients (Hill et al., 2015). Studies support the identification of distinct TB and PB factors, but have differed in terms of the particular INQ items that have been used to measure them (Kleiman et al., 2013). While the 15-item INQ (Van Orden et al., 2012) is the empirically derived and psychometrically validated version, other authors have used different adaptations from the original measure; for example, with 18 items (Hill et al., 2015; Marty et al., 2012), 12 items (Freedenthal et al., 2011), or 10 items (Bryan, 2010), which were not necessarily empirically derived or were used mostly in specific populations, such as the 10-item version in military populations (Bryan, 2010). Psychometric properties of the different INQ versions were compared in a recent study by Hill et al. (2015), who report acceptable to good internal consistency across all versions in three samples, with 15- and 10-item versions demonstrating the best fit. Hill et al.

therefore recommend the use of the 15- or 10-item version in further research. Additional studies of the factor structure of the INQ are needed, particularly when it is to be applied to new populations.

Although adolescence is a period of high risk for suicidal thoughts and behaviors (e.g., Tančič, 2009; Van Heeringen, 2001), the INQ has not yet been validated among community adolescents (Stewart, Eaddy, Horton, Hughes, & Kennard, 2015), only in a sample of psychiatric inpatient adolescents (Hill et al., 2015). Indeed, the interpersonal theory of suicide has not been extensively studied in youth. Specifically, Stewart et al. (2015) identified 17 studies of adolescents that tested components of the theory or used it to interpret findings, but only six studies attempted to measure PB or TB (using proxy measures, not the INQ). Given the influence of the theory on suicidology, it is clearly of great importance to study it further and more directly using the INQ in the adolescent period. Additionally, studying the interpersonal theory of suicide and INQ among community youth (vs. in clinical samples and adults) is most relevant to primary prevention and the potential for averting pathological developmental trajectories. Finally, the INQ has some characteristics that are especially relevant to the assessment of adolescents. The majority of young people who self-harm do not seek help beforehand due to barriers such as concerns about confidentiality and stigma (Hawton, Saunders, & O'Connor, 2012), and some youth who deny suicide ideation are nonetheless found to be at high risk of attempt (see King, Jiang, Czyz, & Kerr, 2014). Therefore, risk assessment tools that identify suicide risk without explicitly mentioning suicide in the questions may usefully supplement those that do (e.g., Huth-Bocks, Kerr, Ivey, Kramer, & King, 2007). Determining whether the INQ and interpersonal theory of suicide apply to community adolescents is an essential next step in the field.

It also is important to extend the evidence base on instruments developed with English speakers to those from other regions—and especially where suicide is a more widespread public health problem. Slovenia (a country in central Europe, bordered by Italy, Austria, Hungary, and Croatia) has one of the highest suicide rates in the world (WHO, 2014). The prevalence of suicidal behavior among Slovenian adolescents is also among the highest. A recent study of self-reported lifetime prevalence of thoughts of self-harm among 15- to 16-year-olds from 17 European nations revealed relatively large differences among countries (from 15% to 44%); in Slovenia, 31% of adolescents reported such thoughts, a rate that is similar to percentages found in some of the neighboring countries such as Hungary, Austria, and Croatia (Kokkevi, Rotsika, Arapaki, & Richardson, 2012). Furthermore, whereas lifetime rates of suicide attempt for American adolescent boys and girls have been estimated at 2% and 6%, respectively (Nock et al., 2013), Kokkevi et al. (2012) identified such a history in 8% and 17% of Slovenian boys and girls, respectively.

The aims of the present study were to translate the INQ questionnaire into the Slovenian language and examine the psychometric properties of the empirically validated version (INQ-15) in a sample of adolescents at elevated risk of suicide given region of residence. Findings were expected to extend the literature on the developmental and cross-cultural relevance of TB and PB to suicide risk. Furthermore, we sought an empirical basis and justification for further use of the INQ in assessment and suicide prevention efforts for youth in Slovenia and nearby countries with relatively high national suicide rates.

Our first research question concerned the factor structure of the translated INQ-15. We sought to confirm the two factors, namely TB and PB, within the factor structure of the questionnaire using the baseline data. Second, we intended to document the internal consistencies of observed factor scores and the stability of these scores across a short follow-up period. Third, we

evaluated the validity of the TB and PB factors by examining their associations with recent suicide ideation measured concurrently and at short-term follow-up, and with a lifetime history of suicide attempt. We hypothesized that these associations would persist after controlling for age, gender, and individual and contextual factors that are potentially confounded with TB and PB—specifically, depressive symptoms, peer victimization, and binge drinking. Finally, as TB and PB factors are thought to increase suicide risk through effects on suicide ideation, we hypothesized that predictive associations the factors had with suicide attempt history and follow-up suicide ideation would not remain significant after controlling for concurrent suicide ideation.

