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Associations of loneliness in older married men and women

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We evaluated the associations between loneliness and subjective appraisals of marital relationship as well as reciprocal associations of loneliness in married men and women. The Health and Retirement Study is a national survey of older adults over the age of 50, residing in the US. This study is based on a paper and pencil questionnaire administered in the year 2006. Overall, 2723 couples completed this questionnaire. Loneliness was evaluated using the three-item version of the Revised University of California Los Angeles Loneliness Scale. A non-recursive path analysis was conducted. The model suggested that subjective appraisals of the relationship with spouse play a major role in one's sense of loneliness. In addition, loneliness in men and women shares reciprocal associations. The model explained 24% and 29% of the variability in loneliness reported by married men and women, respectively. Results indicate that capitalizing and enhancing one's social life might also be beneficial for his or her partner. Any intervention to alleviate loneliness in married couples has to take into consideration their perceived marital relationship as well as the reciprocal associations of loneliness in married men and women.

Keywords: loneliness; social network; gender; epidemiology; dyads; marriage

Introduction

The most salient aspect of loneliness concerns its subjective nature. Even though this subjective aspect of loneliness may correlate with objective social situations, it represents a separate realm. Therefore, a distinction should be made between loneliness and aloneness (Andersson, 1998; Marangoni & Ickes, 1989). As noted by Peplau and Perlman (1982), 'Loneliness is a subjective experience, it is not synonymous with objective social isolation. People can be alone without being lonely or lonely in the crowd' (p. 3).

This definition of loneliness is in accordance with the *cognitive theory,* which postulates that loneliness results from the perceived discrepancy between desired and actual social relationships or the subjective gap between one's optimal levels of social relations and achieved levels (de Jong-Gierveld, 1987). Thus, a perceived deficit in one's social interactions is crucial in creating a sense of loneliness. Past experiences and experiences of other people in the social environment influence this evaluation process. Therefore, the cognitive theory suggests an indirect relationship between objective deficits in one's social network and feelings of loneliness, with cognitive processes of perception and evaluation serving as mediators (Peplau, Miceli, & Morasch, 1982; Peplau & Perlman, 1982; Perlman & Peplau, 1981).

Interest in loneliness is due to two primary reasons: (a) its relative high prevalence among older adults (Sundström, Fransson, Malmberg, & Davey, 2009); and (b) its damaging health effects (Cacioppo,

Hawkley, Crawford, et al., 2002). Various studies have explored the negative effects of loneliness on mental health. In both cross-sectional and longitudinal studies, greater loneliness was associated with higher levels of depression after controlling for central demographic and psychosocial factors (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). Loneliness was also found to be negatively associated with emotional well-being (Lee & Ishii-Kuntz, 1987) and positively associated with serious thoughts of suicide and parasuicide (Stravynski & Boyer, 2001). There is also cumulative evidence for the association between loneliness and poorer physical health (Hawkley & Cacioppo, 2010), elevated blood pressure (Hawkley, Masi, Berry, & Cacioppo, 2006) impaired sleep and daytime dysfunction (Cacioppo, Hawkley, Berntson, et al., 2002), impaired mental health and cognition (Wilson et al., 2007) as well as mortality (Shiovitz-Ezra & Ayalon, 2010).

Although loneliness is characterized by its subjective nature and its direct negative impact on the individual, the social context in which loneliness occurs is of great importance. For instance, marriage is considered a major protective factor against loneliness, with both married men and women reporting lower levels of loneliness relative to non-married individuals (Stack, 1998; Theeke, 2009, 2010). Nevertheless, several researchers have argued that the protective effects of marriage are particularly pronounced for men (Dykstra & Gierveld, 2004; Tornstam, 1992). Researchers have argued that wives often take a more

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central role in the initiation and maintenance of social interactions (Korporaal, Broese van Groenou, & van Tilburg, 2008). In support of this argument, researchers have noted that married men and women report similar levels of loneliness, whereas unmarried men tend to report higher levels of loneliness than unmarried women. This finding suggests that marriage is particularly beneficial for men who tend to benefit from the more elaborated network of their wives (Pinquart, 2003).

The quality of marital relations and intimate sexual relationships have shown to be important factors, so that both men and women who report greater satisfaction with their intimate relationship also are less likely to report emotional and social loneliness (de Jong Gierveld, Broese van Groenou, Hoogendoorn, & Smit, 2009). Others noted that different characteristics of the social network relate differently to loneliness in men and women; for married men, lower social density (i.e., a less cohesive social network) is associated with loneliness, whereas for women, it is the quality of dyadic relations, so that greater satisfaction with dyadic relationship is associated with lower loneliness (Stokes & Levin, 1986).

