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Yixin Chen

Thomas Hugh Feeley

University at Buffalo, The State University of New York, USA

Abstract

This study proposed that, among older adults, higher support and lower strain received from each of the four relational sources (spouse/partner, children, family, and friends) were associated with reduced loneliness and improved well-being and that loneliness might mediate the relationship between support/strain and well-being. Structural equation modeling was conducted using a national sample of adults aged 50 years and older ($N = 7,367$) from the Health and Retirement Study. Findings indicated that support from spouse/partner and friends alleviated loneliness, while strain from all the four sources intensified loneliness; higher support and lower strain from various sources directly and indirectly improved well-being, with indirect effects mediated through reduced loneliness. It was concluded that, in later life, various sources of support/strain engender distinct effects on loneliness and well-being, and loneliness serves as one of the psychological pathways linking support/strain to well-being.

Keywords

Interpersonal communication, loneliness, older adults, social contact, social interactions, social strain, social support, well-being

Corresponding author:

Yixin Chen, Department of Communication, University at Buffalo, Buffalo, NY 14260, USA.

Email: yixinche@buffalo.edu

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The United States is facing an aging population, with individuals aged 50 and older numbering over 99 million (i.e., 32% of the total U.S. population) (U.S. Census Bureau, 2012). Considering that a large number of Americans have entered older adulthood, it is essential to explore psychosocial determinants that may impact this population's well-being, an important health outcome involving optimal experience and functioning (Ryan & Deci, 2001). One unique risk factor relating to older adults' well-being is loneliness—one of the most painful of all human experiences, and a pervasive one among the elderly, with about 17% of Americans aged 50 years and older reporting feelings of loneliness (Cacioppo, Hawkley, & Thisted, 2010; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Sullivan, 1953; Theeke, 2010).

A number of factors have been found to influence loneliness and well-being in later life, such as levels of social support (i.e., positive social interactions) and social strain (i.e., negative social interactions) in social relationships (Newsom, Nishishiba, Morgan, & Rook, 2003; Newsom, Rook, Nishishiba, Sorkin, & Mahan, 2005; Shiovitz-Ezra & Leitsch, 2010). The aging process is often accompanied by a decline in physical and cognitive functions and a loss of social network members. As a result, this may increase older adults' need for social support and vulnerability to social strain, and it may also trigger or contribute to feelings of loneliness. Previous studies have examined either the unique impact of loneliness (e.g., Cacioppo et al., 2006, 2010) or the joint influence of social support and social strain on health outcomes among older adults (e.g., Newsom et al., 2003, 2005). However, the mechanisms by which these three factors function together to affect well-being in later life are still being tested, and the various sources of support and strain of older adults have not been examined simultaneously. The present study has two aims: the first is to examine the unique effects of social support and social strain received from various sources on loneliness and well-being among older adults; the second is to explore whether loneliness could account for the association between social support/social strain and well-being in later life.

Loneliness and well-being

Loneliness is a state of emotional distress accompanying perceived deficiencies in the quantity and/or quality of one's social relationships (Peplau & Perlman, 1982). Recently, Cacioppo, Hawkley, and colleagues articulated a theory of loneliness and health, arguing that loneliness has a unique and detrimental effect on physical and psychological health (e.g., Hawkley & Cacioppo, 2010). Studies on the aging population have generally supported this theory. For example, greater loneliness has been linked to increased systolic blood pressure (Hawkley, Thisted, Masi, & Cacioppo, 2010), increased depression (Cacioppo et al., 2010), and poorer physical health (Cornwell & Waite, 2009) among older adults.

Much research on the impact of loneliness in later life has been devoted to negative health outcomes, but overlooked positive psychological health outcomes, such as well-being (e.g., Cacioppo et al., 2006, 2010). There are many conceptualizations of well-being in the extant literature. The current study focuses on subjective well-being, defined as individuals' self-evaluation of their lives, as subjective well-being is considered an essential element of positive psychological health (Diener, Sapyta, & Suh,

1998). Studies have reported loneliness to be negatively associated with both health-related quality of life (Liu & Guo, 2007) and subjective well-being among older adults (Windle & Woods, 2004).

Social contact and loneliness

Loneliness may vary as a function of the amount of social contact one has (Gross, Juvonen, & Gable, 2002). Social contact is defined as individuals' daily social interactions (Jones, 1981). Major sources of social contact are marriage, partnership, family, and friendships (Berkman & Syme, 1994). Studies in the 1990s found that a low frequency of social contact with family and friends was associated with greater loneliness among the elderly (e.g., Bondevik & Skogstad, 1998; Holmén, Ericsson, Andersson, & Winblad, 1992; Mullins & Dugan, 1990). More recent research found that the frequency of contact with children and friends was not significantly related to loneliness among older adults (e.g., Routasalo, Savikko, Tilvis, Strandberg, & Pitkälä, 2006). These contradictory findings suggest that it may be premature to infer a causal relationship between social contact and loneliness in the aging population. It is possible that loneliness experienced in later life is not due to a low frequency of social contact but due to perceived lack of interpersonal intimacy or low quality of social relationships. The current study treats social contact as a control variable and operationalizes it as older adults' frequency of contact with children, family members, and friends.

