An Experimental Test of the ‘‘Interpersonal’’ in the Interpersonal Theory of Suicide

Sarah E. George, Khan R. L. Collins, Temily Cao, Werner G. K. Stritzke, and Andrew C. Page

University of Western Australia

For correspondence and for copies of the Interpersonal Persistence Task, please contact Prof. Andrew C Page at the School of Psychological Science, University of Western Australia, 35 Stirling Highway Crawley, W.A. 6009, Australia. Email: andrew.page@uwa.edu.au. Phone: +61 8 6488 3577; Fax +61 8 6488 1006

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Abstract

The interpersonal theory of suicide posits that failed interpersonal needs for efficacy and belongingness cause suicide ideation (Joiner, 2005). To distinguish whether their mechanism of action is interpersonal or via failure per se, an experimental paradigm was used. In Study 1 \((n = 98)\), participants were randomly allocated to high or low perceived burdensomeness and thwarted belongingness conditions. Those who experienced high levels of the interpersonal factors expressed a heightened desire to disengage from the interactive computerized team task. To test whether disengagement was caused by interpersonal factors or just poor performance, participants in Study 2 \((n = 63)\) were randomly allocated to complete the task in collaborative (i.e., interpersonal) or competitive (i.e., intrapersonal) conditions. The deficits in persistence were greater among participants in the interpersonal condition, indicating that the interpersonal nature of perceived burdensomeness and thwarted belongingness makes these factors particularly pernicious, supporting the emphasis of the interpersonal theory of suicide.

**Keywords:** burdensomeness, thwarted belongingness, suicide, interpersonal theory of suicide, zest for life
An Experimental Test of the “Interpersonal” in the Interpersonal Theory of Suicide

The interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) identifies two fundamental interpersonal needs that if unmet are thought to drive active suicidal desire. The first is the need to belong and have mutually caring relationships. The second is the need to meaningfully and effectively contribute within one’s social network. When both needs are perceived as unfulfilled they are experienced as thwarted belongingness and perceived burdensomeness, respectively. Hence, “the simultaneous presence of thwarted belongingness and perceived burdensomeness, when perceived as stable and unchanging (i.e., hopelessness regarding these states), is a proximal and sufficient cause of active suicidal desire” (van Orden et al., 2010; p. 581). Thus, the present focus is upon a defining feature of these two key factors posited by the theory in that they are interpersonal in nature. While there is growing empirical support for several of the theory’s predictions (Ma, Batterham, Calear, & Han, 2016), the fundamental underlying assumption that it is the interpersonal nature of feeling disconnected and a liability on others that causes the desire to escape life via suicide, rather than a general sense of inadequacy and failure (Baumeister, 1991), has not been examined or tested. The aim of the present research was to disambiguate whether desire to disengage was due to the interpersonal or the intrapersonal nature of failure and in so doing, test the central tenet of the theory.

In an experimental test of the interpersonal theory (Collins et al., 2016), perceived burdensomeness and thwarted belongingness were experimentally manipulated using an interactive computer team task to measure their relative influence on the desire to escape from an interpersonally adverse situation. Here, both thwarted belongingness and perceived burdensomeness caused a heightened desire to escape, although the effect of experimentally induced perceived burdensomeness was over two times greater than that of thwarted
belongingness (Collins et al., 2016), consistent with most non-experimental studies (e.g., Ma, Calear, Batterham, & Soubelet, 2016).

This experimental evidence showing that the interpersonal factors drive a heightened desire to escape (Collins et al., 2016) is in line with cross-sectional (e.g., Christensen et al., 2013), and longitudinal (e.g., Van Orden, Cukrowicz, Witte, & Joiner, 2012) research indicating that burdensomeness and thwarted belongingness are associated with thoughts of escape from life – suicide ideation. Existing research on the theory is limited to date however by an inability to distinguish whether it is the interpersonal nature of burdensomeness and thwarted belongingness that causes thoughts of escape. The interpersonal factors may instill a general sense of inadequacy and failure (e.g., Baumeister, 1991) and failure may drive suicide ideation irrespective of its specific (interpersonal) causes. This is consistent with the escape theory of suicide, where suicide is posited to result from aversive self-awareness following failure to meet a salient standard (Baumeister, 1990), and with evidence that self-discrepancy (falling short of a standard) is significantly associated with suicide ideation (Chatard & Selimbegovic, 2011; Cornette, Strauman, Abramson, & Busch, 2009). An experimental test with high internal validity, such as the Persistence Task (Collins et al., 2016), would allow the careful separation of interpersonal from intrapersonal failure, clarifying if it is specifically the interpersonal nature of the variables that drives a desire to give up.