METHOD

Participants

Participants were students at schools selected from two regions with the highest suicide rates in Slovenia (Koroska and Podravska). In September 2013, all 122 primary, occupational, and high schools in these regions were invited to participate in a school-based mental health promotion and suicide prevention program called "Do you understand (yourself)?!?", which was developed on the basis of an European program called Saving and Empowering Young Lives in Europe (SEYLE; Carli et al., 2013; Wasserman et al., 2010, 2015). Nine schools agreed to participate and one additional school from the Central Slovenian region was included on the basis of their expressed interest in participation. Schools that declined to participate reported having problems with finding time for the project activities. Altogether, 324 adolescents were enrolled.

The subset (n = 307) of participants who completed the INQ at baseline (T1) were included in the present analyses. Participants were between the ages of 12–17 years (mean [*SD*] = 14.1 [.96]), and identified as boys (n = 125), girls (n = 178), or did not specify (n = 4). Approximately one third (n = 105) of the participants came from one school, whereas participation at the other nine schools ranged from 9 to 34; primary models accounted for the nesting of students within schools. At follow-up (T2), 217 of the 307 youth participated (71% retention). Retention at 7 of the 10 schools ranged from 84% to 100%, whereas retention rates were extremely low at the other three (n = 0 of 29, n = 9 of 33, and n = 8 of 14) due to a variety of reasons; for example, the follow-up coincided with summer vacation due to late enrollment of the school, and institutional factors potentially impacted student understanding of the project, motivation, and interest at follow-up.

Measures

All measures were administered in Slovene. With the exception of the INQ, which was translated for the purpose of this study, preexisting translations of other measures were used (Avsec & Musek, 2010; Wasserman et al., 2010, 2015). Psychometric properties are reported when available.

Age and Gender. Participants' age in years (whole number) was measured at baseline, and gender was assessed and coded as boy (1) or girl (2).

TB and PB. The INQ (Van Orden, Witte, Gordon, et al., 2008) was designed to measure these two constructs. Questions were answered on a 7-point Likert scale ranging from *not at all true* (1) to *very true* (7). Higher scores are coded to reflect higher levels of TB and PB. We used the original 25-item form of the questionnaire (10 items measuring TB and 15 items measuring PB), given that the prior studies revealed a need for further confirmation of the questionnaire's factor structure. One researcher translated the questionnaire into Slovenian following the principle of translating conceptually in order to preserve the meaning of individual statements. A second researcher, blind to the original English version of the questionnaire, back-translated it to English. A third researcher compared the

back-translation to the original to confirm that the meaning of each statement was the same and then the team made some final corrections. All three researchers were Slovenian, had advanced education in psychology (which in Slovenia is primarily based on the scientific literature written in English, and emphasizes scientific writing in English), and read and spoke English fluently. The abbreviated Slovenian translations of the INQ items is shown in Table 1, and the complete translated INQ is available at https://psy.fsu.edu/~joinerlab/resources.html.

Depressive Symptoms. The 20-item Center for Epidemiological Studies Depression (Radloff, 1977) is a widely used measure of depressive symptoms. Participants rated the frequency of experiencing individual symptoms (e.g., depressed mood, appetite disturbance) in the last 2 weeks using a 4-point Likert scale, ranging from *rarely* (0) to *most of the time* (3). The scale has good psychometric properties and is acceptable and reliable in adolescents (Radloff, 1991). Slovene translation of the scale is reliable with coefficient of internal consistency $\alpha = .86$ (Avsec & Musek, 2010). We operationalized clinically significant depressive symptoms as scores $\geq$22 and 24 for boys and girls, respectively, as described by Lewinsohn, Rohde, and Seeley (1998).

Suicide Ideation. At each assessment, we used two items from the Paykel Suicide Scale (Paykel, Myers, Lindenthal, & Tanner, 1974; translated into Slovene for use in the SEYLE study; Wasserman et al., 2010) measuring suicide ideation: "During the past 2 weeks, have you thought of taking your life, even if you would not really do it?" and "During the past 2 weeks, have you reached the point where you seriously considered taking your life or perhaps made plans how you would go about doing it?". Participants responded using a 6-point scale ranging from *never* (0) to *always* (5). If a participant reported "never" on both questions, suicide ideation was coded as absent (0); otherwise, it was coded as present (1).

Lifetime Suicide Attempt History. At both assessments, we asked: "Have you ever tried to take your own life?" Participants who responded "yes" at either assessment were coded as having a lifetime suicide attempt history (1); otherwise, such a history was coded as "no" (0). This item was translated into Slovene for use in SEYLE (Wasserman et al., 2010).

Binge Drinking. Participants used a scale from 0 (*never*) to 5 *(4 or more times a week*) to answer the question, "How often did you drink 5 (boys)/4 (girls) or more units of alcohol containing beverages on one occasion in the last 12 months?" which was translated into Slovene in SEYLE (Wasserman et al., 2010). A unit was defined as a standard drink (2.5 deciliter [dl] of beer, 1 dl of wine, or 0.3 dl of spirit), and the question differed by respondent gender based on the standard thresholds for defining binge drinking (e.g., Courtney & Polich, 2009).

