



Cross-cultural relevance of the Interpersonal Theory of suicide across Korean and U.S. undergraduate students

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ABSTRACT

This study investigated the cross-cultural relevance and validity of the Interpersonal Theory of Suicide (ITS) utilizing young adult samples from South Korea ($n = 554$) and the United States (U.S.; $n = 390$). To examine the ITS, all participants completed self-report questionnaires measuring *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide*. We examined whether each construct significantly predicted the severity of suicidal risk in both samples. We also determined whether the strength of the effects of *Thwarted Belongingness* and *Perceived Burdensomeness* on suicidal ideation differed between the two samples due to the greater degree of importance placed on interpersonal relationships in collectivistic cultures such as South Korea. Structural equation modeling was used to examine these hypotheses. *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* significantly predicted elevated suicidal risk. However, there were no significant differences in the paths from *Thwarted Belongingness* or *Perceived Burdensomeness* to suicide risk between the South Korean and U.S. samples. These findings support the cross-cultural relevance and applicability of the ITS, whereby *Thwarted Belongingness* and *Perceived Burdensomeness* serve as indicators of suicide risk in both Western (U.S.) and East Asian (Korean) samples.

1. Introduction

Suicide rates in South Korea are the world's second highest and are increasing at an alarming rate (Normile, 2012). Suicide rates rose from 10 suicide deaths per 100,000 people in 1990 to 13.8 suicides per 100,000 in 2000. Suicide rates then increased by over 100% to 29.1 suicides per 100,000 people in 2012, with suicide currently being the fourth leading cause of death in South Korea—the highest rate among Organization for Economic Cooperation and Development (OECD, 2013) countries during the past 10 years (Korean National Statistical Office, 2013; World Health Organization, 2014). Elevated and accelerating rates of suicide in South Korea emphasize the critical need for more studies that identify evidence-based risk factors and intervention targets, including those taking cultural factors into consideration, to guide suicide prevention efforts.

The Interpersonal Theory of Suicide (ITS) provides a theoretical, empirically supported framework for understanding risk factors for suicide (Van Orden et al., 2010). The ITS highlights the necessity for

the co-occurrence of two interpersonal factors – *Perceived Burdensomeness* and *Thwarted Belongingness* – for the emergence of suicidal thoughts and desire. *Perceived Burdensomeness* is characterized by the perception that one is a liability on others with whom one is close and is typically accompanied by emotions and cognitions associated with self-contempt. *Thwarted Belongingness* is characterized by loneliness and an absence of reciprocal social relationships (Van Orden et al., 2010). The ITS proposes that when these two interpersonal factors (i.e. *Perceived Burdensomeness* and *Thwarted Belongingness*) co-occur and are perceived to be hopelessly intractable, and when an individual possesses elevated *Capability for Suicide* (i.e., high pain tolerance, fearlessness about death), he or she will engage in lethal or near-lethal suicidal behavior. It is this specific interaction of three components, *Perceived Burdensomeness*, *Thwarted Belongingness*, and *Capability for Suicide*, that leads to elevated risk for death by suicide.

Although the tenets of the ITS have been supported by many research studies (e.g., Bryan et al., 2010; Joiner Jr. et al., 2009), it is

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important not to assume that it functions identically across cultures. Thus, empirical studies must test whether the ITS can be applied to non-Western cultures, and if so, whether alterations are required (Hagan et al., in press; Lester, 2008). This is particularly important because, while the ITS emphasizes interpersonal risk factors for suicide, an individual's experience of interpersonal context may differ across cultures. This is highlighted in cultural differences regarding self-construal; that is, individuals who live in collectivistic cultures such as South Korea construe the self as interdependent, promoting fundamental connectedness among individuals within significant relationships (Markus and Kitayama, 1991).

In collectivistic cultures, psychological processes involved in the self, such as mood and positive evaluation of self, are not viewed as separate from the social context (Markus and Kitayama, 1991; Kitayama et al., 1997). In contrast, individuals who live in individualistic cultures such as the U.S. typically construe the self as independent, and independence and autonomy are promoted and separated from social context (Markus and Kitayama, 1991; Kitayama et al., 1997). Additionally, “saving face”, or a desire to avoid embarrassment and preserve one's reputation, is more closely tied to Asian societies than Western societies (Yabuuchi, 2004). Furthermore, the Confucian roots of many Asian cultures have led to Asian societies strongly emphasizing social relationships (Yum, 1988). The sociologist Durkheim (1897) also suggested that collective social forces, such as strong social integration within a society, may be more strongly associated with suicide than individualistic social forces. Thus, it is necessary to explore the extent to which the ITS' interpersonal factors (i.e., *Perceived Burdensomeness* and *Thwarted Belongingness*) are associated with suicide across cultures.

Although some reports have investigated the propositions of the ITS within collectivistic cultures, to our knowledge, no studies to date have evaluated cross-cultural comparisons of the ITS between samples from two different cultures. One study by Zhang et al. (2013) tested the ITS in a sample of 439 Chinese college students and found that *Perceived Burdensomeness* and *Capability for Suicide* were each significantly associated with suicidal ideation, but *Thwarted Belongingness* was not. Another study by Wang et al. (2013) investigated interpersonal factors such as perfectionistic family discrepancy and discrimination within the ITS framework on Asian international students study in the U.S. and found family discrepancy and perceived discrimination to intensify the associations between interpersonal risk factors and suicide ideation. Another study by Wong et al. (2011) found that perceived burdensomeness was a more robust predictor of suicidal ideation compared to thwarted belongingness in Asian American college students living in the U.S. To date, only one study has investigated the ITS in a Korean sample. Kim and Yang (2015) compared predictors of suicidal ideation among homosexual participants to those found among heterosexual participants in South Korea based on ITS constructs. This study showed that *Perceived Burdensomeness* was a stronger predictor of suicidal ideation among homosexual participants than among heterosexual participants. Although this study expanded the applicability of the ITS in a Korean sample, this study did not examine cross-cultural differences in the ITS variables.