**Research Rationale and Aims**

Prior to examining the mechanisms via which the interpersonal factors cause disengagement, we first sought to replicate existing experimental findings (Collins et al., 2016) to confirm that (a) the Interpersonal Persistence Task is a valid manipulation of the confluence of the two key interpersonal risk factors identified by the interpersonal theory, (b) that these interpersonal factors cause a desire to disengage, and (c) that zest for life, defined
as a sense of connection to and enthusiasm for life (George, Stritzke, Page, & Brown, 2016), buffers the adverse effects of the interpersonal factors on disengagement. Since the experimental manipulation of the interpersonal factors produced strong effects early in the task (Collins et al., 2016), an abbreviated version of the paradigm was used in the present research.

After confirming that the Interpersonal Persistence Task effectively manipulates burdensomeness and thwarted belongingness in Study 1, and that the combination of these factors causes a wish to disengage from adversity, we next sought to test the mechanisms via which the interpersonal factors caused disengagement in Study 2. Here, the original persistence task, which experimentally induces high and low levels of interpersonal failure (perceived burdensomeness and thwarted belongingness), was modified to include a comparable intrapersonal manipulation of high and low levels of individual failure. Participants were then randomly allocated to either high or low levels of either the interpersonal or intrapersonal versions. By comparing those who experienced high levels of interpersonal failure with those who experienced high levels of intraindividual failure, it was possible to distil the interpersonal from a more general sense of failure and inadequacy, providing the first test of how the interpersonal factors exert their effects.

Should the high interpersonal and high intrapersonal failure conditions have equivalent adverse effects on disengagement, this would support the escape theory of suicide’s proposal that desire to escape results from a general sense of inadequacy (Baumeister, 1990). Conversely, should interpersonal failure emerge as especially pernicious, this would support the more specific emphasis of the interpersonal theory.

**Study 1**

**Method**
Participants and procedures. Ninety-eight university students (51 females, 46 males)\(^1\) ranging in age from 17 to 56 years ($M = 20.20$, $SD = 6.15$) whose scores on a screening measure of zest for life (George, Stritzke, et al., 2016) fell in the upper 10 (high zest) or lower 15 percentiles (low zest) participated for course credit. Self-reported ethnicity comprised Australian/Caucasian (61.2%), Asian (18.4%), European (5.1%), African (1.0%) and Other (14.3%) ethnicities. Participants were randomly allocated to either the high or low perceived burdensomeness-thwarted belongingness (PB-TB) experimental conditions. Following the task, participants completed a brief battery of questionnaires about zest for life and suicide risk. All participants were debriefed and provided with details of campus and community mental health resources. Procedures were approved by the institution’s Human Research Ethics Office.

Interpersonal Persistence Task (Collins et al., 2016). A brief version of the computerized task (Collins et al., 2016) was used, lasting approximately ten minutes in duration. Participants were informed that they were playing online with two fellow participants in separate testing rooms, and that they would each work to accumulate points toward their team score with the aim of beating a target score. Participants were told that points would be won or lost on the basis of both speed and accuracy, by correctly identifying whether two characters were identical or different. The doors of the testing rooms were closed during the task, to preclude conversation between participants.

After every five responses, a summary table was displayed with each player’s scores (points won and lost), the team total, and the target score. All participant scores were unreflective of actual performance and were instead manipulated so that those in the high PB-TB group received feedback that they were performing worse than their co-players, while those in the low PB-TB group consistently received feedback that they were performing similarly to co-players (and their team approximated the target score). Hence, while those in
the low PB-TB condition received feedback that they performed similarly to their team mates and their team was comparable to the target score, those in the high PB-TB condition were given feedback that their performance was less than the target by virtue of their performance being lower than that of their team members.

In addition to receiving numerical feedback about their relative contribution to the team, participants were also invited to exchange written feedback with their co-players on three occasions, after every 15 figure discrimination trials, in an “online chat”. After sending their text messages, participants received teammate feedback. Co-player feedback was also entirely determined such that all high PB-TB participants received messages that became increasingly critical and impatient, while low PB-TB participants received feedback that encouraged them to maintain their positive contribution. Spelling and grammatical errors were included in both conditions to increase plausibility that comments were written by fellow students.

Following the reception of each set of co-player feedback, participants rated their current level of belongingness to the team (“The other players make me feel like I am part of the team”), perceived burdensomeness relative to the team (“I think I am a burden on my other team members”), and desire to disengage (“If I had the option, I would rather drop out of the game”) on a scale from 0 (‘not at all true for me’) to 6 (‘very true for me’). One-item measures were used to facilitate information-gathering over the course of the brief task.

