



Working Paper Series
WP-10-09

August 2010

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Among Older Adults:
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This research was supported by the National Center for Family & Marriage Research, which is funded by a cooperative agreement, grant number 5 UOI AE000001-03, between the Assistant Secretary for Planning and Evaluation (ASPE) in the U.S. Department of Health and Human Services (HHS) and Bowling Green State University.

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**THE SOCIAL CONTEXT OF DISABLEMENT AMONG OLDER ADULTS:
DOES MARITAL QUALITY MATTER FOR LONELINESS?**

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*This research was supported in part by the National Center for Family and Marriage Research (NCFMR) at Bowling Green State University, Bowling Green, OH, where the first author is a Visiting Scholar. The NCFMR is supported with a grant from the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, grant number 5 U01 AE000001-03. The opinions and conclusions expressed herein are solely those of the author(s) and should not be construed as representing the opinions or policy of any agency of the Federal Government. We gratefully acknowledge the comments of participants at the NSHAP Early Results Conference held January 28-29, 2009, at NORC and the University of Chicago, where an earlier version of this paper was presented. We extend special thanks to Linda Waite, P.I. of NSHAP, for helpful comments and guidance. Thanks also to Scott Adams, Jamila Bookwala, Melissa Hardy, and Tara D. Warner for comments on previous drafts. Direct Correspondence to: David F. Warner, Assistant Professor, Department of Sociology, Case Western Reserve University, 10900 Euclid Ave., Cleveland, OH 44102-7124. Telephone: 216.368.2697, Fax: 216.368.2676, email: david.warner@case.edu

THE SOCIAL CONTEXT OF DISABLEMENT AMONG OLDER ADULTS: DOES MARITAL QUALITY MATTER FOR LONELINESS?

ABSTRACT

Prior research has often failed to consider that disablement occurs within a web of relationships that provide psychosocial resources to and/or place demands on older adults. Drawing on the stress process and life course perspectives, we considered the social context of disablement by examining the influence of marital quality on the relationship between disability and loneliness among married older adults. Using data from the nationally representative *National Social Life, Health, and Aging Project* (NSHAP), we found (1) functional impairment was associated with higher levels of loneliness; (2) neither positive nor negative marital quality mediated this association, contrary to the stress-deterioration hypothesis; and (3) positive (but not negative) marital quality moderated this association, consistent with the stress-buffering hypothesis. These associations were similar for women and men. These findings indicate the importance of the social context of disablement, as interpersonal resources offer protection from the deleterious psychosocial consequences of disability.

**The Social Context of Disablement among Older Adults:
Does Marital Quality Matter for Loneliness?**

Older Americans are at great risk of disabling health conditions (Land & Yang, 2006), which—by presenting challenges to routine functioning and activities of daily living (Korporaal, van Groenou, & van Tilburg, 2008)—may result in a loss of independence and autonomy and potentially hamper social relationships. Thus, given that social ties are important for psychosocial well-being (Cohen, 2004; Thoits, 1995), poor health and disabling health conditions have been conceptualized as significant stressors in the lives of older adults that have a negative impact on their mental health (Bookwala & Franks, 2005; Booth & Johnson, 1994; Turner & Noh, 1988). Consistent with this stress process perspective (Pearlin, Menaghan, Lieberman, & Mullan, 1981) prior studies have found that disabled older adults report lower-levels of well-being on a number of mental health outcomes, including depressive symptoms (Bierman & Statland, 2010; Turner & Noh, 1988; Yang, 2006), self-esteem (Duffy & MacDonald, 1990; Reitzes & Mutran, 2006), and life satisfaction (Ducharme, 1994). However, prior research focused on mental health outcomes has often failed to consider the fact that disablement occurs within a social context—the web of long-term relationships such as marriage that provide psychosocial resources to and/or place demands on persons over the life course. Consequently, despite studies that have documented higher levels of reported loneliness among disabled older adults (Korporaal et al., 2008; Savikko, Routasalo, Tilvis, Standberg, & Pitkälä, 2005), few studies have examined how and in what way the quality of the marital relationship may influence loneliness for functionally-limited older adults.

Therefore, the purpose of the current study was to bridge stress process (Pearlin et al., 1981) and life course perspectives (George, 2003) and explicitly consider the social context of disablement and the consequences for psychosocial well-being. To do this, we examined the

influence of positive and negative marital quality on the relationship between physical disability and loneliness using data on married older adults from the nationally representative *National Social Life, Health, and Aging Project* (NSHAP). We focused our examination on married older adults because marriage is the primary social institution that organizes social roles and interactions for most persons across the adult life course. The quality of the marital relationship can vary over the years, but it is generally the product of accumulated events, experiences, and habituated social interaction between partners. Thus, the marital relationship is the principal social context in which disablement occurs and is a challenge faced by both members of the marital dyad. The risk of loneliness, a self-assessment of the degree to which an individual's social needs are being met, may be attenuated in marriages with positive coping strategies and a history of supportive interaction. Loneliness is a notable gauge of psychosocial well-being, predicting declines in self-rated health, cardiovascular disease, increased depression, cognitive decline, use of health services and institutionalization, and mortality (Cacioppo, Hawkley, & Berntson, 2003; Hughes, Waite, Hawkley, & Cacioppo, 2004; Savikko et al., 2005). Thus a full understanding of the risk of loneliness among disabled older adults—and the potential role that marital quality may play—is important for explicating the social context of disability.

BACKGROUND

The Social Context of Disablement, Marriage, and Loneliness

Primarily grounded in the stress process perspective (Pearlin et al., 1981), previous literature has typically focused on the mental health consequences of functional impairment and disablement, such as depression (Turner & Noh, 1988; Yang, 2006), self-esteem (Duffy & MacDonald, 1990; Reitzes & Mutran, 2006), and life satisfaction (Ducharme, 1994). However, unlike these indicators of mental well-being, loneliness is a potential adverse outcome of

mounting functional limitations that is inherently embedded in one's social world. Loneliness is an emotional state encompassing feelings of emptiness, isolation and abandonment and is relatively independent of objective contact with others or social integration (Cacioppo et al., 2003; Cornwell & Waite, 2009b; Savikko et al., 2005). Thus, unlike indicators of mental health, loneliness is an evaluative assessment of the correspondence between one's *need* for social resources and the *ability* of those resources to meet those needs (Cacioppo et al., 2003; Cornwell & Waite, 2009a).

Loneliness may be an adverse outcome of mid- to late-life disablement because declines in functional ability and autonomy require significant changes in the structure and quality of social relations (Thompson & Heller, 1990), which are important for overall health and well-being (Cohen, 2004). Prior studies have found that functionally impaired older adults tend to curb participation in activities (Williamson & Schultz, 1992) and experience isolation from family and friends (Thompson & Heller, 1990). Disabled older adults also experience lower levels of social support (Steffens, Hays, & Krishnan, 1999) and are less satisfied with their social interactions (Yang, 2006). As a result of these changes, the functionally limited older adult may have social and emotional needs that are unmet by the existing social connections. Indeed, prior studies consistently find that older adults in poor health, those with more health problems, or who have more functional impairments are more likely to be lonely (Essex & Nam, 1987; Korporaal et al., 2008; Russell, 2009; Savikko et al., 2005; Stevens & Westerhof, 2006).