Social support and social strain

The lack of intimate social contacts is more likely to induce loneliness than the lack of regular social contacts for older adults (Green, Richardson, Lago, & Shatten-Jones, 2001). Such intimate social contacts are important sources of social support in later life. Social support from an interpersonal communication perspective is understood as supportive behavior performed for an individual by others and is often assessed by an individual's perception of *received support* (Burlinson & MacGeorge, 2002; Goldsmith, 2004). Received support can be further categorized into emotional support, informational support, and instrumental support (House, 1981). Emotional support has been reported to be especially consequential, with significant physical and psychological health outcomes (Burlinson, 2003). Thus, the current study operationalizes social support as older adults' perception of emotional support (i.e., positive social interactions) received from their social network members (Newsom et al., 2003, 2005).

Research on social support in later life examines positive social interactions, which could be considered as one dimension of social relationships (Bengtson, Giarrusso, Mabry, & Silverstein, 2002). It should be noted that not all social relationships are beneficial and pleasant and that frequent social contact may actually increase the chances of conflicts, disputes, or strained relations (i.e., negative social interactions). Such negative social interactions among social relationships are referred to as social strain (Shiovitz-Ezra & Leitsch, 2010), social negativity (Bertera, 2005), or negative social exchanges (Newsom et al., 2003, 2005). Studies on the aging population have recommended that the independent effects of positive and negative social interactions

be examined simultaneously (Newsom et al., 2003; Shiovitz-Ezra & Leitsch, 2010). Thus, the current study treats social strain as an important dimension of social relationships and operationalizes it as older adults' perception of negative social interactions received from their social network members (Newsom et al., 2003, 2005).

Social support and social strain represent unique dimensions of social relationships (Bengtson et al., 2002). One would expect that social support and social strain are complementary, so that high levels of one imply low levels of the other; however, relationships can paradoxically embrace high support and high strain or low support and low strain. In any given relationship, an individual can feel loved, understood, or cared for, and also feel rejected, criticized, or ignored. This love-hate dynamic is often evident within families and has been captured by the family solidarity-conflict model proposed by Bengtson, Rosenthal, and Burton (1995).

The solidarity-conflict model

The solidarity-conflict model contends that intergenerational relationships consist of seven dimensions—association, affect, consensus, function, norms, family structure, and conflict—with the first six classified as solidarity (Bengtson et al., 1995). This framework emphasizes that intergenerational relationships are multidimensional (Silverstein & Bengtson, 1997) and that each of the seven dimensions is distinct (Bengtson et al., 2002). The model was later challenged by Luescher and Pillemer (1998), who argued that the concept of ambivalence—mixed and contradictory feelings toward a relationship—is an alternative and a more useful perspective for studying intergenerational relations. The ambivalence concept was viewed by Bengtson et al. (2002) as complementing rather than competing with the solidarity-conflict model.

Although the solidarity-conflict model with the addition of the ambivalence concept has mostly been used for studying relationships between generations, such as older parents' relations with their adult children (e.g., Lowenstein, 2007), it is also applicable for the wider social network of older adults, such as the relationship with a spouse, a family member, or a friend. Similar to intergenerational relationships, any social relationship of older adults can potentially incorporate solidarity, conflict, and ambivalence. There is empirical evidence showing that solidarity, conflict, and ambivalence coexist among older adults' family and nonfamily relationships (Fingerman, Hay, & Birditt, 2004).

It is beyond the scope of the present study to incorporate all dimensions delineated by the paradigms of solidarity-conflict and ambivalence. However, three important dimensions from these paradigms—association (frequency of social contact), affect (feelings of emotional intimacy), and conflict (feelings of tension or criticism)—corresponding to social contact (treated as a control variable), social support, and social strain separately are included in the present study. Ambivalence is not considered in the current study, as the concept of this construct needs to be refined and it is difficult to measure (Luescher, 2004; Rappoport & Lowenstein, 2007).

Effects of social support and social strain on loneliness

Previous studies involving social support and loneliness in the aging population suggest that social support is generally associated with lower loneliness, if social support is

assessed by a global measurement without differentiating sources of support (e.g., Cacioppo et al., 2010). However, findings are mixed when different sources of support are delineated. For example, Shiovitz-Ezra and Leitsch (2010) reported that social support from family was a negative predictor of loneliness, while social support from friends was not a predictor of loneliness, in a sample of adults aged 57–85 years. Stevens and Westerhof (2006) found that only social support from partner and friends was significantly related to lower levels of loneliness, whereas social support from family members was unrelated, among a sample of adults aged 40–85 years. These findings suggest support from different sources may exhibit different effects on loneliness, and it appears necessary to differentiate sources of support in research on older adults.

While research has established that social support protects older adults from loneliness (e.g., Cacioppo et al., 2010), only two studies have examined the link between social strain and loneliness. A study by Stevens and Westerhof (2006) found that negative interactions with one's partner and non-kin were related to higher levels of loneliness. A later study by Shiovitz-Ezra and Leitsch (2010) reported that social strain from family was positively related to loneliness, but social strain from friends was unrelated. Taken together, these findings indicate that social strain from different sources may yield different effects on loneliness, and higher social strain from any specific source is likely to create a greater sense of loneliness for older adults. The current study sets out to address this possibility.