Peer Victimization. Participants were given a list (drawn from the battery used in the SEYLE study; Wasserman et al., 2010) of 13 different forms of victimization by peers (e.g., "others pushed, hit or kicked you;" "made fun of your looks or talking;" "took your money, property or food;" and a general "any other form" item). For each form, they were asked (yes/no) whether it had happened to them often in the past 12 months. Due to small numbers of participants reporting particular forms of peer victimization, answers were recoded to a 6-point scale[1] to represent that *no form* (0), or that *one* (1), *two* (2), *three* (3), *four* (4), or *five or more* (5) forms of victimization were experienced often.

Procedures

At baseline (T1; between November 2013 and May 2014), participants completed

[1]Preliminary analyses indicated a binary (absence/presence) recoding of peer victimization was less strongly associated with PB, TB, and the outcomes than the 6-point scale. Thus, the 6-point scale represents a more conservative control.

TABLE 1

Standardized Estimate and Standard Errors of Item Loadings on Thwarted Belongingness and Perceived Burdensomeness Factors based on the Confirmatory Factors Analyses of the INQ-15a (Original) and INQ-15c (Omitting TB items 3,5,6, and Permitting Item Covariances) on Baseline Data

			INQ-15a		INQ-15c	
Item	Abbreviated English Content	Abbreviated Slovene Translation[b]	TB Est. (*SE*)	PB Est. (*SE*)	TB Est. (*SE*)	PB Est. (*SE*)
BEL1R[a]	Others care about me	Drugim je mar zame	.54 (.06)***		.53 (.05)***	
BEL2R[a]	I feel like I belong	Imam občutek pripadnosti	.69 (.04)***		.68 (.04)***	
BEL3[a]	Rarely interact w/others who care	Redki stiki z ljudmi, ki jim je mar	.17 (.07)*		–	
BEL4R[a]	Many supportive friends	Veliko skrbnih prijateljev	.66 (.05)***		.69 (.05)***	
BEL5[a]	Disconnected from others	Čutim se nepovezanega z drugimi	.35 (.08)***		–	
BEL6[a]	Outsider at gatherings	Počutim se izločenega iz družbe	.43 (.07)***		–	
BEL7R[a]	People to turn to	Ljudje, na katere se lahko obrnem	.72 (.04)***		.77 (.04)***	
BEL8	Unwelcome in social situations	Počutim se nedobrodošlega v družabnih situacijah	–		–	
BEL9R[a]	Close to others	Blizu sem si z drugimi ljudmi	.76 (.04)***		.72 (.05)***	
BEL10R[a]	Daily satisfying interaction	Dnevni pozitiven stik	.67 (.04)***		.63 (.05)***	
BUR1[a]	Better off if I were gone	Ljudem bi bilo bolje, če me ne bi bilo		.83 (.04)***		.85 (.03)***
BUR2R	Give back to society	Vračam svoj prispevek družbi		–		–
BUR3[a]	Happier without me	Ljudje bi bili srečnejši brez mene		.79 (.05)***		.80 (.05)***
BUR4	Failed people in my life	Razočaral sem ljudi okrog sebe		–		–
BUR5R	Miss me if I went away	Ljudje bi me pogrešali, če bi odšel stran		–		–
BUR6[a]	Burden on society	Družbi sem v breme		.78 (.05)***		.78 (.05)***
BUR7R	Asset to people in my life	Sem pomemben člen za ljudi okrog mene		–		–
BUR8R	I make a difference	Moje ideje, veščine in energija nekaj štejejo		–		–
BUR9[a]	My death a relief to others	Moja smrt bi ljudem predstavljala olajšanje		.75 (.06)***		.78 (.05)***
BUR10R	Contribute to others' well-being	Prispevam k dobremu počutju ljudi		–		–
BUR11	Burden on the people in my life	Sem v breme ljudem		–		–
BUR12[a]	Wish they could be rid of me	Ljudje si želijo, da bi se me lahko rešili		.79 (.06)***		.79 (.06)***
BUR13R	Contribute to my community	Dajem prispevek svoji skupnosti		–		–
BUR14[a]	Make things worse for others	Za ljudi okrog mene stvari samo poslabšam		.89 (.02)***		.87 (.03)***
BUR15R	I matter to people in my life	Pomemben sem za ljudi okrog mene		–		–

BEL, thwarted belongingness; BUR, perceived burdensomeness. Item numbers ending with "R" indicate they are reverse-coded.

[a]Item is included in the INQ-15 form.

[b]Full Slovenian translation of the questionnaire can be found online at https://psy.fsu.edu/~joinerlab/resources.html.

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

the first set of questionnaires, which included the INQ. Following the intervention (T2; between January 2014 and June 2014), questionnaires were re-administered. The time span between T1 and T2 varied by school (but not by participants within schools) from 1.6 to 4 months (mean [*SD*] = 2.6 [.67]).

Data Analysis

The first of our two primary foci was to test the fit of a two-factor model of the translated INQ-15 at baseline using confirmatory factor analysis (CFA). Given the novelty of evaluating the INQ among community adolescents, we also examined the fit of other proposed versions of the INQ (i.e., 10-, 12-, 18-, and 25-item versions). CFAs were conducted using Mplus 7.11 (Muthén & Muthén, 2013). Items were constrained to load on either the PB or TB factor, and the factors were allowed to correlate. Like Van Orden et al. (2012), we used the robust maximum-likelihood (MLR) estimator given the nonnormality of responses to INQ items. Models were evaluated using conventional criteria of fit adequacy: nonsignificant ($p \geq .05$) model chi-square;[2] root mean square error of approximation (RMSEA < .08); standardized root mean square residual (SRMR < .08); comparative fit index (CFI > .90); and Tucker–Lewis index (TLI > .90).