Situating disablement within its social context calls for reconsideration of the ways in which disability may lead to loneliness. Given that most older adults are married, any consideration of the social context of disablement must begin with the disabled person's spouse—the central figure in a married person's social network, who connects her or him to

other individuals and social institutions and is typically identified as one's most significant source of companionship and social support (Nock, 1998; Waite, 2005; Waite & Lehrer, 2003). Since mid-life and older adults become disabled overwhelmingly due to chronic illness or accumulated functional limitations (Ferrucci et al., 1996), the marital dyad has likely made ongoing adjustments over many years in response to the mounting disability of one spouse. By the time the couple with a disabled spouse reaches late adulthood, they have established care routines, transferred some roles, and adapted their social outings. The spouse plays an even more central role in the social network of the disabled older adult because he or she is the likely primary care provider (Spitze & Ward, 2000). Consequently, the effect of disablement on loneliness, that is, the perceived adequacy of one's social connections, cannot be considered outside the context of the marital relationship.

Despite the centrality of the spouse for social connectedness and support, however, few studies have explicitly examined the importance of the *quality* of the marital relationship for understanding how disability affects loneliness (Essex & Nam, 1987; Korporaal et al., 2008).¹ What is known from prior studies is that better marital quality is associated with better mental health overall, including fewer depressive symptoms and greater life satisfaction (Waite & Gallagher, 2000). Yet marriage itself does not necessarily protect against feelings of loneliness (de Jong Gierveld, Broese van Groenou, Hoogendoorn, & Smit, 2009; Russell, 2009). In fact, a recent study of community dwelling-persons over the age of 60 in South Florida (Russell, 2009) found that while married persons had lower levels of loneliness, physically-disabled persons reported greater loneliness across living arrangements. Thus, it appears that it is not just marriage, but having a high quality marriage—one characterized by a spouse who provides emotional support, companionship, and with whom one can discuss problems—should be

associated with lower levels of loneliness (Stevens & Westerhof, 2006). There is some indication that the salience of the marital relationship increases with age such that marital quality may be especially important for mental well-being among older married adults (Choi & Marks, 2008; Umberson, Williams, Powers, Liu, & Needham, 2006).

Disablement and the Role of Marital Quality: Competing Hypotheses

Weakening of marital relationship. Prior studies that have examined the marital context of disability have largely done so consistent with the stress process perspective's *stress-deterioration hypothesis* (Ensel & Lin, 1991; Pearlin et al., 1981). The stress-deterioration hypothesis argues that disablement is a chronic stressor that disrupts a person's identity and sense of self-worth, which in turn negatively affects or undermines their social relationships and consequently their health. The effects of disablement on the marital relationship are expected to be pronounced given the primacy of the marital role, and because the deleterious effects of stress are likely to be greater when more salient roles are challenged by chronic, diffuse strains such as poor health (Thoits, 1996).

The stress-deterioration hypothesis posits that marital quality *mediates* the link between physical disability and loneliness among older adults (Essex & Nam, 1987; Korporaal et al., 2008). Poor and declining health, particularly with respect to mobility limitations, may lead to changes in marital dynamics, including declines in the number of shared leisure activities and social support exchanged within couples (Booth & Johnson, 1994), changes in sexual intimacy (Korporaal et al., 2008), and increases in instrumental care provided by one's spouse (Hafstrom & Schram, 1984). Given such changes, disabled older adults may be unable to carry on their relationship satisfactorily with their spouse, diminishing the quality of their relationship, and may consequently experience declines in psychosocial well-being (Cutrona, 1996; Kiecolt-

Glaser & Newton, 2001) including increased loneliness (Korporaal et al., 2008).

There is mixed empirical support for the stress-deterioration hypothesis postulating that disablement negatively influences well-being by undermining marital quality. While several studies find that marital quality, and perceived support more generally, mediates the relationship between disability and depressive symptoms (Bookwala & Franks, 2005; Fincham & Linfield, 1997; Taylor & Lynch, 2004), other studies have not found marital quality to mediate the link between disability and depression (Choi & Marks, 2008) or life satisfaction (Ducharme, 1994). However, since loneliness indicates an underlying social process, there are limits to what we can learn from mental health outcomes such as depression. Indeed, the findings are inconclusive from the few studies that have explicitly considered whether declines in marital quality link physical disability and loneliness (Essex & Nam, 1987; Korporaal et al., 2008)—even though loneliness itself is a risk factor for depressive symptoms (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006).

Marital relationship as resource. A significant failing of the stress-deterioration hypothesis is that it requires marital quality to be specified as temporally-subsequent to the stressor of disablement. Conceptualizing marriages as susceptible to deterioration in the face of stressors such as physical disability neglects the fact that marriages have “history,” notably characterized by the accumulation of shared experience and routinized interactions. Viewed from a life course perspective, marital quality may be thought of as a stable property of long-term relationships (Amato, Booth, Johnson, & Rogers, 2007; Johnson, Amoloza, & Booth, 1992), reflecting habituated social interactions, tested coping strategies, mutual investments, and dynamically-constructed narratives developed between spouses over the length of their marriage. Later-life disablement is just one of many circumstances or challenges faced by the marital dyad,

likely sparking the routinized patterns of coping that were developed over many years and enacted for previous stressors. Reports of marital quality among older adults thus represent the perceived availability of a range of resources, both enacted and in reserve, that can be mobilized in the face of stressors. Therefore, we would not expect disablement to deteriorate marital quality, but rather for marital quality to buffer the socioemotional challenges that accompany functional impairment in later life.²

Thus, we turn to an alternative hypothesis, also grounded in the stress process perspective, the *stress-buffering hypothesis* (Ensel & Lin, 1991; Pearlin et al., 1981; Wheaton, 1985). This hypothesis postulates that access to supportive relationships such as a high quality marriage can ameliorate the effects of illness and disability on psychological well-being. Conversely, the absence of supportive relationships may exacerbate the negative effects of illness (Cohen, 2004; Ensel & Lin, 1991; George, 1996; Wheaton, 1985). We argue that such a buffering effect is especially likely to be the case within older adults' marriages, because these marriages tend to be responsive to the social needs of disabled older adults due to the accumulated interpersonal resources and shared history of the marital dyad. In fact, social support and companionship provided by the spouse has been theorized to be one of the key mechanisms by which marriage promotes positive physical and mental health (Nock, 1998; Waite, 2005; Waite & Lehrer, 2003). Consequently, the perceived availability of a confidant (e.g., a spouse) and satisfaction with their support (e.g., high marital quality) may be an important resource to buffer the social and psychological consequences of disablement. Indeed, a number of prior studies demonstrate that perceived social support from intimate relationships is associated with better mental health (Hawkley et al., 2008; Thoits, 1995; Turner & Noh, 1988; Umberson, Chen, House, Hopkins, & Slaten, 1996; Yang, 2006). By contrast, having an

unsupportive spouse or a marital relationship marked by negative interaction is associated generally with worse mental health (Choi & Marks, 2008; Hawkins & Booth, 2005; Umberson et al., 2006) and with greater loneliness (de Jong Gierveld et al., 2009; Stevens & Westerhof, 2006).

