

## Research Article

## How Can I Connect With Thee?

## Let Me Count the Ways

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**ABSTRACT**—Two studies were conducted to examine mental representations of loneliness and social connectedness. In Study 1, young adults ( $N = 2,531$ ) completed the revised UCLA Loneliness Scale (R-UCLA scale) and demographic questionnaires. An exploratory factor analysis of the R-UCLA scale on half the sample revealed a three-dimensional conceptual structure that generalized across gender. This mental representation consisted of correlated facets labeled *Isolation, Relational Connectedness, and Collective Connectedness*. A confirmatory factor analysis on the other half of the sample corroborated this three-factor solution. In Study 2, a population-based sample of 197 older males and females ( $M_{age} = 57.5$  years) completed the R-UCLA scale and measures of objective social circumstances. The confirmatory factor analysis supported the three-factor structure in this diverse and older adult sample. Each facet was uniquely predicted by theoretically related social circumstances. These findings suggest how humans make meaning of their social relationships in their mental representations of loneliness and connectedness.

The survival of the human species depends on social abilities to communicate with, understand, and work with other individuals. Psychological studies of the self confirm the importance of sociality, as numerous studies now show that the self is inextricably and reciprocally linked with social relationships and identities (e.g., Brewer & Gardner, 1996; Leary, 1999). People are motivated to form relationships that lead to the acquisition of social identities and to the incorporation of close others into their self-construals (Baumeister & Leary, 1995). To the extent that social others become part of one's self-construal, the self undergoes an expansion that, at least in the case of romantic partners, is associated with relationship satisfaction (Aron & Fraley, 1999).

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The antithesis of the experience of self-expansion is the experience of social isolation or loneliness. In the literature on loneliness, however, greater emphasis has been placed on people's feelings about the adequacy of their social connections and on the measurement of individual differences in these experiences than on the mental representations of social connections. Perhaps the most frequently used measure of social isolation is the revised UCLA Loneliness Scale (R-UCLA scale), a 20-item questionnaire measuring general feelings of social isolation and dissatisfaction with one's social interactions (Russell, Peplau, & Cutrona, 1980). From a measurement perspective, individual differences in the experience of loneliness are adequately gauged by a unidimensional measurement instrument.

The same kind of data that has been used to measure individual differences, however, can be used instead to answer questions about the dimensions of individuals' conceptual organization of their relationships to others. Precedent for such an approach to understanding mental representations derives from early work by Osgood, Suci, and Tannenbaum (1957), who used a factor analytic method to understand the structural dimensions of semantic space that contributed to connotative judgments. The three dimensions they identified—evaluation, potency, and activity—were conceived not as individual difference dimensions, but as aspects of human meaning making in the conceptual semantic domain.

In the present study, we employed a factor analytic method to investigate how humans make meaning of their social relationships. Prior research on the factorial structure of the R-UCLA scale provides a glimpse into the structure of these conceptual organizations. For example, Knight, Chisholm, Nigel, and Godfrey (1988) found that feelings of social isolation may derive from the absence of "emotional" connections with others for some individuals, and from the absence of "social" connections for others; McWhirter (1990) identified three sources of individual differences in social connectedness—"intimate others," "social others," and "belonging/affiliation"—whereas Hays and DiMatteo (1987) identified five dimensions that distinguish

individuals who feel socially connected and satisfied from those who feel isolated and dissatisfied. None of these studies were designed explicitly to investigate people's mental representations of their social relationships, however. Moreover, differences in sample composition, statistical approach, and sample size have contributed to inconsistencies in the structure of loneliness across studies. Research on the dimensions of loneliness is nevertheless noteworthy for its parallels with research on the dimensions of the social self. Specifically, psychological theories of the self, which, like theories of loneliness, originally focused on a person's sense of unique identity differentiated from others, now distinguish among the personal self (individual level of analysis), relational self (interpersonal level of analysis), and collective self (group level of analysis; Brewer & Gardner, 1996).