The current study aimed to test the propositions of the ITS in a Korean undergraduate sample and to compare these findings to data collected from a U.S. undergraduate sample. Considering that South Korea is a collectivistic culture, and based on past studies investigating the ITS in Asian countries, we hypothesized that *Perceived Burdensomeness* and *Thwarted Belongingness* would be stronger correlates of suicidal ideation among Korean undergraduates than U.S. undergraduates belonging to a more individualistic culture. The current study used structural equation modeling to test this hypothesis and investigate the relationship between ITS factors (*Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide*) and suicide risk across two distinct cultural samples. In

Table 1
Demographic information of U.S. and Korean samples.

Variable name	U.S.	Korea	t or χ^2	p-value
N	M (SD) / N (%) 390	M (SD) / N (%) 554		
Age	19.08 (1.37)	21.87 (2.23)	-21.89	< 0.001**
Gender	282 (72.3%) Female	413 (74.8%) Female	0.75	0.388
Living arrangements	Lives Alone 14 (3.6%) With spouse or significant other 8 (2.1%) With parents 7 (1.8%) With other students/friend(s) 348 (89.2%) With relative 4 (1.0%) Other 9 (2.3%)	Lives Alone 138 (25.0%) With spouse or significant other 4 (0.7%) With parents 295 (53.4%) With other students/friend(s) 65 (11.2%) With relative 7 (1.3%) Other 46 (8.3%)	592.00	< 0.001**

** $p < 0.001$

addition, we also explored possible differences in the interactions between ITS factors across cultures.

2. Methods

2.1. Participants and procedures

Participants were recruited from both the U.S. and South Korea. For the Korean sample, participants were 554 college undergraduates (74.8% female) recruited from psychology courses across four major universities in Seoul and Daejeon, South Korea (Table 1). On average, participants were 21.87 years old ($SD = 2.25$). Approximately 53.4% of participants lived with their parents, 25% lived alone, 11.2% lived with friends, 1.3% lived with another relative, 0.7% lived with spouse/significant other, and 8.3% lived with someone else. Participants completed self-report measures as part of a larger investigation of sleep disturbances and suicidal ideation. All participants provided informed consent prior to participation and were compensated with course credit following completion of the study. All data were collected in 2015 using paper-and-pencil self-report surveys.

The U.S. sample included 390 undergraduate students who completed self-report measures as part of a larger study. Participants in this sample were predominantly female (72.3%) and had a mean age of 19.08 years ($SD = 1.37$, range 18–27). The majority of participants self-reported their primary racial identity as White (76.2%), 9.7% as Hispanic/Latino, 9.2% as African-American, 4.4% as Asian/Asian-American, and 0.6% as Other. The majority of U.S. participants lived with other students/their friends (89.2%) in dormitories or off-campus apartments; the remainder reported living with their parents (1.8%), other relatives (1%), their spouse/significant other (2.1%), alone (3.6%), or with other roommates (2.3%). All participants provided informed consent prior to participation and were compensated with course credit following completion of the study. All data were collected during the Fall 2014 semester through an online survey.

These studies were approved by the Institutional Review Boards from all institutions where the samples were recruited.

2.2. Measures

All questionnaires used in the Korean sample were translated from English to Korean, back-translated from Korean to English, and then compared with the original version by an independent bilingual translator who was a native English speaker. Both the translator and back-translator of all questionnaires were bicultural and familiar to both U.S. and Korean cultures. The translated version was tested on a small group of undergraduate students and awkward wording was modified for use in the study. In order to ensure cultural sensitivity of the measures for content and construct validity, we conducted thorough literature reviews of the conceptually defined and empirically supported construct by the original author (T. J.). Additionally, we also had a group of content experts review the items the research team initially developed and had colleagues familiar with the context of the research review and modify the content as needed. This was consistent with guidelines provided by De Vellis (2016), which states that content validity can be established through conceptual definition of the construct, literature reviews, and focus groups that inform item construction. Additionally, a group of content experts can be asked to review the items the research team initially developed vis-à-vis their conceptual definition. All measures used in the U.S. sample utilized the original English versions.

2.2.1. Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012)

The *Thwarted Belongingness* subscale of the INQ (INQ-TB) consists of nine items that assess participants' current levels of *Thwarted Belongingness*, a construct comprised of loneliness and a lack of reciprocal caring. The *Perceived Burdensomeness* subscale (INQ-PB) includes six statements that measure participants' feelings of being a burden on their family, friends, and society as well as their belief that their death is more valuable than their life. Responses are rated utilizing a 7-point scale ranging from 1 (*Not at all true for me*) to 7 (*Very true for me*). Positive items are reverse coded, such that higher scores reflect higher levels of *Thwarted Belongingness* and *Perceived Burdensomeness*. The INQ has been used in several domestic studies that have investigated the relevance of ITS constructs in the Korean culture (Chu and Lee, 2012; Ha et al., 2010, 2012; Hong and Chung, 2012). The INQ demonstrated good to excellent internal consistency in the present study samples ($\alpha_{\text{Korean}} = 0.90$ [TB = 0.87; PB = 0.92]; $\alpha_{\text{U.S.}} = 0.92$ [TB = 0.90; PB = 0.93]).

2.2.2. Acquired Capability for Suicide Scale (ACSS; Bender et al., 2011)

The ACSS includes 20 items and measures perceptions of physical pain tolerance and fearlessness about death (Bender et al., 2011). It has been revised for use as a 7-item scale derived from the original 20 items (ACSS-Fearlessness About Death [FAD]; Ribeiro et al., 2014). This abbreviated version has been shown to be less affected by gender differences than the original version (Ribeiro et al., 2014). Item responses are recorded using a 5-point Likert scale with anchors of 0 ("Not at all like me") to 4 ("Very much like me"). Both versions of this measure have demonstrated good construct and convergent/divergent validity with relevant measures such as the self-report Painful and Provocative Events Scale and objective measures of pain threshold and pain tolerance, as well as good internal consistency (Bender et al., 2011; Ribeiro et al., 2014). For the current study, we used the abbreviated 7-item ACSS-FAD subscale. Internal consistency was good in the current samples ($\alpha_{\text{Korean-FAD}} = 0.89$; $\alpha_{\text{U.S.-FAD}} = 0.85$).

