Short Communication

Response surface modeling of how love mitigates the association between a need to belong and suicidality

Ronald R. Holden*, Christine E. Lambert, Genevieve Bianchini, Robbie E. Wong, Shahrukh Towheed, Christy Yeung, G. Cynthia Fekken

Department of Psychology, Queen's University, Kingston, Ontario, Canada

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ABSTRACT

Research indicates that discrepancies between a need to belong and relationship satisfaction relate to negative well-being (i.e., loneliness, depression, low self-esteem) in adolescents. We extend these findings to adults and to more intense forms of relationship satisfaction (i.e., love-mattering) and negative well-being (i.e., suicidality). Belongingness needs did not relate to suicidality, but discrepancies between high belongingness needs and low love associated with greater suicidality. For those with a high need to belong, love-mattering may potentially mitigate the link between a need to belong and suicidality.

omnia vincit amor [Love Conquers All] (Virgil, ~38–39 BCE)

1. Introduction

Connectedness with others has an evolutionary basis that provides individuals with access to resources such as protection, food, mating, and other benefits (Verhagen, Lodder, & Baumeister, 2017). Fostering interpersonal relationships improves survival and reproduction, contributing to a natural selection process that develops a motivation for social bonding. Baumeister and Leary (1995) refer to this motivation as a need to belong and it represents a fundamental human motivation involving positive, temporally stable interactions with a small number of others. A lack of belongingness "should constitute severe deprivation and cause a variety of ill effects" (Baumeister & Leary, 1995, p. 497).

Verhagen et al. (2017) refined the role of need to belong by demonstrating that unmet belongingness needs rather than high belongingness needs were associated with adverse well-being. They reported no empirical link to greater loneliness, more depression, or lower self-esteem when the degree of need to belong matched the degree of relationship satisfaction. Conversely, an unfilled need to belong (i.e., the combination of high belongingness needs and low relationship satisfaction) indicated negative well-being. In operationalizing an unfulfilled need to belong, Verhagen et al. analyzed discrepancies between a need to belong and relationship satisfaction using response surface modeling (Shanock, Baran, Gentry, Pattison, & Heggestadt, 2010).

The relationship satisfaction construct applies both to acquaintances as well as intimate partners. The construct of love-mattering, however, focuses on close, intensely emotional relationships. Mattering, the sense that we make a differences in others' lives (Elliott, Colangelo, & Gelles, 2005), associates positively with academic buoyancy (Flett, Su, Ma, & Guo, 2014) and negatively with depression (Taylor & Turner, 2001), loneliness, and social anxiety (Flett, Goldstein, Pechenkov, Nepon, & Wekerle, 2016). Whether relationship satisfaction relates to an extreme index of well-being such as suicidality is uninvestigated.

2. Aim and hypothesis

Our aim was to extend previous findings regarding the need to belong to more intense forms of relationship satisfaction and well-being constructs. Following Verhagen et al. (2017), we hypothesized that, for individuals high on unmet belongingness needs, love would mitigate the association between these unmet needs and suicidality.

3. Method of analysis

Quadratic polynomial regression and response surface modeling (Shanock et al., 2010) evaluated agreement and discrepancy between two predictors (i.e., need to belong and love) in the same domain as they related to three indices of suicidality. The two predictors are centered and the outcome variable is regressed on to centered predictor scores, centered predictor scores squared, and cross-products of the centered predictor scores. This evaluates complex construct relationships while reducing potential difference score reliability issues (Cohen, Nahum-Shani, & Doveh, 2010). Further, this technique addresses how

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agreement between predictors relates to the outcome, how the degree of discrepancy between predictors relates to the outcome, and how the direction of the discrepancy between the predictors relates to the outcome. Following Verhagen et al. (2017), predictors were from a common conceptual domain, predictor scales were assessed on identical response ratings, predictor scores were evaluated for the presence of discrepancies, and predictor scores were centered around scale midpoints before undertaking polynomial regression analyses.

4. Method

4.1. Participants and procedure

Participants were 244 American adults (144 men, 100 women) recruited through Mechanical Turk and were paid $7.00 US. Mean age was 35.42 years ($SD = 10.24$).

4.2. Measures

4.2.1. Predictors

Belongingness needs were assessed with the Need to Belong Scale (Leary et al., 2013) comprising 10 items (e.g., "If other people don't seem to accept me, I don't let it bother me.") answered on 5-point ratings (1 = *strongly disagree* to 5 = *strongly agree*). Coefficient alpha reliability in the current study was 0.88.