In the event of inadequate fit of the INQ-15 CFA, we first examined whether specifying covariances among items within a factor that were suggested by modification indices would yield an acceptable fit. We made the more serious decision to omit an item and rerun the CFA when an item loaded weakly on its hypothesized factor and modification indices suggested a strong cross-factor loading that, if specified, would yield a significantly improved model fit (a change in chi-square [$\Delta\chi^2$] > 3.84 per change in degrees of freedom). We repeated this process one item at a time until adequate fit was achieved, but given space constraints we summarize this process in one step. Omitted items were scrutinized to identify potential explanations for unexpected loadings.

After identifying an adequate CFA model with two factors, we calculated observed scores for the baseline and follow-up factors as means of relevant items. These scores were used to examine PB and TB internal consistencies (Cronbach's alpha), cross-time stability (correlations), change over time (repeated measures ANOVA), gender differences (*t* tests and chi-square), and unadjusted correlations among study outcomes and covariates.

Next, we addressed the second of our two primary foci. We used the baseline CFA to specify the latent TB and PB factors and test whether they independently predicted baseline and follow-up suicide ideation and lifetime suicide attempt history in logistic regressions. We explored whether the latent factors interacted (using the XWITH command) to predict the outcomes, but we anticipated that low variability in measures collected from community participants would constrain power. Finally, we tested whether any predictive paths from TB and PB factors to the outcomes would persist after adjusting for covariates, including baseline suicide ideation in the models for follow-up ideation and suicide attempt history. We used the cluster option in MPlus to account for shared characteristics (unmeasured and measured) and nonindependence of participants within schools.

RESULTS

Descriptive Statistics

Descriptive statistics on study measures are shown in Table 2. Suicide ideation was reported by 19% ($n = 57$) and 11%

[2]We used the mean-adjusted chi-square, which is derived by dividing the chi-square by a scaling correction factor provided by the Mplus program for models testing nonnormal outcomes using the MLR estimator.

TABLE 2
Means, Standard Deviations, Intercorrelations, and Alphas of Observed Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. T1 Perceived burdensomeness[a]	–	.37***	.69***	.56***	−.02	.20***	.30***	.41***	.19**	.27***	.35***
2. T1 Thwarted belongingness[a]		–	.38***	.28***	.10	−.10	.08	.22**	.55***	.15*	.20***
3. T1 Depressive symptoms			–	.46***	−.02	.19**	.38***	.36***	.22**	.25***	.33***
4. T1 Suicidal ideation				–	.04	.23***	.19**	.42***	.24***	.48***	.39***
5. T1 Age					–	.26***	.05	−.04	−.10	−.10	.10
6. T1 Binge drinking						–	.10	.07	.08	.11	.28***
7. T1 Peer victimization							–	.26***	.18**	.13	.16**
8. T2 Perceived burdensomeness[a]								–	.45***	.48***	.27***
9. T2 Thwarted belongingness[a]									–	.29***	.19**
10. T2 Suicidal ideation										–	.45***
11. T1/T2 Suicide attempt history											–
Mean or % positive (sample)	1.97	3.04	13.44	19%	14.05	.43	1.12	1.88	2.90	11%	7%
Standard deviation	1.14	1.24	10.39	–	.90	.85	1.59	1.12	1.35	–	–
Skewness	2.06	.31	1.59	–	1.06	2.66	1.35	1.95	.54	–	–
Kurtosis	5.18	−.67	2.90	–	1.23	8.38	.53	4.46	−.38	–	–
Alpha	.92	.85	.91	–	–	–	–	.91	.86	–	–
Mean or % positive (boys)	1.80	3.30	10.00	15%	13.98	.49	.90	1.86	3.02	8%	5%
Standard deviation (boys)	.84	1.14	6.64	–	.78	.93	1.38	1.08	1.29	–	–
Mean or % positive (girls)	2.07	2.89	15.70	22%	14.11	.40	1.25	1.91	2.83	14%	9%
Standard deviation (girls)	1.30	1.28	11.68	–	.97	.80	1.70	1.14	1.37	–	–

[a]Scores were calculated as means of relevant items from INQ-15c. T1 = baseline assessment; T2 = follow-up assessment.
*$p < .05$, **$p < .01$, ***$p < .001$.

(n = 25) of participants at baseline and follow-up, respectively; a lifetime history of suicide attempt was reported by 7% (n = 22) of the sample. At baseline, 15% (n = 47) reported clinically significant depressive symptoms. Approximately 70% reported no binge drinking in the past year; others reported doing so no more than once monthly (21%), or 2 to 3 times/month or more (8%). Nearly half of students reported being victimized by a peer (45%) in the past year, in one (19%, n = 58), two (10%; n = 29), three (4%; n = 11), four (7%; n = 21), or five or more (5%; n = 15) forms.