To account for the potential influence of participant interest and effort in the experiment, two items were administered (“I found the task interesting” and “I made an effort to do well on the task”) on a scale from 0 (‘not at all true for me’) to 6 (‘very true for me’). To determine whether participants experienced suspicion that the task may have been fixed, participants were invited to comment about the experiment (“Do you have any
comments about the experiment?’’) and their co-players (‘‘Do you have any comments about your teammates?’’) prior to debriefing.

Measures

Participants completed questionnaires about zest for life first at screening and again directly following the task. All other below-mentioned measures were administered following the task prior to debriefing.

Zest for life scale (ZLS; George, Stritzke, et al., 2016). The ZLS is a 12-item measure of general engagement with and enthusiasm for life (e.g., ‘‘I am embracing life’’). Items are measured on a scale from 0 (‘not at all’) to 8 (‘very strongly’). The scale includes six reverse-scored items (e.g., ‘‘Life seems to hold less for me than it used to’’), such that higher scores denote heightened zest. The ZLS is suitable for use in non-clinical samples and demonstrates good internal consistency and construct validity (George, Stritzke, et al., 2016). A 7-item version of the scale was administered during the initial screening. Both 7- and 12-item scales were strongly correlated ($r = .93$, $p < .01$) and demonstrated excellent internal consistency ($\alpha = .96$ and .97, respectively).

Interpersonal needs questionnaire (INQ; Van Orden et al., 2008). The INQ was also administered at screening and following the task to assess perceived burdensomeness (six items; e.g., ‘‘The people in my life would be better off if I were gone’’) and thwarted belongingness (nine items; e.g., ‘‘I feel disconnected from other people’’). Items are measured on a 7-point scale from 1-7, where high scores denote heightened perceived burdensomeness and thwarted belongingness. The INQ has been used in non-clinical settings and demonstrates construct validity and internal consistency (Van Orden et al., 2012; Van Orden et al., 2008). The internal consistency in the current sample was excellent (PB subscale = .96; TB subscale = .91; Total INQ = .95 and similar in Study 2: PB = .88; TB = .88; Total = .91).
Suicide risk. Two items from the Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock, Holmberg, Photos & Michel, 2007) were administered to measure frequency of suicide ideation in the past year (‘How many times have you thought about suicide?’), on a 6-point scale (never’ to ‘almost every day’), and lifetime suicide attempts (‘How many times in your lifetime have you made an actual attempt to kill yourself in which you had at least some intent to die?’) on a 5-point scale (‘never’ to ‘five or more times’). The SITBI is appropriate for administration in self-report format (Latimer, Meade, & Tennant, 2013) and has demonstrated inter-rater reliability, test-retest reliability and construct validity with other measures of suicide risk (Nock et al., 2007).

As the SITBI items refer to past behavior, one reverse-scored item was also administered to measure imminent suicidal intent (‘I have no intention of killing myself in the near future’) on a scale from 0 (not at all) to 8 (very strongly). This item is appropriate for use in non-clinical samples and correlates significantly with past suicidal behavior (George, Page, Hooke, & Stritzke, 2016).

General psychological distress. The Kessler Psychological Distress Scale (K10; Kessler et al., 2003) comprises ten items measuring emotional states occurring in the past four weeks on a scale from 1 (‘none of the time’) to 5 (‘all of the time’). High scores denote heightened general psychological distress and increased probability of experiencing a mental health problem (Andrews & Slade, 2001).

Results & Discussion

Data analytic strategy. Data were screened for outliers and participant feedback was examined independently by two researchers to determine whether participants expressed suspicion that the task was fixed. Zest for life scores at testing were examined to verify whether participants remained in their respective screening groups (low/high zest participants remained below/above the median of zest scores, respectively). The effects of the
manipulation on burdensomeness, belongingness, and desire to disengage were tested using three 2 (high/low PB-TB) × 2 (high/low zest) × 3 (three blocks of trials) mixed-design analyses of variance (ANOVAs). To clarify the relative influence of burdensomeness and thwarted belongingness on desire to disengage in the high PB-TB condition, a hierarchical multiple regression was conducted.

**Screening and manipulation checks.** Data were screened for outliers, with two cases exceeding the critical value (z = 3.29, p < .001) on the reaction time variable. As these participants responded within the normal range on all other measures, they were assigned a score of three standard deviations above the mean (Field, 2009). Task measures were normally distributed (skew < ±2; Field, 2009²). Mean burdensomeness and thwarted belongingness ratings were significantly correlated (r = .63, p < .01).