A Love-mattering scale (Table 1) was rationally constructed for this study. Unlike other measures of mattering (e.g., France & Finney, 2009) that focus on mattering to other people, the current scale regarded mattering reciprocally: mattering comprised both mattering to other people and how much other people matter to the individual. Items are answered on a 5-point rating. For this study, coefficient alpha was 0.87.[1]

4.2.2. Suicidality criteria

The Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1993) comprises 19 items measuring ideation and intent. Items are multiple choice with three or four options. Consistent with previous factor analyses (e.g., Holden & Delisle, 2005), the BSS was scored on subscales of Suicide Motivation and Suicide Preparation. Suicide Motivation measures passive aspects of ideation such as ambiguity about living or dying; Suicide Preparation quantifies an active suicide component including planning the suicidal act. In the present study, coefficients alpha were 0.88 and 0.78, respectively.

The Suicide Behaviors Questionnaire–Revised (Osman et al., 2001) is a suicide risk measure appropriate for nonclinical populations and includes four multiple choice items with varying numbers of response options: "Have you ever thought about or attempted to kill yourself?", "How often have you thought about killing yourself in the past year?" "Have you ever told someone that you were going to commit suicide, or that you might do it?", and "How likely is that you will attempt suicide someday?". In the current study, coefficient alpha was 0.79.

5. Results

Descriptive statistics and correlations are presented in Table 2. All suicidality measures intercorrelated with more than a large effect size. Whereas scores on the Love scale had negative associations of a medium effect size with the suicidality scales, the need to belong was linearly unrelated to the other measures, consistent with Verhagen et al.'s (2017) view that the unfulfilled need to belong, not the need itself, is important.

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[1] In an exploratory factor analysis of items (see supplementary materials), parallel analysis (1000 replications), a scree test, and the eigenvalue-greater-than-one heuristic all supported a one-factor solution where all items had loadings greater than 0.78.

Table 1

The Love-Mattering Scale.

1. I am loved.
2. I am in love.
3. There is someone who is in love with me.
4. I matter to others.
5. Others matter to me.

Note. Answered as 5-point ratings: Strongly disagree, Moderately disagree, Neither agree or disagree, Moderately agree, Strongly agree.
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Table 2

Descriptive statistics and scale intercorrelations ($N = 244$).

Measure	Descriptives		Correlations			
	Mean	SD	1	2	3	4
1. Need to Belong	2.82	0.81				
2. Love-Mattering	3.87	1.04	−0.03			
3. Suicide Motivation	1.94	3.27	−0.01	−0.47**		
4. Suicide Preparation	4.23	3.28	−0.04	−0.25**	0.73**	
5. Suicidal Behaviors Questionnaire–Revised	5.41	3.10	0.00	−0.35**	0.78**	0.73**

** $p < 0.01$.

Following Shanock et al. (2010), discrepancies between belongingness needs and love were evaluated by standardizing each predictor and examining the number of cases having differences in standardized scores exceeding half a standard deviation. Given 69.7% discrepant cases, response surface modeling was justified.

Polynomial regression models yielded significant prediction for scores on scales of: Suicide Motivation, $R^2 = 0.18$, $F(5, 238) = 10.72$, $p < 0.001$; Suicide Preparation, $R^2 = 0.31$, $F(5, 238) = 20.92$, $p < 0.001$; and the Suicide Behaviors Questionnaire–Revised, $R^2 = 0.11$, $F(5, 238) = 5.88$, $p < 0.001$. Of note, for each suicidality criterion, subsequent analyses confirmed that inclusion of quadratic terms significantly enhanced ($ps < 0.01$) variance accounted for, relative to only the moderator effect. Regression coefficients from these polynomial analyses were used to estimate response surface values (Table 3) for the line of perfect agreement and the line of incongruence separately for each outcome variable. Across all three outcome variables, results were consistent. As an example, Fig. 1 displays the response surface obtained when Suicide Motivation scale scores were the outcome. As indicated by the slope of the line of agreement, a_1, when need to belong and love were in agreement, suicide motivation significantly decreased as need to belong and love increased. Significant positive values for a_2, the curve of the line of agreement, signified that the line of agreement had a concave (i.e., downward curving) surface. For the line of incongruence, a significant value for its slope, a_3, indicated that suicide motivation was higher when the discrepancy was such that love was lower than the need to belong rather than vice versa. Further, this latter association had a significant downward curving (i.e., concave) surface as shown by a_4.

6. Discussion

A lack of belongingness is theorized (Baumeister & Leary, 1995) to cause deleterious effects, however, present findings indicate this is nuanced beyond a simple linear relation. The non-significant linear association between a need to belong and suicidality, in contrast to the at least medium associations between love and suicidality, aligns with Flett's (2018) perspective that mattering is important to human functioning. The lack of a linear association between a need to belong and suicidality is consistent with a recent review (Hatcher & Stubbersfield, 2013) and highlights that need to belong is distinct from Joiner's (2005) thwarted belongingness which involves a painful mental state.