Few prior studies have empirically considered the stress-buffering hypothesis that marital quality buffers threats to psychosocial well-being among disabled older adults. A few studies—though not examining marital relationships specifically—find that the availability of a confidant and perceived emotional support from family can ameliorate depressive symptoms and feelings of loneliness among older disabled adults (Allen, Ciambrone, & Welch, 2000; Bierman & Statland, 2010; Thompson & Heller, 1990; but see Yang, 2006). Bookwala and Franks (2005) demonstrated the moderating effect of marital quality in the relationship between disability and depression, finding that negative marital quality exacerbated depressive symptoms among disabled older adults over age 60. Positive marital quality, though associated with depression, did not mitigate the effects of physical impairment on depression. While negative and positive aspects of social relationships are independent predictors of health (Kiecolt-Glaser & Newton, 2001), the findings of the Bookwala and Franks (2005) study are generally consistent with prior research that negative marital processes have stronger effects than positive processes (Carr & Springer, 2010). However, again, the applicability of findings on depression to loneliness is limited because these constructs do not share the same underlying social process.

We posit that marital quality may be an important buffer from the feelings of social isolation and loneliness that accompany health-related declines (Hawkley et al., 2008)—a proposition not often considered by prior research, which has failed to contextualize both marriage and disablement in the life course, ignoring the ongoing and long-term marital

relationship that has both routinized coping mechanisms and shared history. This position is much more consistent with a *moderating* relationship for marital quality. Persons in high quality marriages may continue to receive support (or even additional support) from their spouse in the face of poor health, lessening the negative consequences of poor health; while persons in low quality marriages may not receive adequate levels of support from their spouse, worsening the effects of physical disability. Older adults in low quality marriages may be especially at risk for feeling socially isolated because prior to disablement, these persons may have had alternative (non-spousal) social outlets for support or placed fewer socioemotional demands on his/her spouse. However, with disablement, older adults in low quality marriages could be more dependent on their spouse to meet their social needs. To our knowledge, the current study is the first to examine explicitly whether assessments of marital quality moderate the association between physical disability and loneliness.

Gender, the Social Context of Disablement, and Loneliness

A life course perspective on marriage and health points to the importance of gender for understanding how marriage affects feelings of social isolation among those who are physically disabled. Since gender is a key dimension of social stratification over the entire life course (Moen, 2001), men and women have access to different sets of resources and confront different constraints. Therefore, they frequently have dissimilar experiences within the same institutions and contexts. Indeed, a considerable body of research indicates that men and women have different health experiences within marriage, with men benefiting to a greater degree from marriage in terms of physical health, mental health, and mortality (Kiecolt-Glaser & Newton, 2001; Nock, 1998; Umberson, 1987; Waite, 1995; but see Williams, 2003). If marital quality does indeed moderate the relationship between disablement and loneliness, do wives and

husbands yield the same benefits?

Some research suggests that men may be less lonely in the face of disablement because they receive more health and social benefits from marriage. Men have smaller networks (Haines & Hurlbert, 1992), and thus are more likely to rely exclusively on their spouses for both instrumental and emotional support and connections to others, especially kin, than are women (Antonucci & Akiyama, 1987; Spitze & Ward, 2000; Stevens & Westerhof, 2006; Umberson et al., 1996). Moreover, wives tend to be more responsive to the emotional and support needs of their husbands than are husbands to the needs of their wives (Neff & Karney, 2005), and this pattern is more pronounced when the husband has a chronic illness (Hafstrom & Schram, 1984).

On the other hand, prior studies also suggest that women are more attuned and responsive to the quality of their marriages than are men (Antonucci & Akiyama, 1987; Cutrona, 1996; Essex & Nam, 1987; although see Umberson et al., 1996), particularly negative marital functioning (Almeida & Kessler, 1998; Kiecolt-Glaser & Newton, 2001), so they may be at greater risk of loneliness when disablement occurs. In a study of older adults, Hawkey and colleagues (2008) found that association between a count of stressful life events and loneliness was greater for women than men. This evidence suggests that any moderating effect of marital quality on the relationship between physical disability and loneliness will be stronger for women than for men. The ambiguity as to how the social context of disablement may be gendered with respect to loneliness is reinforced by that fact that few prior studies have thoroughly examined these associations with an eye toward gender (Korporaal et al., 2008).

RESEARCH QUESTIONS

Drawing on theory and prior research from the stress process (Pearlin et al., 1981) and life course perspectives (George, 2003), the aim of the current study is to consider explicitly the

social context of disablement by examining whether and how marital quality affects loneliness among disabled older adults. To that end, we address three broad research questions that advance our understanding of the social context of disablement and the importance of marriage for the effect of physical disability and loneliness among older adults:

- 1) In accordance with the stress-deterioration hypothesis, does marital quality *mediate* the association between physical disability and loneliness?
- 2) In accordance with the stress-buffering hypothesis, does marital quality *moderate* the association between physical disability and loneliness?
- 3) Do the associations between physical disability, loneliness, and marital quality vary for married women and men?

Based on the arguments presented above, we expect, contrary to the stress-deterioration hypothesis, marital quality does not mediate the association between physical disability and loneliness but rather moderates that association in line with the social-buffering hypothesis. Due to contradictory evidence about health benefits of marriage and marital quality, we have no clear expectation as to whether (and in what direction) gender affects relationships between disability, loneliness, and marital quality.

METHODS

We used data from the *National, Social Life, Health and Aging Project (NSAHP)* (Waite et al., 2007), a nationally representative sample of 3,005 community-dwelling individuals ages 57 to 85 in the contiguous United States. Racial/ethnic minorities, older persons, and men were oversampled. The study achieved a final weighted response rate of 75.5%. Data on a wide variety of domains related to physical health, mental health, and social relations were collected during two-hour in-home interviews. However, to facilitate the collection of information across a wide-range of life domains and minimize respondent burden, NSAHP used a modularized questionnaire design so that some questions were included in a Leave Behind Questionnaire for a randomly selected subset of respondents. The return rate for the leave behind questionnaire was

84% (see O’Muircheartaigh, Eckman, & Smith, 2009 for detailed information about the NSHAP study design). Unfortunately, given our interest in married persons, spouses of respondents were not also interviewed.

Analytic Sample

Our analytic sample was restricted in several ways. First, we limited the analyses to respondents with a valid score on our dependent variable, the UCLA Short Loneliness Scale (described below). As the items comprising the loneliness scale were asked in the Leave Behind Questionnaire, 481 respondents (16% of the sample) who did not return the questionnaire were consequently ineligible for inclusion. An additional 139 respondents were excluded because of item non-response on one or more of the three UCLA items. Altogether, 20.6% of the sample was excluded from the analysis due to missing information on the dependent variable.³

Second, we limited our analyses to respondents who reported being married or living together in a marriage-like cohabiting relationship.⁴ This excluded an additional 863 respondents, about one-third of the total sample. Lastly, we excluded 22 respondents missing information on at least one of the explanatory variables used in our analyses. Our overall analytic sample was comprised of 1,500 married older adults (49.9% of the total available sample).