One participant was excluded due to an extreme change in reported desire to disengage from the first to the second interval, a possible response error consistent with their reported difficulty viewing the screen. Seventeen suspicious cases were identified (inter-rater reliability = 95%), with an approximately even split across the four experimental groups. While mean scores on all task-related measures revealed no significant differences between those who expressed suspicion and those who did not (p > .05), suspicious participants were excluded from all analyses.

**Participant characteristics by group and condition.** One participant from the high zest group was excluded due to a decrease in zest scores from screening to testing, and remaining participants did not overlap in zest scores across high (range = 6.42 – 8.00) and low (range = 1.50 – 6.08) zest groups. The high zest group reported significantly higher levels of zest for life than those in the low zest group (M = 7.43, SD = 0.47 vs. M = 3.85, SD = 1.13), t(50.67) = -18.24, p < .001, d = 4.14. The high zest group also scored significantly lower than the low zest group on baseline burdensomeness (M = 1.15, SD = 0.27 vs. M =
2.75, SD = 1.44), t(40.53) = 6.81, p < .001, d = 1.54, and thwarted belongingness (M = 1.59, SD = 0.52 vs. M = 3.70, SD = 0.96), t(58.33) = 12.19, p < .001, d = 2.75. Zest scores were significantly negatively associated with suicide ideation (r = -.70, p < .01) and intent (r = -.53, p < .01). Suicide ideation was more frequent in the low zest for life group, with 84.6% thinking about suicide at least once in the past year, 33.3% thinking about suicide on at least a monthly basis, and 28.2% thinking about suicide at least weekly. In contrast, 15% of high zest participants reported thinking about suicide in the past year, with 2.5% thinking about suicide monthly, and 0% thinking about suicide weekly. Similarly, the low zest group reported higher rates of lifetime suicide attempts, with 28.2% reporting at least one prior attempt, with 15.4% reporting multiple attempts. Conversely, 7.5% of the high zest group reported one prior attempt, with 0% reporting multiple attempts.

Participants did not significantly differ across high (M = 3.64, SD = 1.58) and low (M = 4.13, SD = 1.62) PB-TB conditions in reported level of interest in the task, t(77) = 1.343, p = .18, d = -0.31. However they differed across high (M = 5.31, SD = 0.89) and low (M = 5.73, SD = 0.55) PB-TB conditions on effort, t(63.20) = 2.49, p = .01, d = -0.57.

**Experimental manipulation of perceived burdensomeness and thwarted belongingness.** ANOVA tested the effects of condition and zest group across time on burdensomeness. As shown in Figure 1a, participants in the high PB-TB condition reported significantly greater perceptions of burdensomeness compared to participants in the low PB-TB condition, $F(1,75) = 91.52, p < .001, \eta^2_p = .55$, 90% CI (.42, .64). No other main or interaction effects were significant.

A second ANOVA examined the effects of condition and zest group across time on belongingness. As shown in Figure 1b, participants in the high PB-TB condition reported significantly lower belongingness compared to those in the low PB-TB condition, $F(1,75) = 197.31, p < .001, \eta^2_p = .73$, 90% CI (.63, .78). A significant main effect of time was also
observed, $F(2,150) = 18.36$, $p < .001$, $\eta_p^2 = .20$, 90% CI (.10, .28), which was qualified by a significant Condition $\times$ Time interaction, $F(2,74) = 22.56$, $p < .001$, $\eta_p^2 = .38$, 90% CI (.22, .48). Follow-up contrasts revealed non-significant linear, $F(1, 38) = 0.44$, $p = .51$, $\eta_p^2 = .011$, 90% CI (.00, .12) and quadratic, $F(1, 38) = 0.80$, $p = .38$, $\eta_p^2 = .021$, 90% CI (.00, .14) trends in the low PB-TB condition, and significant linear, $F(1, 37) = 24.08$, $p < .001$, $\eta_p^2 = .39$, 90% CI (.19, .54) and quadratic, $F(1, 37) = 27.23$, $p < .001$, $\eta_p^2 = .42$, 90% CI (.21, .56) trends in the high PB-TB condition. That is, while belongingness was low and stable in the low PB-TB condition, those in the high PB-TB condition reported a rapid decrement in belongingness that plateaued after Time 2 and increased again slightly by Time 3.