Effects of social support and social strain on well-being

It is proposed that the effects of different sources of social support/social strain on well-being be examined independently, as each type of relationship may exhibit distinct influences on critical outcomes. For example, the spousal relationship generally has centrality status among all possible social relationships. In the support network of older adults, the spouse is usually the preferred source of social support, if available (Cantor, 1979). Among older adults, the spousal relationship was also reported as the most positive and negative, and its quality was more strongly related to well-being than the quality of relationships with family or friends (Antonucci, Lansford, & Akiyama, 2001). In addition, the nature of marriage and kinship connections gives relationships with spouse and children an involuntary character, which can create contradictory sentiments (e.g., affection vs. conflict) in these relationships (Hogerbrugge & Komter, 2012). A national longitudinal study has reported that low social support and high social strain from spouse or child were associated with increased mortality among middle-aged and older adults (Birditt & Antonucci, 2008).

In contrast to family relationships, a defining feature of friendships is their voluntary character, such that individuals have the option to withdraw from an unsatisfying friendship (Lawton, Silverstein, & Bengtson, 1994). In fact, some extended family relationships may also exhibit voluntary character: individuals may discontinue a relationship with an extended family member if the relationship is not perceived as beneficial. Thus, friendships and extended family relationships are less likely to exhibit conflicts or tensions (examples of social strain), compared to family relationships with spouse or children. There is evidence that voluntary support from friends such as

companionship can improve daily well-being in later life (Sherman, de Vries, & Lansford, 2000). Taken together, there is compelling reason to differentiate and examine the various sources of social support/social strain when studying the well-being of older adults.

Loneliness as a mediating factor

The exact mechanisms by which social support, social strain, and loneliness jointly influence well-being in older adulthood remain unclear. Berkman, Glass, Brissette, and Seeman (2000) presented a conceptual model of how social networks impact health, arguing that it is “a cascading causal process beginning with the macro-social to psychobiological processes that are dynamically linked together” (p. 846). Their conceptual model identifies psychological states and traits (e.g., self-esteem and self-efficacy) as one of the proximate pathways through which social support influences health status.

Berkman et al.’s (2000) model does not list loneliness as a possible psychological pathway, but there is empirical evidence that social support influences health through loneliness. For example, Stroebe, Stroebe, Abakoumkin, and Schut’s (1996) study indicated that the impact of social support on lower psychological symptoms (depression and somatic complaints) was partially mediated by reduced loneliness. Two studies by Segrin and Domschke (2011) and Segrin and Passalacqua (2010) found the relationship between social support and improved health was fully mediated through decreased loneliness. These findings thus complemented Berkman et al.’s (2000) model, indicating that loneliness may be one of the psychological pathways through which social support affects physical or mental health.

Although Berkman et al.’s (2000) conceptual model does not incorporate social strain, the authors remarked that not all relationships are positive and that social relationships may have powerful impacts on health through acts of abuse, violence, and trauma (examples of negative social interactions). A recent study by Fiori and Consedine (2013) on first-year college students reported that effects of positive (or negative) social exchanges on positive (or negative) emotional well-being were partially mediated by loneliness. This finding suggests loneliness serves as an important mediating factor in the relationships between social support/social strain and critical health outcomes. Relying on Berkman et al.’s (2000) conceptual model and empirical findings, we propose a filtration model in which distal social relationship factors (social support and social strain) operate through proximal psychological factors (e.g., loneliness) to influence well-being. The underlying assumption is that distal social relationship factors will have an impact on well-being to the extent that they filter down to affect psychological states such as loneliness. In light of this reasoning, lower support and higher strain may each have an indirect detrimental effect on well-being through increased loneliness, which itself is deleterious to well-being in later life.

Research hypotheses and questions

The initial aim in this investigation is to test the independent effects of social support and social strain received from four sources (i.e., spouse/partner, children, family members, and

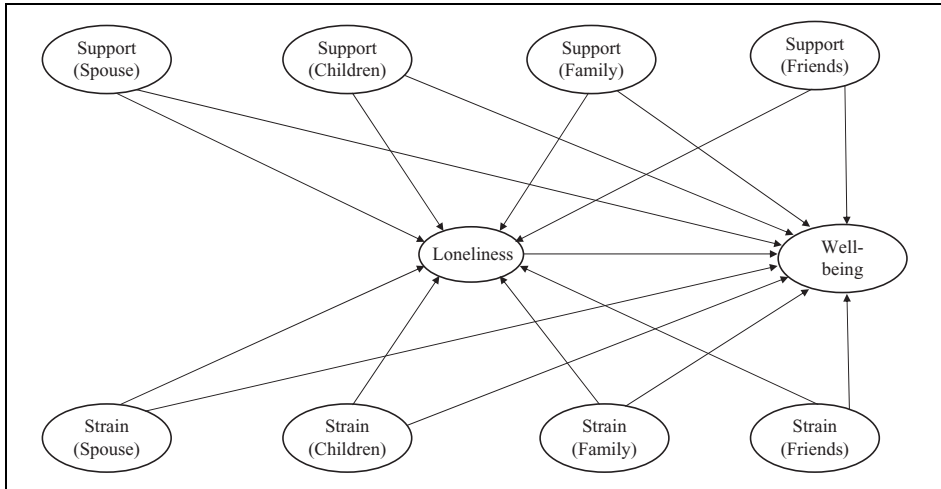


Figure 1. Hypothesized theoretical model showing the relationship between each construct.

friends) on loneliness and well-being among older adults, as no single existing study in this inquiry has included different sources of support and strain. Two hypotheses are posed:

- H1:** Higher social support from each of the four sources is associated with (a) lower loneliness and (b) higher well-being.
- H2:** Higher social strain from each of the four sources is associated with (a) higher loneliness and (b) lower well-being.