2.2.3. Depressive Symptoms Inventory – Suicidality Subscale (DSI-SS; Metalsky and Joiner Jr, 1997)

The DSI-SS is a 4-item self-report measure designed to assess suicide risk through the presence and severity of suicidal thoughts, plans, and urges. Each item consists of a group of statements with

scores ranging from 0 to 3, with higher scores indicating more severe suicide risk. Participants are asked to select the statement within the group that best describes their experiences within the past two weeks. Previous research has found the DSI-SS to have strong psychometric properties (Thomas E Joiner et al., 2002; Metalsky and Joiner Jr, 1997; Ribeiro et al., 2012) and internal consistency in the current samples was good to excellent ($\alpha_{\text{Korean}} = 0.93$; $\alpha_{\text{U.S.}} = 0.83$).

2.3. Data analytic approach

Structural equation modeling (SEM) with Mplus version 7.11 (Muthen and Muthen, 2010) was employed to examine the relationship between *Thwarted Belongingness*, *Perceived Burdensomeness*, *Capability for Suicide*, and suicide risk across the two samples.¹ Based on Anderson and Gerbing's (1988) recommendation, a two-step approach was used to examine the extent to which *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* predicted suicide risk. To test the specific propositions of the ITS, we evaluated not only the main effects of these variables, but also all possible interactions since the ITS proposes that the interaction between *Thwarted Belongingness* and *Perceived Burdensomeness* leads to the development of suicidal thoughts and desire and that the interaction of all three variables results in elevated risk for death by suicide. These tests allow us to evaluate the ITS' specific predictions cross-culturally and additionally provide evidence of incremental validity over main effects analyses by evaluating whether suicide risk is high specifically when all factors are simultaneously elevated.

2.3.1. Measurement model

First, confirmatory factor analysis (CFA) was used to identify a good-fitting measurement model of these four constructs. The variance of each factor was fixed to 1.00 to provide a metric for these latent constructs (Byrne, 1989). Items one through six from the INQ were used as the indicators for latent *Perceived Burdensomeness*. Items seven through fifteen from the INQ were used as the indicators for latent *Thwarted Belongingness*. Items from the 7-item ACSS-FAD were used as the indicators for latent *Capability for Suicide*. Items from the DSI-SS were used as the indicators for latent suicidal symptoms. We utilized an item parceling approach, which is the recommended approach to improve the performance of a measurement model given that: (a) using more than three indicators per latent variable tends to yield poorer-fitting measurement models (Chorpita and Daleiden, 2002), (b) item parceling improves the distribution properties of each indicator, (West et al., 1995) and (c) item parceling minimizes the contribution of measurement effects to overall model fit. To create the item parcels, we summed every third item (within each set of reversed or non-reversed items).²

The Mean- and Variance-adjusted Weighted Least Square (WLSMV) estimator was used for all CFA and SEM analyses, as this is an efficient and accurate estimator, appropriate for datasets with both continuous and categorical variables (Muthén et al., 1997). In this study, the DSI-SS variables were categorical and all others were continuous.

Model fit of the measurement models in both samples was examined with the Comparative Fit Index (CFI), Standardized Root

¹ SEM was used due to its advantages over regression. In particular, SEM accounts for measurement error and thus reduces the likelihood of attenuation effects. SEM also allows for the ability to examine the degree of measurement and structural invariance across meaningful and relevant subgroups.

² The composition of each set of item parcels were as follows: (a) Burdensomeness Parcel #1: INQ1, INQ3; Burdensomeness Parcel #2: INQ2, INQ5; Burdensomeness Parcel #3: INQ4, INQ6. (b) Thwarted Belongingness Parcel #1: INQ9, INQ11, INQ12; Thwarted Belongingness Parcel #2: INQ7, INQ10, INQ14; Thwarted Belongingness Parcel #3: INQ8, INQ13, INQ15. (c) Suicidal Capability Parcel #1: ACSS8, ACSS10, ACSS13; Suicidal Capability Parcel #2: ACSS7, ACSS14; Suicidal Capability Parcel #3: ACSS11, ACSS19.