A third ANOVA tested the effect of condition and zest group across time on desire to disengage. A significant main effect of condition, $F(1,75) = 32.93$, $p < .001$, $\eta_p^2 = .31$, 90% CI (.17, .42) indicated that those in the high PB-TB condition expressed significantly higher desire to disengage from the task over the course of the experiment compared to those in the low PB-TB condition. Significant main effects of time were also observed, $F(2,74) = 3.90$, $p = .025$, $\eta_p^2 = .10$, 90% CI (.01, .20) which were qualified by a significant Condition $\times$ Time interaction, $F(2,119.79) = 6.23$, $p = .005$, $\eta_p^2 = .08$, 90% CI (.02, .17), and a significant three-way interaction between condition, time and zest group, $F(2,119.79) = 5.44$, $p = .009$, $\eta_p^2 = .07$, 90% CI (.02, .16). As shown in Figure 1c, the three-way interaction appeared to be due to different patterns of change from Time 1 to Time 2 for the two zest groups in the high PB-TB condition, but not in the low PB-TB condition. Specifically, at Time 1, high zest participants in the high PB-TB condition expressed a lower desire to disengage than low zest participants, while there were no differences between the groups at Time 2. No other main or interaction effects were significant.\(^3\)

Results thus replicate previous research (Collins et al., 2016) showing that: (a) the Interpersonal Persistence Task is a valid manipulation of burdensomeness and lowered
belongingness, (b) the combination of these factors causes a desire to disengage, while (c) zest for life delays against the initial adverse effects of the interpersonal factors on disengagement.

To clarify the relative influence of burdensomeness and thwarted belongingness on desire to disengage in the high PB-TB condition, a hierarchical multiple regression was conducted (Table 1). To control for effort and interest, both variables were entered at step one. Mean burdensomeness and thwarted belongingness ratings were added at step two, and their interaction was added at step three. At step one, the model was not significant, $F(2,36) = .24, p = .79$, indicating that participants’ level of effort and interest did not contribute significantly to their desire to disengage. At step two, the model was significant, $F(4,34) = 3.81, p = .01$, with the interpersonal factors explaining an additional 30% of the variance in desire to disengage, however only burdensomeness was a significant predictor. The addition of the interaction between burdensomeness and lowered belongingness at step three did not add significantly to the model.

**Study 2**

Study 1 confirmed that lowered belongingness and perceived burdensomeness can be simultaneously experimentally manipulated, and that these variables cause a wish to disengage. The interpersonal theory stipulates that it is the interpersonal nature of burdensomeness and thwarted belongingness that drive thoughts of disengagement (Joiner, 2005), yet this fundamental assumption has never been tested. To date all research on the theory has been limited by this key confound, where the well-documented associations (e.g., Ribeiro et al., 2013) between these interpersonal factors and suicidal thoughts may be unrelated to the interpersonal nature of the constructs, but could instead be caused by a more general sense of inadequacy. The latter would be consistent with the escape theory of suicide (Baumeister, 1990), and with evidence indicating that failure to meet a standard is associated
with suicide ideation (e.g., Chatard & Selimbegovic, 2011). To distill interpersonal from intrapersonal failure, the Persistence Task was modified to also contain an intrapersonal manipulation, and participants played the task either competitively (against each other; high and low failure: intrapersonal condition), or on a team, as outlined in Study 1 (high and low failure: interpersonal condition). As Study 1 used a participant sample who fell at the extremes of zest for life scores, Study 2 examined the effect of the different manipulations on a sample falling within the normal ranges on belongingness, burdensomeness, and zest for life.

Method

Participants and Procedures. Sixty-three undergraduate students (34 females and 29 males) ranging in age from 17-46 years ($M = 18.90$ years, $SD = 4.28$) whose scores fell within the average range (one standard deviation above and below the mean) on measures of thwarted belongingness, perceived burdensomeness, and zest for life participated for course credit. Self-reported ethnicity consisted of Caucasian/Australian (61.9%), Asian (19.0%), European (3.2%), African (1.6%) and Other (14.3%) ethnicities. All participants were debriefed and provided with mental health resources following the study.

Persistence task. Participants were randomly allocated to one of four experimental groups. Two groups (high and low failure: interpersonal condition) played the task as outlined in Study 1. Two other groups (high and low failure: intrapersonal condition) played a nearly identical task with one modification. Here, participants were informed that they would be playing a competitive task, and would be competing against two other players with the goal of beating an individual target score. The task and all other procedures were identical to Study 1, such that those in the high failure condition (like those in the high PB-TB condition) consistently performed worse than their co-players and received critical feedback, while those in the low failure condition (like those in the low PB-TB condition)
consistently performed slightly better than their co-players, and received encouraging comments from co-players.