The second aim is to explore the possible mediating role of loneliness in the relationship between each source of support/strain and well-being in later life. Given that the present study is the first attempt in this inquiry and that loneliness may serve as one of the psychological pathways linking support/strain to well-being, two research questions (RQs) are posed:

- RQ1:** Does loneliness mediate the relationship between each of the four sources of social support and well-being?
- RQ2:** Does loneliness mediate the relationship between each of the four sources of social strain and well-being?

Figure 1 shows the hypothesized theoretical model with direct and indirect paths linking four sources of support/strain to loneliness and well-being.

Method

Participants

Data for this study came from the 2008 Health and Retirement Study (HRS) conducted from February 2008 through February 2009 (Health and Retirement Study, 2010; visit

<http://hrsonline.isr.umich.edu>). The HRS is a national longitudinal study of the economic, health, marital, and family status, as well as public and private support systems, of Americans aged 50 years and older. The HRS was sponsored by the National Institute on Aging (grant number NIA U01AG009740) and was conducted by the University of Michigan, USA.

Participants were 7,367 older adults who completed phone interviews regarding demographics and health conditions and the Leave-Behind Questionnaire in the 2008 HRS. The Leave-Behind Questionnaire collected additional information from participants without adding to the interview length, and included questions on level of participation in general activities, relationships with others, and views on both general and specific aspects of life. Participants' ages ranged from 50 to 108 years ($M = 69.40$, $SD = 10.43$), and of the total, 3,022 (40.3%) were male. Participants' years of education ranged from 0 to 17 years ($M = 12.47$, $SD = 3.22$). A majority of participants were married (60.3%) and most of them were born in the United States (89.7%).

Measures

Demographic variables and self-reported health status. Age, gender, education, marital status, and self-reported health status were included in the analysis as control variables. Self-reported health status was assessed by one item: "Would you say your health is . . . ?" The response options ranged from 1 (*excellent*), 2 (*very good*), 3 (*good*), 4 (*fair*), to 5 (*poor*). This item was re-coded so that a higher value indicates a better health status.

Social contact. The current study operationalizes social contact using three indices: (1) social contact with children, (2) social contact with family members, and (3) social contact with friends. Each of the three indices was measured by three items, which took the general form: "On average, how often do you do *each of the following* with any of your children/family members/friends, not counting any who live with you?" "*Each of the following*" ranged from "meet up (include both arranged and chance meetings)," "speak on the phone," to "write or e-mail." The response options ranged from 1 (*three or more times a week*), 2 (*once or twice a week*), 3 (*once or twice a month*), 4 (*every few months*), 5 (*once or twice a year*), to 6 (*less than once a year or never*). Items were re-coded so that a higher value indicates a higher frequency of social contact. To reduce the number of predictors and facilitate the analysis, social contact with each source was calculated by adding up the frequency of communicating with each source using three communication channels (meeting up, speaking on the phone, and writing or e-mailing). This procedure generated three indices of social contact mentioned above.

Social support. Social support was measured by three items of a social support scale developed by Walen and Lachman (2000). Similar measurements were used by previous studies and were found to be reliable (e.g., Bertera, 2005). Three items assessing social support include: "How much do they really understand the way you feel about things?" "How much can you rely on them if you have a serious problem?" and "How much can you open up to them if you need to talk about your worries?" Items were asked in four loops in reference to participants' spouse/partner, children, family members, and friends.

The response options ranged from 1 (*a lot*), 2 (*some*), 3 (*a little*), to 4 (*not at all*). Items were re-coded so that a higher value indicates a higher level of social support. Social support from each of the four sources was calculated separately by the average of the above three items measuring support from the corresponding source. This procedure generated four scales of social support and their reliabilities were: $\alpha = .81$ for support from spouse/partner; $\alpha = .82$ for support from children; $\alpha = .86$ for support from family members; and $\alpha = .83$ for support from friends.

Social strain. Social strain was measured by four items of a social strain scale developed by Walen and Lachman (2000). Similar measurements were used by previous studies and were recommended as reliable scales (e.g., Bertera, 2005). Four items measuring social strain were: "How often do they make too many demands on you?" "How much do they criticize you?" "How much do they let you down when you are counting on them?" and "How much do they get on your nerves?" Items were asked in four loops in reference to participants' spouse/partner, children, family members, and friends. The response options ranged from 1 (*a lot*), 2 (*some*), 3 (*a little*), to 4 (*not at all*). Items were re-coded so that a higher value indicates a higher level of social strain. Social strain from each of the four sources was calculated separately by the average of the above four items measuring strain from the corresponding source. This procedure generated four scales of social strain and their reliabilities were: $\alpha = .79$ for strain from spouse/partner; $\alpha = .78$ for strain from children; $\alpha = .79$ for strain from family members; and $\alpha = .76$ for strain from friends.