Measures

The dependent variable in our analysis, *loneliness*, is measured with the UCLA Short Loneliness Scale, a three-item summated rating scale validated for use in surveys of older persons (Hughes et al., 2004). Respondents were asked to indicate the frequency with which they felt they lacked companionship, were left out, and isolated from others. For each question, responses included “hardly ever (or never),” “sometimes,” and “often” coded from one to three, (1-3). We recoded these items by subtracting one from each value. The summated scale had a

range of zero-six (0-6) and demonstrated good internal consistency ($\alpha = 0.82$).⁵

The primary explanatory variables in our analysis were physical disability and marital quality. Physical disability was measured by a count of *functional* limitations as indicated by reported difficulty with seven standard Activities of Daily Living (ADL), excluding any difficulties that the respondent expected to last less than three months. The ADL items included difficulty walking one block, walking across a room, dressing, bathing or showering, eating (such as cutting food), getting in and out of bed, and using the toilet. For each task, respondents were asked to indicate whether they had 0="no difficulty," 1="some difficulty," 2="much difficulty," or were 3="unable to do." Given that these indicators were highly right skewed, we dichotomized each item so that reports of any difficulty were coded one and summed the seven items for a range of zero to seven (0-7), where higher scores indicate more functional limitations (KR20 = 0.81). Preliminary analyses indicated that the sum of dichotomous indicators provided a better model fit than alternative coding schemes.

To measure the multidimensional quality of the marital relationship (Glenn, 1990), we drew on six indicators that largely corresponded to the positive and negative aspects of marital quality identified in prior research (Bookwala & Franks, 2005; Fincham & Linfield, 1997; Johnson et al., 1992). Four items asked respondents about the frequency with which they could "talk about... worries" with their spouses, they could "rely on [their spouses] if [they] have problems, whether their spouses made "too many demands," and whether their spouses "criticize[d]" them. Responses were coded 1= "hardly ever (or never)," 2="some of the time," and 3= "often." A fifth item asked respondents whether respondents and their spouses "spend free time doing things together, or doing things separately," with responses of 1= "together," 2= "some together, some different," and 3= "different/ separate things," reverse coded so that higher

scores indicated more time spent together. The sixth item was a global assessment of marital happiness, where respondents indicated how they would describe their relationship with their spouses “taking all things together.” Responses ranged from 1= “very unhappy” to 7= “very happy,” which we recoded into 1= “Unhappy (1,2,3,4),” 2=“Happy (5,6),” and 3= “Very Happy (7)” to adjust for left the skew of original responses ($r = 0.91$ with original measure) and to obtain consistent response categories across all six measures.

We subjected these six-items to exploratory factor analysis with the principle factor method used to extract the factors. A scree test (Hatcher, 1994) suggested two meaningful marital quality factors consistent with prior research (Fincham & Linfield, 1997; Johnson et al., 1992), and accordingly, we retained two factors for oblique rotation. In interpreting the rotated factors, we considered an item with a loading of 0.35 or greater significant. We designated Factor 1 as *Positive Marital Quality* ($\alpha = 0.62$) and Factor 2 as *Negative Marital Quality* ($\alpha = 0.60$). The Factor Pattern loadings and the Factor Structure correlations suggested factorial complexity with the marital happiness item and accordingly we included it in the reliability assessment of both factors. The inter-factor correlation was -0.54. We used the Standardized Scoring Coefficients to calculate estimated factor scores (Hatcher, 1994), which we retained and included as explanatory variables in our models. Alternative solutions, including a single factor with all items or a single positive factor excluding the spouse demands and criticism items, did not fit the data as well.⁶ Table 1 summarizes the results of the exploratory factor analysis, including the factor loadings, for the two factor solution.

[Insert Table 1 about here]

We included a number of additional measures of demographic characteristics, socioeconomic status, and social integration as controls in the analysis based on findings from

previous studies (Bookwala & Franks, 2005; Hawkey et al., 2008; Hughes et al., 2004; Korporaal et al., 2008; Savikko et al., 2005). The indicators of demographic characteristics known to be associated with both disability and loneliness included *age*, *female*, *race/ethnicity*, whether the respondent was *cohabiting*, and the number of *times previously married*.⁷ We measured socioeconomic status with indicators for *education* and *household income*. In preliminary models, we also included a measure of household wealth; however, the findings were unchanged, so we excluded this measure from the final models in the interest of parsimony. Although objective and subjective indicators of social isolation are relatively independent (Cornwell & Waite, 2009a, 2009b), we included measures of social integration to control for potential mediators between physical disability and loneliness (Thompson & Heller, 1990; Williamson & Schultz, 1992), including whether the respondent was *working* for pay, their frequency of *religious service attendance*, and *network size*. In the interest of space, we present the full list of the variables and details on coding, as well as descriptive statistics in Table 2.

Analytic Strategy

To examine the relationship between physical disability, marital quality, and loneliness among married older adults, we employed Tobit or censored regression models. Tobit models account explicitly for the restricted measurement of our dependent variable (Long, 1997), where a limited range of response categories results in a large cluster of responses at the lowest value (high positive or right skew). In the current study, 63% of respondents scored zero (0), and 23% scored one or two (1-2), and the remaining 14% scored three or higher (3-6) on the UCLA Short Loneliness Scale (not shown). In the Tobit model framework, this clustering occurs because the measured categories are not detailed enough to detect variation in the unobserved underlying continuous latent loneliness construct, consequently, some responses are censored at zero. For

example, in this study the lowest category on the scale indicated that an older adult “hardly ever or never” experienced loneliness. This response category includes persons who truly never experienced loneliness as well as those that experienced loneliness, but so infrequently that they did not categorize their experience as “sometimes.” Failure to recognize the censored nature of the theoretically continuous underlying dependent variable by using OLS techniques yields downwardly biased parameter estimates (Long, 1997), and dichotomizing the measure results in a loss of information and precision.

The Tobit regression models we employ here provide maximum likelihood estimates of the theoretically continuous and normally distributed underlying loneliness construct (y_i), where the observed UCLA loneliness measure (y_i^*) is censored at zero (τ):

$$y_i = \begin{cases} y_i^* = \mathbf{x}_i\boldsymbol{\beta} + \varepsilon_i & \text{if } y_i^* > \tau \\ \tau_y & \text{if } y_i^* \leq \tau \end{cases} \quad (1)$$

For cases above the censoring value zero, the structural equation in the Tobit model estimates the effect of a vector of covariates ($\mathbf{x}_i\boldsymbol{\beta}$) on the observed loneliness measure (y_i^*) using a standard linear model, while for cases at or below the censoring value zero, the probability of being censored is estimated, and this quantity is used in the likelihood equation (Long, 1997:204-207). We estimated our Tobit models using the SAS[®] *lifereg* procedure. While there are several outcomes of potential interest in the Tobit model, we focused here on changes in the latent outcome y_i^* . As the structural equation is linear, the effect of any covariate may be interpreted in the standard linear fashion (Long, 1997).