**Measures.** All measures were identical to those in Study 1. Questionnaires about perceived burdensomeness, thwarted belongingness, and zest for life were administered at screening (baseline), and questionnaires about suicide risk and general psychological distress were administered directly following the task prior to debriefing.

**Results & Discussion**

**Data analytic strategy.** Data were screened for outliers and participant feedback was examined independently by two researchers to evaluate whether participants expressed suspicion that the task may have been rigged. To determine the effect of the manipulation on desire to disengage, a 2 (intrapersonal/interpersonal condition) × 2 (high/low failure) × 3 (blocks of trials) mixed-design ANOVA was run.

**Data screening and manipulation checks.** One case was identified who exceeded the critical value ($z = 3.29$) on the reaction-time variable. As this participant responded within the normal range on all other measures, they were assigned a score of three standard deviations above the mean (Field, 2009). All task measures were normally distributed (skew $< ±2$; Field, 2009). Mean task burdensomeness and belongingness ratings were significantly correlated ($r = .65$, $p < .01$).

Twelve participants were identified who expressed suspicion that the task was fixed. While these participants did not differ from non-suspicious participants in mean scores of task related measures ($ps > .05$), they were removed from subsequent analyses.

**Sample characteristics.** Frequency of self-reported suicide ideation was as follows: 43.1% thought about suicide at least once in the past year, 5.9% thought about suicide on at least a monthly basis, and 2.0% thought about suicide at least weekly. More than a tenth of the sample (11.8%) reported at least one lifetime suicide attempt, with 3.9% reporting
multiple attempts. These findings are consistent with others showing heightened rates of suicide ideation (Johnson, Gooding, Wood, & Tarrier, 2010) and lifetime suicide attempts (e.g., Bauer, Chestin, & Jeglic, 2015; Center for Collegiate Mental Health, 2015; Hirsch & Barton, 2011) among university students.

Participants did not significantly differ across the four experimental groups in levels of suicide ideation, $F(3, 47) = 0.79, p = .51, \eta^2 = .048, 90\% \text{ CI (.00, .05)}$, suicide attempts, $F(3, 47) = 0.52, p = .67, \eta^2 = .032, 90\% \text{ CI (.00, .33)}$, baseline burdensomeness, $F(3, 47) = 0.33, p = .80, \eta^2 = .021, 90\% \text{ CI (.00, .06)}$, baseline belongingness, $F(3, 47) = 0.84, p = .48, \eta^2 = .051, 90\% \text{ CI (.00, .13)}$, or baseline zest for life $F(3, 47) = 0.34, p = .80, \eta^2 = .029, 90\% \text{ CI (.00, .08)}$. Participants also did not significantly differ across groups in reported levels of interest in the task, $F(3, 47) = 1.86, p = .15, \eta^2 = .106, 90\% \text{ CI (.00, .21)}$, or effort exercised while playing, $F(3, 47) = 1.52, p = .22, \eta^2 = .088, 90\% \text{ CI (.00, .19)}$.

**Experimental manipulation.** An ANOVA was run to determine the effect of condition (intrapersonal/interpersonal) by failure rate (high/low) on desire to disengage. Participants in the high failure conditions expressed a significantly greater desire to disengage relative to those in the low failure conditions, $F(1, 47) = 32.16, p < .001, \eta^2_p = .41, 90\% \text{ CI (.22, .54)}$, indicating that failure, whether interpersonal or intrapersonal, causes a wish to give up. The main effect of failure was qualified by a significant Time x Failure interaction, $F(2, 94) = 4.65, p = .012, \eta^2_p = .09, 90\% \text{ CI (.01, .18)}$. Follow-up contrasts revealed a significant linear trend across time, $F(1, 26) = 8.20, p = .004, \eta^2_p = .24, 90\% \text{ CI (.04, .43)}$ in the high failure conditions, but not in the low failure conditions, $F(1, 21) = 0.53, p = .48, \eta^2_p = .03, 90\% \text{ CI (.00, .20)}$, indicating that those in the high failure groups experienced an increasing desire to disengage over the course of the experiment while desire to disengage remained relatively stable in the low failure groups.
A significant main effect of condition, $F(1, 47) = 5.78, p = .020, \eta^2_p = .11, 90\% \text{ CI (.01, .25)}$ and a significant Condition x Failure interaction, $F(1, 47) = 8.88, p = .005, \eta^2_p = .16, 90\% \text{ CI (.03, .31)}$ were also observed. Follow-up tests revealed a significant main effect of condition among high failure, $F(1, 26) = 10.95, p = .003, \eta^2_p = .30, 90\% \text{ CI (.07, .48)}$, but not low failure groups, $F(1, 21) = 0.37, p = .55, \eta^2_p = .02, 90\% \text{ CI (.00, .18)}$. As shown in Figure 2, it was the interpersonal/high failure (high PB-TB) condition that caused the greatest desire to disengage of the four experimental conditions.