In the research reported in this article, we aimed to test whether the individual, relational, and collective levels of analysis characterize people's mental representations of their social connections, in particular, their relationship satisfaction as measured by the R-UCLA scale. A secondary aim was to investigate whether any such distinctions are grounded in differences in objective social relationships.

## STUDY 1: LONELINESS AND SOCIAL CONNECTEDNESS IN YOUNG ADULTS

### Method

#### *Participants, Measures, and Procedures*

Participants were 2,628 undergraduate students at Ohio State University who completed demographic and psychological assessment forms (see Hawkley, Burleson, Berntson, & Cacioppo, 2003, for recruitment details). Loneliness-social connectedness was assessed using the R-UCLA scale (Russell et al., 1980), a measure of general loneliness and degree of satisfaction with one's social connections. After elimination of participants whose data were incomplete or unreliable, the final sample size was 2,531 (1,198 male, 1,315 female, and 18 undeclared).

#### *Data Analysis*

Following the example of Osgood (Osgood & Suci, 1955), we used factor analysis to identify dimensions of meaning in social space. Moreover, we allowed correlations among the structural dimensions of social connectedness. We then conducted a confirmatory analysis on an independent data set to test the reliability of the structure identified in the exploratory factor analyses. Finally, we performed a second-order factor analysis to examine the plausibility of a single loneliness factor that exhibits different facets depending on the types of items employed.

### Results

#### *Factor Analyses of the R-UCLA Scale*

The factor structure of the R-UCLA scale was assessed by randomly dividing the sample into an exploratory data set ( $n =$

1,255) and a confirmatory data set ( $n = 1,276$ ). The data from the exploratory sample were analyzed using the maximum likelihood (ML) option in comprehensive exploratory factor analysis (CEFA; Browne, Cudeck, Tatneni, & Mels, 1998), employing oblique rotations (Direct Quartimin with Kaiser standardization) to allow for the possibility of correlated factors.

Using the root mean square error of approximation (RMSEA; Browne & Cudeck, 1992) as an index of statistical fit, we found the one-factor solution was unsatisfactory ( $RMSEA = 0.103$ , 90% confidence interval,  $CI = 0.099-0.106$ ). The two-factor solution ( $RMSEA = 0.066$ , 90%  $CI = 0.062-0.070$ ) and three-factor solution ( $RMSEA = 0.056$ , 90%  $CI = 0.052-0.060$ ) provided reasonable fit, with the three-factor solution superior to the two-factor solution as gauged by the lack of overlap in the CIs around the RMSEAs. Furthermore, the two-factor solution showed evidence of underfactoring: Several items loaded on both factors. The four-factor solution ( $RMSEA = 0.049$ , 90%  $CI = 0.045-0.054$ ), in contrast, showed evidence of overfactoring: Only one item loaded on the last factor. Thus, despite the slightly improved statistical fit of the four-factor solution, the three-factor solution appeared optimal. The item loadings from the rotated pattern matrix are presented in Table 1 with their respective standard errors. As in prior research, the three factors were highly correlated ( $|r|s \geq .55$ ; see Table 2).

The second data set was used to conduct a confirmatory factor analysis with RAMONA (Browne & Mels, 2000). Factor loadings and standard errors from this analysis are presented in the last three columns of Table 1. Factor intercorrelations were again found to be substantial ( $|r|s \geq .73$ ; see Table 2). The  $RMSEA$  was 0.067 (90%  $CI = 0.063-0.071$ ), indicating a reasonably good overall fit of the restricted three-factor solution to the data.<sup>1</sup>

The confirmatory factor analysis presented in Table 1 fits the data well but does not model whether there is a single latent loneliness construct overarching these three factors. We therefore conducted a second-order factor analysis that explicitly represented this model. The second-order factor analysis model was mathematically equivalent to the first-order factor analysis model, and fit the data to exactly the same extent. This is not the same as saying that the first-order one-factor model fit as well as the three-factor model, however. Indeed, a statistical difference test,  $\chi^2(37) = 1,756, p < .001$ , indicated a significantly worse fit for the one-factor than for the three-factor first-order structure.