We conducted our analysis in three steps corresponding to our primary research questions described above. First, we estimated a simple zero-order model to establish the baseline association between physical disability and loneliness and then added the measures of marital quality to ascertain whether marital quality mediated that association as predicted by the stress-

deterioration hypothesis. Second, we examined whether marital quality moderated the association between physical disability and loneliness as predicted by the stress-buffering hypothesis. To test for the moderating effect, we specified an interaction term between each measure of marital quality and physical disability (e.g., *Positive Marital Quality x Disability*). Finally, we explored whether the associations between disability, marital quality, and loneliness elucidated in the prior two steps differed for men and women. Because exploring gender differences in a pooled model would have required unwieldy three-way interactions (e.g., *Positive Marital Quality x Disability x Female*), we re-estimated the previous models separately for women and men. We tested for significant differences between the estimated effects for women and men using a t-test for equality of regression coefficients between independent samples (Clogg, Petkova, & Haritou, 1995). All estimates were weighted to account for differential probabilities of selection and differential non-response.

[Insert Table 2 about here]

RESULTS

Descriptive Statistics

The mean (\bar{x}) and standard deviation (s.d.) for each study variable as well as the bivariate correlation (r) with the measure of loneliness are presented in Table 2. As would be expected among a sample of married older adults, respondents reported low levels of loneliness ($\bar{x} = 0.75$) and few functional limitations ($\bar{x} = .70$), and the two were positively correlated ($r = 0.07, p < 0.01$), albeit weakly. Most respondents indicated that their marriages were characterized by high levels of positive marital quality and low levels of negative marital quality. Although given the range on both measures, a few respondents indicated marriages low in positive marital quality and high in negative marital quality. Not surprisingly, our measures of marital quality were

inversely correlated with loneliness. The distribution of the remaining study variables was as expected, and their correlation with loneliness was generally consistent with prior studies—age, male, white, education, income, religious service attendance, and network size were all negatively correlated with loneliness, while black and number of times previously married were positively correlated.

The Role of Marital Quality in the Disability-Loneliness Association

The results from the Tobit regression models examining the relationship between physical disability, marital quality, and loneliness among married older adults are presented in Table 3. Recall that Tobit regression models explicitly account for the fact that the limited measurement of loneliness results in clustering at zero and high positive skew. Indeed, the zero-order Tobit model (Model 1) regressing loneliness on functional limitations shows an association twice as strong as that implied by the correlation coefficient where the censored nature of the dependent variable was ignored ($b = 0.16, p < .01$). Thus, prior studies that have not explicitly modeled the censored nature loneliness and employed ordinary least squares regression may have underestimated the strength of the association with disability.

As expected, and contrary to the stress-deterioration hypothesis, marital quality did not mediate the association between physical disability and loneliness, as the introduction of positive and negative marital quality indicators in Model 2 did not alter the magnitude of the effect for functional limitations. This is consistent with prior studies that also did not find marital quality to mediate the association between functional limitations and loneliness (Korporaal et al., 2008) or depression (Bookwala & Franks, 2005; Fincham & Linfield, 1997; Taylor & Lynch, 2004). Marital quality was inversely associated with loneliness such that a one standard deviation increase in *positive* marital quality *reduced* loneliness by almost one point ($b = -0.97, p < 0.001$),

and a one standard deviation increase in *negative* marital quality *raised* feelings of loneliness by two-thirds of a point ($b = 0.67, p < 0.001$).

[Insert Table 3 about here]

Overall, the association between functional limitations and loneliness was robust to controls for demographic characteristics, socioeconomic status, and social integration (See Models 3-5, respectively, Table 3). The inclusion of indicators for income in Model 4 attenuated the effect of functional limitations by about 25% ($[0.12-0.16]/0.16 = 0.25$), as persons higher incomes have fewer functional limitations and feel less lonely. With the other indicators in the model, measures of social integration—which reflect opportunities for social interaction and support apart from marriage—were not associated with loneliness, a finding that is consistent with prior research on loneliness among married persons (Stevens & Westerhof, 2006) and demonstrates the fact the objective indicators of social integration and perceptions of available support are distinct (Cornwell & Waite, 2009a, 2009b).

Employing a life course perspective on marriage, we expected that marital quality, rather than mediating the association, would be a stress-buffering resource and moderate the effect of functional limitations on loneliness. We specified interaction terms between each indicator of marital quality and functional limitations to test this proposition. As presented in Table 4, we found partial support for our hypothesis. Positive marital quality significantly moderated the effect of functional limitation on loneliness ($b = -0.19, p < 0.05$), but negative marital quality did not. The absence of a moderating effect of negative marital quality differs from previous research examining depression (Bookwala & Franks, 2005), a point we consider fully in the discussion.

To facilitate interpretation of the interaction term, we calculated predicted values for the

effect of functional limitations on loneliness for below average, average, and above average levels of positive marital quality, with all other covariates set to zero. We followed the procedure detailed by Roncek (1992) and plotted these in Figure 1 (calculations not shown).

[Insert Figure 1 about here]

When respondents have average levels of positive marital quality, the interaction term drops out of the model, and we see that with each additional functional limitation the level of loneliness reported is modestly higher. Respondents with above average (one standard deviation above the mean) positive relationship quality are effectively buffered from the deleterious effects of physical disability on loneliness, as the slope of functional limitations is essentially zero and the line of predicted values flat. However, the effect of functional limitations on loneliness is exacerbated for respondents who characterize their marriages as below average (one standard deviation below the mean) in positive marital quality. Although the cross-sectional nature of the data preclude definitive conclusions, as displayed in Figure 1, the interaction effect suggests that older adults who feel that their marriages are supportive are somewhat insulated from feeling socially isolated with physical limitations, while those who feel that their marriages lack positive emotional and social support are especially at risk of loneliness when confronted with physical limitations.

Gender, the Social Context of Disablement, and Loneliness

We explored whether the effect of marital quality on the association between functional limitations on loneliness differed for husbands and wives by estimating gender stratified models and testing for significant differences in the effects of the coefficients between the models. As we noted above, prior research suggested competing hypotheses as to whether the effect of marital quality would be more consequential for married women or men. We did not, however,

detect any significant gender differences in the effect of functional limitations, marital quality, or their interaction, on loneliness (not shown). There was some indication that negative marital quality may be more consequential for feelings of loneliness among married men than women ($t = 1.62$, with $df = 40$, $p < 0.06$), which would support the idea that poor marital relations are more detrimental for men's mental health given that they are more likely to rely exclusively on their spouses for support than are women (Antonucci & Akiyama, 1987; Umberson et al., 1996). Nevertheless, our findings suggest that marital quality moderates the association between functional limitations and loneliness similarly for men and women.

DISCUSSION

The current study brought together the stress process (Pearlin et al., 1981) and life course perspectives (George, 2003) to understand the social context of disablement, examining whether marital quality matters for the relationship between functional limitations and loneliness. Loneliness is a potential adverse outcome of functional limitations, inherently embedded in one's social world, because it is an assessment of the degree to which an individual's social needs are being met; therefore, it is an appropriate indicator of the social context of disablement. As marriage is one of the primary and enduring social relationships of the adult life course, we focused on married older adults. We theorized that the quality of the marriage would be of particular importance, as marital quality assessments reflect perceptions of the availability and adequacy of social support from an intimate partner, grounded in the routinized social interactions and coping strategies, mutual investments, and dynamically-constructed narratives developed over the course of the marriage.