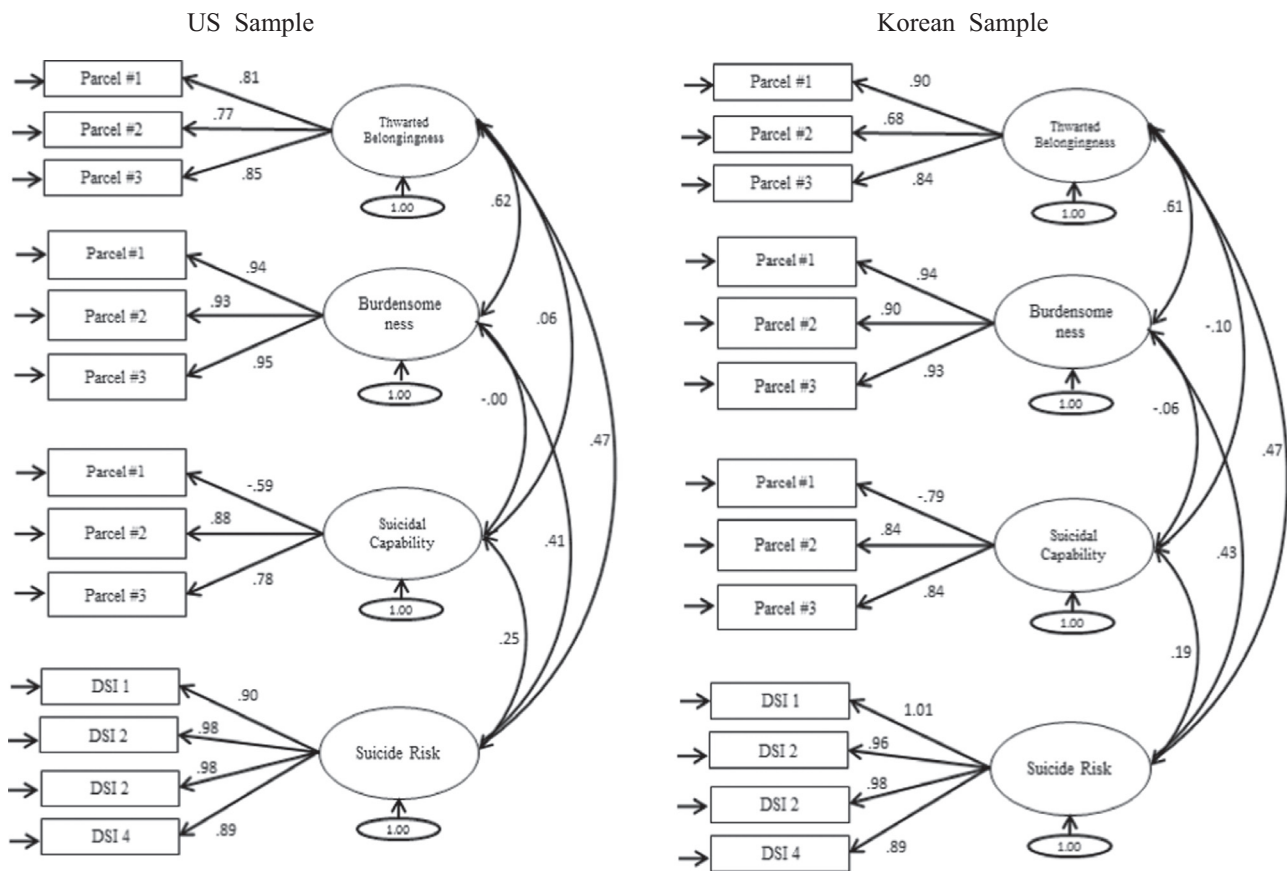


Fig. 1. Measurement models.

Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA). Cut-offs for good model fit included the following: CFI > 0.95 indicative of good fit (Hu and Bentler, 1999), and RMSEA < 0.08 and RMSEA < 0.05 indicative of fair and good fit, respectively (Browne et al., 1993). Significance of SEM parameters were determined by dividing each unstandardized parameter by their respective standard error and treating this as a z-statistic; these z values statistics were considered significant at the $p < 0.01$ level.

2.3.2. Structural model: predictors of suicidal ideation symptoms across culture

After establishing a well-fitting measurement model in both samples, we then tested the structural model across both the U.S. and Korean samples. The structural model tested was based on the ITS (Joiner, 2005; Van Orden et al., 2010), with *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* all contributing to suicide risk. The structural model tested may be seen in Fig. 2.

2.3.3. Structural model: equivalence of Thwarted belongingness and Perceived burdensomeness paths across cultures

Considering that Asian societies strongly emphasize social relationships (Yum, 1988), we used SEM (and specifically the chi-square difference test) to examine path equivalence and, more specifically, to test whether the paths from *Thwarted Belongingness* and *Perceived Burdensomeness* to suicidal thoughts, plans, and urges (“suicide risk”) were significantly different between the U.S. and Korean samples. To implement this, we examined the invariance of the structural model [i.e., invariance of the gamma (ζ) paths from *Thwarted Belongingness* and *Perceived Burdensomeness* to suicide risk] across Korean and U.S. participants. We compared a constrained model (i.e., the path from *Thwarted Belongingness* or *Perceived Burdensomeness* to suicide risk is constrained to equality between cultures) to a freely estimated

structural model (i.e., the path from *Thwarted Belongingness* or *Perceived Burdensomeness* to suicide risk is freely estimated in both samples’ data; cf. Kim et al., 2012). A significant chi-square difference test would suggest that the paths significantly differ across cultures.

2.3.4. Investigating interactions of ITS variables between cultures

We used a stepwise regression model using SPSS version 22 to examine interactions between *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* in predicting suicide risk across the two samples. In the first step, *Thwarted Belongingness* and *Perceived Burdensomeness* were entered into the model. The second step included *Capability for Suicide*, the third step included all two-way interactions, and the final step added a three-way interaction.

3. Results

3.1. Cross-cultural comparisons

Living arrangements differed notably across cultures, with U.S. students being more likely to live with other students, and Korean students being more likely to live with their parents. There was a significant difference in age distribution across the two samples, with Korean participants being slightly older than those in the U.S. sample ($p < 0.001$; Table 1). There was a significant mean difference between the two samples for all measures (INQ, DSI-SS, and ACSS-FAD; all $ps < 0.001$; Table 2). The Korean sample reported higher levels of *Perceived Burdensomeness* (INQ-PB), *Thwarted Belongingness* (INQ-TB), overall unmet interpersonal needs (INQ total), and suicidal thoughts, plans, and urges (DSI-SS). In contrast, the U.S. sample reported higher levels of fearlessness of death (ACSS-FAD).