CFA of INQ

As shown in Table 3, none of the previously proposed INQ versions fit the data. Given our primary focus on the INQ-15, we evaluated this version further. In the unmodified INQ-15 model (labeled INQ-15a in Tables 1 and 3), we noted that whereas all PB items had strong standardized loadings on the PB factor (β = .75–.89, p < .001), several TB items loaded only moderately or modestly on the TB factor (see Table 1). Loading on the TB factor was weakest for TB item 3; loadings of TB items 5 and 6 were higher, but still low in the context of factor indicators. Most problematic were the modification indices indicating that these TB items would load significantly on the PB factor (standardized estimates = .28, .52, and .69, respectively) and dramatically improve model fit (estimated $\Delta\chi^2$ [df = 1] = 12.08, 46.4, and 83.6, respectively).

Inspection of TB items 3, 5, and 6 indicated these were the only TB items in the INQ-15 that were not reverse-coded. Additionally, whereas well-performing TB items were worded with a positive valence (e.g., "...others care about me"), all PB items were worded with a negative valence (e.g., "...people would be better off if I were gone"). Thus it is possible that these TB items showed weak hypothesized loadings and moderate cross-loadings due to shared wording valence rather than construct overlap. Some respondents may not have noticed the valence reversal for these items, or perhaps high and low belongingness are not opposite poles of the same dimension. We also noted that in Van Orden et al. (2012; p. 205, Table 5) CFAs using three different samples (young adults, clinical outpatients, and older adults); these three items were among those with the lowest loadings on the TB factor.

CFAs of Modified INQ-15

After omitting TB items 3, 5, and 6, the CFA model (see INQ-15b in Table 3) showed adequate fit across all indices. As

TABLE 3
Fit Statistics for INQ Versions, Including INQ-15 and Two Modifications

INQ version	Model χ^2	df	Scaling factor	Mean-adjusted model χ^2	p Value	RMSEA	CFI	TLI	SRMR
INQ-25	1,463.869	274	1.178	1,242.673	<.001	.119	.639	.605	0.133
INQ-18	624.223	134	1.211	515.545	<.001	.109	.780	.749	0.137
INQ-12	199.487	53	1.195	166.977	<.001	.095	.885	.857	0.110
INQ-10	160.831	34	1.206	133.381	<.001	.110	.851	.803	0.075[a]
INQ-15a	323.996	89	1.246	260.029	<.001	.093	.842	.813	0.119
INQ-15b	86.366	53	1.351	63.942	.144[a]	.045[a]	.970[a]	.963[a]	0.036[a]
INQ-15c	51.782	50	1.335	38.800	.875[a]	.011[a]	.998[a]	.998[a]	0.031[a]

[a]Fit indicator is within acceptable limits. INQ-15a = INQ-15 that has been specified in the prior studies; INQ-15b = INQ-15 minus items 3, 5, and 6; INQ-15c = INQ-15b with covariances specified in the measurement model.

shown in Table 3 for model INQ-15c, permitting covariances between TB items 1 and 2, TB items 9 and 10, and PB items 1 and 9 (standardized correlations [*SE*] = .26 [.08], .27 [.08], and −.32 [.09], respectively, $p < .001$) yielded an adequately fitting model based on all fit statistics. Additionally, a nested model comparison (Yuan–Bentler scaled χ^2 [$df = 3$] = 29.37, $p < .001$) indicated the model INQ-15c fit the data significantly better than INQ-15b. Standardized loadings of the items are shown in Table 1, model INQ-15c.

Internal Consistency and Cross-time Stability of PB and TB Scores (Model INQ-15c)

As shown in Table 2, internal consistencies were adequate for PB and TB scales at baseline and follow-up, and cross-time correlations indicated that the individual differences in both scales were moderately stable over the follow-up period. Within-subjects change over time was evaluated using repeated measures ANOVAs; TB showed a significant within-subjects decrease over time [i.e., belongingness increased; $F(1, 221) = 7.03$, $p < .01$], whereas PB did not show any significant change [$F(1, 222) = 2.28$, $p = .13$]. Change over time was not a function of follow-up duration for either scale ($F = .19$ and .44 for TB × duration and PB × duration, respectively).

Univariate Associations

Next, we examined Pearson (or its binary equivalent) correlations among study variables, including observed PB and TB scores (see Table 2). Spearman correlations (not shown) also were conducted given the nonnormality of some variables (e.g., PB and binge drinking); however, the patterns of significance were the same and the estimates lead to the same conclusions. PB and TB were associated with covariates (depressive symptoms, binge drinking, and peer victimization) and outcomes (suicidal thoughts and behaviors) in expected ways; likewise, the covariates generally were associated with the outcomes. Age was positively associated with binge drinking, but did not correlate with TB, PB, or the outcomes. *t* tests (accounting for unequal variances) indicated that the girls reported higher mean levels (all $p < .05$) of baseline depressive symptoms, peer victimization, and baseline TB, while they reported lower levels of baseline PB than boys. There were no statistically significant differences between girls and boys on other continuous variables, including follow-up PB or TB, or on rates of suicidal thoughts and behaviors (chi-square). Overall, patterns supported the need to control for covariates in order to identify the unique contributions of TB and PB to prediction of outcomes.