Despite growing interest in loneliness in married men and women and past research that has shown that marriage is a protective factor for loneliness (Stack, 1998; Theeke, 2009, 2010), little is known about the reciprocal associations in marriage. Furthermore, even the few studies that have argued for such reciprocal associations did not examine them simultaneously, but instead evaluated the impact of married men on women and vice versa using separate models to predict loneliness in the partners (de Jong Gierveld et al., 2009).

As previously suggested by Kenny (1996), non-independence likely prevails in the study of dyadic relationship. This non-independence may take three potential paths: (a) partner effect, in which a characteristic of one partner directly influences the other partner; (b) mutual influence, in which one member's score causes the other partner's score and vice versa; and (c) common fate, in which both members are exposed to the same common causal factor (Kenny, 1996). To account for this non-independence, this study evaluates the reciprocal associations of loneliness in married men and women simultaneously. Using path analysis, we evaluate a non-recursive model in which the reciprocal associations of men's loneliness with women's loneliness and vice versa are examined simultaneously.

We test the mutual influence model, as we expect loneliness in one partner to be associated with loneliness in the other partner. Although not specifically examined in the context of loneliness, research has demonstrated mutual dyadic influences in relation to related conditions, such as depression (Feng, Shaw, Skuban, & Lane, 2007). We also examined how the subjective appraisals of the interaction with one's spouse are associated with loneliness in both men and women. Figure 1 outlines our hypothesized model.

In light of limited research on loneliness among married partners, two competing hypotheses may arise.

The first would argue that women's investment in social interactions throughout their lives places them in an advantageous social position (Antonucci & Akiyama, 1987; Korporaal et al., 2008; Stevens & Westerhof, 2006) in particular in the second half of life, which is characterized by a tendency to reduce the size of the social network in order to focus on those relationships that are more rewarding (Carstensen, Fung, & Charles, 2003). Respectively, men enjoy a lesser social network in old age (Antonucci & Akiyama, 1987; Korporaal et al., 2008; Stevens & Westerhof, 2006). Therefore, it is expected that in older adults, men's appraisal of the relationship with their spouse has a stronger association with their loneliness compared to women.

The second hypothesis is in line with the induction hypothesis which posits that loneliness in one person contributes to, or causes loneliness in others (Cacioppo, Fowler, & Christakis, 2009). According to this hypothesis, women's tendency to engage in more intimate disclosures than men as well as their emotional investment in an attempt to establish relational connectedness with others are responsible for the fact that loneliness spreads more easily among women than among men. To support this hypothesis, research has shown that women are both more likely to be affected by loneliness reported by their friends and neighbors, and that their own loneliness is also more likely to spread to other people in their social network (Cacioppo et al., 2009). According to this hypothesis, in the second half of life, loneliness in women is expected to have a stronger association with men's sense of loneliness than the other way around.

Methods

The Health and Retirement Study (HRS) is a nationally representative sample of individuals 50 years and older and their spouse of any age, residing in the US (http://hrsonline.isr.umich.edu/). The HRS is sponsored by the National Institute of Aging and is conducted by the University of Michigan. The study is reviewed and approved by the University of Michigan's Health Sciences IRB. Participants take part in a biennial interview that covers a range of topics including income, wealth, work, retirement, health, health care utilization, etc.

Baseline data for this study were collected in the year 2006. Overall, 18,469 individuals responded to the 2006 HRS questionnaire (Final, V2 September 2010). Of these, 8899 were randomized to receive the self-report psychosocial questionnaire and 8568 were eligible to complete it. Overall, 865 respondents did not complete the leave behind questionnaire. These respondents were significantly younger ($M = 66.2$, $SD = 12.1$) compared to those who completed the questionnaire ($M = 67.6$, $SD = 10.7$; $t(8595) = -3.5$,

$p < 0.001$). Compared to those who did not complete the questionnaire (55% female), those who completed the questionnaire were more likely to be female (59% female, χ^2 [1] = 4.47, $p < 0.05$). Because we were interested only in married men and women, the analytic sample for this study comprises 2723 couples, in which both partners completed the psychosocial questionnaire. Mean age of husbands was 67.4 (SD = 9.8) and wives was 64.0 (SD = 9.0).