<sup>1</sup>To ensure that the three-factor structure we identified using the R-UCLA scale was not limited to this instrument, we factor-analyzed independent data from conceptually related items from the Social & Emotional Loneliness Scale (Cramer, Ofosu, & Barry, 2000; DiTommaso & Spinner, 1993), Relational Interdependence Self-Construal Scale (Cross, Bacon, & Morris, 2000), Collective Interdependence Self-Construal Scale (Gabriel & Gardner, 1999), and Collective Self-Esteem Scale (Luhtanen & Crocker, 1992). Comparisons of one-, two-, three-, and four-factor models supported the superiority of a three-factor model, and the pattern of factor loadings conformed to theoretical expectations. Interested readers are invited to contact the primary author for more information on these analyses.

**TABLE 1**  
*Factor Loadings of Items From the Revised UCLA Loneliness Scale in Study 1*

Item	Exploratory factor analysis ( <i>n</i> = 1,255)			Confirmatory factor analysis ( <i>n</i> = 1,276)		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
<b>2. I lack companionship.</b>	<b>.676 (.034)</b>	.032 (.028)	-.074 (.034)	.661 (.017)		
3. There is no one I can turn to.	<b>.538 (.041)</b>	.331 (.033)	-.110 (.033)	.716 (.017)		
4. I feel alone. <sup>a</sup>	<b>.636 (.037)</b>	.022 (.030)	-.008 (.037)	.590 (.019)		
7. I am no longer close to anyone.	<b>.504 (.041)</b>	.218 (.032)	.033 (.038)	.728 (.014)		
<b>11. I feel left out.</b>	<b>.735 (.035)</b>	-.055 (.026)	.084 (.037)	.735 (.014)		
12. My social relationships are superficial.	<b>.487 (.043)</b>	.025 (.033)	.039 (.042)	.566 (.020)		
13. No one really knows me well.	<b>.413 (.045)</b>	.155 (.032)	.166 (.043)	.696 (.016)		
<b>14. I feel isolated from others.</b>	<b>.768 (.035)</b>	-.040 (.025)	.129 (.037)	.822 (.010)		
<b>17. I am unhappy being so withdrawn.</b>	<b>.697 (.034)</b>	-.012 (.027)	-.036 (.034)	.640 (.018)		
18. People are around me but not with me.	<b>.620 (.042)</b>	-.050 (.027)	.210 (.043)	.779 (.012)		
<b>10. There are people I feel close to.</b>	.128 (.036)	<b>.525 (.031)</b>	.167 (.036)		.701 (.015)	
15. I can find companionship when I want it.	<b>.305 (.044)</b>	<b>.360 (.035)</b>	.061 (.038)	.259 (.041)	.346 (.041)	
<b>16. There are people who really understand me.</b>	.153 (.038)	<b>.463 (.033)</b>	.177 (.038)		.674 (.017)	
<b>19. There are people I can talk to.</b>	-.016 (.024)	<b>.888 (.022)</b>	.037 (.023)		.883 (.008)	
<b>20. There are people I can turn to.</b>	-.050 (.023)	<b>.963 (.021)</b>	.030 (.022)		.918 (.007)	
<b>1. I feel in tune with the people around me.</b>	.086 (.051)	.089 (.032)	<b>.549 (.054)</b>			.731 (.017)
<b>5. I feel part of a group of friends.</b>	.144 (.049)	.181 (.035)	<b>.404 (.052)</b>			.701 (.018)
<b>6. I have a lot in common with the people around me.</b>	-.083 (.032)	.108 (.031)	<b>.833 (.038)</b>			.732 (.017)
8. My interests and ideas are not shared by those around me.	<b>.336 (.056)</b>	-.038 (.029)	<b>.391 (.054)</b>	.499 (.049)		.091 (.053)
<b>9. I am an outgoing person.</b>	<b>.227 (.057)</b>	.011 (.032)	<b>.301 (.056)</b>	.024 (.056)		.540 (.056)

**Note.** Standard errors are in parentheses. Factor-specific item loadings are indicated in boldface. Items in boldface are the four highest-loading items on each factor (or in the case of Item 9, an item with a pattern of loadings that best distinguishes between factors).