Using data on 1,500 married/partnered older adults from the *National Social Life, Health, and Aging Project* (NSHAP), we found that functional impairment was associated with higher

levels of loneliness, and while positive and negative marital quality were inversely associated with feelings of loneliness, neither positive nor negative marital quality *mediated* the association between disability and loneliness. Thus, we found no support for the stress-deterioration hypothesis that disablement is a chronic stressor that erodes marital quality, leading to greater loneliness. Rather, consistent with the stress-buffering hypothesis and the life course perspective, we found that positive marital quality *moderates* the association between functional limitations and loneliness, offering protection from the deleterious psychosocial consequences of disablement. Given that the patterns of marital quality (through routinized interactions and shared coping strategies) have developed over many years for these older couples, it stands to reason that the entire experience of disablement and whether it leads to later-life loneliness is embedded in this ongoing social relationship.

In the stress-deteriorating framework, an older adult's marriage—and the quality of the marriage in particular—is considered to be susceptible in the face of a chronic, diffuse stressor such as disablement, exposing one to diminished well-being. Such a perspective assumes, either explicitly or implicitly, that (1) disablement is a chronic stressor that leads to diminished social resources; (2) there is a temporally-sequential order in the stress process, from disablement, to undermined interpersonal relationships, and finally to diminished well-being. Alternatively, the stress-buffering hypothesis conceptualizes disablement, the need for social relations, and marital processes as *concurrent* and *embedded within the life course*. These interact to shape one's psychosocial well-being not just at the point of disablement, but throughout life. Given the centrality of marriage in adult social lives and its importance for organizing social interaction, we hypothesized—and found support for—the moderating effect of marital quality on the relationship between late-life disablement and loneliness. It is not that positive marital quality

prevents loneliness only in the face of disability. Rather, the positive habituated interactions and activities within a dyad change the very nature of how one may frame and experience a stressor such as disablement. Loneliness, an evaluative judgment of unmet social needs, is very low and appears to be independent of level of functional limitations for those who have high positive marital quality.

Surprisingly, we found that it was not negative marital quality (reporting a spouse who is too demanding and who levies frequent criticism), but *rather low levels of positive marital quality* that increased feeling lonely in the face of functional limitations. Partners who reported less openness in the relationship, less ability to rely on spouse to deal with problems, and/or spent little time in shared activities, had incrementally higher levels of loneliness with each additional functional impairment. To be sure, for those who were not functionally limited, having lower levels of positive marital quality was associated with greater loneliness in general—but older adults with greater functional limitations *and* marriages characterized by less positive marital quality had even higher levels of loneliness. One possible explanation for this increase in loneliness with functional impairment is that persons in long-term marriages that are not the highest quality may have developed social resources outside of the marital dyad that partially compensate for the lack of perceived social support from the spouse. Yet upon disablement, these extra-marital social resources may be less accessible—with fewer social outings, for example—and the functionally impaired older adult may look more toward his/her spouse to fill these social needs. Without the accumulated patterns of positive interaction within the marriage, the spouse may be less able (or less willing) to meet these social needs adequately, and the disabled older adult may perceive an even greater disjuncture between received and needed social interaction.

The fact that, in this study of community-dwelling older adults, negative marital quality did not moderate the effect of functional limitations on loneliness, contributes to an ongoing discussion in the literature. Rather than reflect two ends of the same marital quality spectrum, negative and positive marital processes tend to be associated with different types of well-being outcomes. Negative marital quality, for example, tends to be a stronger predictor of physical health and physiological indicators than are positive ones (Carr & Springer, 2010). That said, Bookwala and Franks (2005) found negative marital quality exacerbated feelings of depression among physically impaired older adults; however, positive marital quality had no moderating effect. These mixed findings underscore the importance of considering negative and positive marital dynamics as separate processes that have potentially independent effects on well-being and that the nature of effects may differ across psychosocial outcomes. Thus, rather than our findings being contradictory with Bookwala and Franks (2005), the absence of any a moderating effect of negative marital quality on loneliness may reflect either the fact that loneliness and depressive symptoms are fundamentally different indicators of mental health, or it may be that negative marital quality is simply less consequential for loneliness among older adults who are functionally limited.

We do acknowledge that the absence of a moderating effect of negative marital quality may be due to differences in the measurement of negative marital quality between this study and others. For example, our measure of negative marital quality differs from that used by Bookwala and Franks (2005) because it does not contain an item corresponding to frequency of disagreements, which is not available in NSHAP. This omission may be particularly consequential for our finding that that marital quality affects the association between functional limitation and loneliness similarly for women and men, as women find arguments with the

spouse to be more upsetting than do men (Almeida & Kessler, 1998). Unfortunately, we cannot assess either of these potential explanations within the limits of the data in the current study.

This study makes several contributions to our understanding of the social context of disablement and the consequences for psychosocial well-being. First, we brought together the stress-process and life course perspectives to examine how the social embeddedness of disability has consequences for loneliness. Second, and relatedly, we tested whether marital quality (measured in terms of latent indicators of positive and negative dimensions) moderated the effects of disablement on loneliness, casting marital quality as a relationship-specific resource.

Few prior studies have explicitly examined the importance of the *quality* of the marital relationship for understanding how disability affects loneliness, and those that have done so have tended to do so from, either implicitly or explicitly, the stress-deterioration hypothesis. In this study we critically examined the role of marital quality, testing *both* the stress-deterioration and stress-buffering hypotheses. The absence of critical examinations of how marital quality affects mental health and indicators of psychosocial well-being among older adults may stem from the presumption that long-lasting marriages—given that duration is highly correlated with age—are necessarily “good” marriages (Carr & Springer, 2010). However, a number of studies have shown that marital quality is important for physical health and this study contributes to the growing body of research demonstrating the same pattern with indicators of mental health and psychosocial well-being.

Third, and finally, the current study applied a gendered life course perspective to further explicate the social context of disablement. We did not find any systematic gender effect, indicating that marital quality is an important resource for psychosocial well-being among both older men and older women, despite the fact that men and women have, on average, different

social resource profiles. That the moderating effect of positive marital quality appears to operate similarly for women and men is consistent with findings of gender parity in the effects of marital quality on depression and life satisfaction (Williams, 2003).

Future research is needed to address a number of questions about the social context of disablement that remain unanswered. In this study, we focused on married older adults to understand the social context of disablement, because spouses are likely to play a central role in the social needs of disabled older adults—because of the shared history of the marital dyad—in ways that other sources cannot. However, older adults are embedded in a number of social relationships and support from non-spouse family and from friends may also be important resources, contributing to heterogeneity in feelings of loneliness among disabled older adults. Additional studies are needed to examine how these other types of social relations affect loneliness, as well as other indicators of psychosocial well-being among disabled older adults. One important question to consider is whether support from friends and family can offset the negative effects of low positive marital quality we have identified here. How these other sources of support affect feelings of loneliness among the non-married is another avenue for exploration in future studies (Carr & Springer, 2010).

Future studies on the social context of disablement should also consider the health status of spouses and what consequence this has for one's psychosocial well-being. In this study, we focused solely on how marital quality may moderate the effect of one's own functional impairment on loneliness. Yet, in accordance to the life course perspective's attention to linked lives, it will be important to examine how non-disabled spouses' well-being is affected by the physical impairment of the other and whether persons in high quality marriages are better able to adjust. A study of Dutch older adults (Korporaal et al., 2008) suggested that the both spousal and

own disability are associated with increased loneliness (and in different ways for men and women), but did not test whether marital quality moderated these relationships. Unfortunately, we cannot test this possibility in NSHAP because information on spouses' health status was not collected.