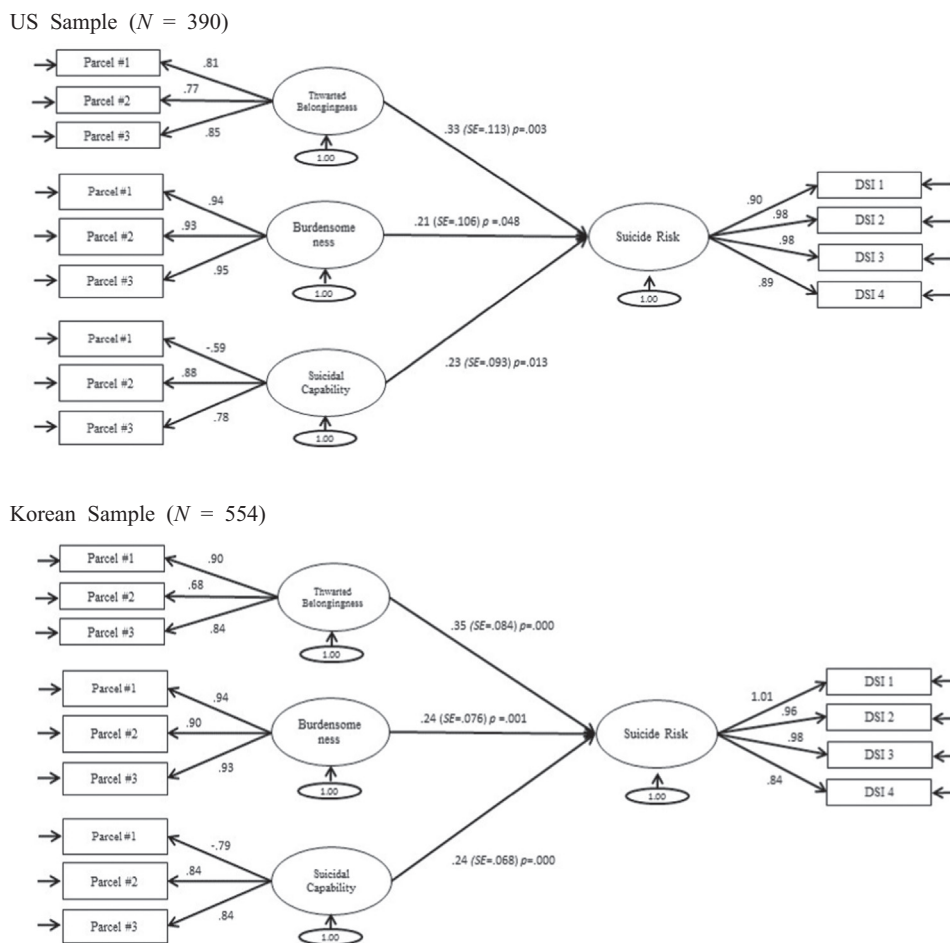


Fig. 2. Structural models predicting suicide risk.

Table 2
Cross-cultural comparisons of U.S. and Korea samples.

Variable name	U.S. M (S.D.) 390	Korea M (S.D.) 554	F	p-value
ACSS-FAD	14.95 (5.86)	13.02 (6.31)	22.56	< 0.001**
INQ-PB	7.36 (2.95)	8.56 (3.95)	25.72	< 0.001**
INQ-TB	15.86 (6.32)	22.67 (6.59)	251.55	< 0.001**
INQ-Total	23.22 (8.33)	31.23 (9.08)	189.32	< 0.001**
DSI-SS	0.30 (0.96)	1.03 (1.85)	51.25	< 0.001**

Abbreviations: ACSS-FAD = Acquired Capability for Suicide Scale – Fearlessness about Death; INQ-PB = Interpersonal Needs Questionnaire-Perceived Burdensomeness Subscale; INQ-TB = Interpersonal Needs Questionnaire-Thwarted Belongingness Subscale; DSI - SS = Depressive Symptoms Inventory – Suicidality Subscale
** p < 0.001

3.2. Cross-cultural comparison of the Interpersonal Theory of Suicide

3.2.1. Measurement model

The measurement model—positing four latent factors (i.e., *Thwarted Belongingness*, *Perceived Burdensomeness*, *Capability for Suicide*, and *suicide risk*)—is presented in Fig. 1. Table 3 contains descriptive statistics and correlations for all observed indicators of the four latent factors from both samples. Results revealed that all factor loadings for all four factors in both the U.S. and Korean samples were significant ($p < 0.01$). The measurement model also fit the data well in both the U.S. sample ($\chi^2 = 66.16, p = 0.24; CFI = 0.99; RMSEA = 0.03$) and the Korean sample ($\chi^2 = 102.76, p < 0.001; CFI = 0.99; RMSEA = 0.05$).

Since we established a well-fitting measurement model in both samples, we then proceeded to examine the structural model in both samples with *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* set to predict suicidal risk.

3.2.2. Structural model: predictors of suicide risk across cultures

The structural models conducted separately on the U.S. and Korean samples are presented in Fig. 2. In the U.S. sample, *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* significantly predicted suicide risk, consistent with the ITS (Joiner, 2005; Van Orden et al., 2010). In the Korean culture, we replicated the same pattern of results, whereby *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* significantly predicted Suicide risk (see Fig. 2, bottom figure).

We then conducted more specific tests of the equivalence of the *Thwarted Belongingness* and *Perceived Burdensomeness* paths (predicting suicide risk) between cultures. In other words, we were interested in whether feelings of social disconnectedness and feelings of social burdensomeness were associated with suicide risk to the same degree across our U.S. and Korean samples.

3.2.3. Structural model: equivalence of *Thwarted belongingness* and *Perceived burdensomeness* path across cultures

The fit of the constrained model was as follows: $\chi^2 = 384.78, p < 0.001; df = 119; CFI = 0.97; RMSEA = 0.07$. The fit of the freely estimated model for *Thwarted Belongingness* was as follows: $\chi^2 = 384.20, p < 0.001; df = 118; CFI = 0.97; RMSEA = 0.07$. The chi-square difference test between these two models was not significant, $\chi^2_{diff} = 0.58, df_{diff} = 1, p = 0.45$. These results suggest that the strength of the

Table 3
Descriptive statistics and correlations of indicators of Thwarted Belongingness, Perceived Burdensomeness, Capability for Suicide, and Suicide Risk in the U.S. and Korea samples.