Logistic Regressions: Predicting Suicidal Thoughts and Behaviors from INQ Factors

We used the latent PB and TB variables identified in the CFA (model INQ-15c) to predict (1) concurrent suicide ideation, (2) follow-up suicide ideation, or (3) lifetime history of suicide attempt (see Table 4). We first ran regression models predicting each outcome from the two INQ factors simultaneously (model A).[3] Next, we re-ran each model controlling for gender, baseline age, depressive symptoms, binge drinking, and peer victimization (model B). Finally, we re-ran the follow-up suicide ideation and suicide attempt history models controlling for baseline suicide ideation (model C).

First, PB, but not TB, was related to baseline suicide ideation (outcome 1, model A; or model 1A). This association was robust to controls for other variables

[3]Although primary latent models accounted for differences by school in the follow-up period (using clustering), we also probed whether either of the factors would interact with follow-up duration to predict the two follow-up outcomes in observed variable models; none of the interaction terms in these exploratory models were significant.

TABLE 4

Logistic Regressions Predicting Suicide Ideation and Attempt Outcomes from Baseline Perceived Burdensomeness (PB) and Thwarted Belongingness (TB) Latent Variables (Model 1), Controlling for Gender, Age, Depressive Symptoms, Binge Drinking, and Peer Victimization (Model 2), and Baseline Suicide Ideation (Model 3)

	Model A			Model B			Model C		
Baseline	B (*SE*)	β	OR	B (*SE*)	β	OR	B (*SE*)	β	OR
Model 1. Outcome: baseline suicide ideation (n = 285)									
PB	1.46 (.23)	.67 (.06)***	4.32	1.30 (.23)	.62 (.07)***	3.66	–	–	–
TB	.17 (.10)	.08 (.05)	1.18	.07 (.10)	.03 (.05)	1.07	–	–	–
Gender	–	–	–	−.07 (.60)	−.01 (.12)	0.94	–	–	–
Age	–	–	–	−.04 (.19)	−.01 (.07)	0.96	–	–	–
Depression	–	–	–	.04 (.03)	.16 (.12)	1.04	–	–	–
Binge	–	–	–	.38 (.19)	.13 (.07)†	1.46	–	–	–
Peer violence	–	–	–	.07 (.13)	.04 (.08)	1.08	–	–	–
Model 2. Outcome: follow-up suicide ideation (n = 284)									
PB	.56 (.15)	.33 (.08)***	1.76	.51 (.30)	.29 (.14)*	1.67	.03 (.33)	.02 (.16)	1.03
TB	.25 (.16)	.15 (.09)†	1.28	.29 (.22)	.17 (.11)	1.34	.15 (.22)	.07 (.11)	1.16
Gender	–	–	–	.35 (.67)	.08 (.16)	1.42	.29 (.57)	.06 (.12)	1.33
Age	–	–	–	−.61 (.30)	−.26 (.12)*	0.55	−1.08 (.18)	−.40 (.06)***	0.34
Depression	–	–	–	.01 (.03)	.03 (.15)	1.01	−.01 (.04)	−.04 (.16)	0.99
Binge	–	–	–	.10 (.31)	.04 (.12)	1.11	−.05 (.32)	−.02 (.11)	0.95
Peer violence	–	–	–	−.02 (.12)	.02 (.09)	0.98	.04 (.12)	.03 (.08)	1.04
Ideation	–	–	–	–	–	–	3.26 (.35)	.53 (.06)***	26.01
Model 3. Outcome: suicide attempt history (n = 284)									
PB	.65 (.15)	.37 (.08)***	1.91	.35 (.20)	.19 (.12)	1.41	−.04 (.28)	−.02 (.14)	.97
TB	.28 (.35)	.16 (.19)	1.33	.36 (.36)	.20 (.19)	1.43	.34 (.41)	.18 (.20)	1.41
Gender	–	–	–	.62 (.48)	.15 (.11)	1.86	.78 (.52)	.17 (.11)	2.18
Age	–	–	–	.30 (.18)	.13 (.08)†	1.35	.35 (.17)	.14 (.06)*	1.42
Depression	–	–	–	.02 (.02)	.08 (.10)†	1.02	.02 (.02)	.10 (.10)	1.02
Binge	–	–	–	.52 (.24)	.20 (.08)*	1.68	.48 (.24)	.18 (.08)*	1.62
Peer violence	–	–	–	.09 (.17)	−.02 (.11)	1.10	.07 (.17)	.05 (.12)	1.07
Ideation	–	–	–	–	–	–	1.92 (.60)	.33 (.09)***	6.82

†$p < .10$, *$p < .05$, ***$p < .001$.