Measures

Loneliness

The 2006 wave of the HRS used a shortened version of one of the most widespread scales of loneliness: the Revised University of California Los Angeles Loneliness Scale (Russell, Peplau, & Cutrona, 1980). In its short form, the measure includes three questions with a simplified set of three response categories. Respondents were asked to rate, on a three point scale, how often they felt as if they: (a) lack companionship, (b) left out, or (c) were isolated from others. Based on HRS' instructions, responses to each question are summed with higher scores indicating greater loneliness and a score was calculated if at least one item was completed. Therefore, range is between one and nine. The three-item loneliness scale has shown good psychometric properties, with internal reliability of 0.72 and a high correlation among the shortened and the larger scale (0.82). The shortened scale also demonstrated adequate discriminant and convergent validity in two large studies (Hughes, Waite, Hawkley, & Cacioppo, 2004). In our sample, this scale achieved good internal reliability with a Cronbach's alpha of 0.82.

Subjective appraisals of marital relations

Positive and negative appraisals were evaluated using seven indicators, originally developed for the MacArthur Mid-Life in the United States Survey to evaluate perceived social support and perceived strain (Honda & Jacobson, 2005; Walen & Lachman, 2000). We included in the analysis only items concerning relationship with partner. Examples of perceived positive support items are: 'How much can you open up to your partner if you need to talk about your worries?' and 'How much can you rely on your partner if you have a serious problem?'. Examples of perceived negative support items are: 'How often does your partner make too many demands on you?' and 'How much does your partner criticize you?'. Response categories for all seven items ranged from one to four. In accordance with other studies using these indicators, we averaged the scores within each dimension separately (Walen & Lachman, 2000). Respondents were also asked how close they feel toward their spouse. Response option ranged between one and four with a higher score representing a greater degree of closeness.

Statistical analysis

In order to compare the characteristics of men and women in this sample, we used t-test analyses for dependent samples. Next, we ran two separate correlation matrices for men and women in order to evaluate the relationships between the variables in the model. Finally, we tested our hypothetical model, by conducting path analysis. Path analysis is a statistical method that can be used to test a comprehensive model of how all variables go together. We used AMOS 7 to test the proposed hypothesized model, estimated by maximum likelihood procedure. A pairwise covariance matrix was used to estimate the goodness-of-fit between the data and the hypothesized model, which is outlined in Figure 1. The model specified is a non-recursive one, in which a feedback loop between men's and women's loneliness is tested simultaneously. Such a loop allows for the same variable (loneliness) to serve as both an outcome variable and an independent variable. For a detailed discussion of non-recursive models and the rationale for using such models specifically to test reciprocal continuous associations see John (1990).

To acknowledge the correlations between subjective appraisals of the relationship (e.g., positive aspects of the relationship, negative aspects of the relationship, and closeness to spouse scores), appraisals were allowed to correlate within each partner. Because data from husbands and wives are never truly independent, failing to account for this may bias significance tests of the overall model (Kenny, 1995, 1996). Thus, subjective appraisals of the relationship in men and women were allowed to correlate with each other. Subjective appraisals of the relationship were centered on the grand mean.

Figure 1. Hypothesized model of correlates of loneliness in married men and women.
Note: Dashed arrows indicate negative relationship. Subjective characteristics are allowed to correlate.

In order to test our two hypotheses concerning gender differences in loneliness, we conducted a series of nested-path models and compared to other models with fewer constraints. The most parsimonious model that provided a fit to the data and was not significantly different from models with fewer constraints was selected. The first model was the unconstrained model outlined in Figure 1. The next model was specified to test the hypothesis that the subjective appraisals of the relationship are more strongly correlated with loneliness in men than in women. To test this model, the relationship between subjective appraisals of the relationship and loneliness in men and women were set to be equal (e.g., path from positive aspects of the relationship to loneliness is equal in men and women). Because this model was nested within the first model, chi-square difference test was calculated to identify whether this model provides a significantly worse fit to the data than the first model.

The next model tested the second hypothesis, which argues for a stronger association of women's loneliness with men's loneliness than the other direction. In this model, the reciprocal association of loneliness in men and women was set to be equal.

We report the following goodness-of-fit statistics: chi-square statistic, comparative fit index (CFI), goodness of fit index (GFI), and root mean squared error (RMSEA) (Hu & Bentler, 1999; Raykov, Tomer, & Nesselroade, 1991). If the chi-square is small relative to the degrees of freedom, resulting in a ratio between two and five than the observed data do not differ significantly from the hypothesized model (Kelm, 2000). In addition, CFI and GFI that exceeds 0.95 (Hu & Bentler, 1995) and RMSEA below 0.08 (Musil, Jones, & Warner, 1998) are indicative of acceptable model fit. The significant level criterion for all statistical tests was set at 0.05.