<sup>a</sup>Approximately the first 200 students who completed the scale responded to this question in its initial form: “I do not feel alone.” Because of the frequency with which students left this item blank and prior reports on the confusion generated by this item (Hartshorne, 1993), we altered the wording as indicated.

What the second-order factor structure provides is an alternative conceptualization of the dimensionality of loneliness, as it explicitly includes a single second-order Loneliness factor that accounts for the correlations among the three first-order factors. The second-order factor influences all the measured variables through the first-order factors, but each first-order factor is also influenced by a specific aspect of loneliness. This conceptualization of loneliness supports the notion of loneliness as a coherent mental representation with three separable facets that are subordinate to a single overarching loneliness construct.

*Structure Interpretation*

To examine the nature of the three-faceted representation of loneliness-connectedness, we began by forming subscales consisting of only the four items with the highest loadings on each factor in order to ensure equal weighting for the three factors (items in boldface in Table 1; for Factor 3, Item 9 was selected over Item 8 because its factor loadings better discriminated between Factors 1 and 3). This strategy produced high and equivalent reliabilities across all the subscales. Cronbach’s alphas were .81, .87, and .76 for the first-, second-, and third-factor subscales, respectively.

**TABLE 2**  
*Factor Intercorrelations in Exploratory and Confirmatory Analyses of the Revised UCLA Loneliness Scale in Study 1*

Factor	Exploratory factor analysis ( <i>n</i> = 1,255)			Confirmatory factor analysis ( <i>n</i> = 1,276)		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
Factor 1	1			1		
Factor 2	-.65 (.020)	1		-.76 (.015)	1	
Factor 3	-.69 (.031)	.55 (.035)	1	-.80 (.017)	.73 (.019)	1

**Note.** Standard errors are in parentheses.

The four items constituting the first-factor subscale reflect feelings of aloneness, rejection, and withdrawal; this facet corresponds most closely to the overall feeling of isolation that individual differences researchers assume underlies loneliness. We labeled this facet Isolation to indicate that it pertains to social dissatisfaction at the individual level of analysis. The second and third factors, in contrast, consist of items that pertain to a social level of analysis. For the second factor, the items acknowledge feelings of familiarity, closeness, and support corresponding to the idea of a relational social self (Brewer & Gardner, 1996), and therefore prompted the label Relational Connectedness. The third factor consists of items that deal with feelings of group identification and cohesion corresponding to the idea of a collective social self and was therefore labeled Collective Connectedness. Our interpretation of these dimensions of loneliness-connectedness was not altered when we extended our examination to include all the items loading on each factor.

As in previous factor analyses of the R-UCLA scale (e.g., Austin, 1983; McWhirter, 1990), negatively worded items loaded on the first factor, and positively worded items loaded on the second and third factors. This wording bias has been a criticism of factor analyses of the R-UCLA scale, but if wording bias were solely responsible for the factor structure of the scale, then the second and third factors should not have been distinguishable. Instead, we found clear statistical and qualitative support for the separability of three distinct loneliness-connectedness facets.

#### *Generalizability Across Gender*

For each gender, CEFA was used to conduct an exploratory factor analysis, followed by an oblique target rotation to the same partially specified target (Browne, 1972). The target consisted of zero loadings in positions that corresponded to zero loadings in the confirmatory factor analysis, leaving free the remaining 20 factor loadings. Overlapping CIs around the RMSEAs for males ( $RMSEA = 0.052$ , 90% CI = 0.047–0.056) and females ( $RMSEA = 0.058$ , 90% CI = 0.054–0.068) indicate that the fit of the three-factor structure is equivalent for males and females, and support the appropriateness of a three-factor structure for both groups. Further inspection confirmed that the items loading on each factor contribute comparably to the constitution of that factor in males and females.