Finally, we note the need for longitudinal studies in exploring the social context of disablement. A number of prior longitudinal studies have found high levels of negative marital quality and low levels of positive marital quality are associated with increased functional impairment and worse self-rated health (Choi & Marks, 2008; Hawkins & Booth, 2005; Umberson et al., 2006). The findings here are limited by the cross-sectional nature of this study. We are somewhat bolstered in our interpretation that positive marital quality is an important resource for buffering the effect of marital quality on loneliness by the absence of any direct correlation between functional limitations and either dimension of marital quality. Nevertheless, we cannot rule out alternative causal interpretations within the constraints of our data. Longitudinal data will provide significant leverage on this matter and also permit exploration of how marital quality promotes psychosocial well-being changes in the face of changes in functional status.

Overall, this study illustrates the importance of considering the social context in which disablement occurs. While most older adults are married or partnered, these relationships vary in quality and this has implications for psychosocial well-being. The marital relationship is a potential resource for coping with functional impairment and poor physical health (Cutrona, 1996); however, given normative expectations that spouses provide physical and emotional support, disabled older adults in lower quality marriages may be at risk of negative psychosocial outcomes. This risk is likely to grow among future cohorts of married older adults as institutional

supports for marriage and social connections to others have waned at the same time that marriage and relations between husbands and wives have become more individualistic (Amato et al., 2007; Waite & Lehrer, 2003). Understanding how marital quality and relationship characteristics, beyond simple marital status, are associated with physical, mental, and social well-being is becoming ever more important as older adults' relationship histories and experience become increasingly diverse.

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Table 1. Exploratory Factor Analysis of Marital Quality among Married Older Adults, Items and Corresponding Factor Loadings from the Rotated Oblique Factor Pattern Matrix and Factor Structure Matrix for Two-Factor Solution (N=1,500) ^a

Factor Pattern ^b		Factor Structure ^c		Questionnaire Items ^d
1	2	1	2	
0.35*	-0.05	0.38*	-0.24	1. “Some couples like to spend their free time doing things together, while others like to do different things in their free time... Do you [and partner] like to spend free time doing things together or doing things separately?”
0.60*	0.07	0.56*	-0.25	2. “How often can you open up to [partner] if you need to talk about your worries?”
0.55*	-0.01	0.56*	-0.31	3. “How often can you rely on [partner] for help if you have a problem?”
-0.04	0.55*	-0.34	0.57*	4. “How often does [partner] make too many demands on you?”
0.04	0.57*	-0.27	0.55*	5. “How often does [partner] criticize you?”
0.42*	-0.24	0.55*	-0.47*	6. “Taking all things together, how would you describe your [marriage/relationship] with [partner] on a scale from... very unhappy [to] very happy?”

Notes: ^a The six-items were subjected to exploratory factor analysis with the principle factor method used to extract the factors. Two factors were retained for oblique rotation and items with loadings of 0.35 or greater were considered meaningful. Factor 1 was designated as “positive marital quality” ($\alpha = 0.62$), and Factor 2 was designated as “negative marital quality” ($\alpha = 0.60$). The Factor Pattern loadings and the Factor Structure correlations suggested factorial complexity with Item 6, and accordingly, it is included in the reliability assessment of both factors. The inter-factor correlation $r = -0.54$. Standardized Scoring Coefficients were used to calculate estimated factor scores (Hatcher 1994); ^b Factor Pattern loadings are standardized regression coefficients for the unique contribution of each latent factor to the observed indicator—loadings greater than 0.35 are designated with a ‘*’; ^c Factor Structure correlations between the observed indicators and the latent factors—correlations greater than 0.35 are designated with a ‘*’.; ^d See text for details on response options and coding for each item.

Source: National Social Life, Health, and Aging Project (NSHAP).

Table 2: Model Variables, Coding, and Descriptive Statistics, Analytic Sample of Married Older Adults (N=1,500) ^a

Variable	Description and Coding	Mean	S.D.	Corr.
<i>Dependent Variable</i>				
Loneliness	UCLA Short Loneliness Scale. Summated score of three items assessing the frequency that R felt “lack [of] companionship,” “left out,” and “isolated from others” with responses to each of 1= “hardly ever (or never),” 2= “some of the time,” and 3= “often” ($\alpha = 0.82$). Items were recoded by subtracting one: range 0-6.	0.75	1.29	1.00
<i>Independent Variables</i>				
Functional Limitations	Count of any difficulty with seven activities of daily living, including walking one block, walking across a room, dressing, bathing, eating, getting and out of bed, and using the toilet (KR20 = 0.81): range 0 to 7.	0.70	1.51	0.07**
Marital Quality				
Positive Marital Quality	Estimated factor score; see Table 1 for description ($\alpha = 0.62$): range -3.42 to 0.69.	0.00	0.77	-0.40***
Negative Marital Quality	Estimated factor score; see Table 1 for description ($\alpha = 0.60$): range -0.75 to 2.52.	0.00	0.73	0.36***
<i>Control Variables</i>				
Age	Age of Respondent mean centered: range -9.94 to 18.06.	0.00	7.55	-0.05†
Female	Female (1=yes; 0=otherwise).	0.44	—	0.05*
Race/ Ethnicity				
White ^b	Non-Hispanic White (1=yes; 0=otherwise).	0.85	—	-0.10***
Black	Black (1=yes; 0=otherwise).	0.07	—	0.12***
Hispanic	Hispanic (1=yes; 0=otherwise).	0.06	—	-0.01
Other	Other/ Race Ethnicity (1=yes; 0=otherwise).	0.02	—	0.06*
Cohabiting	Relationship legal status. 1=Currently Cohabiting, 0=Currently Married.	0.03	—	0.02
Times Previously Married	Number of Times Previously Married: range 0 to ≥ 2 .	0.41	0.68	0.08**
<i>(Continued Below)</i>				

Table 2 (Continued)

Variable	Description and Coding	Mean	S.D.	Corr.
Education				
Less than High School	Less than High School (1=yes; 0=otherwise).	0.13	—	0.06*
High School ^b	High School or equivalent (1=yes; 0=otherwise).	0.25	—	0.00
Some College	Some post-secondary education (1=yes; 0=otherwise).	0.33	—	0.03
College and Beyond	Four-year degree or more (1=yes; 0=otherwise).	0.29	—	-0.08**
Income				
Less than \$25,000	Household income of < \$25,000 last year (1=yes; 0=otherwise).	0.14	—	0.08**
\$25,000 to < \$50,000	Household income of \$25,000 to < \$50,000 last year (1=yes; 0=otherwise).	0.28	—	0.04
\$50,000 to < \$100,000 ^b	Household income of \$50,000 to < \$100,000 last year (1=yes; 0=otherwise).	0.31	—	-0.09***
\$100,000 or More	Household income of ≥ \$100,000 last year (1=yes; 0=otherwise).	0.18	—	-0.04
Income Missing	Income Missing (1=yes; 0=otherwise).	0.08	—	0.04†
Social Integration				
Working	Working for pay (1=yes; 0=otherwise).	0.38	—	0.04
Religious Service Attendance	Frequency attended religious services in the past 12 months: responses coded from 0=never to 6= a few times per week.	3.30	2.25	-0.04†
Network Size	Number of persons in Respondent's discussion network, excluding spouse: range 0 to ≥ 5	2.77	1.60	-0.06*

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Notes: ^a All estimates were weighted to account for differential probabilities of selection and differential non-response; Mean is equivalent to the proportion coded 1 for dummy variables; S.D. = Standard Deviation (omitted for dummy variables); Correlation between variable and UCLA Short Loneliness scale; α = Cronbach's alpha for internal reliability of continuous measures; KR20= Kuder-Richardson Formula 20 for internal reliability of dichotomous measures; ^b Serves as reference category in multivariate analyses.