Indicators	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	M	SD
1. INQ-TB Parcel #1	1	0.91**	0.92**	0.67**	0.53**	0.91**	-0.01	0.00	0.00	0.12*	0.10	0.13*	0.08	6.04	5.33
2. INQ-TB Parcel #2	0.50**	1	0.97**	0.65**	0.55**	0.93**	-0.02	-0.01	-0.02	0.12*	0.09	0.11*	0.06	5.06	5.27
3. INQ-TB Parcel #3	0.38**	0.42**	1	0.64**	0.54**	0.92**	-0.03	0.00	-0.02	0.15*	0.11*	0.15**	0.07	5.49	5.34
4. INQ-PB Parcel #1	0.51**	0.26**	0.20**	1	0.41**	0.71**	-0.03	0.03	0.03	0.05	0.04	0.06	0.03	3.04	7.00
5. INQ-PB Parcel #2	0.26**	0.18**	0.12**	0.32**	1	0.58**	-0.01	0.02	0.02	0.01	0.01	0.03	0.01	3.15	8.50
6. INQ-PB Parcel #3	0.45**	0.20**	0.18**	0.79**	0.30**	1	-0.01	0.00	0.00	0.07	0.06	0.09	0.05	2.65	4.98
7. ACSS-FAD Parcel #1	-0.02	-0.04	-0.04	0.01	-0.03	0.00	1	0.62**	0.64**	-0.06	-0.06	-0.05	-0.06	8.80	5.53
8. ACSS-FAD Parcel #2	-0.02	-0.05	-0.03	-0.03	0.01	-0.01	-0.12*	1	0.95**	0.02	0.05	0.02	0.06	5.78	5.20
9. ACSS-FAD Parcel #3	0.05	0.08	0.03	0.01	0.03	0.02	-0.12*	0.06	1	0.01	0.05	0.03	0.05	5.90	5.14
10. DSI-SS #1	0.34**	0.18**	0.15**	0.34**	0.15**	0.41**	-0.04	0.07	0.08	1	0.56**	0.64**	0.43**	0.12	0.35
11. DSI-SS #2	0.33**	0.22**	0.16**	0.35**	0.16**	0.42**	-0.04	0.11*	0.03	0.83**	1	0.75**	0.51**	0.05	0.25
12. DSI-SS #3	0.38**	0.21**	0.16**	0.38**	0.22**	0.44**	-0.03	0.06	0.11**	0.84**	0.80**	1	0.46**	0.09	0.32
13. DSI-SS #4	0.32**	0.19**	0.15**	0.35**	0.16**	0.40**	-0.04	0.09*	0.08*	0.73**	0.66**	0.72**	1	0.04	0.24
M	5.94	8.94	7.95	2.99	2.84	2.91	5.76	3.73	3.42	0.25	0.25	0.32	0.21		
SD	2.53	2.37	4.71	1.53	4.27	1.50	6.38	6.15	6.08	0.50	0.51	0.57	0.46		

Note. Upper right correlations represent the US sample (n =390), and lower left correlations represent the Korean sample (n =554).

** p < 0.01

* p < 0.05.

path from *Thwarted Belongingness* to suicide risk was generally equivalent between the U.S. and Korean samples. That is, feelings of social disconnectedness were associated with suicide risk to the same extent across the US and Korean samples.

The fit of the constrained model was as follows: $\chi^2 = 386.30$, $p < 0.001$; $df = 119$; CFI = 0.97; RMSEA = 0.07. The fit of the freely estimated model for *Perceived Burdensomeness* was as follows: $\chi^2 = 384.20$, $p < 0.001$; $df = 118$; CFI = 0.97; RMSEA = 0.07. The chi-square difference test between these two models was not significant ($\chi^2_{diff} = 2.10$, $df_{diff} = 1$, $p = 0.147$). These results suggest that the strength of the path from *Perceived Burdensomeness* to Suicide risk was generally equivalent between the U.S. and Korean samples. Feelings of social burdensomeness were associated with suicide risk to the same extent across the US and Korean samples.

3.3. Interactions between ITS variables across cultures

In the U.S. sample (Table 4a), results from the stepwise regression analysis revealed that the final model significantly predicted 33% of the variance in suicidal thoughts, urges, and plans [$F(2,385) = 28.67$, $p < 0.001$]. There was a significant interaction between *Perceived Burdensomeness* and *Thwarted Belongingness*, as well as between *Perceived Burdensomeness* and *Capability for Suicide* ($p < 0.001$), but not between *Thwarted Belongingness* and *Capability for Suicide*. The three-way interaction between *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* was also nonsignificant.

In the Korean sample (Table 4b), results from the stepwise regression analysis revealed that the final model significantly predicted 24.5% of the variance in suicidal risk [$F(2,550) = 26.53$, $p < 0.001$]. There was a significant interaction between *Perceived Burdensomeness* and *Capability for Suicide* ($p = 0.007$), but not between *Perceived Burdensomeness* and *Thwarted Belongingness*, or *Thwarted Belongingness* and *Capability for Suicide*. The three-way interaction between *Thwarted Belongingness*, *Perceived Burdensomeness*, and *Capability for Suicide* was also nonsignificant.

4. Discussion

4.1. Summary and implications of findings

The current study examined the cross-cultural relevance of the ITS in samples from South Korea and the U.S. Overall, the two samples were relatively similar with regard to demographic variables, with minor differences in age and notable differences in living situation observed between the two groups. These differences are likely the result

Table 4a
Interactions among ITS variables in the U.S.

Step 1: INQ-PB, INQ-TB			
	Standardized B	Adjusted R-squared	p-value
INQ-PB	0.41	0.25	< 0.001
INQ-TB	0.14		0.006
Step 2: Adding ACSS-FAD			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.41	0.27	< 0.001
INQ-TB	0.14		0.007
ACSS-FAD	0.12		0.004
Step 3: Adding two-way interactions			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.24	0.33	< 0.001
INQ-TB	0.18		< 0.001
ACSS-FAD	0.17		0.001
INQ-PB X INQ-TB	0.16		0.001
INQ-PB X ACSS-FAD	0.18		0.004
INQ-TB X ACSS-FAD	0.03		0.610
Step 4: Adding three-way interactions			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.22	0.335	< 0.001
INQ-TB	0.19		< 0.001
ACSS-FAD	0.22		< 0.001
INQ-PB X INQ-TB	0.21		< 0.001
INQ-PB X ACSS-FAD	0.27		0.001
INQ-TB X ACSS-FAD	-0.004		0.956
INQ-PB X INQ-TB X ACSS-FAD	-0.13		0.07

Abbreviations: ACSS-FAD = Acquired Capability for Suicide Scale – Fearlessness about Death; INQ-PB = Interpersonal Needs Questionnaire-Perceived Burdensomeness Subscale; INQ-TB = Interpersonal Needs Questionnaire-Thwarted Belongingness Subscale.

of cultural differences—specifically, South Koreans generally live with their families for a longer period of time than young adults in the United States (Yi et al., 1994). Furthermore, the U.S. sample was recruited primarily from introductory level psychology courses, likely accounting for the slightly younger sample.

Regarding the ITS, South Korean students demonstrated signifi-

Table 4b
Interactions among ITS variables in Korea.