Loneliness. Loneliness was assessed by a shortened version of the UCLA Loneliness Scale (Version 3) (Russell, 1996), which has been well established and has been found to have excellent psychometric properties in previous studies (e.g., Segrin & Domschke, 2011). This measurement took the general form: "How much of the time do you feel . . . ?" The four items for completing this question were: "you lack companionship," "left out," "isolated from others," and "alone." The response options ranged from 1 (*often*), 2 (*some of the time*), to 3 (*hardly ever or never*). Items were re-coded so that a higher value indicates a higher level of loneliness. The reliability of this measurement was $\alpha = .85$.

Well-being. Well-being was assessed by the Satisfaction with Life scale (Diener, Emmons, Larsen, & Griffin, 1985), which has been widely used by previous studies as a measure of well-being with favorable psychometric properties (e.g., Steinfeld, Ellison, & Lampe, 2008). This scale contains the following five items: "In most ways my life is close to ideal," "The conditions of my life are excellent," "I am satisfied with my life," "So far, I have gotten the important things I want in life," and "If I could live my life again, I would change almost nothing." The response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). A higher value indicates a higher level of well-being. The reliability of this scale was $\alpha = .88$.

Analysis plan

The hypothesized model shown in Figure 1 was tested using structural equation modeling (SEM). The SEM analysis was conducted using AMOS software (version 20.0) and

maximum likelihood estimation. Figure 1 depicts 17 causal paths without showing the measurement portion of the model. In addition to the causal paths shown in Figure 1, the model also specifies covariances between each pair of the eight exogenous variables (i.e., four sources of support and four sources of strain). The covariances are not shown in Figure 1 to maintain a better overview of the model. The direct and indirect effects of four sources of support and four sources of strain on well-being (the outcome variable) were estimated, along with the direct effects of these eight exogenous variables on loneliness (the mediator) and the direct effect of loneliness on well-being.

As χ^2 is usually significant with large samples (Kenny, 2012), several alternative fit indices were examined to assess model fit. These fit indices included the comparative fit index (CFI), the Tucker–Lewis index (TLI, also known as the non-normed fit index), the root mean square error of approximation (RMSEA). The CFI and the TLI values larger than .90 and .95 are considered acceptable and excellent fit (Kline, 1998), and the RMSEA values smaller than .05 and .08 are considered close fit and reasonable fit (McDonald & Ho, 2002).

Results

Descriptive statistics of study factors and a zero-order correlation matrix are provided in Table 1. Results of the SEM analysis indicated that the model provided a good fit to the data, CFI = .92, TLI = .90, and RMSEA = .043 (90% confidence interval (CI) = .042–.044), although the χ^2 was significant at $\chi^2(584, N = 7,367) = 8,425.08, p < .001$, and $\chi^2/df = 14.43$. Overall, four sources of support and four sources of strain accounted for approximately 41% of the variance in loneliness ($R^2 = .408$); four sources of support, four sources of strain along with loneliness explained approximately 28% of the variance in well-being ($R^2 = .284$).

The standardized path coefficients including direct effects and indirect effects are presented in Table 2. As shown in Table 2, support from spouse ($\beta = -.405, p < .001$) and support from friends ($\beta = -.08, p < .001$) were both significantly related to loneliness, but support from children and support from family were not. Strain from spouse ($\beta = .118, p < .001$), strain from children ($\beta = .092, p < .01$), strain from family ($\beta = .062, p < .05$), and strain from friends ($\beta = .117, p < .001$) were all significantly related to loneliness.

Table 2 also shows that the direct effects of support from spouse ($\beta = .126, p < .001$), support from children ($\beta = .117, p < .001$), strain from spouse ($\beta = -.125, p < .001$), and loneliness ($\beta = -.307, p < .001$) on well-being were significant; other direct paths were not significant. In addition, Table 2 shows that the indirect effects of support from spouse ($\beta = .124, p < .001$) and support from friends ($\beta = .024, p < .001$) on well-being through the pathway of loneliness were both significant, but the indirect effects of support from children and support from family were not; the indirect effects of strain from spouse ($\beta = -.036, p < .001$), strain from children ($\beta = -.028, p < .01$), strain from family ($\beta = -.019, p < .05$), and strain from friends ($\beta = -.036, p < .001$) on well-being through the pathway of loneliness were all significant.

In sum, support from spouse/partner and friends reduced loneliness, while support from children and family failed to do so; strain from all four sources increased