### **STUDY 2: LONELINESS AND SOCIAL CONNECTEDNESS IN OLDER ADULTS**

The results of Study 1 indicate that, for young adults, mental representations of loneliness-connectedness appear to originate from three highly related but distinct aspects of the social domain. Moreover, these aspects—Isolation, Relational Connectedness, and Collective Connectedness—are compatible with individual, relational, and collective aspects of the self

(Brewer & Gardner, 1996). Whether a population-based sample of older adults at a different point in their lives than the young adults in Study 1 would manifest a similar mental representation of loneliness-connectedness was the topic of our next study.

Differences in the everyday lives of young and older adults could contribute to differences in the experience and conceptual representations of loneliness-connectedness. Young adult undergraduate students organize their activities around fairly regimented schedules, devote considerable time to scholastic endeavors, and live with roommates, suite-mates, and hall-mates not of their own choosing. They are afforded numerous opportunities to socialize in a dormitory setting, but if the constrained choice of social partners or roommates fails to result in a social fit, dormitory social opportunities can, paradoxically, foster feelings of loneliness. Older adults are less likely to have their social opportunities dictated by circumstances, and are more likely to have choices regarding their everyday activities. In addition, whereas young adults are forming new friendships and are often in the process of seeking out a life mate, older adults are more likely to have stable friendships and to be married. Given these differences in everyday circumstances and social goals, we conducted Study 2 to test whether the fit of the three-dimensional structure identified in Study 1 would generalize to a population-based sample of older adults. Moreover, in Study 2, we used a multistage probability sampling design to recruit a population-based sample of older adults. Results from such samples have higher generalizability than results from samples of convenience, such as the one we employed in Study 1.

An additional goal of Study 2 was to examine predictors of the three facets of loneliness-connectedness. A three-dimensional structure of social meaning making would garner additional support if, for example, objective social circumstances were uniquely associated with feelings of Isolation, Relational Connectedness, and Collective Connectedness.

#### **Method**

A population-based sample of 229 African Americans (37 males, 44 females), Hispanics (33 males, 33 females), and Caucasians (39 males, 43 females) between the ages of 50 and 68 years were recruited from Cook County, Illinois, to participate in a longitudinal study of social relationships and health. Participants had to be ambulatory and able to speak English; no other exclusionary criteria were imposed. The sampling procedure has been detailed elsewhere (Hughes, Waite, Hawkley, & Cacioppo, 2004).

Participants completed approximately 8 hr of psychological and physiological testing that included administration of the R-UCLA scale and questions regarding their objective social circumstances; these questions asked about their marital status (1 = married or living with a partner, 0 = all others; henceforward, “married” refers to participants who were married or living with a partner and “nonmarried” refers to all other participants), the

**TABLE 3**  
*Factor Loadings in a Confirmatory Factor Analysis of the Revised UCLA Loneliness Scale in a Mid-Aged Sample, Study 2*

Item	Isolation	Relational Connectedness	Collective Connectedness
2. I lack companionship.	.574 (.052)		
3. There is no one I can turn to.	.663 (.044)		
4. I feel alone.	.726 (.038)		
7. I am no longer close to anyone.	.690 (.041)		
8. My interests and ideas are not shared by those around me.	.437 (.061)		
11. I feel left out.	.702 (.040)		
12. My social relationships are superficial.	.533 (.055)		
13. No one really knows me well.	.647 (.045)		
14. I feel isolated from others.	.805 (.030)		
17. I am unhappy being so withdrawn.	.736 (.037)		
18. People are around me but not with me.	.664 (.044)		
10. There are people I feel close to.		.689 (.042)	
15. I can find companionship when I want it.		.447 (.061)	
16. There are people who really understand me.		.745 (.037)	
19. There are people I can talk to.		.849 (.027)	
20. There are people I can turn to.		.814 (.030)	
1. I feel in tune with the people around me.			.642 (.049)
5. I feel part of a group of friends.			.791 (.036)
6. I have a lot in common with the people around me.			.767 (.038)
9. I am an outgoing person.			.435 (.064)

**Note.** Standard errors are in parentheses. *n* = 197.

number of friends and relatives with whom they spoke at least every 2 weeks, their religious affiliation (1 = affiliated, 0 = unaffiliated), and their number of group memberships (e.g., civic groups, neighborhood organizations, sports clubs). These objective social indices exhibited low but significant intercorrelations, *r*s < .33.