(model 1B). Second, a similar pattern was found for the second outcome: Only PB was a significant predictor of follow-up suicide ideation (model 2A). In model 2B, PB remained a significant predictor of suicide ideation, and the only significant control variable was the association between younger age and suicide ideation. Model 2C indicated that baseline suicide ideation was a strong predictor of later suicide ideation, and age remained inversely associated with it, whereas baseline PB was no longer a significant predictor. Third, when suicide attempt history was the outcome (outcome 3), PB was once again the only significant predictor (model 3A). Model 3B indicated that the control variables largely explained this association, although binge drinking was the only significant predictor (depressive symptoms and age were only trend-level predictors). In Model 3C, baseline suicide ideation was found to be associated with suicide attempt history, but did not appreciably change the associations binge drinking and older age had with suicide attempt.

Returning to model A, exploratory analyses did not support that an interaction between the latent factors significantly predicted any of the three outcomes (models not shown).

DISCUSSION

To our knowledge, the present study is the first to examine the validity of the INQ in community adolescents, and one of only a few to test portions of the interpersonal theory of suicide in youth (Joiner et al., 2009; Stewart et al., 2015). In accordance with the theory and consistent with findings from studies with adults (Bryan, 2010; Freedenthal et al., 2011; Marty et al., 2012; Van Orden et al., 2012), our data provided further confirmation of the two-factor structure of the INQ questionnaire, with factors corresponding to TB and PB. However, none of the previously proposed versions of the INQ fit our data adequately. Our model of the INQ-15 (the version for which there is most support) did not fit the data well and required some modifications. Specifically, the model fit when the only three items on the INQ-15 that were reverse-scored were omitted. Notably, these also were the worst fitting INQ-15 items in all three of Van Orden et al.'s (2012; p. 205, Table 5) validation samples. The INQ-15 was found to fit adequately in the prior studies with younger and older adult samples and with one inpatient adolescent sample (e.g., Hill et al., 2015; Van Orden et al., 2012). Given the many differences between our sample and Hill and colleagues' sample in terms of culture (e.g., values regarding burdening others), language, and setting, it is not possible to specify the reasons for the differences in solutions. It also is premature to recommend a single version of the INQ for use with adolescents. Future research in this growing area should answer such questions and lead to assessment recommendations.

Nevertheless, our best-fitting model retained 12 items[4] from the INQ-15. Items in our solution formed internally consistent TB and PB scales, and these scales showed greater stability over time within rather than between factors. This is comparable to findings of previous studies even though not all of the same items for the individual scales were used (Bryan, 2010; Freedenthal et al., 2011; Marty et al., 2012; Van Orden et al., 2012). It is notable that the scales have good psychometric characteristics even though the numbers of items are relatively few.

Further supporting the validity of the INQ factors, TB and PB scores were associated with concurrent and follow-up suicide ideation and lifetime history of suicide attempt, as well as individual characteristics (depressive symptoms), another risk behavior (binge drinking), and a socio-contextual risk

[4]We suggest the solution not be termed the "INQ-12" to avoid confusion with the previously proposed INQ-12 and given the need for replication of our findings.

(peer victimization) that are theoretically relevant to the interpersonal theory and suicide risk. Of note, however, when the two factors were examined simultaneously, only PB was uniquely associated with suicidal thoughts and attempt history. As suicide ideation could be influenced by these covariates and gender and age, we re-ran the models controlling for these variables to identify any unique contributions of TB and PB to suicide risk outcomes. Burdensomeness held unique predictive associations with concurrent and later suicide ideation, but not with suicide attempt history; again, TB did not uniquely contribute to the prediction model. These results are not entirely in accordance with the theory—which assumes that both constructs are needed in order for suicide ideation to develop (Joiner et al., 2009; Van Orden et al., 2010, 2012)—or the findings of some previous studies that support it (Christensen et al., 2013, 2014; Joiner et al., 2009; Van Orden, Witte, Gordon, et al., 2008). However, some researchers have found an effect of TB that is unique from that of burdensomeness (Cero, Zuromski, Witte, Ribeiro, & Joiner, 2015), whereas others have reported that PB explained more variance in predicting suicide ideation than TB (Christensen et al., 2013; Van Orden, Witte, Gordon, et al., 2008), as was found presently. Importantly, PB remained a significant predictor of concurrent and later suicide ideation after controlling for the covariates. This suggests that PB may make a unique contribution to suicide ideation over and above depression and other covariates, which is in line with theory and previous findings.

Perceived burdensomeness also predicted suicide ideation at follow-up (whereas TB did not), even controlling for several covariates. Its predictive value was no longer significant after controlling for baseline suicide ideation. We interpret these findings as consistent with the idea that the perception of burdensomeness is not a stable trait, but rather is a dynamic cognitive state (Van Orden et al., 2010) that varies over time and in relation to other changing psychological and interpersonal factors. Thus, PB may be an unstable cognitive mechanism linking relatively stable risk factors to the relatively unstable risk state of suicide ideation. A potential implication is that PB may be modifiable, and therefore individual (e.g., cognitions) and contextual interventions (e.g., mentoring; involvement in community activities; encouraging peers, families, and teachers to communicate inclusion/mattering) that protect against PB might be appropriate.