Step 1: INQ-PB, INQ-TB			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.34	0.21	< 0.001
INQ-TB	0.20		< 0.001
Step 2: Adding ACSS-FAD			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.34	0.22	< 0.001
INQ-TB	0.20		< 0.001
ACSS-FAD	0.11		0.003
Step 3: Adding two-way interactions			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.35	0.24	< 0.001
INQ-TB	0.19		< 0.001
ACSS-FAD	0.08		0.020
INQ-PB X INQ-TB	0.02		0.630
INQ-PB X ACSS-FAD	0.14		0.001
INQ-TB X ACSS-FAD	0.02		0.620
Step 4: Adding three-way interactions			
	Standardized B	Adjusted R-Squared	p-value
INQ-PB	0.35	0.24	< 0.001
INQ-TB	0.19		< 0.001
ACSS-FAD	0.09		0.020
INQ-PB X INQ-TB	0.02		0.710
INQ-PB X ACSS-FAD	0.15		0.007
INQ-TB X ACSS-FAD	0.02		0.600
INQ-PB X INQ-TB X ACSS-FAD	-0.01		0.790

Abbreviations: ACSS-FAD = Acquired Capability for Suicide Scale – Fearlessness about Death; INQ-PB = Interpersonal Needs Questionnaire-Perceived Burdensomeness Subscale; INQ-TB = Interpersonal Needs Questionnaire-Thwarted Belongingness Subscale

cantly higher levels of *Perceived Burdensomeness*, *Thwarted Belongingness*, and suicide risk (i.e., suicidal thoughts, plans, and urges) compared to the U.S. sample. This may reflect the collectivistic nature of South Korea, such that more emphasis is placed on an individual's relationship with other group members, rather than the self, potentially resulting in increased distress based on similar levels of objective interpersonal difficulties (Han and Ahn, 1994). Furthermore, suicide rates in South Korea have been consistently high and have risen sharply in recent years, doubling over the past two decades (Kim et al., 2011; Kwon et al., 2009; OECD, 2013). Therefore, it is not surprising that the South Korean sample endorsed more severe suicide risk than the U.S. sample. Although factors that are contributing to these elevated rates of suicide are not well established or understood, there is evidence that they may be related, in part, to the strong national emphasis on academic achievement, at least among adolescents and university students (Kang et al., 2015; Lee et al., 2008). By contrast, the U.S. sample endorsed significantly higher rates of *Capability for Suicide*, specifically, greater fearlessness about death. It is unclear why this may have been the case in our two samples; however, it is possible that there may be differences in exposure to violence between the two groups that may be able to partially account for the observed differences in this study.

Interpersonal factors (*Thwarted Belongingness* and *Perceived Burdensomeness*) were equivalent predictors of suicidal symptoms between the two samples in our structural equation models. Despite differences in symptom severity of suicide risk, these results indicate that the ITS may serve as a useful framework for understanding suicide

risk in both populations. I Specifically, in both samples, our findings supported the tenets of the theory as outlined by Joiner (2005) and Van Orden et al. (2010), with nearly identical loadings on suicide risk, despite cultural differences between samples. These findings align with previous studies of the ITS in East Asian populations (e.g., Zhang et al., 2013), further underscoring the potential utility of this theory for suicide research and prevention efforts in East Asia.

Assessing the interaction between perceived burdensomeness and thwarted belongingness is a key component of testing the interpersonal theory of suicide (ITS). The theory specifically states that the interaction of these two variables—rather than only their main effects—predicts suicidal desire. This desire is then likely to lead to death by suicide (or a near-lethal attempt) when paired with sufficient capability to make a lethal suicide attempt (cf. capability for suicide). Testing this interaction can provide incremental utility by demonstrating that elevated risk occurs specifically when both factors are elevated simultaneously, which enhances the specificity of risk detection efforts and our understanding of the conditions under which suicide risk emerges. Despite the convergence of our findings across these samples in our structural equation models, the interaction of the interpersonal ITS factors (*Thwarted Belongingness* and *Perceived Burdensomeness*) was not consistent between the two samples. The non-significant three-way interactions from both samples is consistent with the ITS predictions that the two-way interaction will predict suicidal thoughts, whereas the three-way interaction is hypothesized to predict suicidal behavior (Van Orden et al., 2010). The ITS' hypotheses regarding interactive effects have produced mixed results in a number of studies (see Ma et al., 2016). It is unclear what may have led to the non-significance of the two-way interaction in the Korean sample. It is possible that in a collectivistic culture, these factors have an additive rather than interactive effect on suicide risk. Other factors that have not yet been identified may have also contributed to these differences, as a number of studies have found disparate results when testing these hypotheses.

Although definitive conclusions cannot yet be drawn regarding the cross-cultural validity of the ITS, our findings add to a relatively new body of evidence that the ITS is not only applicable to Western and/or individualistic societies, but may also function similarly, though potentially not identically, in Eastern and/or collectivistic societies. These interpersonal factors can be used to help identify those with an elevated risk for suicide. They may be especially helpful for clinicians in identifying people who may be reluctant to disclose suicidal desires, as they do not appear, to lay individuals, to be associated with suicide. Current models of suicide risk assessments include these, and other notable suicide risk factors within their evaluations (Chu et al., 2015). Clinicians in both Western and Eastern cultures may find it useful to assess these risk factors when seeking to identify and treat those at highest risk for suicide. Furthermore, treatments aimed at reducing these interpersonal difficulties may also help to reduce risk for suicide attempts.

4.2. Limitations and future directions

Despite the promising nature of these findings, the present study has several important limitations. First, since only cross-sectional data were collected, conclusions cannot be drawn regarding the extent to which ITS variables prospectively predicted suicide risk (suicidal thoughts, plans, and urges) in our two study samples. Further work is needed to evaluate the extent to which *Thwarted Belongingness*, *Perceived Burdensomeness*, and the *Capability for Suicide* may interact to prospectively predict risk for suicidal ideation and, particularly suicidal behaviors among Korean populations, especially given that this is a critical proposition of the ITS (Joiner, 2005; Van Orden et al., 2010). Future studies, especially in Eastern cultures, should include prospective, longitudinal tests of the ITS in order to thoroughly evaluate its prospective claims of the prediction of future suicidal

behavior. Other important factors that may contribute to the theoretical model, such as social support and psychiatric disorders (e.g. depression) (Davidson et al., 2011, Kleiman and Liu, 2013).