**General Discussion**

At the core of the interpersonal theory lies the assumption that it is the interpersonal nature of perceived burdensomeness and thwarted belongingness that drives risk for suicide. To date, empirical support for the theory (e.g., Ribeiro et al., 2013) has failed to distinguish whether the interpersonal factors drive disengagement because they instill a general sense of inadequacy and failure, or whether it is more specifically failed interpersonal needs that are particularly pernicious. We thus sought to disentangle this confound limiting existing research by clarifying the causal mechanism via which the interpersonal variables caused a desire to disengage.

Findings showed that participants allocated to the high failure manipulations (interpersonal or intrapersonal) expressed a heightened desire to disengage from the task compared to those in the low fail conditions, indicating that failure, regardless of whether one is acting individually or on a team, drives a desire to give up. Large effect sizes highlight that desire to disengage was stimulated to a significant degree by both failure manipulations, however it was the interpersonal high failure (PB-TB) manipulation that was especially pernicious, with those allocated to this condition expressing a significantly greater desire to disengage relative to the individual high fail group.
Together, findings show that while any form of failure is aversive, this is particularly so when failure is framed interpersonally. The persistence task permitted the extraction of the interpersonal nature of failure to provide the first causal evidence that failing others amplifies a desire to disengage over and above that caused by intrapersonal failure. While not inconsistent with the escape theory of suicide, where ideation is thought to ensue from aversive self-awareness following failure (Baumeister, 1990), results support the interpersonal theory’s more specific proposal that even short-lived failed interpersonal efficacy and belongingness are particularly powerful adverse states that cause a wish to disengage (Joiner, 2005).

In addition to supporting the essence of the interpersonal theory, findings from Study 1 also showed that the brief version Interpersonal Persistence Task is a valid manipulation of perceived burdensomeness and thwarted belongingness. Large effect sizes indicate that both interpersonal constructs were manipulated to a significant degree. Results also confirmed that the combination of the two interpersonal factors causes a desire to disengage, though when their relative effects were tested separately, only perceived burdensomeness made a significant contribution. While inconsistent with the interpersonal theory’s proposal that both burdensomeness and thwarted belongingness confer adverse effects, findings are consistent with prior research using the task (Collins et al., 2016) and with the non-experimental literature (Ma et al., 2016) indicating that perceived burdensomeness tends to emerge as the more pernicious interpersonal risk factor. It is possible that thwarted belongingness acts indirectly via burdensomeness to amplify disengagement, consistent with speculation that the interpersonal factors may mutually influence each other (Joiner, 2005), though this has yet to be examined empirically.

Findings also confirmed that zest for life partly buffers (Johnson, Wood, Gooding, & Tarrier, 2011) the initial adverse effects of the interpersonal risk factors on disengagement by
delaying their adverse effects. This was consistent with findings showing that zest for life mitigates risk conferred by the interpersonal factors (Collins et al., 2016; George, Stritzke, et al., 2016) and further attests to the importance of considering both risk and resilience when evaluating suicide risk (e.g., Rutter, Osman, & Freedenthal, 2008). Moreover, the strong negative correlations observed between zest for life suicide ideation and intention suggest that screening for zest for life may be a valuable means to assess suicide risk among those who may be reticent to disclose intent.

**Limitations and Directions for Future Research**

The present research should be considered in the context of its limitations. The brief version of the task may have been of insufficient length to test the full protective properties of zest for life, since resilience does not necessarily confer immunity but allows the successful adaptation following exposure to stressors (e.g., Kleiman et al., 2013). High zest participants may hence have had insufficient time to recover from the thwarted interpersonal states.

The use of explicit questions about burdensomeness, belongingness, and desire to disengage may have also fostered demand characteristics. However, the large effects observed between conditions at the first time interval partly allay these concerns. To minimize demand effects, all participants expressing disbelief about the task were removed from the analyses, though the open-ended suspicion questions may have lacked sensitivity in identifying all suspicious participants.

Generalizability of findings is limited to the samples studied. Findings from Study 1 may not necessarily generalize to those who experience moderate levels of zest for life, while results from Study 2 might not generalize to those who experience more extreme levels of zest, perceived burdensomeness, or thwarted belongingness.