In relation to suicide attempt history, PB (unlike TB) was associated with attempt history, but its predictive value was diminished when other variables were controlled. In contrast to follow-up suicide ideation prediction, older age was a predictor for lifetime history of a suicide attempt. Furthermore, depressive symptoms and binge drinking appeared to make modest contributions, while ideation was strongly associated with history of a suicide attempt. The connection between lifetime attempt history and current suicidal thoughts is in line with the fact that previous suicide attempts are among the most important predictors of subsequent suicidal behavior (Beghi, Rosenbaum, Cerri, & Cornaggia, 2013; Kerkhof & Arensman, 2001; Mehlum & Mork, 2011).

A few other results are worth discussing. First, an interactive effect of the burdensomeness and belongingness factors on suicide ideation and attempt was not supported by the analyses. Low variability in predictors and outcomes is expectable in a community sample and decreases statistical power. Thus, we considered this to be an exploratory analysis, and null findings generally should not be interpreted. Some previous studies have found the interaction effect proposed by the theory (Christensen et al., 2013, 2014; Joiner et al., 2009; Van loose whereas others have not (Cero et al., 2015). Second, consistent with the prior studies of Slovenian adolescents (Kokkevi et al., 2012) and reflecting our efforts at recruiting a regionally at-risk community sample, rates of recent suicide ideation

(19%) and lifetime suicide attempt history (7%) were high. These rates underscore the ongoing need to prevent, identify, and intervene on suicidal thoughts and behaviors in these youth in order to address the long-term public health crisis of suicide in Slovenia and other nearby countries. Third, binge drinking was unique from the cognitive and social contextual factors as a predictor of suicide attempt history. The effect is paralleled by studies of suicide risk among adolescents in other countries (Miller, Naimi, Brewer, & Jones, 2007) and is consistent with theoretical models of how alcohol use confers distal and proximal risk for attempted and completed suicide (Bridge et al., 2006). It is also possible that binge drinking increases risk for suicide attempt beyond the factors that contribute to suicide ideation because it indicates dispositional or acquired capability for suicide—for example, intoxication may increase capacity by temporarily decreasing fear of pain and death (see Klonsky, May, & Saffer, 2016; Smith, Stanley, Joiner, Sachs-Ericsson, & Van Orden, 2016). The binge drinking finding also has special relevance to assessment and prevention in Slovenia. As reviewed by Marušič and Farmer (2001), alcohol abuse takes an especially heavy toll on Slovenians relative to residents of many neighboring European countries, in terms of rates of nonsuicidal alcohol-related deaths (e.g., from cirrhosis) and alcohol-related disorders among suicide decedents. They speculate that the high rates of alcohol-related problems interact with other regionally concentrated genetic liabilities to help explain the higher rates of suicidal thoughts, behaviors, and suicide in Slovenia and nearby countries (Marušič & Farmer, 2001). Thus, reducing binge drinking may be a particularly fruitful component of suicide prevention for Slovenian youth.

Limitations

There were several limitations that suggest directions for future research. First, although the recruitment method was focused on enhancing representation of more difficult-to-reach schools in geographic regions with higher suicide rates, the sample was not obtained by a probabilistic sampling method and overall recruitment rates were low. Second, youth participated in a prevention program based on one that has been found to decrease suicide risk factors in the prior studies (Wasserman et al., 2015). Thus, to the extent the prevention program changed TB, PB, and school climate (e.g., bullying; reduced stigma), the longitudinal associations that baseline factors had to later suicide risk may have been disrupted. Additionally, given that respondents expected ongoing contact with the preventionists, they may have had less confidence in the anonymity of their reports than respondents in previous epidemiological studies (De Wilde & Kienhorst, 1995; Kokkevi et al., 2012). Third, although retention rates were high in most participating schools, the high dropout rate in several schools is another limitation. Fourth, the time span between baseline and follow-up varied between schools due to implementation constraints; this limitation is offset somewhat by clustering in data analyses. Fifth, we relied exclusively on self-report measures, used dichotomized measures for several variables (suicide ideation, attempt, and binge drinking), and a limited measure of peer victimization. These constraints, the nonnormal distributions of other variables and the low rates of the outcomes, both may have weakened power to estimate some associations. Sixth, the study sample size did not allow us to conduct multigroup analyses by age and gender, which is an important next step in future research on the INQ and the interpersonal theory of suicide among adolescents. Finally, sample characteristics may limit the generalizability of findings; further studies of the INQ should use larger, more diverse adolescent samples, and the Slovene translation also should be tested in adult samples.

CONCLUSIONS

This is the first study to document the factor structure, other psychometric properties, and validity of the INQ in community adolescents. The translated INQ confirmed two distinguishable and internally consistent factors corresponding to PB and TB. These factors showed moderate stability across a period of months and were associated with concurrent and future suicidal thinking and history of suicide attempt. PB was uniquely related to concurrent and later suicide ideation. Training in suicide prevention screening emphasizes asking directly about suicidal thoughts and behaviors. However, in some contexts and for some youth, doing so may elicit fear, defensiveness, and underreporting or may misclassify youth who are at elevated risk but not currently suicidal. We suggest supplementing suicide risk assessments by inquiring about PB (using the INQ) and binge drinking as these questions are not face-valid indicators of suicide risk, but are nonetheless associated with it in this and prior studies.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:
Appendix S1. Slovenian translation of the Interpersonal Needs Questionnaire.