Although we analyzed the interaction between the ITS constructs in our study, further investigation of these interactions in samples more generalizable to the broader Korean population and with behavioral-based outcomes are needed. Since the interaction between *Thwarted Belongingness* and *Perceived Burdensomeness* was a significant predictor of our outcomes in the U.S. sample but not the Korean sample, future studies should also investigate the possibility that due to the greater degree of importance placed on interpersonal relationships in collectivistic cultures, the interpersonal ITS variables may be better viewed as additive risks rather than interactive risk factors in South Korea. Furthermore, the increased importance of both belonging and interpersonal contributions (i.e., not being a burden) in collectivistic cultures may result in a decreased threshold required for one interpersonal factor to contribute meaningfully to suicide risk in the presence of elevated levels of the other factor. It will also be informative to investigate the degree to which the ITS constructs are able to predict future suicide risk above and beyond, or in interaction with, other evidence-based risk factors (e.g., depression, anxiety, hopelessness, insomnia, agitation) in Korean samples evaluated over time, rather than just cross-sectionally (Park, 2008; Kim et al., 2010).

The predicted three-way interaction of ITS variables identifying suicidal thoughts, plans, and urges was not supported in either sample. This was likely due to the nature of the outcome measure. *Capability for Suicide*, in the ITS framework, is a predictor of lethal or near-lethal suicide attempts, not suicidal ideation. While the DSI-SS includes assessments of suicidal plans and urges, these items assess primarily thoughts about suicide and thoughts about making suicidal actions. This brief measure is a clinically useful measure of suicidal risk, and as the lower order regression and SEM analyses indicate, is clearly associated with *Capability for Suicide*. However, the lack of objective assessment of actions and behaviors may have contributed to the non-significance of the three-way interaction analyses. Future studies of the full ITS model should include measures of suicidal actions and behaviors as well as facets of suicide risk primarily associated with cognitions. Additionally, replication of this model in community and clinical samples may lead to a differential pattern of results since the base rate of suicidal ideation is low among undergraduate students as compared to clinical samples.

Although the self-report questionnaires (i.e., INQ, ACSS-FAD, DSI-SS) utilized for this study underwent a rigorous translation and back-translation process, these Korean language versions have not yet been formally validated or are in the process of being validated. Past research has emphasized the importance of investigating cross-cultural invariance of instruments when making cross-cultural comparisons (Chen, 2008). Cultural invariance indicates that the measure predicts the same behavioral outcomes in both cultures, which we were able to demonstrate in our study. While we investigated some aspects of cross-cultural invariance, it will be critical to investigate the psychometric properties of these Korean language measures in the future, particularly since there are existing differences in culture and conceptualization of mental health-related experiences between U.S. and Korean populations. Research may reveal, for example, that these measures differ across cultures in their threshold for clinical significance, especially when assessing interactive effects, as noted above. Relatedly, future studies may benefit from assessment of participants' cultural values and beliefs, degree of acculturation, alignment with individualistic versus collectivistic principles, and social cohesion. Investigation of such constructs may shed light on the pathways by which cultural factors may impact suicide risk. On this point, because measurement of cultural constructs was not included in the present studies, the specific degree of cultural distinction between the samples is unknown, representing an additional limitation of our study.

Another limitation of our study was the use of online questionnaires in the U.S. study and paper and pencil assessments in the Korean sample. Although some research demonstrates that well designed measures are invariant whether utilized via paper and pencil or electronic based data collection (Davidov and Depner, 2011; Vallejo et al., 2007), some measures do demonstrate non-equivalence when assessed using a different medium (Meade et al., 2007; Vallejo et al., 2007). As no thorough evaluations have been conducted on the potential invariance between the measures utilized in this study, the specific amount of variance between the samples due to assessment medium is unknown. Future studies should standardize the assessment procedures for a more robust cross-cultural comparison of these variables.

One additional limitation to note was the differences in demographic information between cross-cultural samples, especially living situation between USA and Korea. While consideration of confounding factors such as demographic variables are important when interpreting results, controlling for these factors may result in spurious findings when groups that are compared are not obtained through random assignment (Miller and Chapman, 2001). Future studies should focus on more precise measurement and control of these variables based on past cross-cultural studies. However, it should be noted that demographic variables such as living differences are not population differences that spuriously create cross-cultural differences. The different living situations are part of the cultural differences, thus analyses to control for such group differences may not be appropriate.

Finally, our study samples were limited to university undergraduates. We selected this population for our sample because suicide rates in South Korea are alarmingly high among individuals in their 20's, especially among females (Jeon et al., 2010; Hong et al., 2006). This is a trend that is also found in the US, as past studies have highlighted elevated rates of suicidal ideation and behavior in females in age ranges 18–29 (Crosby et al., 2011). Although risk is elevated among this age group both within Korea and the U.S., further work is needed to evaluate the generalizability of our findings to other demographic groups (e.g., adults, older adults), other clinical settings (e.g., psychiatric inpatients, primary care patients), and high suicide risk populations (e.g., individuals with a history of prior suicide attempts) in South Korea. However, the use of data collection at multiple universities in Korean undergraduate populations was a strength in the present study since it afforded the opportunity to evaluate evidence for the ITS across several relatively comparable groups of individuals that were also comparable to the U.S. sample.

5. Conclusion

This study sought to expand upon the current literature on the ITS by examining its generalizability to a non-Western culture. The findings indicated that the ITS constructs significantly predicted suicidal thoughts, urges, and plans in both U.S. and Korean samples and thus provided support for the applicability of the theory across cultures. Future research is needed to expand these findings by continuing to test the predictive power of the theory's constructs and propositions longitudinally and across cultures. An enhanced understanding of the cross-cultural applicability of the ITS has the potential to critically inform the development and implementation of global suicide prevention efforts.

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