Table 1. Descriptive statistics and zero-order correlation matrix of study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	—	-.03*	-.14**	-.19**	-.10**	-.06**	-.05**	-.09**	.05**	.18**	.06**	-.04**	-.07**	-.22**	-.20**	-.15**	-.02	.08**
2. Gender		—	-.04**	-.24**	.01	.18**	.14**	.15**	-.18**	.12**	.11**	.21**	.09**	.04**	.06**	-.02	.07**	-.02
3. Education			—	.11**	.31**	.18**	.07**	.26**	.14**	-.01	-.06**	.08**	-.07**	-.05**	-.06**	.06**	-.13**	.11**
4. Marital status				—	.12**	.05**	-.03*	-.05**	.18**	-.03*	-.09**	-.11**	.01	-.04**	-.03**	-.05**	-.25**	.18**
5. Health status					—	.14**	.07**	.20**	.15**	.10**	.03*	.09**	-.11**	-.13**	-.13**	-.12**	-.25**	.35**
6. Contact with children						—	.43**	.38**	.05**	.39**	.13**	.14**	-.01	-.07**	-.03*	-.05**	-.13**	.13**
7. Contact with family							—	.30**	.02	.18**	.49**	.15**	-.02	-.02	.02	.03*	-.08**	.06**
8. Contact with friends								—	.07**	.08**	.07**	.39**	-.03	-.03	.00	.04**	-.14**	.13**
9. Support from spouse									—	.20**	.10**	.11**	.49**	-.18**	-.17**	-.16**	-.45**	.34**
10. Support from children										—	.39**	.25**	-.12**	-.39**	-.19**	-.14**	-.22**	.24**
11. Support from family											—	.29**	-.08**	-.15**	-.19**	-.06**	-.14**	.12**
12. Support from friends												—	-.08**	-.05**	-.01	-.07**	-.14**	.10**
13. Strain from Spouse														.36**	.30**	.31**	.39**	-.30**
14. Strain from children														—	.52**	.42**	.29**	-.24**
15. Strain from family															—	.48**	.28**	-.20**
16. Strain from friends																—	.27**	-.16**
17. Loneliness																	—	-.41**
18. Well-being																		—
Mean	69.84	1.59	12.47	.60	3.08	11.79	9.95	11.17	3.44	3.27	2.90	3.06	1.97	1.69	1.57	1.41	1.50	4.95
SD	9.95	.49	3.23	.49	1.10	3.05	3.22	3.18	.68	.73	.88	.75	.69	.64	.63	.49	.54	1.52

* $p < .05$, ** $p < .01$.

Table 2. Standardized path coefficients from structural equation modeling analysis.

Predictors	Standardized direct effects on loneliness	Standardized direct and indirect effects on well-being	
		Direct	Indirect
Support from spouse	-.405***	.126***	.124***
Support from children	-.038	.117***	.012
Support from family	-.013	-.027	.004
Support from friends	-.08***	.015	.024***
Strain from spouse	.118***	-.125***	-.036***
Strain from children	.092**	-.023	-.028**
Strain from family	.062*	-.046	-.019*
Strain from friends	.117***	.049	-.036***
Loneliness		-.307***	

* $p < .05$, ** $p < .01$, *** $p < .001$.

loneliness; higher support and lower strain from spouse/partner directly and indirectly improved well-being, with indirect effects mediated through reduced loneliness; higher support from children was directly associated with higher well-being; lower loneliness fully mediated the effects of higher support from friends and of lower strain from children, family, and friends on higher well-being. Thus, H1a, H1b, and H2b were partially supported, and H2a was supported. Loneliness served as a partial mediator linking support/strain to well-being.

Alternative models

Demographics and three sources (children, family members, and friends) of social contact both serve as potential alternative explanations, variables that could potentially account for the effects of social support, social strain, and loneliness on well-being. Two alternative models using the proposed model (Figure 1) as the baseline model were tested. The first alternative model added demographics and self-reported health status. Fit statistics indicated that this alternative model did not have a better fit to the data than the baseline model, CFI = .91, TLI = .88, and RMSEA = .042 (90% CI = .041–.043); the χ^2 was significant at $\chi^2(719, N = 7,367) = 10,043.26, p < .001$, and $\chi^2/df = 13.97$.

The second alternative model added three sources (children, family members, and friends) of social contact. Fit statistics indicated that this second alternative model did not provide a better fit to the data than the baseline model, CFI = .82, TLI = .79, and RMSEA = .055 (90% CI = .055–.056); the χ^2 was significant at $\chi^2(911, N = 7,367) = 21,498.74, p < .001$, and $\chi^2/df = 23.56$. Thus, the proposed baseline model provided a more parsimonious fit for the data.

Discussion

This study examined the unique effects of various sources of social support/social strain on loneliness and well-being in a national sample of older adults. Results indicated that

loneliness is a unique negative predictor of well-being and exerted the strongest effect on well-being. The findings with respect to social support and social strain were mixed. Specifically, social support from one's spouse/partner and friends alleviated loneliness, with spousal support exhibiting a much stronger effect than friend support; social strain from all four sources intensified loneliness. Social support had a stronger effect on well-being than did social strain, and support from one's spouse/partner was the most important source for improved well-being, followed by support from children, and then support from friends. Furthermore, social strain from one's spouse/partner showed the strongest negative effect on well-being among all sources of strain. Finally, higher support and lower strain directly and indirectly improved well-being, with indirect effects mediated through reduced loneliness.

Study contributions

Three contributions of this study warrant mention. First, social support and social strain were examined both simultaneously and separately as antecedents of loneliness and well-being. It is widely known that social support serves as a coping resource to protect individuals' physical and mental health (Cohen & Wills, 1985). However, the possible independent effect on positive psychological health (e.g., well-being) resulting from social strain is less understood. The present findings indicated that both social support and social strain exhibited direct effects on well-being and that social support had a stronger association with well-being than did social strain. These findings are inconsistent with previous studies, which reported that only social strain was positively related to depression, while social support was unrelated (e.g., Mavandadi, Sorkin, Rook, & Newsom, 2007), or that social strain had a larger impact on mental health indicators (i.e., anxiety and mood disorders) than did social support (e.g., Bertera, 2005).