Results

Table 1 outlines the demographic and social characteristics of the sample. With the exception of level of education, there were statistically significant differences between married men and women on all characteristics, yet most were relatively small and not meaningful. In comparison to the 2002 HRS module (Hughes et al., 2004), which consisted of a representative sample of individuals over the age of 50, both married men ($t(2443) = 8.83$, $p < 0.001$) and married women ($t(2481) = 1205$, $p < 0.001$) in this study were lonelier than the general sample drawn in 2002. However, these statistically significant findings are attributed to the large sample size, rather than to true meaningful differences between the samples (which were less than half a point). Table 2 outlines the correlation matrix for men and women. As can be seen, the correlations were low to moderate in size. The highest correlates of loneliness for both men and women were with positive aspects of the relationship with spouse.

Figure 1 outlines our hypothesized model. This model was largely supported by the data: χ^2 [5] = 20.2; CFI = 0.99, GFI = 0.99, RMSEA [CI] = 0.03 [0.02–0.05].

Next, we constrained the relationship between subjective appraisals of the relationship and loneliness to be equal in men and women. This model resulted in an adequate fit: χ^2 [8] = 23.6; CFI = 0.99, GFI = 0.99, RMSEA [CI] = 0.03[0.01–0.04]. χ^2 difference [3] = 3.4, n.s. Thus, we maintain the null hypothesis, which suggests that subjective appraisals of the relationship in men and women have similar associations with loneliness.

In the final model, we tested whether loneliness in men and women has different reciprocal associations. This model also resulted in an adequate fit: χ^2 [9] = 26.1; CFI = 0.99, GFI = 0.99, RMSEA[CI] = 0.03[0.02–0.04]. χ^2 difference [1] = 2.5, n.s. Thus, once again we maintain the null hypothesis, which suggests that the reciprocal associations of loneliness in men and women are equivalent.

We report in detail (Table 3) the results of this final model that suggested that the relationship between the subjective appraisals of the relationship and loneliness in men and women is equal and the reciprocal associations of loneliness in men and women is equal.

Table 1. Sample characteristics.

	Males (2723)	Females (2723)	Paired t-test
Age	67.4 (9.8)	64.0 (9.0)	30.9***
Education (0–17)	12.9 (5.2)	12.9 (4.9)	−0.06
Medical status (0–7)	1.8 (1.3)	2 (17.1)	5.0***
Positive relations with spouse (1–4)	3.6 (0.5)	3.4 (0.6)	14.4***
Negative relations with spouse (1–4)	1.9 (0.6)	2.0 (0.6)	−5.8***
Level of closeness with spouse (1–4)	3.5 (0.6)	3.4 (0.7)	9.1***
Loneliness (1–9)	4.1 (1.4)	4.2 (1.5)	−3.3**

Notes: Results are presented as mean (SD).
***$p < 0.001$; **$p < 0.01$.

Table 2. A correlation matrix for married men ($n = 2723$) and women ($n = 2723$).

	1	2	3	4
Loneliness (1–9)		−0.45**	0.43**	−0.42**
Positive relations with spouse (1–4)	−0.41**		−0.57**	0.68**
Negative relations with spouse (1–4)	0.37**	−0.46**		−0.51**
Level of closeness with spouse	−0.36**	0.56**	−0.43**	

Notes: Correlations within married men are presented in the lower diagonal and correlations within married women are presented in the upper diagonal.
**$p < 0.01$.

Table 3. Estimates of the hypothesized model.

	Unstandardized estimates	Standardized estimates	Standard error	Critical ratio
Married men: relationship characteristics → loneliness				
Positive relations with spouse (1–4)	−0.54	−0.20	0.04	−12.74*
Negative relations with spouse (1–4)	0.47	0.20	0.03	13.98*
Level of closeness with spouse (1–4)	−0.31	−0.14	0.03	−8.65*
Married women: relationship characteristics → loneliness				
Positive relations with spouse (1–4)	−55	−0.23	0.04	−12.74*
Negative relations with spouse (1–4)	0.47	0.21	0.03	13.93*
Level of closeness with spouse (1–4)	−0.31	−0.14	0.04	−8.65*
Loneliness in women → loneliness in men	−0.09	0.09	0.01	9.05*
Loneliness in men → loneliness in women	−0.09	0.08	0.01	9.05*

Notes: Critical region or the 'region of rejection' greater than 1.96 indicates significance at the 0.05 level.
*$p < 0.001$.