Finally, it is acknowledged that desire to disengage from experimentally induced adversity differs from the “ultimate disengagement – a disengagement from life itself”
(Scheier & Carver, 1992, p. 251). Recent evidence suggests though that desire to disengage from the Interpersonal Persistence Task is significantly associated with multiple indices of suicide risk (Collins et al., 2016; Collins, Stebbing, Stritzke, & Page, 2017), consistent with earlier speculation that the desire to disengage from interpersonal adversity and from life itself may recruit similar psychological processes (cf. Joiner, 2005). Furthermore, the Interpersonal Theory notes that a sense of hopelessness exists when the causes of perceived burdensomeness and thwarted belongingness are perceived as stable and unchanging. The present experimental task deliberately involved a time-limited and focused manipulation of these constructs but, the manipulation of heightened thwarted belongingness and perceived burdensomeness was stable, unchanging, and no relief occurs for the duration of the task. Therefore, this simulates in an experimental context the role of hopelessness in relation to thwarted belongingness and perceived burdensomeness as proposed by the theory.

The current research used the Interpersonal Persistence Task to test a key assumption of one theory of suicide and in so doing highlighted two issues. First, it suggests that the same experimental paradigm could be used to test other predictions of the model (e.g., predictions concerning the effects of changes in burdensomeness independent of belongingness). Second, the experimental paradigm could be modified to test predictions of other theories. For example, the effects of rumination about burdensomeness and belongingness could be examined by modifying the task to foster a sense of entrapment in these perceptions. In so doing, the paradigm can complement existing research by permitting tests of theoretical predictions in situations with high internal validity.
Conclusion

The current research tested a previously unexamined assumption of the interpersonal theory that it is the interpersonal nature of perceived burdensomeness and thwarted belongingness that drives disengagement. Though similar deficits in persistence were also observed when participants failed at an equivalent competitive task, deficits were significantly worse when failure was framed interpersonally, indicating that there is something especially pernicious about thwarted interpersonal needs.

Taken together, our findings support the interpersonal emphasis of the interpersonal theory of suicide. Perceived burdensomeness and thwarted belongingness drive heightened thoughts of escape not just because they involve personal inadequacy and failure to meet a standard, but because their interpersonal nature confers additional risk. Results also suggest that interventions targeting the reduction of perceived burdensomeness and the enhancement of zest for life will result in a decreased desire to disengage from difficult circumstances. This appears to have particularly vital implications for those who are contemplating disengagement from life.
References


mindfulness intervention attenuates desire to escape following experimental induction of the interpersonal adversity implicated in suicide risk. *Mindfulness.*
doi: 10.1007/s12671-017-0686-1


Footnotes

1 One participant reported that they preferred not to disclose their gender.

2 The interest variable exceeded this value marginally (skew = -2.10), but a square root transformation did not alter outcomes on any subsequent statistical test, and hence all results are reported using the untransformed variable.

3 When effort and general psychological distress were entered as covariates in each of the ANOVAs, no significant effects were observed ($p > .05$).

4 Team task belongingness ratings were reverse-coded such that high scores represent higher levels of thwarted belongingness. Recent research indicates that participants who play the Persistence Task express a strong desire to belong to their team, and the large effect of the experimental belongingness manipulation shows that this powerful need to belong to the team can be thwarted (Collins et al., 2017).
Table 1

*Hierarchical Regression using the High PB-TB Group: Burdensomeness predicts Desire to Disengage after Controlling for Interest and Effort (n = 39)*

<table>
<thead>
<tr>
<th>Step 1</th>
<th>$b$</th>
<th>SE $b$</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>-.27</td>
<td>.40</td>
<td>-.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>.11</td>
<td>.23</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\text{Step 2}$

| Effort   | -.34  | .35    | -.17    | $R^2$ | .31**       |
| Interest | .01   | .20    | .01     |       | .30**       |
| Burdensomeness | .62 | .16    | .55**   |       |             |
| Thwarted Belongingness | .07 | .27    | .04     |       |             |

$\text{Step 3}$

| Effort   | -.37  | .36    | -.18    |       | .31         |
| Interest | .03   | .21    | .03     |       | .003        |
| Burdensomeness | .61 | .17    | .55**   |       |             |
| Thwarted Belongingness | .06 | .27    | .03     |       |             |
| PB x TB  | .13   | .36    | .06     |       |             |

*Note. PB x TB = Perceived burdensomeness x Thwarted belongingness*

** $p < .01$
Figure 1. Mean perceived burdensomeness (a), belongingness (b) and desire to disengage (c) ratings across the three blocks of task trials (Study 1); error bars represent standard error.
Figure 2. Mean desire to disengage ratings across the three blocks of task trials (Study 2); error bars represent standard error.