A likely explanation for this discrepancy is the sampling difference. For example, Bertera's (2005) study was based on a national sample of young and middle-aged adults with a high prevalence of psychiatric disorders. Individuals with psychiatric disorders may be more vulnerable to the impact of social strain, as it may entail more stress and anxiety, which intensify preexisting psychological symptoms. The current investigation was based on a national sample of older adults, and thus these findings are generalizable to the population of older adults in the US. A second explanation may be the differences of the measurements on social support and social strain. For instance, Mavandadi et al.'s (2007) study used a global measure of social support consisting of four types of support: companionship, emotional, instrumental, and informational support. In contrast, the social support measure in the present study focused on emotional support. We consider examining each type of support separately a better practice, as existing research has documented that different types of support may exert distinct effects on well-being (Reinhardt, Boerner, & Horowitz, 2006). Still a third reason for these varied findings may be the different choices of outcome variables. For example, the outcome variables in Bertera's (2005) study were anxiety and mood disorders and the one in Mavandadi et al.'s (2007) study was depression. These negative psychological health outcomes may be more sensitive to the impact of social strain than social support. In contrast, the well-being outcome in our study represents positive

psychological health, which may be subjected to the influences of both social support and social strain.

Although the current finding that social support yielded a stronger effect on well-being than social strain is inconsistent with the previous findings mentioned above, this finding is in line with socioemotional selectivity theory (SST). SST argues that individuals' selection and pursuit of social goals are determined by their perception of time (Carstensen, Isaacowitz, & Charles, 1999). According to SST, when individuals get older, they may perceive time as limited and are consequently motivated to reduce their range of social contacts and focus on relationships that are emotionally rewarding (Carstensen et al., 1999). As the current participants were in later life, negative social interactions might become less salient for them, and thus have comparatively less impact on well-being than positive social interactions (Birditt, Jackey, & Antonucci, 2009).

A second contribution of this study is the method of categorizing and accounting for the various sources of support and strain (i.e., spouse/partner, children, family members, and friends). This practice is important for two reasons. The first reason is that it revealed that only social support from spouse/partner and friends reduced loneliness, while social support from children and family failed to do so. This finding suggests that loneliness may be a two-dimensional construct and is in line with Weiss' (1973) typology of emotional and social loneliness, which argues that emotional loneliness results from an absence/deficiency of intimate relationships, while social loneliness stems from a lack of general social relationships. It is possible that among older adults, the intimacy with a spouse/partner alleviates emotional loneliness, while a social network of friends diminishes social loneliness. The finding that lower levels of support received from spouse/partner had a greater influence on loneliness than did lower levels of support received from friends indicates that emotional loneliness is a more pervasive problem than is social loneliness in later life.

The second reason is that the extant research on the impact of social relationships on older adults' health or well-being failed to differentiate sources/providers of support and strain (e.g., Mavandadi et al., 2007; Newsom et al., 2005). Although some studies examined different providers of support, they did not include social strain in their investigations (e.g., Merz & Huxhold, 2010). The decision to include these four sources generated richer results and revealed varied strengths of association between social support/social strain and well-being in later life.

One important finding is that support from friends is beneficial for older adults' well-being, while support from family is not significant. This finding is inconsistent with Merz and Huxhold's (2010) study that reported emotional support from kin was significantly and positively related to well-being, while emotional support from non-kin was insignificant, among older adults. One possible reason is that our study differentiated children and family members among kin members, while Merz and Huxhold (2010) did not. As indicated by our findings, support from children significantly improved older adults' well-being. It appears that older adults rely more on children for social support, as children may be perceived as much closer than other family members, with whom relationships may be more distant. Also, Merz and Huxhold (2010) examined support from non-kin, which may include friends and acquaintances, while we only examined

support from friends. Perhaps for older adults, only support from non-kin who are considered friends is beneficial for well-being. Our findings suggest that a more nuanced approach may be needed to tease out the complex relationships between different sources of support and well-being in later life.

In addition, our findings indicated that spouse/partner is the most important source of both social support and social strain. This finding is in line with the solidarity–conflict model, which argues that affection and conflict can coexist among close family relationships (Bengtson et al., 1995). This finding is also consistent with Birditt et al.'s (2009) study, which suggested that the relationship with spouse/partner most likely exhibits negative patterns compared to relationships with children or friends among older adults.

A third contribution of this study is that it tested whether loneliness mediates the relationship between social support/social strain and well-being. There are likely numerous mechanisms through which social support promotes well-being. Our findings clearly indicated that part of the effect of social support on well-being is mediated by reduced loneliness. Perhaps social support provided to older adults reassures them that they are loved, needed, and cared for, and such supportive messages prevent or reduce loneliness, which itself has a deleterious effect on well-being. On the other hand, our findings justified that there is a possible pathway linking social strain to well-being through increased loneliness. In contrast to the caring and supportive messages sent by social support, social strain experienced by older adults likely sends the message that they are unloved, unwanted, or neglected, and such hurtful messages actually increase the likelihood of feeling lonely, which in turn decreases their well-being. In addition, the finding that loneliness serves as a mediator in the relationship between social support/social strain and well-being supports Berkman et al.'s (2000) conceptual model of how social networks impact health. Based on our findings, it appears that social support and social strain are distal factors and that part of their effects on health outcomes are mediated through the pathway of more proximal psychological factors (e.g., loneliness).