Subjective appraisals of the relationship were associated with loneliness in both men and women; positive aspects of the relationship were significantly correlated with loneliness in both men and women ($\beta = -0.20$***, $\beta = -0.23$***, respectively), negative aspects of the relationship were significantly correlated with loneliness in both men and women ($\beta = 0.20$***, $\beta = 0.21$***, respectively), and closeness scores were correlated with loneliness in both men and women ($\beta = -0.14$***, $\beta = -0.14$***, respectively). Thus, lower positive appraisals, greater negative appraisals, and lower levels of closeness to spouse are all associated with loneliness in married men and women. In addition, the reciprocal associations of loneliness in men and women were both significant ($\beta = 0.08$***, $\beta = 0.09$***, respectively), suggesting that loneliness in men and women have reciprocal associations. The final model explained 24% of the variance of loneliness in men and 29% of the variance of loneliness in women.

Discussion

Despite the protective effects of marriage, there is a growing body of research to demonstrate that loneliness is quite prevalent in married couples (de Jong Gierveld et al., 2009). Because loneliness has many detrimental effects including increased morbidity and mortality (Shiovitz-Ezra & Ayalon, 2010), it is important to evaluate its determinants to identify individuals at high risk and to develop interventions to alleviate loneliness. This study evaluated loneliness in married men and women. Using a non-recursive model, we were able to demonstrate the important role that marital relationships play in loneliness. Our results suggest that about quarter of the variance associated with loneliness in married men and women is explained by their relationship each other. Thus, similarly to past research (Shiovitz-Ezra & Leitsch, 2010), this results emphasize the significant role that the quality of marriage plays in the life of older adults.

Our overall model was largely supported. This model suggests that in addition to the relationship between subjective appraisals of the relationship with one's partner and loneliness, there are reciprocal associations in loneliness, so that loneliness in men is directly associated with loneliness in women and vice versa. Nevertheless, our hypotheses concerning gender differences in the determinants of loneliness were unsupported. Our final model suggests that loneliness in men and women has similar qualities.

All three characteristics evaluated in relation to spousal relationship (e.g., positive aspects, negative aspects, degree of closeness) were significantly correlated with loneliness in both men and women. This finding further emphasizes the strong role that marital relationship plays in one's sense of loneliness. In contrast to the first hypothesis, no gender differences were found between men and women. Unlike previous findings (Stokes & Levin, 1986), the quality of spousal relationship has similar associations with loneliness in both men and women. Important to note, however, that only subjective appraisals of the relationship with one's spouse were evaluated in this study. Future research will benefit from evaluating the additional role of objective appraisals (e.g., number of hours spent with spouse) as correlates of loneliness in married men and women.

This study also found a reciprocal association in loneliness in married men and women, suggesting that loneliness equally spreads from married men to women and vice versa. These findings are somewhat in contrast to past research (Cacioppo et al., 2009). This could be due to the fact that in contrast to past research, this study focused only on married couples, ignoring all other family and social interactions.

This study has several limitations that should be noted. First, its cross-sectional design does not allow for inferences about cause and effect. Nonetheless, the use of a non-recursive technique does allow inferring direction of association better than more conservative regression approaches (John, 1990). Another limitation of this study is the use of a three-item loneliness scale. However, this short scale has been extensively studied

in past research (Hughes et al., 2004). In addition, the fact that both partners completed the self-report questionnaire may imply that potentially the two have more in common or even enjoy better relationship than those couples in which only one partner completed the questionnaire. The relatively high levels of relationship quality found in this study should be taken into consideration when interpreting the findings. It also is important to note that we explained only about a quarter of the variance in loneliness in married men and women. Other factors may also be important in determining one's sense of loneliness. We decided not to include additional potential explanatory variables in the model as our focus was on aspects of the marital relationship and their associations with loneliness in both partners, rather than potential predictors of loneliness. Similar methodology has been used in past research of this sort (Whisman, Uebelacker, & Weinstock, 2004). Finally, research has shown that social support characteristics are culturally bound (Litwin, 2009) and that loneliness varies across different cultures (Perlman, 2004; Rokach, 1999; Sundström et al., 2009). The present findings are based on a sample of Americans 50 years and older and their spouse of any age, who responded to the survey questions in 2006. It is expected that the roles that women and men play in their social networks reflect not only cultural, but also cohort effects. Thus, it is important to continue to study these same issues in other cohorts and cultural groups.

Nonetheless, to the best of our knowledge, this is the first study to simultaneously evaluate the reciprocal associations of loneliness in married men and women. Our results point to the important role that marriage plays in the experience of loneliness. Any intervention to alleviate loneliness in married couples has to take into consideration their perceived marital relationship as well as the reciprocal associations of loneliness in married men and women. In contrast to our expectations, both subjective appraisals of the relationship and the experience of loneliness play similar roles in the loneliness of men and women. Given the contagious nature of loneliness and the major role that subjective appraisals of the marital relationship play in loneliness, any intervention that is designed to alleviate loneliness in married couples should address both partners and their marital relationship.

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