Source: National Social Life, Health, and Aging Project (NSHAP).

Table 3: The Association between Functional Limitations, Marital Quality and Loneliness among Married Older Adults, Tobit Regression Estimates (N=1,500) ^a

	Model 1	Model 2	Model 3	Model 4	Model 5
Functional Limitations	0.16**	0.16***	0.15**	0.12**	0.12**
Positive Marital Quality		-0.97***	-0.95***	-0.93***	-0.92***
Negative Marital Quality		0.67***	0.68***	0.69***	0.68***
Age ^b			-0.03**	-0.04***	-0.03**
Female			0.19	0.13	0.17
Race/ Ethnicity					
Black			0.89***	0.73**	0.74**
White ^c			—	—	—
Hispanic			0.06	-0.18	-0.20
Other			1.49***	1.51***	1.49***
Cohabiting			-0.42		
Times Previously Married			0.33**	0.32**	0.30**
Education					
Less than High School				0.38†	0.38†
High School ^c				—	—
Some College				0.03	0.05
College and Beyond				-0.17	-0.14
Income					
Less than \$25,000				0.01	0.00
\$25,000 to < \$50,000 ^c				—	—
\$50,000 to < \$100,000				-0.32*	-0.34*
\$100,000 or More				-0.45*	-0.48*
Income Missing				0.11	0.09
Social Integration					
Working					0.12
Religious Service Attendance					-0.01
Network Size					-0.05
Intercept	-1.02***	-0.94***	-1.27**	-1.05***	-0.92***
Sigma	2.76	2.43	2.38	2.36	2.36
Model Fit ^d					
Log Likelihood	-2079.09	-1952.22	-1932.11	-1923.53	-1922.60
Δ Model χ^2	8.84***	253.74***	40.22***	17.16*	1.86
Δ <i>df</i>	1	3	7	7	3

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Notes: ^a All estimates were weighted to account for differential probabilities of selection and differential non-response; ^b variable is mean-centered; ^c Serves as reference category; ^d Δ Model χ^2 is improvement in model fit and Δ *df* is the change in degrees of freedom relative to the preceding model; For Model 1 the comparison is to the null model without any predictors (not shown).

Source: National Social Life, Health, and Aging Project (NSHAP).

Table 4: The Moderating Effect of Marital Quality on the Association between Functional Limitations and Loneliness among Married Older Adults, Tobit Regression Estimates (N=1,500) ^a

	Model ^b
Functional Limitations	0.12**
Positive Marital Quality	-0.79***
Negative Marital Quality	0.77***
Marital Quality Interactions	
Positive Marital Quality \times Functional Limitations	-0.19*
Negative Marital Quality \times Functional Limitations	-0.12
Intercept	-0.88***
Sigma	2.51
Model Fit ^c	
Log Likelihood	-1810.10
Δ Model χ^2	225.00***
Δ <i>df</i>	2

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Notes: ^a All estimates were weighted to account for differential probabilities of selection and differential non-response; ^b Model also includes controls for age, female, race/ ethnicity, whether current partnership a cohabitation, the number of times previously married, education, income, working for pay, religious service attendance, and size of network (excluding spouse); ^c Δ Model χ^2 is improvement in model fit relative to the model excluding the interaction terms (See Model 5, Table 3).

Source: National Social Life, Health, and Aging Project (NSHAP).

NOTES

¹ Part of the failure to examine critically how marital quality affects psychosocial well-being among older adults may stem from the presumption that long-lasting marriages—given that duration is highly correlated with age—are necessarily “good” marriages because marriages of poorer quality will have been dissolved through divorce (Glenn, 1990). While such selection toward high quality marriages with duration may be true among young adults and more recent birth cohorts (Hatch and Bulcroft, 2004; but see Amato et al., 2007), it is not clear that the same can be said of current cohorts of older adults for whom marital dissolution was not as common. Moreover, a number of studies demonstrate that there is considerable heterogeneity in marital quality in marriages of all durations and that variations in marital quality are associated variations in physical health (Hawkins and Booth, 2005; Umberson et al., 2006).

² We might expect health-related stressors to have deleterious effects on marital quality among *younger* adults because such experiences would be non-normative or “off-time” (Hatch and Bulcroft, 2004) and their marriages would be of comparatively shorter durations, and thus would not have the benefit of sustained patterns of interaction, tested coping strategies, and mutual investments that we theorize make marital quality a potential resource among older adults.

³ Preliminary analyses of NSHAP respondents revealed the expected correlates for failure to return the Leave Behind Questionnaire (or, if returned, to provide complete responses to the UCLA Short-Loneliness Scale items). Male, black, Hispanic, unmarried, less educated, low income, and working respondents were less likely to return completed questionnaires and these factors are controlled in our multivariate models. Importantly, among married NSHAP respondents none of our primary explanatory variables—functional limitations, positive relationship quality, and negative relationship quality—were significantly associated with non-response.

⁴ About 3% of respondents were in cohabiting relationships. Preliminary analyses indicated that the inclusion of non-married cohabiting persons had no substantive influence on the results presented below. As a consequence, we make reference to married persons and marital quality throughout the text in order to simplify the discussion.

⁵ While some prior studies of loneliness have distinguished between the perceived adequacy of one’s social network and intimate companionship (de Jong Gierveld et al., 2009; van Baarsen et al., 2001), the UCLA Short Loneliness scale we use in the current study is a more general indicator corresponding to *overall* feelings of emptiness, isolation and abandonment (Cacioppo et al., 2003; Cohen, 2004; Cornwell and Waite, 2009a; Savikko et al., 2005).

⁶ In preliminary analyses, we also considered items that dealt with sexual satisfaction, including the extent to which the respondent finds their relationship physically pleasurable and satisfaction with the frequency of sexual activity with the partner (de Jong Gierveld et al., 2009; Korporaal et al., 2008), but various specifications of these item did not load significantly with either the positive or negative marital quality factors identified.

⁷ Marital history and marital duration are highly correlated ($r = -0.70, p < 0.001$) and preliminary analyses indicated that the indicator of marital history alone provided a slightly better model fit. This is likely because even the higher-order marriages of the NSHAP respondents are of comparatively long durations. Respondents in our sample have been married on average 37 years— with those in their first marriages having marital durations of 44 years on average, while those in second and third (or higher order) marriages have average marital durations of 23 and 17 years respectively.