**Results**

The R-UCLA scale was completed in its entirety by 197 participants (*M*<sub>age</sub> = 57.5, *SD* = 4.4)—77 Caucasians (38 males), 66 African Americans (33 males), and 54 Hispanics (26 males)—and these data were used for the confirmatory factor analysis using RAMONA. We obtained an *RMSEA* of 0.057 (90% CI = 0.044–0.069), indicative of a good fit of the restricted three-factor solution to the data. Tables 3 and 4 provide factor loadings, factor intercorrelations, and standard errors. More-

**TABLE 4**  
*Factor Intercorrelations in the Confirmatory Factor Analysis of the Revised UCLA Loneliness Scale in Study 2*

Factor	Factor 1	Factor 2	Factor 3
Factor 1	1		
Factor 2	-.66 (.050)	1	
Factor 3	-.67 (.053)	.82 (.040)	1

**Note.** Standard errors are in parentheses.

over, ancillary analyses revealed a reasonable fit of the same three-factor structure across ethnicity and gender.<sup>2</sup>

To examine objective social predictors of the three facets of loneliness-connectedness, we derived subscale scores by summing response values for the same items as were used to form subscales in the young-adult sample. We used data from all participants with fewer than two missing item responses and replaced each missing response with the mean of that participant’s remaining response values (*n* = 225). Cronbach alphas were .80, .86, and .85 for Isolation, Relational Connectedness, and Collective Connectedness, respectively.

The first factor, Isolation, was considered to be indicative of a pervasive sense of aloneness and social dissatisfaction at the personal level. Being married, and presumably living in the knowledge that one is not alone, should minimize a sense of aloneness. Consistent with this conceptualization, bivariate regression analyses indicated that being married or living with a partner predicted lower Isolation scores, *b* = -0.77, *p* = .040. Holding constant the effects of age, gender, ethnicity, the remaining objective social indices, and the highly correlated Relational and Collective Connectedness scores, marital status continued to predict Isolation, *b* = -0.76, *p* = .023. In addition, age interacted with marital status, *b* = 0.15, *p* = .041, a finding attributable to a diminishing sense of isolation with increased age among nonmarried, but not married, individuals. Ancillary

<sup>2</sup>Results of these analyses are available on request from the primary author.

analyses revealed that number of friends and relatives also predicted lower levels of Isolation, but only among the non-married,  $b = -0.10$ ,  $p = .021$ , and not the married,  $b = -0.03$ ,  $p = .495$ .

Isolation also exhibited significant bivariate relationships with number of friends and relatives and number of group memberships,  $ps < .04$ . Holding constant the effects of demographic characteristics, other objective social indices, and Relational and Collective Connectedness scores, number of friends and relatives continued to predict Isolation,  $b = -0.07$ ,  $p = .023$ , although number of group memberships did not. Finally, although religious affiliation did not exhibit a significant bivariate relationship with Isolation,  $p > .4$ , a significant interaction with ethnicity revealed that African Americans and Hispanics with a religious affiliation had lower Isolation scores than their Caucasian counterparts,  $b = -0.97$ ,  $p = .040$ . In addition, African Americans who reported a religious affiliation tended to have lower Isolation scores than did their Hispanic counterparts,  $b = -0.88$ ,  $p = .057$ .