Theoretical implications

Findings from the present study have three implications for the development and testing of theories in this area of inquiry. First, the present study found that social support alleviated loneliness, while social strain intensified loneliness; thus, it appears necessary for theories of loneliness (e.g., Hawkley & Cacioppo, 2010) to take into account the deleterious impact of negative social interactions. Incorporating social strain into theories of loneliness promises to provide a full-range understanding as to the independent impacts of positive and negative aspects of social relationships on the occurrence of loneliness. Second, as social support and social strain received from different sources exhibit distinct impacts on loneliness and well-being, this may suggest that future research on social relationships should differentiate support/strain from various sources, rather than using a global measure consisting of support/strain from all possible providers. Clearly, a more fine-grained distinction among support/strain providers would create a more nuanced picture of the complex relationships among social support, social strain, loneliness, and well-being. Third, as the current study found that social support and social strain both exhibited direct and indirect effects on well-being, a partial

mediational model may be more appropriate to understand the mechanism by which social support and social strain act on well-being, in addition to the well-established main-effect and buffering models (Cohen & Wills, 1985). This finding may also prompt researchers to explore other potential mediators between social support/social strain and well-being.

Practical implications

In practice, the current findings have important implications for developing intervention strategies toward the improvement of well-being among older adults. As psychosocial factors (social support, social strain, and loneliness) were found to have a significant impact on well-being in older adulthood, health interventions targeting older adults should focus on enhancing support and minimizing strain among social relationships in an effort to alleviate feelings of loneliness. Specifically, these interventions might be implemented at both interpersonal and group levels.

At the interpersonal level, intervention programs should focus on maintaining older adults' positive interactions with their existing close social contacts. Specifically, intervention approaches can be directed at encouraging close contacts of older adults to provide companionship, make home visits, or send caring and supportive messages through phone calls/e-mails. Such intervention programs should first target older adults' spouse and children for two reasons. One reason is that spouse and children are the most important sources of social support, as shown by the present findings. Another reason is that individuals in later life may constrain their social contacts to those with whom they feel closely connected, as suggested by SST (Carstensen et al., 1999). Spouse and children may become especially important in fulfilling the roles of intimate social contacts in later life; thus, support from these sources may be more effective in improving the well-being of older adults than from other sources (e.g., non-kin).

At the group level, intervention programs could help older adults to form support groups among peers. A friendship enrichment program in the Netherlands has been successful in helping older women to cope with loneliness (Stevens, 2001). Beneficent friendships built with other older adults in these support groups may compensate for the absence of close social contacts and thus buffer feelings of loneliness. Because of perceived similarities, support from peers may be more effective in alleviating loneliness and improving well-being among support recipients. In addition, such self-help groups could serve as a monitoring system for any negative interactions, such as domestic violence, abuse, or neglect, in the social relationships of older adults, with the aim of eliminating or reducing social strain and preventing its recurrence in the future.

Limitations

Several limitations of this study should be considered when interpreting findings. First, this study operationalized social support as emotional support, but did not examine other types of support, such as instrumental support and informational support, as measurements on the latter two types of support were not available in the 2008 HRS. Although existing literature has suggested that emotional support is most consequential (Burlleson,

2003), including all types of support in the analysis may provide an optimal view of the independent effect of each type of support, as different types of support may have distinct effects on well-being (Reinhardt et al., 2006). Similarly, social strain in the present study was operationalized as a measure opposite to emotional support, while other unsupportive behaviors, such as failure to offer instrumental support and bad/unwanted advice and information, were not examined (Newsom et al., 2005).

Second, this study considered social contact, social support, and social strain, which represent three important dimensions of social relationships. However, there are likely other dimensions (e.g., consensus and ambivalence), according to the solidarity–conflict model (Bengtson et al., 1995) and the ambivalence paradigm (Luescher & Pillemer, 1998). Third, loneliness in this study was measured by a shortened version of the UCLA loneliness scale, which treated loneliness as a unidimensional construct (Russell, 1996). It is possible that loneliness is a multidimensional construct, consisting of emotional loneliness and social loneliness (Weiss, 1973). Finally, although loneliness was found to partially mediate the relationship between social support/social strain and well-being, other factors (e.g., perceived control) may also act as potential mediators in such relationships (Windle & Woods, 2004) and need to be considered in conjunction with loneliness. It should also be noted that the causal relationships among social support/social strain, loneliness, and well-being cannot be inferred due to the correlational and cross sectional nature of this study.

Conclusion

This study contributes to the gerontology literature by highlighting the distinct associations of positive and negative social interactions with loneliness or well-being. Findings are also important in terms of the identification of the independent association of each relational source of social support/social strain with loneliness or well-being, and the justification of the role of spouse and children as the most important sources of support in later life. Additionally, this study evinces that enhanced support and diminished strain directly and indirectly relate to improved well-being, and that the indirect relationships are mediated through reduced loneliness. Health interventions are recommended at the interpersonal and group levels, with the aims of alleviating loneliness and improving the well-being of older adults. Future research may want to examine other types of received support/strain as well as other dimensions of social relationships (e.g., ambivalence), differentiate between emotional loneliness and social loneliness, explore other potential mediators, and conduct experimental studies to further investigate the relationships among social support, social strain, loneliness, and well-being in the aging population.

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