In bivariate analyses, Relational Connectedness scores did not differ as a function of marital status, but were predicted by regular contact with a greater number of close relatives and friends,  $b = 0.11$ ,  $p < .001$ ; by a greater number of group memberships,  $b = 0.21$ ,  $p = .002$ ; and by religious affiliation,  $b = 0.63$ ,  $p = .037$ . We interpreted Relational Connectedness as reflecting social satisfaction at the interpersonal level; the results were consistent with this interpretation in that the only unique predictor of Relational Connectedness (i.e., controlling for the effects of all covariates in the model) was the number of close friends and relatives with whom participants spoke regularly,  $b = 0.043$ ,  $p = .026$ . In addition, marital status interacted with age,  $b = 0.11$ ,  $p = .024$ ; feelings of Relational Connectedness decreased with age among the nonmarried, but did not change with age among the married.

Like Relational Connectedness, Collective Connectedness did not exhibit a significant bivariate relationship with marital status, but was predicted by regular contact with a greater number of close relatives and friends,  $b = 0.10$ ,  $p < .001$ ; by a greater number of group memberships,  $b = 0.30$ ,  $p < .001$ ; and by religious affiliation,  $b = 0.71$ ,  $p = .02$ . Moreover, consistent with our interpretation of Collective Connectedness as reflecting social satisfaction at a group level, the only unique predictor of Collective Connectedness (i.e., controlling for the effects of all covariates) was number of group memberships,  $b = 0.16$ ,  $p = .002$ .

## DISCUSSION

Analyses of data provided by young and older adults were remarkably consistent in revealing three distinct dimensions of conceptual space representing satisfaction with social connectedness. The discovery of the same conceptual representation of loneliness-connectedness in young and older adults and

across gender and ethnicity lends generalizability to these results and raises the question of whether the mental representations of satisfaction in the social domain have a universal structure that reflects how human beings make meaning of their social relationships.

The existence and possible universality of a multidimensional mental representation of social space should not be surprising, given that the survival of the human species depends on communication and cooperation at several levels of social organization. First, people need to be comfortable with themselves and their fit in a social world; when this sense is missing, they feel isolated and low in self-worth. A spouse, for instance, can become part of an expanded self (Aron & Fraley, 1999) and promote self-worth (Leary, Tambor, Terdal, & Downs, 1995). This is not to say that marriage is the sole determinant of isolation or worth, however. In Study 2, ancillary analyses revealed that regular contact with friends and relatives predicted lower levels of Isolation, but only among the nonmarried. This suggests that the remaining social inputs may be used to compensate for the absence of any one of the inputs, thereby maintaining the multidimensional mental representation.

Second, theories of the self suggest that people have the capacity, and perhaps the need, to experience a deep sense of interpersonal connectedness in dyadic relationships. The notion of a relational self is paralleled by the notion of relational connectedness as distinct from other ways in which people satisfy their needs for connectedness (Brewer & Gardner, 1996): Relational Connectedness was predicted by having a number of close friends and relatives to speak with at least every 2 weeks. The fact that simply being married did not contribute to feelings of relational connectedness supports the distinctiveness of the individual and relational levels in mental representations of social satisfaction. However, with increasing age, not being married extracted a cost in feelings of relational connectedness.

Third, self theories have also suggested a collective self (Brewer & Gardner, 1996) that is associated with social categories that provide a sense of identity and belonging. Paralleling the notion of a collective self is the notion of collective connectedness as distinct from interpersonal sources of connectedness: We found that Collective Connectedness was predicted by number of group memberships and not by any other objective social circumstance.

Alternative measurement items produced a comparable three-factor solution (see footnote 1), and items loaded in the anticipated, theoretically consistent manner such that Isolation, Relational Connectedness, and Collective Connectedness were appropriate labels for these factors. Thus, the three-faceted mental representation of social connections we describe here does not appear bound to the use of a single instrument. Rather, a three-faceted mental representation of social connectedness that encompasses individual, relational, and collective aspects of the social self appears reliable, generalizes from a college sample to a population-based sample of older adults in an urban

area, and holds for men as well as women. The finding that the three aspects of this mental representation have unique predictors suggests that there are differential sources, and possibly differential consequences, of a sense of connectedness.

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